Versions of De-industrialization

A model-based analysis of structural change (1973-2008)

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Abstract

The term ‘de-industrialization’ stands for an element of structural change, indicating some form of decline within the secondary sector of a national economy. Sociologists use relative decline of manufacturing as their standard definition while economists often consider reductions in sectoral output as equally or even more important. There is a variety of other current descriptions. As a key element of this thesis, rigid definitions were constituted and utilized in two complementary models of de-industrialization. These were tested by macroeconomic data for 12 mature and 25 emerging countries, covering the years 1973-2008 with successive 15 + 5 +15-year sub-periods.

Productivity was identified as the key driver and indicator for success of the manufacturing sector. It was found that the country-specific maximum in relative employment in manufacturing is reached at a threshold productivity that can be calculated by two linear functions of productivity over time, related to mature and emerging economies, respectively.

On the basis of the model-based findings and additional socio-economic analyses, different paths of industrial development were distinguished for mature economies (i.e. fully industrialized states beyond their maximum relative employment in manufacturing) and emerging economies (i.e. states that have not yet industrialized to their full potential) with regard to their final outcome, i.e. the sectoral parameters and the resulting GDP per capita, employment and trade. From these findings, lessons to be learnt for policy makers were derived.

Author's declaration

I declare that the work in this thesis was carried out in accordance with the regulations of the University of Gloucestershire and is original except where indicated by specific reference in the text. No part of the thesis has been submitted as part of any other academic award.

Any views expressed in this thesis are those of the author and in no way represent those of the University.

Signed [redacted]

Date: 30/08/2016

Preface and acknowledgements

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It was a great experience!

Contents (overview)

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Abbreviations and glossary

%p	percentage points
abs.	absolute
bn	billion (10^9)
CAGF	constant annual growth factor
CAGR	constant annual growth rate
CME	coordinated market economy
CU	currency unit(s)
DME	dependent market economy
FTA	free trade agreement
GDP	gross domestic product
GNI	gross national income
GVA	gross value added
HME	hierarchical market economy
ICT	information and communication technologies
k	kilo (10^3)
KIBS	knowledge-intensive business services
KIS	knowledge-intensive services
LAB CONT	labour content (total working hours)
LME	liberal market economy
log	logarithm In this thesis, the natural logarithm is utilized, also denoted as ln (x).
ME	manufacturing employment
mn	million (10^6)
MNC	multi-national company
MO	manufacturing output
p/c	per capita
R^2	coefficient of determination
rel.	relative
SME	state-perpetuated economy
USD	US dollar (in constant 2010 prices)
tn	trillion (10^{12})
VA	value added

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1 Introduction

In the announcement of a scientific conference in Toronto held in May 2014, the origins of the term 'de-industrialization' and the effects caused by industrial change were described in a highly emotional way, presumably aiming at generating feelings of deep concern. The Centre for Oral History and Storytelling (2014) wrote:

> De-industrialization may not be a recent phenomenon but the study of it is. The word has its origins in the Second World War when the Nazis stripped occupied areas of their industry. The term was then picked-up by the Allies in the war's immediate aftermath to describe possible postwar retribution against Germany. It was only in the midst of the economic crisis of the 1970s and 1980s, however, that de-industrialization re-surfaced as an explanation for economic change. The study of de-industrialization thus emerged in response to the catastrophic decline of employment in manufacturing and basic industries. By the early 1980s, North America and Western Europe were hemorrhaging tens of millions of industrial jobs and trade union membership collapsed in many countries. Inner city areas, one-industry towns, and industrial suburbs were particularly hard-hit, accelerating urban decline, outmigration, employment mobility, and in some cases gentrification. This displacement is often highly gendered and/or racialized.
>
> In the bitter aftermath of de-industrialization, working-class communities are often enveloped in silence and contend with stigmatization. Anyone who has interviewed displaced workers, or is from a working-class family, has seen or felt some of the pain and suffering that has resulted. Working people have resisted these changes, but a discourse of inevitability has established itself. For most former industrial sites, abandonment is fleeting: lasting a few years, or perhaps a decade or two. For others, decline and out-migration persist for longer.
>
> De-industrialization has profound cultural and political, as well as socio-economic effects […]

Characterizing de-industrialization as a threat is reached and amplified by the language chosen and the associations suggested to the reader. In the text above, de-industrialization is 'nazi, racial, gendered, stigmatizing'. Could anything be more horrifying? Unfortunately, the sources for the allegations are not mentioned by the authors. The first date of known use (again without mentioning the source) of the term 'de-industrialization' listed by the Merriam-Webster dictionary is 1940 (Merriam-Webster, 2015), a date which fits in the descriptions of the cited text.

In sharp contrast to this emotional text, authors from the field of macro-economy and socio-economy utilize the term 'de-industrialization' on a rather dry and unemotional basis. The authors of the mid-20th century who first predicted the post-industrial society (e.g. Fisher, 1935; Clark, 1940; Fourastié, 1949) saw the transition from industry to services as something natural and inevitable due to rising productivity in the manufacturing sector (Kollmeyer, 2009). Their view on de-industrialization was shared by the main authors of the 1960s (e.g. Rostow, 1960; Kuznets, 1966). On the other hand, the very influential scientist and UK policy advisor Nicholas Kaldor was of the opinion that manufacturing played a crucial role inevitable for the blossoming of an economy (Kaldor, 1966) and thus saw de-industrialization processes as harmful.

In the 1970s, the rich western economies suffered from the first serious economic drawbacks after the constant growth in the build-up phase after World War II. Moreover, for the first time since the world economic crisis in the late 1920s, unemployment became a real threat. The term ‘de-industrialization’ came into broad use in the UK which suffered from low growth rates and little productivity gains. In the early 1980s, the term was also used in the USA where the economic situation was tense, characterized by stagflation and a weakening industrial base (Klenner & Watanabe, 2009). Thus, de-industrialization developments became intertwined with rising unemployment and related serious socio-economic problems (Kollmeyer, 2009).

Until today, no accepted standard definition of the term ‘de-industrialization’ exists. As Blackaby (1979, p. 2) put it: “De-industrialisation has gate-crashed the literature, thereby avoiding the entrance fee of a definition.” Yet, in scientific journal articles (Jaililian & Weiss, 2000) and in (electronic) magazine and newspaper articles for a broader public (Chakrabortty, 2013), ‘de-industrialization’ is used with a certitude that prompts the assumption that it was an established macro-economic term. Often, the ostensible scientific approach is only a camouflage for a threatening undercurrent in which the 1970s still resonate. In several magazine articles (e.g. Healey, 1994), ‘de-industrialization’ serves as a trigger for generating feelings of concern. As such an emotional carrier, the term can become the central element of a subtle manipulation of the reader who is intrigued by a certain (either euphemistic or threatening) narrative with a convenient economic definition and well-adapted economic figures. In a review paper on economic developments in Sub-Saharan Africa, H. White named the ambiguity of the term de-industrialization, involving its negative connotation: “So when is a contraction in manufacturing output ‘de-industrialization’ (which sounds like a bad thing) and when is it an efficient resource reallocation?” (White H. , 1996, p. 598). Rather implicitly (in the brackets), White touched a second important aspect of 'de-industrialization': it "sounds like a bad thing", i.e. the term is emotionally laden. It is this emotional undercurrent that allows authors to bring about concern or even fear of societal change by using it.

Current definitions of de-industrialization of an economy are (Bryson & Taylor, 2008; Lever, 1991):

- long-term contraction of manufacturing (absolute contraction),
- a shift from manufacturing to services (relative contraction).

Both can be measured either in terms of employment or output. The resulting four indicators (Table 1.1) do not necessarily correlate. With rising productivity, the manufacturing output may increase at the same time as employment declines (def. 1a fulfilled, 1b not fulfilled). Moreover, in a growing economy, absolute growth can go along with a relative decline of the manufacturing sector (def. 1 not fulfilled, def. 2 fulfilled).

Table 1.1 Four standard indicators for de-industrialization

	(a) **Employment**	(b) **Output**
(1) **Absolute contraction** of the manufacturing sector	(1a) Declining absolute value	(1b) Declining absolute value (CU at constant prices)
(2) **Relative contraction** of the manufacturing sector	(2a) Declining sectoral share	(2b) Declining relative value (sectoral share)

Source: Own compilation

An even more relativist position is taken by Pieper (1999) who defines de-industrialization "as a relative loss – with respect to the rest of the economy – of the industrial sector's contribution to overall labor productivity growth" (Cowell, 2014, p. 14). There are more macro-economic definitions of de-industrialization, some of which involving the trade balance (Jaililian & Weiss, 2000; Lever, 1991). No comprehensive study on their inherent meanings and interpretation is currently available. The resulting ambiguity of the term 'de-industrialization' needs to be tackled.

Based on empirical findings, Rowthorn and Wells (1987) contrasted the negative connotation of the term with a phenomenon that they named 'positive de-industrialization'. According to them, positive de-industrialization "occurs because productivity growth in this sector is so rapid that, despite increasing output, employment in this sector is reduced, either absolutely or as a share of total employment. However, this does not lead to unemployment, because new work is created in the service sector on a scale sufficient to absorb any workers displaced from manufacturing" (Rowthorn & Wells, 1987, pp. 5-6).

Sometimes, the industrialization process stops before a country has reached a mature state, i.e. one of full industrial development and a correspondingly high level of national income. 'Negative de-industrialization', as Rowthorn & Wells (1987) called it, can hit economies at all stages of development, also already in a state that Dasgupta and Singh (2006) denominated as 'premature', i.e. before industrializing to full potential and reaching a correspondingly high level of national income. These authors declared that also 'positive de-industrialization' may occur prematurely. Such a state is characterized by generally positive figures of the national economy and driven by other sectors than manufacturing (e.g. KIS).

The above-mentioned phenomena were mostly delineated in stand-alone descriptions which remained unrelated. Moreover, no comprehensive empirical study on de-industrialization phenomena in mature and 'premature' (i.e. emerging) countries was found that relates the course of (de-)industrialization with long-term economic success and evaluates the impact of industrial policies under certain basic conditions.

To close the identified gaps, this research aims at modelling and evaluating the socio-economic change denominated as 'de-industrialization' in the context of the political and economic developments between 1970 and 2010. Building on the results, guidelines for industrial policies assuring sustainable development, both in mature and emerging countries, shall be derived from identified best practices. In the course of reaching these aims, the objectives of this study are to

- tackle the ambiguity of the term 'de-industrialization' by building a comprehensive quantitative model,
- condense actual macro-economic data and information on de-industrialization both for mature and emerging ('premature') countries, also serving to test the model,
- delineate the socio-economic impact of certain forms of de-industrialization, relate industrial policies to economic success or failure and identify best practices.

The analysis was originally intended to focus on the four decades from 1970 to 2010. In the course of analysis, it was found that limiting the economic data on the international developments from the oil shock and OECD 1 (1973) to the Great Recession (2008) was more apt to a better understanding of de-industrialization. For investigating this long-term phenomenon economically, the distortive short-term impact of economic shocks like those marking the time frame should better not be included. This notwithstanding, data of additional time periods was utilized whenever it was utile for the intended purposes.

The continuous economic development over the investigated 35-year period was interrupted by the fall of the Iron Curtain and the opening of the eastern markets as the prerequisites for a truly globalized economy. This happened right in the middle of the investigated period, so it marks an economic watershed which is to be considered.

The starting point of this analysis is the existing literature on the conceptual history and the forms and reasons of de-industrialization in a globalizing economy. The actual status of description and explanation will be summarized in the following chapter 2, aiming at identifying gaps and contradictions as a starting point for own investigations.

Basing on the findings from literature and own considerations, in chapter 3 the methodology and methods for this research will be outlined, also involving the philosophical stance of the author.

In chapter 4, models of de-industrialization aiming at systematically categorizing related socio-economic phenomena will be introduced.

On the basis of macro-economic data, the de-industrialization of a sample of 12 mature economies will individually be analysed in the context of national political developments in chapter 5. In chapter 6, the national results will be compared to identify typical patterns and key drivers of de-industrialization phenomena.

In chapter 7, industrial developments in emerging economies will be analysed with a focus on early forms of de-industrialization. The sample contains a total of 25 Latin-American, Asian and East European states. The results will be compared and condensed regionally and then globally.

In chapter 8, key findings from the previous chapters are picked up and analysed more deeply by relating the results for mature and emerging economies.

Finally, in chapter 9, the conclusions are concentrated, highlighting the scientific contributions made by this work, but also delineating its limitations.

2 A literature review on the conceptual history of de-industrialization

The basic idea of de-industrialization was conceived in the course of the development of the three-sector hypothesis. This politico-economic theory is a special case of sectoral structural change of a national economy (Klodt, 2014c). On a low level of development, the primary sector (agriculture) dominates, later the secondary sector (industrial production) and, as the final achievement, the tertiary sector (services) (Klodt, 2014b).

The three-sector theory was introduced by the British economists Allan G. B. Fisher (1935) and Colin G. Clark (1940) and taken further by the French economist Jean Fourastié (1949). After being translated into German in 1954 (Fourastié, 1954), his book was very influential in the German-speaking countries (Pohl, 1970).

Clark (1940) was inspired by a remark of Sir William Petty (Petty, 1690) published posthumously. Petty's idea of labour reallocation from agriculture to non-agricultural activities, the very ground for the three-sector hypothesis, is often referred to as *Petty's Law*, e.g. by Murata (2008). In Petty's own words, it reads: "There is more to be gained by manufacture than by husbandry, and by merchandise than by manufacture" (Hospers & Steenge, 2002, p. 9).

Unlike his two immediate British predecessors, Fourastié not only provided descriptions of the phenomena, but tried to identify the mechanisms behind them, mainly technology and population growth (Hospers & Steenge, 2002). On this basis, he predicted a transition of all then-developed societies to service societies by millennium (see Figure 2.1). The phenomenon of a relative decline in industrial employment after reaching an all-time peak is considered as 'de-industrialization' (Klodt, 2014b).

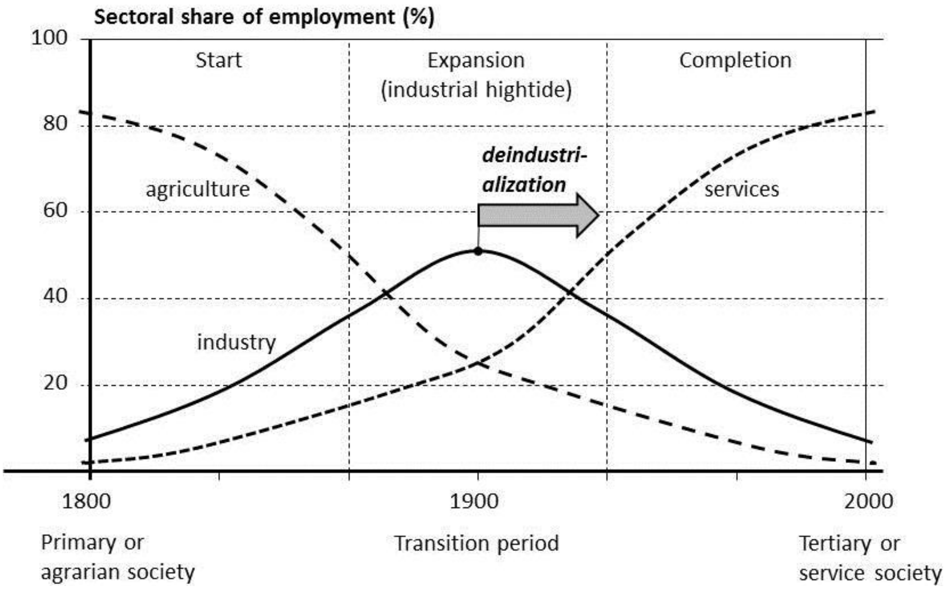
According to the three-sector-hypothesis, the sectoral shift is mainly driven by two influences:

- Rising income elasticity of demand

  On a low income level, the demand for goods is relatively inelastic and focused on the coverage of basic needs. With rising income, the elasticity of demand rises. Thus, industrial goods and – in the course of development – services become more and more favoured.

- Different productivity growth rates per sector

  Technical progress leads to different patterns of growth per sector. In the secondary sector (capital-intensive production), the labour content is constantly reduced by innovations (automation), so a relative decline in sectoral employment results. Possibilities for productivity rises in the tertiary sector were considered as rather limited by the authors of the middle 20th century (Klodt, 2014b).



Source: Own graph, after Henning (1995), p. 21

Figure 2.1 Pattern of structural change according to Fourastié

While the outlined pattern of structural change has been demonstrated in general by empirical studies (Pohl, 1970), the presumption of a general backlog in productivity of the tertiary sector did not prove to be appropriate. It was based on the somewhat antiquated notion of services as typically being consumer-oriented. In recent decades, production- or enterprise-oriented services (e.g. financial or technical services) have played an important and still growing role. Modern information and communication technologies (ICT services) have improved the productivity of many other fields of service (Klodt, 2014a). Therefore, the dominant factor for the advancement of services can be seen in a shift of demand (Klodt, 2014b).

The course of international industrial development and its driving forces, specifically types of capitalism and innovation, will be introduced in section 2.1.

While the original authors saw the upcoming structural sectoral change mostly positive, the perspective of de-industrialization caused rising concern especially in the highly-industrialized societies where a changing society and the perspective job losses caused rising concern (Scheuer & Zimmermann, 2006). Both strings of thought will be followed in sections 2.3-2.3.3.

In section 2.4 of this chapter, the question whether relative employment is the adequate indicator in the short or medium term to adequately describe different forms of de-industrialization will be raised.

In the final section 2.5, conclusions on the previous sections will be drawn, highlighting identified gaps in scientific knowledge with special regard to the need for a comprehensive model of de-industrialization serving as the basis for own socio-economic research.

2.1 The course of global industrial development

Jean Fourastié is relatively little known out of France since his most influential book (Le Grand Espoir du XXe siècle. Progrès technique, progrès économique, progrès social, 1949) has never been translated into English (Hospers & Steenge, 2002). As the (French) title reveals, he considers the projected socio-economic developments to be “the great hope of the twentieth century”. The developments would lead to a higher quality of life underpinned by flourishing education and culture, generally higher level of qualifications, humanized workplaces and improved social security including eschewal of unemployment. As a consequence of this, until the 1970s, the so-called ‘tertiarization’ was understood as a natural and welcome process to follow the industrialization process (Scheuer & Zimmermann, 2006).

Typically, industrialization and in its course de-industrialization take place in an order that follows innovation cycles and the technical requirements of different branches. Three aspects will be considered here:

- The historical industrial development of early modern states, i.e. their sequence of product and process innovations, will be discussed in sub-section 2.1.1. The contributions of France, Great Britain, the United States and Germany are in the focus of this section as the most important contributions from a socio-economic viewpoint.

- Early industrialization is a good proxy for catch-up developments of emerging states, taking into account the well-established model of product cycles (sub-section 2.1.2).
- Finally, the transition of a mature economy including the involved institutional changes will be discussed in sub-section 2.3.1.

2.1.1 Historical phases of industrialization

Despite of the fact that in the 18th century, France was by far in the lead in research and university teaching of natural sciences (especially physics), the first country to industrialize was Great Britain (from 1801: the United Kingdom). This can be chiefly attributed to the fact that industrial progress at that time was rather driven by craftsmanship and private entrepreneurship (Great Britain) than by scientists and state initiative (France).

2.1.1.1 France – Cradle of academic teaching of technology

In France, the mercantilists under Colbert had removed century-old traditions of the guilds, the institutions that had hindered technical developments by fiercely defending their artisan traditions. But as successful as in removing old development hurdles, the French were in putting up new ones by their system of state protectionism. Moreover, their intolerance to religious minorities such as Huguenots, Protestants and Calvinists turned out to be of negative influence for the persecutors. Members of these religious orientations did not preferably seek gratifications for good conduct in afterlife, but considered the accumulation of wealth as the highest authentication for a life agreeable to God. Their ambition and mind-set would be of major influence to the industrial development of the states that received them openly, namely England, the Netherlands, Prussia and the future United States of America (Nedoluha, 1961).

At a time when in Great Britain free entrepreneurship blossomed, the French elite stubbornly stuck to their traditional ideas on state and economy until the *ancien régime* was swept away by the revolution of 1789. In its course and the subsequent Napoleonic era, France completely lost the big technological advance that it had built up and maintained for a good century (Buxbaum, 1921). Yet, its scientific and technical traditions, symbolized by institutions like the *Académie française*, were taken further. The first academic technical schools, the *École des Ponts et Chaussées* (founded 1747) and notably the *École polytech-*

nique (founded 1794), served as role models for academic teaching of science and technology (Spur, 1991). The idea of the technical university, drawing from Galileo's notion that "the book of nature is written in the language of mathematics" (Machamer, 2014), was especially picked up by the German countries. Though it took a while to lift off, it finally helped Germany to overcome its underdevelopment and industrial backwardness and even leapfrog competition (Przywara, 2006).

2.1.1.2 Great Britain – Motherland of industry driven by entrepreneurship

Great Britain was completely different to France. Blessed with available natural resources (coal, wood, water), capital from colonial endeavours and inventive genius not hampered by tradition, it was the first country to industrialize. By improvements in agriculture like new ploughing techniques, Great Britain's primary sector was able to feed a rising number of people. In the enclosure movement, the available agricultural land had been re-shaped and concentrated in the hands of a few land-owners, mainly the local gentry, at the expense of the local commons (Fairlie, 2009; Hardin, 1968). The movement had three major effects:

- The land was more intensively cultivated.
- The disenfranchised commons had to make a living elsewhere, so enough people were ready to work in factories.
- The landlords became more and more business-minded and ready to invest, which later helped develop industrial structures (Niedhart, 1995).

Also, British inventors had improved the production process of garment, especially by removing the long-known bottleneck caused by the spinning process. Finally, industrial production of textiles was ready to beat the precedent proto-industrial structures involving home-based artisan steps of manufacture on a price basis (Mommertz, 1987).

The key material for the industrial age was steel. In the late 18th century, British inventors had gained the ability to generate forgeable steel in large amounts utilizing available black coal instead of rather scarce wood in the production process. Thus, Great Britain became free from the necessity to import large amounts of steel from Sweden (Niedhart, 1995).

Yet, another obstacle had to be overcome before the industrial age. Until the very late 18th century, there was no possibility to shape parts made of steel on a non-manual basis. Thus, no production of standardized parts could be realized. It required a combination of technical genius and palmary mechanical skills to overcome these obstacles and build the first machine tools on the basis of craftsmanship before machines could be used to make machines. Henry Maudsley was the man who made the first industrial lathe in 1797. With his machine, elements like metal screws and nuts could be cut at constant dimensions for the first time. Once this Gordian knot was cut, within a few years all other machine tools known today (e.g. machine for milling, drilling, grinding and slotting) were invented and built, facilitating mass production on the basis of precise and interchangeable parts (Przywara, 2006).

Already the very early industrial development of Great Britain was driven by entrepreneurship and individual technical genius. It could blossom because, unlike in contemporary European countries like France and Germany, creativity was not hampered by narrow traditions defended by guilds and crafts or state regulations. Throughout the 18th and the first half of the 19th century, technical progress was mainly achieved by trial-and-error procedures executed by persons often outside the subject area. They found the most suitable natural and economic conditions in Great Britain. On this basis, and despite of not being the leading nation in natural and engineering sciences which clearly was France, Great Britain became the motherland of the industrial revolution (Przywara, 2006).

Machine tools are inevitable for precision and mass production. Interesting enough, the UK did not change existing production processes requiring manual skills, e.g. for rifle production, but utilized the new ways of production almost exclusively for new products in heavy industries (Spur, 1991). Among these was the steam engine. Its grade of efficiency could be largely increased by precision manufacture, and so it became widespread in different heavy industry applications like the railway and the ship-building sector (Mommertz, 1987).

2.1.1.3 United States of America – Home of modern production systems

Utilizing machines, namely machine tools, in mass production processes was realized for the first time in a country free from the traditions, skills and limitations of craftsmanship. The young USA suffered from British sanctions on the export of goods and the emigration of highly-skilled people, so new ways of production had to be developed that would replace manual skills by machinery and organization. The first sector where a mixture of high demand and ingenuity had led to interchangeability was in the production of rifles in the first two decades of the 19th century.

The 'American system of manufacturing', characterized by division of labour and use of machinery, was then successfully transferred to the manufacture of more and more consumer goods. The American producers benefitted from the fact that they could utilize milling processes as their key steps of production due to the comparatively softer properties of the American iron, whereas in Britain, milling tools did not withstand the material properties of the local iron (Przywara, 2006).

2.1.1.4 Germany – Role model for catch-up modernization

In the late 19th century, innovations at the forefront of technical advance were no longer achieved on a mere trial-and-error basis, but more and more scientifically founded. E.g. producing gears required a precise mathematical understanding of cycloids and a deep knowledge of grinding technologies for machining hardened surfaces. These skills were also necessary for the manufacture of rolling contact bearings, an invention crucial for the production of bicycles and, in their course, motor vehicles. Combining science and technology was the aim of technical universities which became the more useful the higher the technical requirements became.

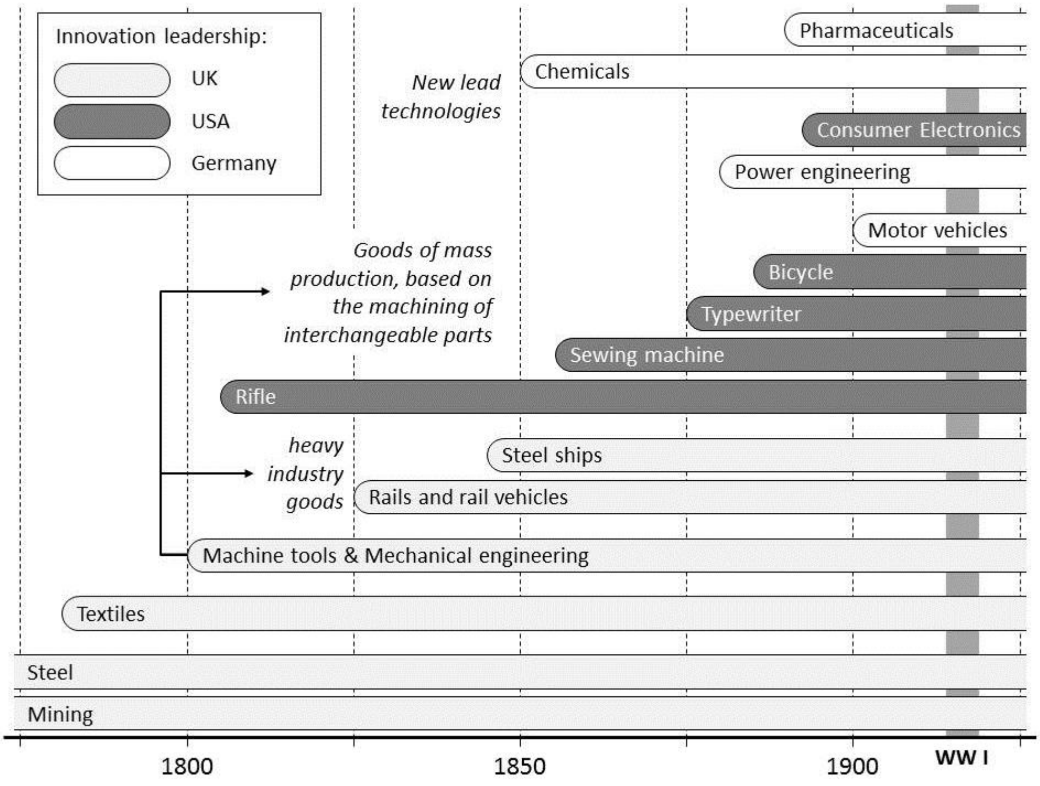
As outlined in section 2.1.1.1, the German countries had picked up the French tradition of academic teaching of technology. In the long run, the early investments of Prussia and other German states paid off. After the German Empire was founded in 1871, Germany's industry gained technological leadership in several fields (e.g. power engineering, chemistry) and before World War I turned the British consumer warning "Made in Germany" into its very opposite: a seal of quality (Przywara, 2006).

2.1.1.5 Chronology of the technical evolution

As a summary of the findings from literature, the technical developments of the long 19th century, i.e. the time span from the French Revolution until the beginning of World War I, are exposed in Figure 2.2. The developments are characterized by three phases:

- Until around the middle of the 19th century, the United Kingdom was the undisputed 'workshop of the world' which presented itself proudly at the first world exposition in London in 1851. It had established the elementary technologies for industrial production (steelmaking and machine tools).

- But within a few years, the situation changed completely. At the world exposition in Philadelphia in 1876, the USA had taken the technological lead especially in machine tools. For its fast-growing domestic market, fostered by excellent natural (coasts and rivers) and man-made (channels, railways) logistical connections, mass goods were produced on the basis of the ’American system of manufacturing’.
- By the end of the century, the German empire had caught up and taken the lead in some of the most demanding technological fields of that era (Spur, 1991). Unlike its Anglo-Saxon competitors, it could draw from excellent technical education rendered by technical universities and vocational schools founded after the French role models. Far-sighted investments of German states, especially the Prussian ministry of culture, eventually paid off (Przywara, 2006).



Sources: Own compilation, based on Henning (1995), Spur (1991), Przywara (2006)

Figure 2.2 Chronology of industrial development

As a conclusion from these findings and the outlined historical developments, the following can be stated for the course of historical industrial development:

1) First, a raw material basis needs to be assured (steel, mining).
2) The textile industry is the vanguard sector.
3) There are high capital and organizational demands to establish mass production (machine tools, mechanical engineering, appropriate division of labour).
4) Scientific skills are required to establish the most advanced technologies (chemicals, pharmaceuticals, power engineering, motor vehicles, electronics).

This course was found to be archetypal also for recent developments in emerging countries.

2.1.2 The course of internationalization

After World War II, national economies were rather confined entities with export rates lower than before World War I. The USA was by far the most powerful and wealthy economy. Over the years, the frame conditions for business changed. By the GATT/WTO rounds and voluntary cooperation like the European Union, markets became more permeable and interconnected (Meier & Roehr, 2004). The new market conditions helped to raise the welfare of high-income countries to about the American level (Vernon, 1979).

With the opening of the East, these developments have been taken further. In the globalized economy, most markets are open and connected and more and more less-developed countries have become economically involved, taking part in the international division of labour (Abele, Kluge, & Näher, 2006). This has been pushed on by multi-national companies (MNCs) whose economic rationale is not the benefit of any national economy, but their own (transnational) well-being, i.e. profit. The economic power of the strongest MNCs is in the order of magnitude of national states (see Table 2.3, p. 25) and so is their aspired political influence.

According to Abele, Kluge and Näher (2006), three phases of globalization can be distinguished (see Figure 2.3):

1) 1850-1930: Exports

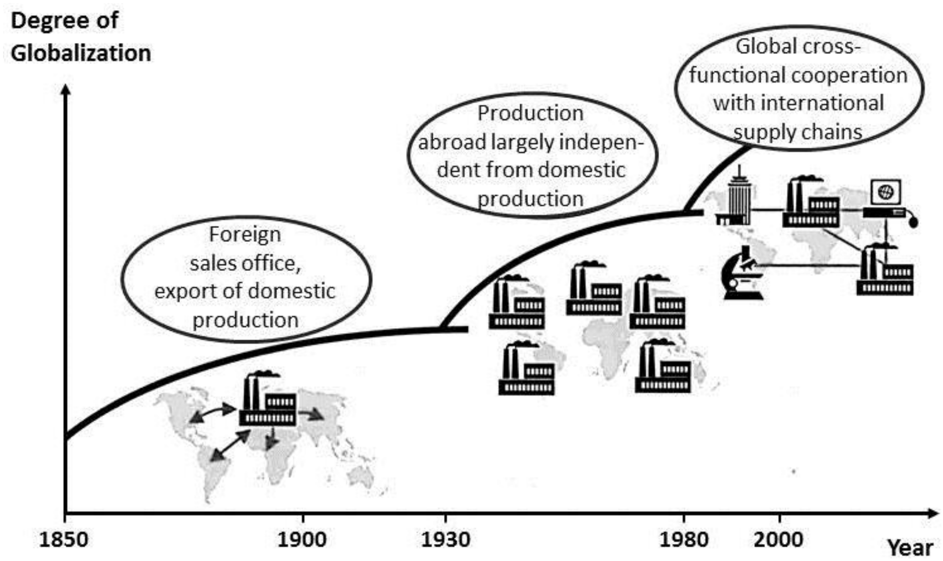
   Starting at around 1850, first enterprises started to expand internationally. E.g. Siemens, founded in 1847, started building up the Russian telegraph network in 1853 and started a British sales office in 1858.

2) 1930-1980: Largely independent production in foreign countries

   Brand names like Coca-Cola and Mercedes gained international awareness and reputation. Local markets were captured on the basis of local production. As a very early example, GM built up a production in Argentina in 1925 and acquired the German Adam Opel AG in 1929.

3) From 1980: Global production networks and cross-functional cooperation

   Driven by improved frame conditions such as reduced hindrances for trade and foreign direct investment (FDI), improved information and communication technology (ICT) and constantly falling transport costs per unit, companies can split their value chains globally. Vendor and supplier networks are controlled by worldwide supply chain management.



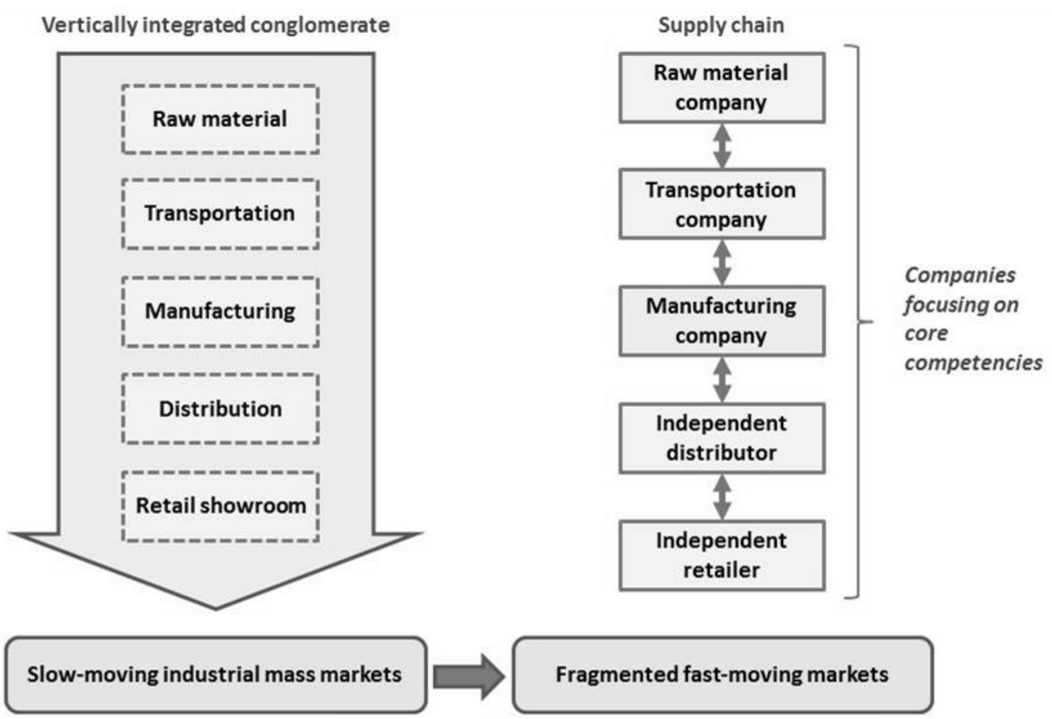
Source: Own graph, after Abele, Kluge, & Näher (2006, p. 4), drawing from McKinsey/PTW data

Figure 2.3 Three phases of globalization

Due to high capital demands for internationalization, companies had to learn to focus on core competencies and to outsource parts of their value chains they considered as vital before, including major shares of R&D (Prahalad & Hamel, 1990). They had to depart from many of their easy-to-handle but comparatively inefficient in-house units. By outsourcing, the benefits of specialization (more customers and know-how, higher efficiency) dominated (Figure 2.4).

Managing the resulting complexity is a key challenge for multi-national enterprises. ICT systems provide technical support while quality management systems are powerful tools for imposing market power. If these do not suffice, new more cooperative forms of organization have to be implemented (Hugos, 2011).

A publication of the *Massachusetts Institute of Technology* (MIT) in 1990 initiated a fundamental change in the production systems of industrial enterprises throughout the world, a change to 'lean production' (Womack, Jones, & Roos, 1990). Experts speak of a second revolution in car-building after the introduction of flow production by Henry Ford. In the study, the automotive industry in Japan, North America and Europe was compared. It proved the clear superiority of the production system utilized by the Japanese manufacturer Toyota in terms of productivity, flexibility and especially in product and process quality. Meanwhile, almost all industrial manufacturers have introduced elements of the system or even the whole systematic with small amendments; e.g. VW have introduced their 'Volkswagen way' (Daum, Greife, & Przywara, 2014).



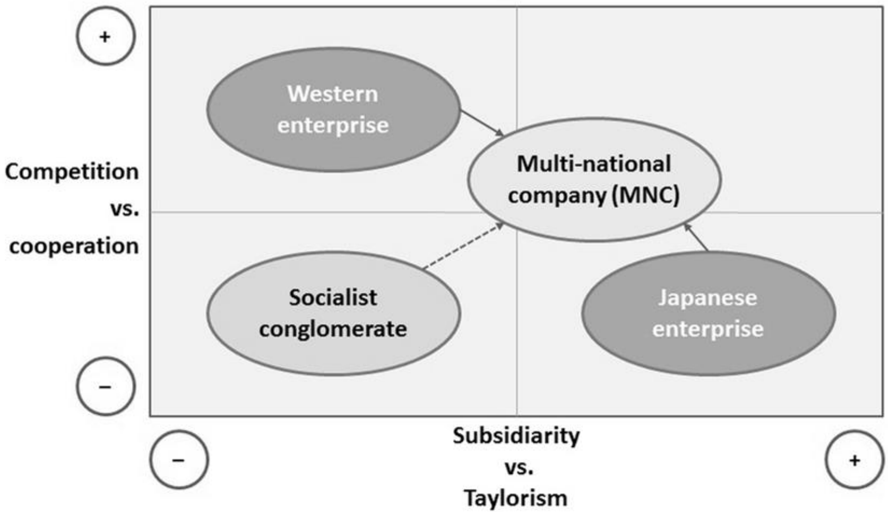
Source: after Hugos (2011)

Figure 2.4 Emergence of supply chains

Nevertheless, in the course of globalization, also the Japanese manufacturers more and more had to cope with unprecedented competition, mostly emerging in their immediate

East-Asian neighbourhood. The survivors are truly international companies integrating the best parts of Western and Japanese traditions (Figure 2.5).

The collapse of the Soviet Union and former East Bloc was very much induced by its ailing economy. Most socialist conglomerates were lacking the skills and market experience to survive, and many were split up in smaller and more viable entities.



Source: Own graph

Figure 2.5 Roots of the multi-national firm

A scheme of the national forms of capitalism rendering the frame conditions for entrepreneurial activities is given within the following sub-chapter 2.2.

2.1.3 Globalization and the emergence of the multinational enterprise

Globalization can be considered as the ultimate stage of internationalization. Its phenomena such as international trade, licensing and direct investment and the reasons behind them can be described at different aggregate levels:

- macro-economic approaches, dealing with the national economy,
- micro-economic approaches, dealing with market-oriented company policies,
- institution-economic approaches (‘theory of the firm’), dealing with internalization of market processes,
- behaviour-oriented approaches, dealing with decision-making processes of individuals.

An overview on the most important theories of each group is given in Table 2.1.

Table 2.1 Theoretical approaches for explaining internationalization

Theories	Originators	Short description
Macro-economic approaches		
Theory of absolute cost advantages	Adam Smith (1776)	Not all countries can simultaneously become rich by mercantilism. Instead, trade and international division of labour are overall beneficial. Countries should specialize on sector in which they possess absolute cost advantages (Mankiw, 2011).
Theory of comparative cost advantages	David Ricardo (1817)	Even when one country has an absolute advantage over another country in all areas of production, free trade between them can be mutually beneficial (Mankiw, 2011).
(Non-) Availability approach	Kravis (1956)	Inherent differences in the natural abundance of raw materials and the development level of technology lead to trade and FDI.
Economies of scale approach	Hufbauer (1966), Linnemann (1966)	Takes up the idea of cost advantages based on mass production.
Theory of comparative development	Lorenz (1967)	Combines a number of arguments on advantage. Mutual advantages result in complementary exchange of capacities exceeding the demand of the domestic market.
Micro-economic approaches		
Monopolistic theory of direct investment	Hymer (1960), Kindleberger (1969)	Direct investments abroad only when it demonstrates company-specific advantages over the local competitors in the foreign country.
Oligopolistic concept	Knickerbocker (1973)	Enterprises in an oligopolistic market tend to imitate each other reciprocally (follow-the-leader behaviour).
Market-theoretical and marketing approach	Hirsch (1965; 1967), Vernon (1966)	Internationalization as being the result of the concept of product life-cycles
Application of available technology	Blair (1976), Schulte (1971)	Utilization of own technology and technological exchange are the decisive motivations for internationalization.
Eclectic Theory	Dunning (1977)	Combines approach of specific individual advantages with aspects of transaction cost theory and production site theory.
Institutional approaches		
Theory of the multinational enterprise	Buckley & Casson (1976)	Based on the assumption that the organizational costs of markets and their imperfections serve as an incentive for further internationalization and the flow of goods across borders.
Internal transfer of technology	Magee (1977)	Assumption that the world-wide internal corporate transfer of technology appears more efficient than its transfer via market processes
Behaviour-oriented approaches		
Behaviour-oriented approach	Stopford & Wells (1972)	Covers those decisions to undertake cross-border activities that are traceable to individual persons, e.g. FDI decisions following • personal goals of managers (for instance prestige), • evaluation of anticipated risk and interest (Dülfer & Jöstingmeier, 2008).

Sources: Own compilation; descriptions based on listed sources and Dülfer & Jöstingmeier (2008)

For explaining de-industrialization processes, those approaches dealing with enterprises and their management are of key relevance. While macro-economic approaches can explain trade, they have little or nothing to say concerning foreign direct investments, since these are carried out at firm level on the basis of management decisions (Dülfer & Jöstingmeier, 2008). (This holds at least as long as these enterprises are free from major state influence.)

Among the micro-economic theories, the life-cycle approach and the OLI paradigm are of special relevance. Both will be discussed in the following sub-sections.

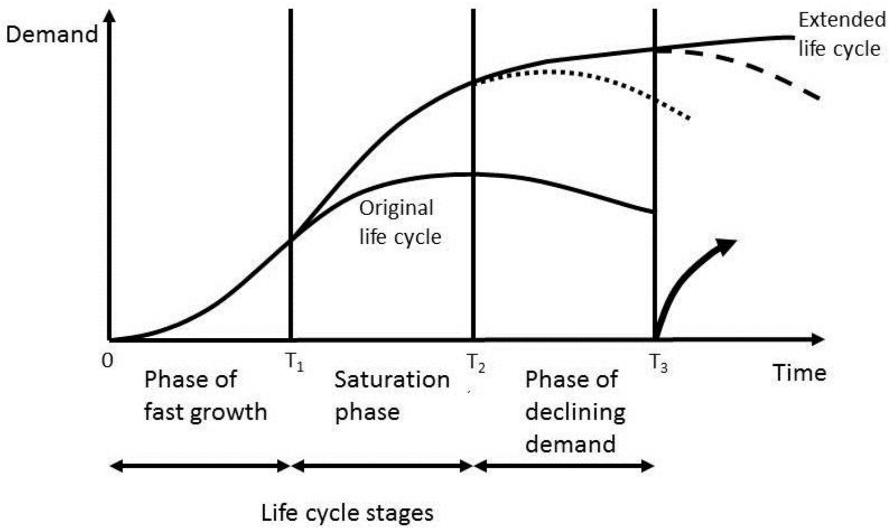
2.1.3.1 The product cycle theory

In addition to Ricardo's classical theory on comparative advantage as the basis for national specialization and trade (Mankiw, 2011) and the Heckscher-Ohlin theory on factor-based national specialization as the causation for trade (Antràs & Caballero, 2007), the product cycle theory emphasizes on the changes of comparative advantage over time (Weerth, 2014). For the first decades after World War II, Vernon's (1966) product cycle theory provided a good explanation and high predictive power for the development of innovations in international markets (Vernon, 1979).

Vernon (1966) characterized a product's life cycle by the following four stages:

- introduction,
- growth,
- maturity (saturation),
- decline.

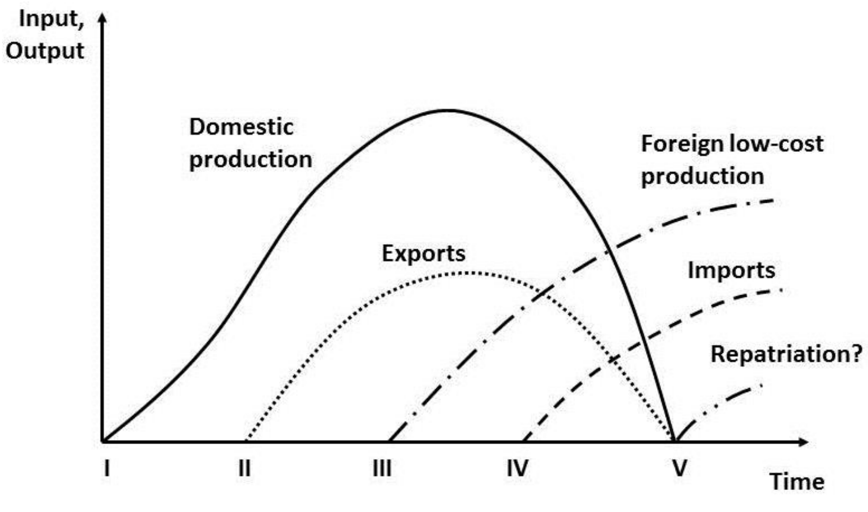
By targeted marketing measures (e.g. product differentiation, re-launch), the product life cycle can be extended (Figure 2.6).



Source: Koutsoyiannis (1988, p. 42)

Figure 2.6 Extended life cycle of products

Vernon also related the location of production to stages of the cycle. The result is displayed graphically in Figure 2.7. Vernon's idea of trade and production patterns is explained in the following along the four stages of the product life.



Source: Own graph, based on Vernon (1966)

Figure 2.7: Product cycle and relocation of production

Stage 1: Introduction

New products are introduced to meet local (national) needs. According to some authors (University of Idaho, 2014), the export of new products to countries with similar needs, preferences and incomes also belongs to the introduction phase. Under the assumption of similar evolutionary patterns for all countries, products are exclusively introduced in the most advanced nations.

Other authors (Weerth, 2014) emphasize that in the introduction phase, the technical competencies are decisive for achieving comparative advantage. Market introduction requires good communication between the supply and demand sides, which is rather given domestically than abroad (Linder hypothesis). These authors would generally attribute exports to the growth phase.

Stage 2: Growth

Copy products are produced abroad and introduced in domestic and similar markets to capture growth. Thus, production is moved to other countries, usually on the basis of cost of production. Economies of scale can support these effects, also product differentiation (Weerth, 2014).

Stage 3: Maturity

After a certain time, the product becomes standardized. The comparative advantage is now realized by costs, not by close communication with the customer. Production in low-cost countries becomes standard, the good will be imported (Weerth, 2014).

Stage 4: Decline

Close to the end of a product's life cycle, only poor countries constitute its market. Therefore, almost all declining products are produced in least-developed countries (University of Idaho, 2014). Finally, the good might be replaced by introducing a completely new one (Weerth, 2014).

More specifically, the product cycle theory can be applied on the location and relocation of production facilities (Figure 2.7). It plays a central role in analysing the localization of high-tech manufacturing as well as the significance of technology on geographically uneven development.

- In the innovation phase of a high-technology product, the production technology is still in an experimental stadium. Market volumes are small and insecure. Little price elasticity in combination with a temporary monopoly enables high profits, but these have to be bought by high initial investments and little possibilities for economies of scale due to small-series production. Metropolitan regions of highly-developed countries, characterized by research centres, buoyant markets, differentiated services and available capital, offer locational advantages.

- In the growth and maturity phase, demand expands regionally and beyond. On the basis of product standardization, mass production is started. Utilizing economies of scale and cost-efficient inputs (material, labour force) for unit cost reduction is more and more important due to increasing competition. Growing competition and significance of foreign markets leads to relocations into peripheral regions of the highly-developed countries and to external markets.
- In the standardization phase, mass production is the norm, production technology is mature, replacement and expansion investments dominate. Growing capital intensity leads to relocations into less-developed regions or countries because of available cheap workforce and investment incentives. In highly-developed countries, imports dominate.
- In the contraction phase, company processes of contraction and vertical integration set in. Export strategies are replaced by import substitution. Sometimes, peripheral locations are saved by state protection advantages (Weerth, 2014).

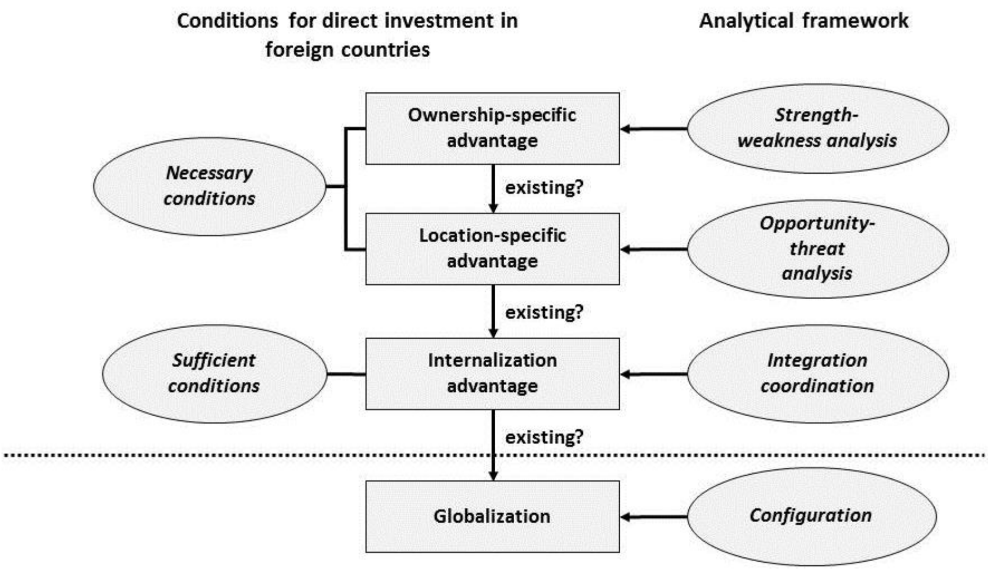
The simplicity of the model is its strength as well as its weakness. It has largely contributed to popularize it, but by focusing on technological change, it disregards some major market aspects and especially the influences of entrepreneurship and political intervention (Weerth, 2014).

The late Raymond Vernon personally realized and evaluated some major deviations of the more and more complex reality from his simple model (Vernon, 1979). In the focus of his thinking was the multinational enterprise. He regarded it as an entity that does not necessarily adhere to the rules set by the product cycle model.

2.1.3.2 Dunning's eclectic theory

In his eclectic theory, also known as the OLI paradigm, John Dunning combined three elements of other theories, one of which is the monopolistic theory of direct investment (see Table 2.1). In Figure 2.8, the OLI logic is visualized. In a sequential analysis, the following items are checked (Dunning, 2000):

1) **O**wnership-specific advantage: Does the firm have a competitive advantage?
2) **L**ocation-specific advantage: Is a foreign location more attractive than a domestic one?
3) **I**nternalization advantage: Does it make sense to perform the activity within the firm?



Source: Choi, S. (1997, p. 113)

Figure 2.8 Visualization of the eclectic theory by John Dunning (OLI paradigm)

By the last step of the OLI analysis, the institutional approach becomes a part of the analysis. Like in pure internalization theory, the eclectic theory "avows that the greater the net benefits of internalizing cross-border intermediate product markets, the more likely a firm will prefer to engage in foreign production itself, rather than license the right to do so, e.g. by a technical service or franchise agreement, to a foreign firm" (Dunning, 2000, p. 164).

The range of opportunities for a firm reaches from buying and selling goods in open markets over licensing to internalizing cross-border activities or engaging in foreign production (Table 2.2).

Table 2.2 Forms of international market participation by the eclectic paradigm

		Categories of advantages		
		Ownership advantages	Internalization advantages	Location advantages
Form of market entry	Licensing	**yes**	no	no
	Export	**yes**	**yes**	no
	FDI	**no**	**yes**	**yes**

Source: after Setzer (2001, p. 82)

2.1.3.3 The role of multi-national companies

Meanwhile, internationalization is often a question of survival for a company. So over the years, more and more multinational companies have evolved:

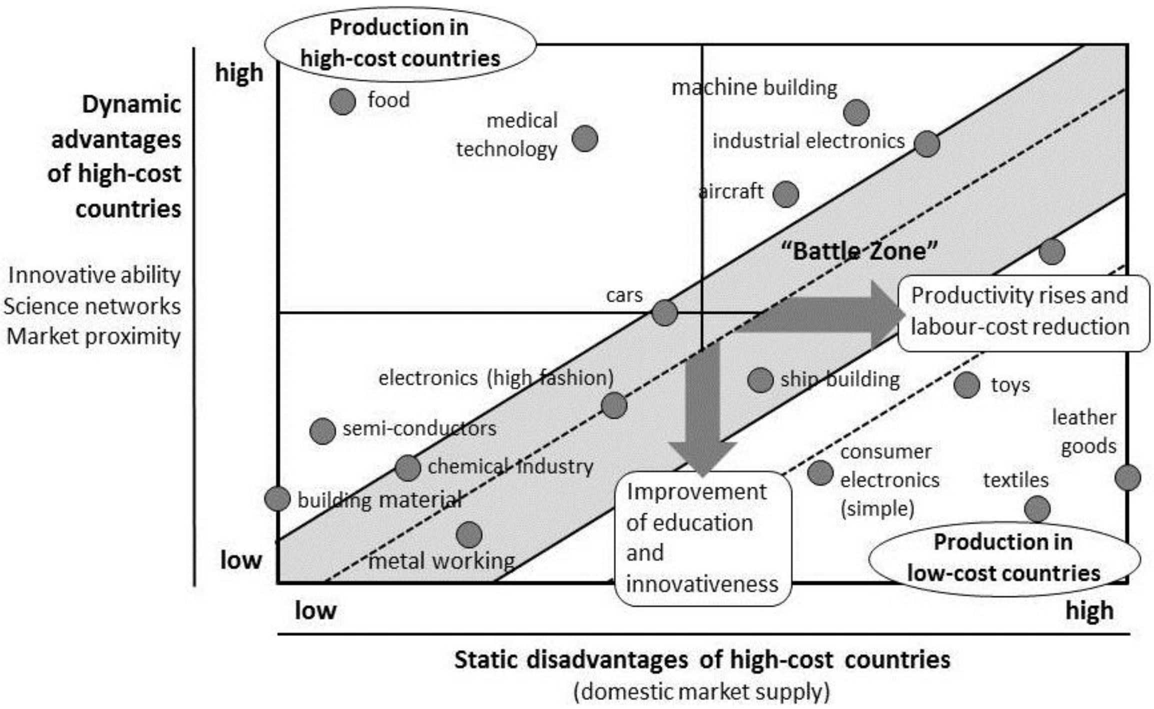
- Out of the 100 biggest economic units of the world, 43 are companies and not states (White D. S., 2012) (see Table 2.3).
- Around one quarter of the international market volume is intra-firm trade between the units of international companies (and not influencing the international markets) (Lanz & Miroudot, 2011).
- There are more than 82,000 transnational groups with 890,000 affiliates in total (UNCTAD, 2013).
- These enterprises controlled foreign investments of almost 1.4 trillion dollars (compared to approx. 21 trillion dollars total volume of the whole international trading) (UNCTAD, 2013).
- Almost half of the foreign investments was controlled by the 100 largest MNCs (UNCTAD, 2013).

In a globalized economic environment, industry in high-cost countries is facing competition of low-cost countries in more and more fields (Figure 2.9). High-cost countries compete on the basis of ever-improved productivity and good education of their workforce. But some low-cost competitors have learnt the lesson from Germany that put emphasis on its education sector during its catch-up modernization in the 19th century.

Table 2.3 The world's biggest economic entities

#	Entity	[tn USD]
1	EU	17.5
2	USA	15.1
3	China	7.3
4	Japan	5.9
5	Germany	3.6
6	France	2.8
7	Brazil	2.5
8	UK	2.4
9	Italy	2.2
10	Russia	1.9
11	India	1.8
12	Canada	1.7
…		
26	Royal Dutch Shell	0.5
27	Exxon	0.5
28	Wal-Mart	0.4
…		
53	Toyota	0.2
…		
57	Volkswagen	0.2
…		
75	Daimler	0.1
…		

Source: White, D. S. (2012)



Source: after Abele, Kluge, & Näher (2006), p. 397

Figure 2.9 Competitive situation of industries in the global environment

While some big players dominate specific industrial markets, the machine building sector is a rag rug of niche markets where small or medium-sized firms, often family-owned, act as ‘hidden champions’ (Abele, Kluge, & Näher, 2006).

In a clairvoyant article, the late Raymond Vernon (1979) classified MNCs into three ideal types (he coined only the first labelling):

1) The global scanner

   This is an MNC with innovating capability that has a global overview over markets based on virtually costless communication. All markets worldwide have an equal chance to stimulate innovation and production, factory sites compete worldwide, economies of scale are still of major importance.

2) The global standardizer

   These companies aim to achieve economies of scale by responding to a homogeneous world demand rather than to the distinctive needs of individual markets. Innovating for the global market involves heavy investments.

3) The regionalized firm

   This MNC only cares for the home market in terms of innovation and production. It leaves foreign market analysis to its subsidiaries. The regional units may choose products that seem appropriate for local markets.

In the last two decades of the 20th century and until 2006, General Motors was a good example for a global standardizer, Siemens a good example for the regionalized firm. In the long run, both these strategies did not work. GM failed due to market ignorance and too high financial burdens and had to be saved by the state (Cohan, 2009), Siemens suffered heavily from a corruption scandal and had to learn that compliance issues could no longer be handled by decentralized units (Schäfer, 2010). A very recent similar lesson had to be learned by VW in the course of its diesel exhaust emission manipulations which could not be handled as a problem restricted to the US market (Weißenberg, 2016).

Today, many firms try to combine strategies for achieving economies of scale with regional marketing strategies. Platform strategies of car manufacturers, often in combination with multi-branding, are exemplary applications (Sehgal & Gorai, 2012).

In recent years, the 'global scanner', which Vernon (1979) qualified as "purely hypothetical, a result of armchair speculation" (p. 261), something that "of course, is not to be found in the real world" (p. 262), has become reality on the basis of web-based information and communication technology. For such a firm, in accordance with what Vernon predicted in his text, the product cycle theory plays a minor role (Hofstra University, 2014):

> Conventionally, as a product went through its life cycle the least profitable functions were relocated to lower costs locations, notably in developing countries. This dichotomy is being challenged since it is becoming more common, even for high technology products, that the manufacturing of a new product immediately takes place in a low labour cost location. Multinational corporations have global production networks that enable them to efficiently allocate design, production and distribution according to global factors of production. This also relies on outsourcing and subcontracting.

The 'global scanner' does not wear national lenses, but acts on a strictly economic and rational basis. Thus, in a market-based environment with possible failure or success, the MNC acting as a 'global scanner' is the driving force behind today's industrialization and de-industrialization processes. To carry this line of thought even further, transnational firms and financial institutions have blown the chains of national states. As Bairoch & Kozul-Wright (1996, p. 3) put it:

> […] the spread of market relations describes only one part of the globalization process, and, arguably, not the most important one. Rather, capital mobility, because of its potential to connect markets and production in a more direct, more complex and much deeper manner than other cross-border flows, emerges as more significant on global economic integration.

2.2 Varieties of capitalism

In the course of industrialization, more than one nation took the leading role (cf. section 2.1.1). As outlined, the developments were influenced by specific national traditions involving different institutions, e.g. in the education sector. In parallel to economic development, the modern welfare state emerged. From its early beginnings, e.g. in Germany from the late 19th century, it was conceived as a stronghold against the labour movement (Ajaß, 2010). Today, all developed states are if not welfare states, but (to a sometimes very different extent) social states. In other words, the expected role of the state within the economy is seen differently from nation to nation. As the notion of the 'land of the free' reveals, most US citizens have not been in favour of a strong state, while the opposite may be the case in countries minted by social-democrat or even socialist traditions. Nonetheless, Roosevelt's 'New Deal' helped to overcome the Great Depression around 1930. The emerging stronger role of the state was only pushed back by the neo-liberal movement around 1980 that was an answer to economic stagnation in England and the USA (Temin, 1989).

The economic mainstream was very much influenced by at a time actual Anglo-Saxon policies. From the 1950s, based on structuralist advice (cf. sub-chapter 2.1), massive state interventions were advocated, i.e. for import substitutions by (heavy) manufacturing. In the 1990s, a complete paradigm change had happened in economic mainstream thinking. Leading economists (not only the neo-liberalist extremists) and institutions like the IMF and the World Bank propagated the 'Washington Consensus', a bundle of measures, recommended deregulation and international competition, even almost complete state withdrawal. In its course, the 2005 World Development Report did not even mention industrial policies anymore (Lin, 2012).

The neo-liberal form of a national economy seemed to be superior to any other form of government. Many researchers believed that sooner or later, all economies would converge into that model. Due to the Great Recession 2008/9, this belief was substantially shaken. Meanwhile, the pendulum of economic mainstream thinking has swung back to a certain extent, with economists advising a stronger role of the state and a wider range of economic orientation (Lin, 2012).

Concerning the periods of this analysis, the early 1970s paradigm was still rather governed by structuralist thinking while the globalization period was marked by the ideas of free trade, deregulation and international competition. Supra-national organizations like the WTO, the EU and NAFTA created the institutional framework that bolstered the thrive and prosper of the world economy, more and more driven by FDIs of the leading MNCs (cf. section 2.1.3).

While the economic policies of national states were influenced by the actual mainstream, driven by the economic and political power of the USA, this happened only to a certain extent. Nations still followed their own often very different approaches towards economic development in the context of their concept of the state and its institutions, thereby creating specific comparative advantages of their economies. Introducing the Varieties of Capitalism (VoC) approach, section 2.2.2 deals with respective patterns of development.

The following section 2.2.3 delineates smart specialisation, a structured approach how to develop coordinated industrial, educational and innovation policies to create and expand national or regional comparative competitive advantages.

Before turning to these varieties, culture as the breeding ground of economic development, bringing about distinctive forms of national economies, will be explained.

2.2.1 Organizational culture in the context of geography-based cultures

According to a well-established definition by Edgar Schein, organizational culture consists of "the basic assumptions and beliefs that are shared by members of an organisation, that operate unconsciously and define in a basic taken-for-granted fashion an organisation's view of itself and its environment" (Schein, 2004, p. 6). The behaviour of members of an organization is influenced by partly overlapping specific cultures, constituting cultural frames of reference of the following spheres (Johnson, Whittington, Scholes, Angwin, & Regnér, 2014):

- national/regional,
- organisational field,
- organisation,
- functional/divisional.

Attitudes to work, authority, equality and other important factors for the development of firms and their functions and divisions, economic sectors and national economies may vary largely at all these aggregate levels of an economy. Yet, national/regional cultural differences have an impact on all organisations of the respective national/regional economy. Such differences have been shaped by factors like geography, religion, politics and socio-economic history over many centuries (Johnson, Whittington, Scholes, Angwin, & Regnér, 2014), so they are deeply rooted in the cultural memory of the people of the respective country or region. The related taken-for-granted assumptions and behaviours pervade the actions of political and economic decision-makers and co-workers at all hierarchical stages, so national culture may exert large influence on the course of socio-economic development of a country.

Geert Hofstede was the first scientist who came up with an evidence-based multi-dimension model (Hofstede, 1984) of culture. As an employee of IBM, he had analysed a large database of employee value scores collected between 1967 and 1973, covering more than 70 countries. By subsequent research in other business environments, the results were validated and refined. In the latest edition of his book on culture and organizations, scores on the dimensions are listed for 76 countries (Hofstede, Hofstede, & Minkov, 2010). Other researchers (Trompenaars & Hampden-Turner, 1997) introduced modified models with somewhat altered dimensions.

Because of good data availability, Hofstede's model of national culture is utilized in this work. In its latest version, the model consists of six dimensions. These cultural dimensions represent certain preferences that distinguish countries from each other. These national preferences correspond to mean values of a group of responders; they do not reveal anything about an individual. These are Hofstede's cultural dimensions (Hofstede, 2014):

> *Power Distance Index (PDI)*
>
> […] People in societies exhibiting a large degree of Power Distance accept a hierarchical order in which everybody has a place and which needs no further justification. In societies with low Power Distance, people strive to equalize the distribution of power and demand justification for inequalities of power.
>
> *Individualism versus Collectivism (IDV)*
>
> The high side of this dimension, called individualism, can be defined as a preference for a loosely-knit social framework in which individuals are expected to take care of only themselves and their immediate families. Its opposite, collectivism, represents a preference for a tightly-knit framework in society in which individuals can expect their relatives or members of a particular in-group to look after them in exchange for unquestioning loyalty. […]
>
> *Masculinity versus Femininity (MAS)*
>
> The Masculinity side of this dimension represents a preference in society for achievement, heroism, assertiveness and material rewards for success. Society at large is more competitive. Its opposite, femininity, stands for a preference for cooperation, modesty, caring for the weak and quality of life. Society at large is more consensus-oriented. […]
>
> *Uncertainty Avoidance Index (UAI)*
>
> […] The fundamental issue here is how a society deals with the fact that the future can never be known: should we try to control the future or just let it happen? Countries exhibiting strong UAI maintain rigid codes of belief and behaviour and are intolerant of unorthodox behaviour and ideas. Weak UAI societies maintain a more relaxed attitude in which practice counts more than principles.

> *Long Term Orientation versus Short Term Normative Orientation (LTO)*
> […] Societies who score low on this dimension, for example, prefer to maintain time-honoured traditions and norms while viewing societal change with suspicion. Those with a culture which scores high, on the other hand, take a more pragmatic approach: they encourage thrift and efforts in modern education as a way to prepare for the future. […]
>
> *Indulgence versus Restraint (IND)*
> Indulgence stands for a society that allows relatively free gratification of basic and natural human drives related to enjoying life and having fun. Restraint stands for a society that suppresses gratification of needs and regulates it by means of strict social norms.

Hofstede's cultural dimensions will be utilized as an explanatory source in subsequent chapters.

2.2.2 Comparative analysis of capitalism

Comparative Capitalism is a stream of economic theory that strives at distinguishing certain types of capitalism by their determinants of economic development and, in more recent publications, also in their relation to social inequality (Nölke, 2010). Starting with the seminal work by Shonfield (1965), a number of typologies of national models of capitalism were developed by writers of different theoretical background, i.e. French regulation school (Amable, 2003), Neo-Marxism (Coates, 2000) and New Institutionalism (Hall & Soskice, 2001a). Like the work of their popular predecessor Albert (1991) who coined the term 'Rhine capitalism' in contrary to the 'Anglo-Saxon' form, the work of Hall and Soskice is based on a juxtaposition of two types of economies (LME vs. CME). Probably due to this parsimonious approach in combination with a sound framework of institutional analysis (Hoffmann, 2003), their 'Varieties of Capitalism' version has gained much acceptance and led to many empirical studies (Nölke, 2010). Even for writers in a Neo-Marxist perspective it offered a starting point of analysis since it predicted path dependency rather than superiority of a single economic model (Bieling, 2011).

Crouch (2005) detected several pitfalls resulting from a mere dichotomy of types, even when limiting the analysis to the around 25 fully developed countries. When either stressing or shrouding certain specific features of the economic reality, Mediterranean countries are either squeezed into the binary model, or a third group is constituted, e.g. by Schmidt (2003). Basing on the seminal paper of Esping-Andersen on forms of Welfare Capitalism

(Esping-Andersen, 1990), Schröder, by integrating VoC and welfare state research, arrived at a unified typology of three forms of capitalism (Schröder, 2013).

Whitley (1999) found national economies too different for any form of typification and instead offered a sophisticated multivariate set of parameters for classification. Although such a multivariate analysis is at the bottom of any kind of typology, not presenting any further kind of grouping has not become widely accepted.

While the VoC approach was originally aimed at mature countries, in recent years more and more research was carried out on emerging economies. Mostly, these investigations focused on regions (Latin America (e.g. Schneider, 2013), East Europe & CIS (e.g. Nölke & Vliegenthart, 2009), Asia (e.g. Andriesse, 2010)), but also comparative studies on the biggest emerging economies (BRIC or BICS states) have been conducted (Nölke, 2010).

In the following, the VoC approach will be introduced in detail (sub-section 2.2.2.1). Outlining its shortfalls, possible amendments will be introduced (sub-section 2.2.2.2). After that, the affiliation of emerging countries will be highlighted (sub-section 2.2.2.3).

2.2.2.1 The Varieties of Capitalism (VoC) dichotomy

The central actor in the model of Hall and Soskice (2001a) is the firm. It is in relation with other actors, namely its own employees (internal) and a range of external actors that include supply chain partners, stakeholders, trade unions, business associations and governments. These can be attributed to five spheres (institutions). Hall and Soskice (2001b) distinguish a fundamental difference in the institutions of liberal market economies (LMEs), e.g. the USA, and coordinated market economies (CMEs), e.g. Germany. The five interdependent spheres of institutions are (Nölke, 2010):

1) corporate finance,
2) corporate governance,
3) industrial relations,
4) education/training,
5) transfer of innovation within the economy.

In all these spheres, coordination needs to be achieved for successful outcomes, i.e. minimized transaction costs and avoidance of problems form principal-agent relationships, i.e. moral hazard, adverse selection, hold-up and shirking. The fundamental difference between LMEs and CMEs lies in the prevalent form of coordination. LME firms coordinate their activities by market relations in a context of competition and formal contracting, while CME firms rather depend on non-market relationships, i.e. incomplete contracting, exchange of private information inside networks, a generally more collaborative approach. The involved institutions include strong employer associations, trade unions, networks of cross-shareholding, legal systems that allow information sharing and collaboration (Hall & Soskice, 2001b).

From their analysis, Hall and Soskice contend that a particular institutional environment renders specific conditions of development and eventual competitive advantage to a firm. The authors name that concept "comparative institutional advantage" (Hall & Soskice, 2001b, p. 37). It shows in the prevalent mode of product innovation. While radical innovation is necessary in fast-moving technology sectors like biotechnology, semiconductors, software development, telecommunications, incremental innovation is essential for keeping competitive advantage in the production of capital goods from the machine building sector, e.g. machine tools, factory equipment, consumer durables, transport equipment. From their analysis, Hall and Soskice deduce that LMEs are better suited for bringing about radical innovation while inhibiting incremental innovation while with CMEs, it is exactly the other way round:

- In CMEs, the (vocational) training systems provide firms with skilled labour at all levels of the firm, required for incremental progress. Cooperation of firms along the value chain is supported by business associations and appropriate contract laws. Moreover, trade unions aim at labour protection and long-term employment. All this is highly indicative for incremental innovation, while radical innovation is hampered by lacking risk capital and labour mobility.
- In LMEs, short-term employment and high market pressure in combination with unilateral control at the firm top prevents the development of a labour force with skills and determination towards incremental innovation. Hire-and-fire policies just do not meet these requirements. On the other hand, available venture capital allows to finance new and risky endeavours with good prospects, drawing from an adaptable and available workforce ready to acquire new skills when paid accordingly. Thus, a good basis for radical innovation is laid.

In most sectors of an LME, production relies on low-cost standardized production driven by employees of low qualification and a corresponding low wage level. This is in sharp contrast to the few high-technology markets, resulting in high wage differentials, indicated by a high GINI index and low levels of social security. The opposite is the case with CMEs.

Table 2.4 VoC dichotomy by Hall and Soskice

Type of capitalism	Countries
Liberal market economy (LME)	UK, USA, Ireland, Canada, New Zealand, Australia
Coordinated market economy (CME)	Germany, Austria, Switzerland, Belgium, France, Netherlands, Italy, Sweden, Denmark, Finland, Norway, Iceland, Japan

Source: Hall & Soskice (2001b, p. 20), amended

Central to the VoC theory is the path dependency of both capitalisms. There is no single optimum policy, no convergence towards one system (presumably LME), but two very different approaches leading to very different results on the basis of specific comparative advantages (Hall, 2005).

Further to that, paths cannot easily be changed or altered, since firms develop long-term strategies complementary to the institutions in place (Whitley, 2003). They adapt to their environment, creating certain sensitive equilibria. Thus, policy-making can neither simply replace one system by another nor put elements of systems together on a voluntary basis, but has to acknowledge the inherited culturally grounded ‘rule of the game’ within each type. If changes are intended aiming at improved coordination of institutions, delicate trust-based equilibria need to be respected. These exist especially in CMEs. In the case of LMEs, such trust and respective institutions are difficult to build up, e.g. vocational training fostering the necessary workforce for technology-based small and medium-sized firms, since firms are afraid of possible agency effects and of poaching (Hoffmann, 2003).

Path dependency shows in the detail. Market pressure from globalization was thought to weaken the influence of unions in CMEs, but the more the firms became lean and focused on core competencies, the more dependent they became on their skilled workers. The unions as intermediaries in wage negotiations could retain their strong position in CMEs like Germany and Sweden (Hoffmann, 2003).

While according to the VoC authors (Hall & Soskice, 2001b) there are enough similarities in both groups to justify a dichotomous approach (c.f. Table 2.4), they acknowledge big differences between institutions of states of one type (e.g. Germany's formation of industry-specific skills in contrast to Japan's formation of skills required in business groups) and also sectoral institutional differences within states. In this respects, Crouch (2005) makes the remark that its large state-led military sector does not fit into the usual scheme of US capitalism.

2.2.2.2 Models containing additional types of capitalism

There is a vast number of models on forms of capitalism. One stream of literature is dealing with mature economies, treated in the following. In recent years, it has been accomplished by a second stream of attempts on classifying emerging economies of various regional affiliations. It will be dealt with in section 2.2.2.3.

In his attempt of integrating varieties of capitalism and welfare state research, Schröder (2013) gives an overview of five typologies consisting of three to five types of capitalism. By then connecting the VoC approach with the classical welfare state typology by Esping-Andersen (1990), he arrives at his own typology of three variations (Table 2.5).

Table 2.5 Unified typology of capitalism by Schröder

Type of capitalism	**Countries**
Liberal (LIB)	UK, USA, Ireland, Canada, New Zealand, Australia
Conservatively coordinated (CC)	Germany, Austria, Switzerland, Belgium, France, Netherlands, Italy, Spain, Portugal, Japan
Social democratically coordinated (SD)	Sweden, Denmark, Finland, Norway

Source: own compilation based on Schröder (2013)

Compared to the VoC dichotomy, the Anglophone group of LMEs remained unaltered under the rubrum 'liberal capitalism' while the group of CMEs was split up into the more welfare-state oriented Scandinavian group labelled as 'social democratically coordinated capitalism' and the intermediate group named as 'conservatively coordinated capitalism'.

While Schröder put his emphasis of analysis on the strength of social security systems, Schmidt (2002; 2003) focused on the role of the state in national institutions. Despite of a tendency towards more liberal markets in the globalization era from the 1990s, she still distinguishes three different market models (Table 2.6), with France as the central actor of the state-led group characterized by high direct influence of the state in terms of economic guidance and interference, e.g. in wage settlements.

Table 2.6 Typology of capitalism by Schmidt

Type of capitalism	Countries
Market (MR)	UK, USA, Ireland, Canada, New Zealand, Australia
Managed (MD)	Germany, Austria, Denmark, Sweden, Netherlands
State-led (S-L)	France, Italy, Spain, Japan, Taiwan, Korea

Source: own compilation based on Schmidt (2003)

As Couch (2005) remarks, Hall and Soskice (2001b) also recognized a ‘Mediterranean’ group (France, Italy, Spain, Portugal, Greece and Turkey), seen as “empirically poised somewhere between the LME and the CME model” (Crouch, 2005, p. 445), but without requiring a specific definition and in most of their text treated as standard CMEs.

Amable (2003), on the basis of a vast range of empirical institutional data, comes up with five geocultural clusters of capitalism Table 2.7.

Table 2.7 Geocultural patterns of capitalism by Amable

Type of capitalism	Countries
Market-based (M-B)	Anglophone countries
Social democratic (S-D)	Nordic
Asian (AS)	Japan, Korea
Mediterranean MED	Southern Europe
Continental European (CE1, CE2)	Continental Western European less Nordic and Mediterranean i) Netherlands, Switzerland ii) Austria, Belgium, France, Germany

Source: Crouch (2005, p. 447)

As these examples of groupings have shown, there is no consensus on how much detail is necessary to not be too inaccurate in terms of diversity for the sake of a parsimonious approach (Crouch, 2005). Yet, the institutional grounds of Hall and Soskice’s (Hall & Soskice, 2001a) analysis have become widely accepted in the analyses of the types of capitalism introduced so far.

A different basic approach is taken by Baumol, Litan and Schramm (2012) who focus their model (Table 2.8) on firm ownership in relation to innovations. They claim that recent successful forms of capitalism are hybrids of entrepreneurial small and medium-sized enterprises generating innovation and powerful firms large enough to succeed in global markets and to constantly acquire innovations from the inventors. Unlike Hall & Soskice (2001b) who connect radical innovation with LMEs and incremental innovation with CMEs, they connect radical innovation with entrepreneurial small and medium-sized enterprises and incremental innovation with the oligopolistic big firms. Thus, no juxtaposition of German and US capitalism is resulting, but different accentuations of a similar form of capitalism.

Table 2.8 Patterns of capitalism by Baumol, Litan and Schramm

Type of capitalism	Countries
Oligarchic	Latin America, Africa, Middle East, Russia
State-guided	Korea, China
Big-firm	Japan
Entrepreneurial	(small and medium-sized enterprises)
Mixed entrepreneurial-oligopolistic	USA, Germany

Source: own compilation, based on Baumol, Litan, & Schramm (2012, pp. 119-121)

One of the basic notions of the VoC approach is the path dependency of economies, based on institutional complementarities, i.e. “institutions within a successful economy are mutually reinforcing, balanced, and complementing” (Nölke & Vliegenthart, 2009, p. 672). National institutional arrangements tend to push firms towards certain corporate strategies especially in terms of innovation. Since LMEs promote simple production on the bottom end and highly innovative technology on the top end, the income difference should be much higher than in CMEs with their well-trained workers in sectors of incremental innovation, e.g. machine building. Therefore, a country’s income distribution should be emblematic for the whole economy. In Table 2.11, p. 50, the income distribution of a set of mature economies is contrasted with their regional and economic affiliation and their type of capitalism according to the patterns discussed so far. From the results, the following can be stated:

- Some empirical evidence for the VoC dichotomy and also Schöder’s stance is given, since as expected most equality is present in the Scandinavian countries (lowest GINI and income ratio values), while the USA (LME) has by far the least equality. But despite of its liberal economy, the UK shows less inequality than the conservatively coordinated Mediterranean countries Italy and Spain. As a key difference to the other LME, the USA, the UK's EU membership is assumed to have an attenuating influence on the country's social policies. The high income differences in both Mediterranean states may have to do with a temporarily unfavourable economic situation.

- Schmidt's distinction does not show in a certain pattern of inequality, since the state-led economies are rather in the midfield of the sample.
- The same holds for Amable's distinction, since both the Netherlands and Japan as members of a distinctive type of capitalism are found in the midfield of the sample.
- The typology of Baumol, Litan and Schramm is too unspecific for deriving useful results for the given sample of countries. The only country deviating from the mixed entrepreneurial-oligopolistic type is Japan which is in the midfield of the sample.

Table 2.9 Inequality and capitalism in selected mature economies

Region	Country	Affiliation	Type of capitalism [7)]	GINI index	Income ratio [1)]
Europe	Austria	EU	**CME** | CC | **MD** | CE2 | MEO	30.5	8.0
	Belgium	EU	**CME** | CC | **MD** | CE2 | MEO	29.0	7.6
	Finland	EU	**CME** | SD | **MD** | S-D | MEO	27.9	6.1
	France	EU	**CME** | CC | **S-L** | CE2 | MEO	33.1	8.5
	Germany	EU	**CME** | CC | **MD** | CE2 | MEO	31.3	7.7
	Italy	EU	**CME** | CC | **S-L** | MED | MEO	33.7	10.7
	Netherlands	EU	**CME** | CC | **MD** | CE1 | MEO	29.9	8.0
	Spain	EU	**CME** | CC | **S-L** | MED | MEO	34.8	13.0
	Sweden	EU	**CME** | SD | **MD** | S-D | MEO	27.1	6.7
	United Kingdom	EU	**LME** | LIB | **MR** | M-B | MEO	34.4	10.1
East Asia	Japan	ASEAN FTA	**CME** | CC | **S-L** | ASIA | B-F	32.1	9.2
N. America	United States [3)]	NAFTA	**LME** | LIB | **MR** | M-B | MEO	41.8	24.0

Source: own compilation based on World Bank (2014a) data for 2008, affiliations as of 2012
Typologies (cf. Tables 2.4-2.8): Hall & Soskice (2001a) | Schröder (2013) | Schmidt (2003) | Amable (2003) | Baumol, Litan, & Schramm (2012)[1)] ratio between income shares of highest/lowest 10 %; [2)] data for 2009; [3)] data for 2007; [4)] data for 2006; [5)] associate members; [6)] also strong ties with ASEAN (ASEAN Plus three)

Summarizing the findings, the VoC approach renders meaningful results. This notwithstanding, institutions may largely vary within its groups. Regional embeddedness seems to lead countries towards common equilibria, at least if guided by strong overarching institutions like the EU, as the example of the UK in comparison to the USA has demonstrated.

The typology of Baumol, Litan and Schramm (2012) is not limited to fully developed economies, but encompasses all global economies. A closer analysis of forms of capitalism in emerging countries will be presented in the following.

2.2.2.3 Types of capitalism in emerging countries

Only in the last decade, developing countries have increasingly been included in the VoC literature (Andriesse, 2010). Most of this research was targeted at specific regions (Latin America, East Europe and CIS states, East Asia including South-East Asia), while connections where made only in comparative studies on the largest emerging countries (BRIC states), e.g. by Andriesse (2010) and Nölke (2010). The following delineation of the actual state of knowledge will follow the outlined geographical order but, despite of the lacking comparative studies (Leszczynski, 2015), is also aimed at identifying cross-regional patterns.

As demonstrated via the example of developed economies, such patterns exist and are essential to the VoC approach. There are worldwide Anglophone LMEs, and there is Japan as a CME in a basically European setting with communalities, but also significant institutional differences, e.g. in skill formation (business group vs. sector orientation). Andriesse (2010) states that only Japan fits into the (extended) VoC scheme that Schmidt (2003) outlined for mature countries. Accordingly, largely different classifications need to be made for emerging countries.

A major difference between regions is caused by the fact that in Latin America, socio-economic structures in their current form have evolved over a very long time from their mainly Spanish and Portuguese (Brazil) colonial history and can thus be considered as relatively stable, while East Europe & Central Asia and also most states of East Asia have only fully participated in the global economy since around year 1990, so their economies have since been transient (Leszczynski, 2015). Central and East Europe have never experienced a period of undisturbed development since WW II, and neither have major parts of East and South-East-Asia.

Latin America

Ever since the first reliable records in the mid-twentieth century, Latin America has remained the most unequal region in the world. Besides of its high concentration of income and wealth, there is a "dual economy syndrome" (Martínez, Molyneux, & Sánchez-

Ancochea, 2009, p. 1), meaning that besides large firms in the hands of a few families, sometimes the state, there is a large sector of unregistered work or small firms where workers, despite of existing laws, do not enjoy protection due to lacking control from state administration and the judicial system (Friel, 2009).

In all Latin-American states, firms have to adapt to weak institutions, lacking trust, little contract enforcement and a low availability of qualified workforce. A standard model to cope with these circumstances is the diversified business group that internalises business transactions, integrating their supply chains and diversifying to balance risks from different sectors. Friel (2009) gives a fine example for this by the Argentinian candy producer Arcor, a firm that has vertically integrated about 95 % of its value chain.

HMEs as an addendum to the VoC framework

Schneider coined the term 'hierarchical market economy' (HME) as an ideal type for describing Latin-American economies (Schneider, 2009) and, together with one of the original authors, linked it to the VoC approach (Schneider & Soskice, 2009). An HME is characterized by "diversified business groups, MNCs, atomistic labour and employee relations, and low-skilled labour" (Schneider, 2009, p. 557).

The HME description has become standard (Bril-Mascarenhas, 2015), meanwhile being worked out more comprehensively (Schneider, 2013). Again, as with the VoC approach, the HME definition might be overly simplistic for differentiating national aspects of the institutional framework, e.g. the role of the state in devising business and in the welfare sector (see details below), and so it has been heavily disputed (e.g. by Andriesse, 2010; Fishwick, 2014). Yet, on a global scale, characterising the Latin-American varieties of capitalism as HMEs appears to be a useful exercise.

Friel (2009) applied the VoC institutional framework on Argentina, coming to the following results for HMEs:

- Because of high volatility and uncertainty, corporate finance is not done via stock markets.
- 90 % of the largest Argentinian firms are owned and managed by families.
- Unions are politicized. In many Latin-American cases, their power is directly linked to the state. Although this is not the case in Argentina, unions are powerful especially in big cities. Therefore, large firms aim at close relations with the government.

- Firms in HMEs tend to work in sectors where no high skills are required. If large firms require specific skills, their employees need to be trained in-house. They neither rely on markets nor institutions.
- There is no innovation generated within the economy. Large firms need to import their design and marketing from the industrialized world.

Theoretically, legal protection is even stronger than in CMEs, e.g. workers are entitled to compensation payments when being terminated. In practice, these laws are only applied on very large firms, so an unprotected second layer of smaller firms exists (Friel, 2009).

From these findings, it may well be concluded that it is very delicate to operate in the Argentinian economy. The existing pitfalls can only be circumnavigated by close informal ties with local authorities. Thus, in HMEs, high market entrance barriers exist even for MNCs.

SMEs as a BRIC-state variety of capitalism

Nölke (2010) focuses on the economy of Brazil, the by far largest and most-populated Latin-American country. The size of its domestic market makes the Brazilian economy different to that of standard Latin-American HMEs as described above. It allows the emergence of large firms that are internationally competitive due to economies of scale. Brazilian exports, unlike those of most other Latin-American countries, are dominated by processed goods, not primary products. The market size makes the country attractive for MNCs who are allowed to enter the Brazilian market in areas where domestic products are not sufficiently available, especially in the transfer of innovative technologies.

The mostly family-owned, sometimes state-owned large businesses are highly diversified and integrate foreign capital without giving up control. On an informal basis, the local bourgeoisie cooperates closely with state institutions, so the persistence of economic conditions is assured against all challenges from smaller local on the one hand and MNCs on the other hand (Nölke, 2010). Because of these close ties, Nölke (2010, p. 3) denominates Brazil as a 'state-permeated market economy (SME)', coordinated by clans. It is put in line with the other BRIC economies.

Notwithstanding Nölke's classification, Brazil also fits well into the HME scheme. It is not the structures that are very different, it is the size-dependent bargaining position of the state and its leading national businesses which renders different institutional equilibria.

Differentiation of national economies by their welfare state regime

Welfare regimes do not necessarily refer to welfare states. "Understood as constellations of practices that reallocate resources, welfare regimes may or may not include well-developed public policy" (Martínez Franzoni, 2008, p. 68; referring to Gough & Wood, 2004). In her essence of a large investigation on Latin-American welfare state regimes, Martínez Franzoni (2008) clustered 18 countries (Table 2.11, p. 50). She structured her analysis by four main sectors, following Esping-Andersen terminology, each of which represented by a number of macro-economic variables. As a main results, she identified three major clusters of welfare regimes by the following results within her four sectors of analysis (Martínez Franzoni, 2008).

The key findings for the sectors of analysis are:

- Commodification

  The first cluster (C1) contains economies of about three quarters of the workforce in officially registered employment. The second, a little less developed cluster (C2) has at average two thirds in the formal labour market, the third cluster (C3) only about half of its workforce. The first clusters are predominantly urban, the third is rural.

- Decommodification

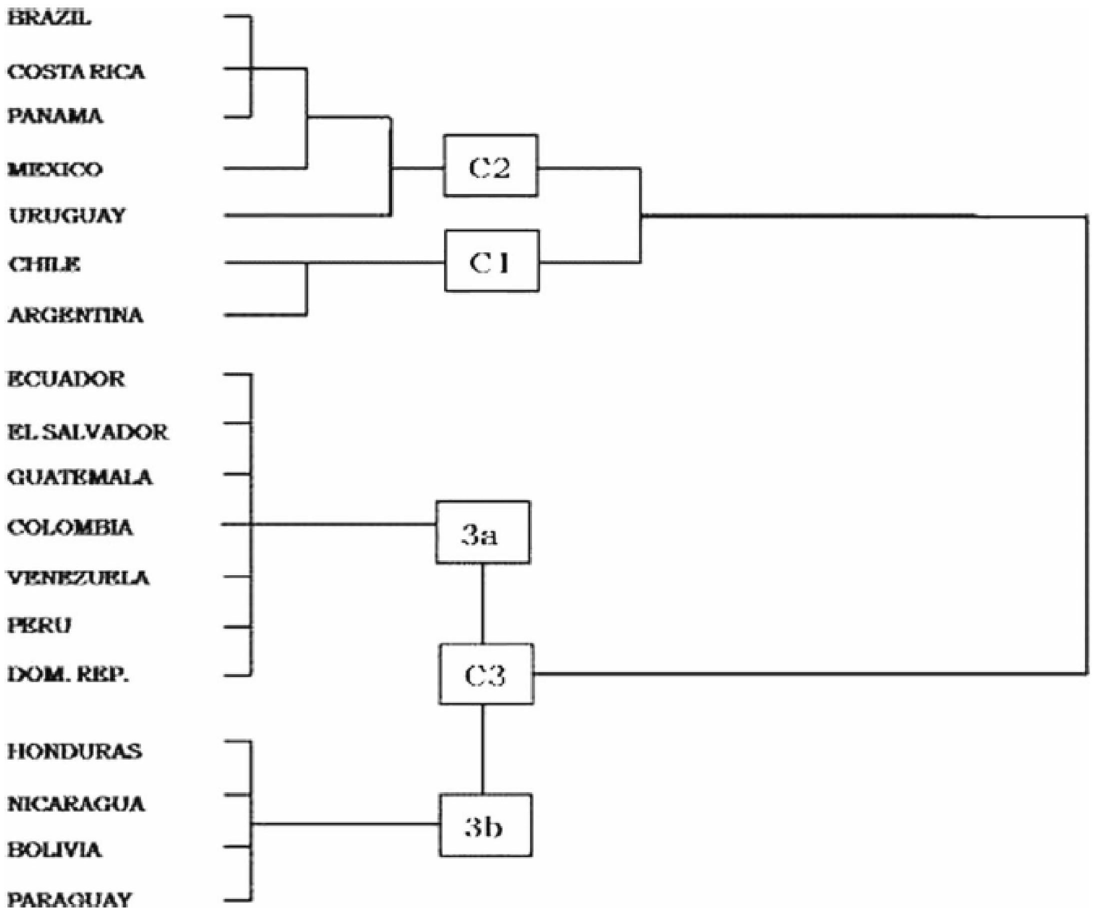
  The absolute social support per capita is highest in cluster 1, a little less in cluster 2, the lowest in cluster 3. Yet, in proportion to GDP, a higher share is paid in cluster 2 than in cluster 1. The lowest share is paid in cluster 3. Payments in cluster 1 are more poor-oriented than those of cluster 2, being more linked to occupation. In this respect, cluster 1 is more liberal-informal in Esping-Andersen's (1990) terminology than cluster 2 which is rather corporate-conservative. Mexico is an exception within cluster 2, following more liberal-informal policies – probably due to its proximity to and economic affiliation with the USA.

- Defamilialization

  The population in cluster 1 becomes older than in cluster 2 and in cluster 3. The traditional family model of the 'male breadwinner' is most represented in clusters 1 and 2 while extended and compound families are most present in cluster 3.

- Performance

  As a central indicator, infant mortality was found to be lowest in cluster 1, followed by cluster 2 and then cluster 3.



Source: Martínez Franzoni (2008, p. 80)

Dendrogram with results from hierarchical cluster analysis (using average linkage between groups). Horizontal lines denote distance between countries in the same cluster. Vertical lines represent clusters that converge when progressively dissimilar countries are merged. The shorter the horizontal lines to the left of the vertical line that joins countries, the more homogeneous the cluster.

Figure 2.10 Welfare regimes in 18 Latin-American countries

Summarizing the findings, states of clusters 1 and 2 can be considered as state welfare systems. Cluster 2 (with the exception of Mexico) is less targeted to the poor, but more linked to formal labour. Cluster 3 is the worst and most inefficient case, neither sufficiently bringing people into registered work nor granting them significant social security.

When assuming the path dependency present in the VoC approach and also in the considerations of welfare state research (Esping-Andersen, 1990; Schröder, 2013), Martínez Franzoni's results might be traitorous for certain structures and clusters of the Latin-American economies.

East Europe & Central Asia

The transient character of the former Eastern bloc became very visible in the 1990s when some form of transition from the socialist to the western-style economic system needed to be carried out. Given the enormous differences between the one and the other basic form of economy (Table 2.10), and at that time being no experience with such changes, the task of transformation was massive and delicate.

Table 2.10 Characteristic features of socialist and capitalist economic systems

Socialist economic system	**Capitalist economic system**
Institutions	
Exclusive power of the communist party	Elected political power supports private property rights and market-based institutions
Dominant state ownership of enterprises	Dominant private ownership of enterprises
Coordination of resources by the state bureaucracy	Market coordination of resources
Soft budget constraints	Hard budget constraints
Weak responsiveness to the price mechanism by economic agents	Strong responsiveness to the price mechanism by economic agents
Plan bargaining by the economic agents	No central planning in the economy
Market driven by the sellers (supply)	Market driven by the buyers (demand)
Results	
Focus on the quantity of output, but not on quality or customer satisfaction	Focus on the quality and quantity of output, as well as customer satisfaction
Chronic shortages in the economy	No chronic shortages in the economy
Shortage of skilled labour	Abundance of skilled labour
Hidden unemployment in the economy	Structural and cyclical unemployment
Business cycle fluctuations not necessarily relevant for output and the employment level	Business cycle fluctuations affect output and the employment level

Source: based on Leszczynski (2015, p. 108)

In the 1990s, several forms between shock therapy and very smooth adaption were discussed and executed. Meanwhile, a certain marked picture of the results has evolved, allowing to identify structural patterns (Bluhm, 2014). Drahokoupil and Myant (2015, p. 8) identify six forms of coordination and international integration. Three of these are of particular relevance:[*]

1) 'FDI-based capitalism': export of products of relatively high value, manufactured by subsidiaries of large MNCs, based on FDI in the capital goods sector (Czech and Slovak Republic, Poland).
2) 'Peripheral market economies': exports in simple manufacturing (Southern and East Europe, Baltic States)
3) 'Oligarchic or clientelistic': exports of raw materials and semi-finished goods (Russia, Ukraine, Kazakhstan).

For the first variety, Nölke & Vliegenthart (2009) coined the term 'Dependent Market Economy (DME)', referring to the fact that the activities of their governments are dependent on the strategic decisions of MNC headquarters made abroad. Their DME subsidiaries do not work at the bottom of the value chain of the production of capital-intensive manufacturing of complex durable goods (e.g. automotive, machine building), but rather in its middle. Meanwhile, even some R&D activities are carried out in DMEs (Bluhm, 2014). To distinguish these economies from the one of group 2, they will be referred to as the DME-1 type (cf. Table 2.11).[†]

The second group of states have, also because being more at the periphery, had less success in attracting FDI and raising their standards of living. Their value proposition of producing simple goods like textiles and footwear became more and more challenged by the emerging South-East Asian countries. With EU membership (or at least candidacy), some institutional convergence towards the first DME group and improved connection with western MNC value chains has been achieved (Leszczynski, 2015). Therefore, these economies will be referred to as the DME-2 type.

[*] 'Order states' are Belarus and Uzbekistan. 'Remittence-and-aid-based' are Armenia and Tajikistan.Moreover, growth on the basis of borrowing was noticed in the Baltic States and Hungary. Besides these groups, export in complex sectors without reliance on FDIs was identified only in Slovenia (Bluhm, 2014).

[†] In Latin America, Mexico plays a similar role, highly intertwined with the US economy and thus influenced by US MNCs, but also by European MNCs who utilize Mexico's low wages to produce for the NAFTA markets.

The third group, all CIS states, is characterized by an authoritarian and 'oligarchic or clientelistic' form of capitalism. It involves close links between firms and the state in the leading economic sectors, assuring financial assistance for necessary investments. Other sectors receive little attention and institutional support, resulting in a relatively low performance that does not allow to succeed in international markets (Drahokoupil & Myant, 2015). The outlined category is equal with 'oligarchic' capitalism (Baumol, Litan, & Schramm, 2012) and 'SME' capitalism (Nölke, 2010).

Asia

Japan as an early fully industrialized country was already part of the original VoC delineation by Hall and Soskice (2001a), locating it in the CME group. From the 1990s, Asian states have become more and more involved in the global economy and developed transient economic institutions. From import substitution, their industries changed to export orientation (Andriesse, 2010), with specialized firms that participate in global commodity chains (Carney, Gedajlovic, & Yang, 2009). Yet, the transition from export orientation to innovative and knowledge-intensive industries seems to be a difficult task that so far has not often been accomplished by Asian firms (Andriesse, 2010). Specialized studies on the emerging varieties of Asian capitalism have been published only in very recent years.The comparatively early industrializers Japan and Korea have developed emblematic firm structures, the 'keiretsu' and 'chaebol' enterprise, respectively (Carney, Gedajlovic, & Yang, 2009). Both are family-controlled conglomerates. While in Japan, the state is more in a supportive role, assuring necessary institutions, e.g. in education, the Korean state is the business owner but hands corporate governance over to families (Andriesse, 2010).

The role and strength of the state is essential to the varieties of capitalism in Asia. Being historically weak and of little reliability, in many cases even predatory, state institutions were not apt to create trust for long-term business relations. Thus, firms could not be grown on the basis of formal rules, but of informal arrangements. The closest available form of trust was found in the family, the second-closest in ethnicity. Accordingly, large firms are very often family-owned in all Asian countries. In many countries, businesses are owned by persons of Chinese ancestry.[*] The wide spread of Chinese identity across Asia

[*] These structures are very similar to Latin-American textures where ethnical Europeans form the business elite (Andriesse, 2010).

helps these family businesses to internationalize their activities, often based on *guanxi*, their specific basis of an informal network (Andriesse, 2010).

The colonial and socialist heritage are still traceable in the present institutional structures:

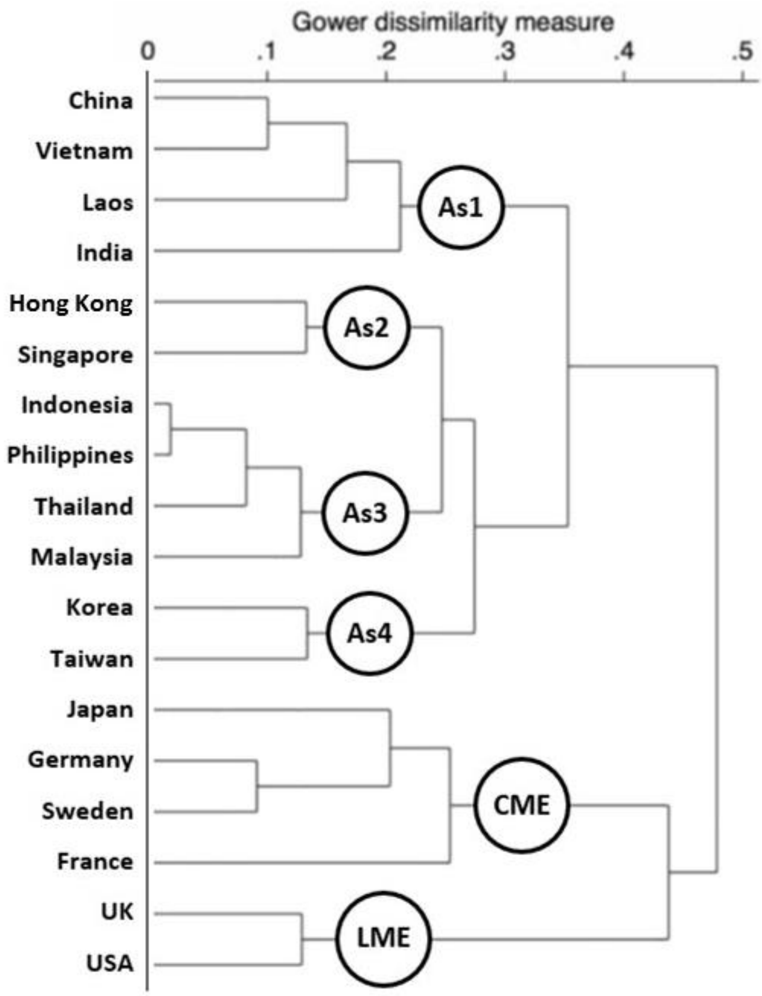
- The formerly Spanish Philippines have a comparatively high level of inequality (GINI = 42.9, World Bank, 2014a), though significantly lower than their Latin-American counterparts of a similar cultural ancestry (cf. Table 2.11, p. 50).
- China has fostered catch-up modernization with parallel sectors of state-supported firms aiming at international markets and a private sector with large regional differences. Following Nölke's (2010) terminology, China is a state-permeated market economy (SME). It is strong enough to allow MNCs to be active in the country and bring in cutting-edge technology without needing to accept their stipulations as DBEs have to do.Vietnam has had some recent success in transforming its underdeveloped economy without abandoning its social standards (Andriesse, 2010).Likewise, India can be classificated as an SME, but due to its overwhelming share of unregistered workers (93 %), it might additionally be considered as an "informally dominated market economy" (Andriesse, 2010, p. 6).Also in Korea, the state has played a key role in determining strategies of identifying and supporting sectors of development (ship building, engineering, electronics, ICT) and creating internationally competitive large enterprises.

If the relations between state and family businesses are close, the development of the national economy might be hampered by rent-seeking activities. The big families will try to prevent foreign MNCs from entering to keep their market position and status. Thus, a source of innovation is hindered from entering (Carney, Gedajlovic, & Yang, 2009).

On the basis of a hierarchical cluster analysis (Figure 2.11) of the institutional characteristics[*] of 13 Asian business systems in comparison to five Western systems, Witt and Redding (2013) identified four Asian clusters. Japan was found to be an outlier, closer to

[*] Described by the following fields equipped with a set of quantitative indicators: education and skills formation, employment relations, financial system, inter-firm networks, internal dynamics of firms, ownership and corporate governance, social capital, role of the state.

Western institutions than to the Asian. It was found to be the only country to fit into the VoC scheme.



Source: after Witt & Redding (2013)

Figure 2.11 Dendrogram of Asian business systems in comparative perspective

The four Asian clusters are:

1) (Post-)socialist countries: China, Vietnam, Laos, India
2) Advanced city economies: Hong Kong, Singapore
3) Remaining South-East Asian nations: Indonesia, Philippines, Thailand, Malaysia
4) Advanced Northeast Asian economies: Korea, Taiwan

None of the countries was even close to LME practices and the 'Washington Consensus'. Instead, Asian analysts even spoke of "the Beijing Consensus: a political model in which a visible hand not only facilitates but steers and where necessary intervenes in markets in order to create global competitiveness, export success and a vibrant urban middle class" (Andriesse, 2010, p. 5).

When recapitulating the distinctive features of Asian firms, these are (Carney, Gedajlovic, & Yang, 2009):

- ownership concentration,
- broad product market scope,
- organization into business groups,
- reliance on personal networks, dependence upon imported technology,
- presence of family in top management.

R&D activities and building international brands is only followed to a modest extent. All of these are also central features of firms in Latin America (see above). Likewise, there are strong similarities between East Asian and Latin-American institutions bringing about these phenomena. It might well be concluded that many Asian economies may be classified as hierarchical market economies (HMEs), but also with significant differences in institutions and results. Three main differences between these regions were identified:

- The social conditions in Latin America have not undergone as much change as those in East Asia over the age of industrialization.
- At average, East Asia has industrialized later than Latin America and still does.
- The main ethnical group of business development in East Asia (the Chinese) has a different cultural heritage than its equivalent in Latin America (the mainly Spanish Europeans). While the Chinese are well-known for their aptitude and lucre, the Spanish have had a long tradition of rent-seeking inactivity, with their landlords resting on their haciendas paralyzed by the continuous inflow of Latin-American precious metals at a time when their British counterparts started acting entrepreneurial, financed daring business activities and thus contributed to societal change (Przywara, 2006).

Comparative assessment of varieties of capitalism in emerging countries

In Table 2.11, a comparison of inequality and capitalism in a selected group of emerging countries is made. It becomes clear from the findings that there are huge differences between the investigated regions.

Table 2.11 Inequality and capitalism in selected emerging economies

Region	Country	Affiliation	Type of capitalism	GINI index	Income ratio [1)]
Latin America	Argentina	Mercosur	OLI | **HME-C1** | -	46.3	26.7
	Brazil	Mercosur	OLI | **HME-C2** | SME	54.4	43.4
	Chile [2)]	Mercosur [5)]	OLI | **HME-C1** | -	52.0	27.6
	Colombia	Mercosur [5)]	OLI | **HME-C3** | -	56.0	48.8
	Ecuador	Mercosur [5)]	OLI | **HME-C3** | -	50.6	34.2
	Mexico	NAFTA	OLI | HME-C2 | - **[DME-1]**	48.2	22.0
	Venezuela [4)]	Mercosur	OLI | **HME-C3** | -	46.9	64.3
Eastern Europe & Central Asia	Bulgaria	EU	- | - | **DME-2**	33.6	10.6
	Croatia	EU	- | - | **DME-2**	33.7	8.5
	Czech Republic	EU	- | - | **DME-1**	26.3	5.9
	Kazakhstan	CIS	OLI | - | **SME**	29.1	6.1
	Poland	EU	- | - | **DME-1**	33.7	8.4
	Romania	EU	- | - | **DME-2**	29.4	6.7
	Russian Federation	CIS	OLI | - | **SME**	41.4	13.4
	Serbia	EU FTA	- | - | **DME-2**	28.2	6.0
	Slovak Republic	EU	- | - | **DME-1**	26.9	5.6
	Turkey [7)]	EU FTA	*CME* | - | ***S-L*** | - | - **[HME**/SME**]**	38.3	13.4
	Ukraine	CIS	OLI | - | **SME**	26.6	5.4
East Asia	China		SG | - | **SME-As1**	42.6	17.5
	India [2)]		- | - | **SME-As1**	33.9	7.8
	Indonesia	ASEAN	- | - | - **[HME]-As3**	34.1	7.8
	Korea, Rep.	EU FTA [6)]	SG | - | - **[SME]-As4**	n/a	n/a
	Malaysia [2)]	ASEAN	- | -- | - **[HME]-As3**	46.3	19.8
	Thailand	ASEAN	- | -- | - **[HME]-As3**	40.3	11.6
	Vietnam	ASEAN	- | -- | - **[SME]-As1**	38.2	10.9

Source: Own compilation based on World Bank (2014a) data for 2008, affiliations as of 2012
Typologies: Baumol, Litan, & Schramm (2012) | Schneider (2009) - Martínez Franzoni (2008) | Nölke (2010) - Witt & Redding (2013)
In bold: most relevant classification (own assessment)
In squared brackets: own assessment
[1)] ratio between income shares of highest/lowest 10 %; [2)] data for 2009; [3)] data for 2007; [4)] data for 2006; [5)] associate member; [6)] also strong ties with ASEAN (ASEAN Plus three); [7)] typologies (cf. Tables 2.4-2.8): Hall & Soskice (2001a) | Schröder (2013) | Schmidt (2003) | Amable (2003) | Baumol, Litan, & Schramm (2012)

Remark: Data for India does not include the informal sector which is a major shortcoming since only about 7 % of the economy is registered (Andriesse, 2010). Since income in this sector is by about a factor of 10 lower (Dasgupta & Singh, 2006), so is the income share of the lowest 10 %. Accordingly, the income ratio is about 10 times higher than officially registered. Inequality in India is the highest of all compared economies.

Grey or half-grey economy is widespread in Latin America and Asia (see text), but not nearly to the Indian extent (c.f. Friel, 2009).

Latin America is based on oligarchic capitalism in a hierarchical market economy. It is the region of the by far highest level of inequality in the world (apart from India when considering its informal sector). The Mexican economy is largely determined by its immediate US neighbourhood.

East Europe falls into two spheres: i) the western-oriented states which are highly dependent on MNCs; ii) the CIS states which are highly dependent on exports of primary products, if available. Inequality is of a level compared to mature states.

Turkey is an outlier with a different cultural heritage and no communist past. Its economy contains two layers: i) large highly productive, mostly family-controlled businesses of manufacturing and heavy industries, relying on a well-trained workforce; ii) a rather informal sector of small and medium-sized firms involving little skills (Bartalevich, 2014). The structure of the economy is of a hybrid nature, so its affiliation has been disputed.[*] While the first layer is very much like a CME, the second sector is unregulated, but with no innovative capacity. Moreover, the first sector depends on informal relations with the state which sometimes intervenes in a seemingly erratic manner (Bartalevich, 2014). Normally, this is more surprising and harder to bear for foreigners, i.e. MNCs, so it helps to stabilize the existing order at the price of lacking innovative capacity. In this respect, but also by its stratified economy, Turkey resembles much of Latin-American HMEs.

East Asia has developed rapidly since the 1990s, following Japan that has been a fully developed industrial nation since the 1960s. Asian nations with a strong and determined state have embarked earlier for industrialization and participation in international markets. The most successful Asian states managed to integrate state institutions with traditional informal structures that assured trust in times of limited beneficial presence of the state. On that basis, a variety of state-owned and family-managed or family-owned and state-supported large companies emerged in certain national varieties. In this respect, they all resemble Latin-American HMEs. Strong states like China, true SMEs, allow for MNCs to bring in latest technology on the basis of FDI, since they are able to impose policies on the foreigners (Nölke, 2010). Smaller states only have the option to get the technology and lose control to MNCs, i.e. to turn into DBEs, or to abstain from FDIs and protect local businesses at the price of not being innovative in the medium and long term.

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[*] Hall and Soskice (Hall & Soskice, 2001b) assigned Turkey to a Mediterranean group within the CMEs.

2.2.3 Smart specialization

Smart specialization is a policy concept that, although developed by an EU work group only in 2008, has made a significant impact on recent EU innovation plans and received support by the OECD (Foray, David, & Hall, 2011). It combines industrial, educational and innovation policies (OECD, 2016). At its core is the idea that the regional resource base of a mature activity shall be enhanced and refurbished by applications of general purpose technologies (e.g. ICT applications) that increase efficiency and productivity quality. Feasible spaces for smart specialisation strategies are to be identified by an "entrepreneurial discovery process" (Foray, David, & Hall, 2011, p. 7), meaning that entrepreneurs (firms and innovators, also including universities) are considered to be likely to identify a suitable direction of regional advance.

According to the OECD (2016), this entails the "creation of synergies between public support mechanisms for R&D and innovation, industrial promotion and training institutions" on the basis of "[m]apping and benchmarking of clusters including analyses of the role and influence of key players" to "enable strategic development based on multi-faceted and multi-governance interactions". Smart specialization is explicitly aimed at an industrial policy "with a focus on revitalising manufacturing production activities in OECD countries" (OECD Secretariat, 2013, p. 17). The approach tries to overcome ill-led innovation incentives that promoted the same technological mix in many regions and thus inhibited knowledge spillovers because of lacking cluster size and scope.

Despite of members of the EU expert group acknowledging that smart specialization "is a perfect example of 'policy running ahead of theory'" (Foray, David, & Hall, 2011, p. 1), the authors of an elaborate OECD report (OECD Secretariat, 2013) list a number of theoretical grounds for the approach. Still, they fail to recognize the smart specialization proximity to VoC theory. By building on available strengths, the VoC-typical path dependency of national or regional economies is implicitly hypothesized. Moreover, cooperation of institutions is mandated. In both approaches, no path of development is considered as the 'silver bullet', but individual comparative competitive advantages are sought for. As Foray, David and Hall (2011, p. 5) put it: "Any region is facing at least some challenges in terms of improving the operational efficiency and product quality of 'something' and this is a matter of R&D, capabilities, innovation, etc." Albeit lacking theoretical grounds, already 17 examples for regional clusters of smart specialization were described in the OECD (2013) report, indicating that the approach seems to offer a reasonable loophole out of economic stagnation.

2.3 De-industrialization as opportunity or threat

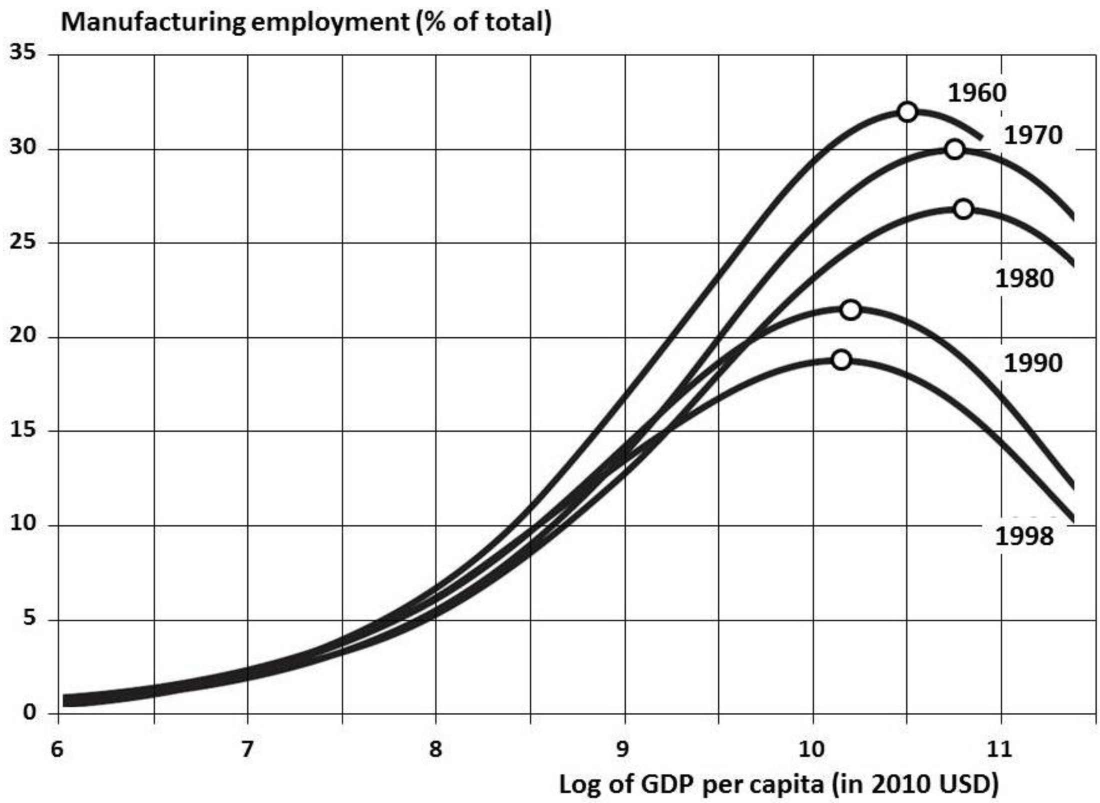
As mentioned in the introduction, the authors of the mid-20th century who first predicted the post-industrial society (e.g. Fisher, 1935; Clark, 1940; Fourastié, 1949; 1954) saw the transition as something natural and inevitable due to rising productivity in the manufacturing sector (Kollmeyer, 2009). Their view was shared by the main authors of the 1960s, (e.g. Rostow, 1960; Kuznets, 1966).

2.3.1 Transition of a mature economy (tipping points)

When assuming continuously rising welfare of a country, its income per capita should rise continuously. So, in line with societal development over time (cf. Figure 2.1, p. 7), the tipping point at which de-industrialization starts should be related to income per capita. In this context, Rowthorn (1994) predicted an inverted-U relationship between income per capita and the share of manufacturing in employment. By regression analysis, he calculated the tipping point at which de-industrialization starts. He estimated tipping at around 12,000 USD (1990 prices), roughly equal to 18,000 USD (2010 prices), resulting in a log value of 9.8 (cf. Figure 2.12). Rowthorn's regression showed a tipping share of manufacturing employment of about 22 % (Palma, 2005, p. 76).

Palma (2005) tested Rowthorn's idea thoroughly and generally confirmed his hypothesis (Figure 2.12). Yet, Palma realized that things were not as simple as Rowthorn expected, since he found the tipping point to be moving over time.

The moving tipping point of the regressions had been predicted by Rowthorn and Wells (1987). They attributed the decline to the rapid productivity growth in (at least some sectors of) manufacturing, brought about by the propagation of the new technological paradigm of microelectronics (Palma, 2005). Because productivity catch-up is fastest in manufacturing, in developing countries de-industrialization would start at a lower level of income per capita than in the early industrialised countries (Rowthorn & Wells, 1987). Still, the magnitude of the shift was surprising to Palma (Palma, 2005).



Source: Based on Palma (2005, p. 77), own calculations

Figure 2.12 Palma's findings for ME (%) vs. GDP per capita (log)

2.3.2 Negative vs. positive de-industrialization

In the early 1970s, the rich Western economies suffered from the first serious economic drawbacks after the constant growth in the build-up phase following World War II. The so-called oil-shock led to car-free Sundays in West Germany and for the first time since the world economic crisis in the late 1920s, unemployment became a real threat. In that scenario, it was hard to sell de-industrialization as a 'good thing'. The *zeitgeist* thirsted for bad news, and so de-industrialization became intertwined with rising unemployment and related serious socio-economic problems (Kollmeyer, 2009) – surely a 'bad thing' (to pick up again the terminology used by White H., 1996, p. 598) which will be viewed more closely in section 2.3.3.

Based on empirical findings, Rowthorn and Wells (1987, pp. 5-6) contrasted these ideas with something they named 'positive de-industrialization', understood as:

> […] the normal result of sustained economic growth in a fully employed, and already highly developed, economy. It occurs because productivity growth in this sector is so rapid that, despite increasing output, employment in this sector is reduced, either absolutely or as a share of total employment. However, this does not lead to unemployment, because new work is created in the

> service sector on a scale sufficient to absorb any workers displaced from manufacturing. Paradoxically, this kind of de-industrialization is a symptom of economic success.

Moreover, they stated that this kind of positive development is limited to rich economies where the industry remains competitive, per capita incomes rise and employment stays almost complete.

In a working paper for the International Monetary Fund (IMF), Rowthorn (with a different co-author) followed this idea more closely on a statistical basis. Both authors explicitly argued against the line of argumentation in public debate connecting de-industrialization with widening disparity of earnings and rising unemployment. While these are considered as negative phenomena, “de-industrialization, in contrast, is not a negative phenomenon in its own right. It is an inevitable feature of the process of economic development […].” (Rowthorn & Ramaswamy, 1997, p. 6).

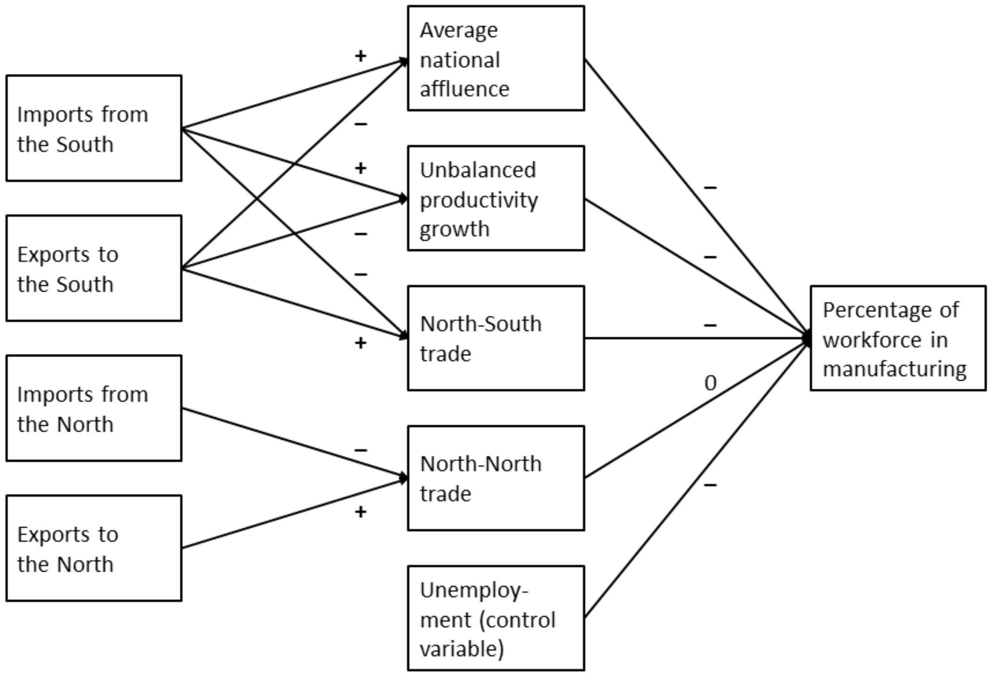
Kitson and Michie (2014), following this idea, identified four lines of argumentation for ‘positive de-industrialization’:

1) A shift in comparative advantage might lead to increased imports of manufactured goods by advanced economies from less developed countries with available low-cost labour supplies. Comparative advantage on the other hand leads to increased exports, especially those of knowledge-intensive business services (KIBS).
2) In rich countries, the consumption of services grows faster than that of manufactures. Demand for services grows faster than the overall economy (by growing affluence of consumers, as Kollmeyer (2009) put it).
3) Labour productivity in manufacturing grows faster than in services.
4) Industrial restructuring and the reconfiguration of the supply chain have led to increases in services and reduced manufactures (which were partly relocated, see section 2.1.3).

Rowthorn and Ramaswamy (1997) found statistical evidence for point 3), while denying major changes in so-called North-South trade, i.e. trade between highly developed and less developed countries. In contrary, the findings of Wood (1995), Saeger (1997) and Kucera and Milberg (2003) support a causal relation between a decline in manufacturing and rising North-South trade. As Wood (1995, p. 66)wrote:

> The fundamental reason for this outcome is that the goods imported by developed countries are more labor intensive than those they export: it would occur even if trade were balanced and thus does not depend on the existence of a trade deficit.

Kollmeyer (2009) criticized these analyses for not being comprehensive and possibly drawing wrong conclusions from either ignoring part of the lines of argumentation or not testing them simultaneously, so incorrect conclusions might have been drawn. He built up a model (Figure 2.13) which directly involves the first three above-mentioned lines of arguments (cf. Kitson & Michie, 2014). Indirectly, conclusions on the fourth argument are also possible. They are related to unexplained period results of the model.



Source: after Kollmeyer (2009, p. 1653). The control variable is not part of his graph. It was added according to the description of his model on subsequent pages.
North-North trade is expected to have little effect on de-industrialization since jobs created by exports should about compensate jobs displaced by imports. Anyhow, for individual countries running a trade imbalance, there might be an influence, so North-North trade was included.

Figure 2.13 Influences on relative manufacturing employment (Kollmeyer model)

Kollmeyer delivered average results for the OECD-18 countries (Table 2.12). According to these results, about one quarter of the experienced de-industrialization (here: relative sector decline) can be attributed to globalization (North-South trade). Half of the de-industrialization would have happened without globalization (consumer affluence and unbalanced productivity growth). These could be attributed to post-industrialism and the idea of 'positive de-industrialization'.

Table 2.12 Factors influencing relative manufacturing employment

#	Influencing factor	Result
1)	North-South trade	24.4 %
2)	Consumer affluence	34.3 %
3)	Unbalanced productivity growth	15.2 %
4 a)	Unemployment	14.9 %
4 b)	Period effects	13.2 %
–	North-North trade	– 2.0 %

Source: Kollmeyer (2009), p. 1667-1669

But there is also a major share of unemployment and period effects. The author mainly attributes both to outsourcing activities, i.e. transfer of less-skilled support work from the manufacturer to a supplier. By this, the same work as before suddenly is registered as service instead of manufacture, but at reduced hourly wages (Kollmeyer, 2009).

2.3.3 De-industrialization as a threat

Singh (1977), backed by Cairncross (1979), argued that "de-industrialization represents a pathological state when it stops the economy from being able to achieve its full potential of growth, employment, and resource utilization" (Dasgupta & Singh, 2006, p. 19).

This argument is picked up by Rowthorn and Wells (1987). In contrast to what they describe as 'positive de-industrialization', they acknowledge that there might be a form of industrialization that is a bad thing. 'Negative industrialization' for them (p. 6)

> […] most certainly is a pathological phenomenon, which can affect economies at any stage of development. It is a product of economic failure and occurs when industry is in severe difficulties and the general performance of the economy is poor. Under these circumstances, labour shed from the manufacturing sector – because of falling output or higher productivity – will not be reabsorbed into the service sector. Unemployment will therefore rise. Thus, negative de-industrialization is associated with stagnant real incomes and rising unemployment.

Moreover, rising income equality and local decline can lead to serious socio-economic problems, as exemplified by the Midlands after the decline of the regional car industry (Bailey, Kobayashi, & MacNeill, 2008) and of Glasgow after the end of most of its shipyards

(Lever, 1991). De-industrialization has rapidly altered the lives of many and as such is perceived as a challenge and a threat (Kollmeyer, 2009).

As Hospers & Steenge (2002) note, already Fourastié (1949), despite of his general positive attitude towards the things to come, acknowledged the difficulties of the transition generation to shift to new circumstances, i.e. to leave their "present institutions (such as habits and norms)" (as the authors put it on p. 11) in the course of the technology-driven change towards services. Social embeddedness is a factor in this respect (Kieser, 1994).

But there is more than just these painful phenomena behind the idea of de-industrialization as a threat. It is the idea that "there is something special about manufacturing", as Kitson and Michie (2014, p. 322) put it. Among the first authors that argued in that direction were Young (1928), Lewis (1954) and Kaldor (1966). Kaldor was of major influence not only in the scientific debate, but in real life as an advisor for the British Labour government since 1964 (Dasgupta & Singh, 2006).

2.3.3.1 Kaldor's 'laws' on the central role of the manufacturing sector

Kaldor derived his idea of the central role of manufacturing for the prosperity of an economy from diagnosed differences in central economic features of the economic sectors. He assumed an income elasticity of demand similar to that of services, but higher than that of agriculture (Dasgupta & Singh, 2006). On the supply side, he estimated the productivity growth of manufacturing higher than that of both other sectors because of its exclusive potential on the basis of economies of scale (Kitson & Michie, 2014). From these basic assumptions, he derived generalizations known as 'Kaldor's laws'.

Kaldor's often-tested (e.g. Libano & Moro, 2009, for Latin America) 'laws' read as follow (Thirlwall, 1983, pp. 345-346):

1) GDP growth is positively related to the growth of the manufacturing output.
2) The productivity of the manufacturing sector is positively related to the growth of the manufacturing output.
3) The productivity of the non-manufacturing sector is positively related to the growth of the manufacturing output.

First of all, Kaldor assumed manufacturing to be the central cause of GDP growth, its 'engine of growth' (Thirlwall, 1983, p. 345). The fulfilment of the second law was to be facilitated by dynamic economies of scale, while the third one was the expression of macroeconomic spill-over effects, e.g. transports resulting from additional manufactures (Dasgupta & Singh, 2006).

In this context, Kitson and Michie (2014) alluded that in many states the manufacturing sector has closely been linked with other economic sectors, not only services, but namely higher education and the public sector. The authors state that by active industrial policies, governments like those of Germany, Japanese and the USA "have been picking winners […] whilst hiding behind the convenient veil of the free market" (p. 325).

As Singh (1977) noted, the manufacturing sector is of crucial influence on the external balance of a country. He followed that idea three decades later when noticing that UK manufacturing accounted for less than 20 % of the GDP, but still for 60 % of its foreign trade (Dasgupta & Singh, 2006). Supporting this idea, in the course of its decline in manufacturing, from the early 1980s the UK for the first time since the industrial revolution had a negative balance on manufactures (Kitson & Michie, 2014).

2.3.3.2 Knowledge-intensive services as a compensation for manufacturing

This argument is around the idea that the British Chancellor of the Exchequer, Nigel Lawson, delineated as follows (Lawson, 1985, p. 554):

> […] there is no adamantine law that says we have to produce as much in the way of manufacturing as we consume. If it does turn out that we are more efficient in world terms at providing services than at producing goods, then our national interest lies in a surplus on services and a deficit on goods.

In a Kaldorian analysis, many services clearly depend on manufacturing, so Nigel Lawson's idea would not work out. Kaldor's analysis, quite adequately at his day, referred to rather simple services (e.g. personal services and transportation). If high-technology services are concerned that have only recently been made available, KIBS like ICT services may well generate follow-up growth even in manufacturing (Dasgupta & Singh, 2006).

The question remains whether services can fully replace the manufacturing sector. Kitson and Michie (2014) cast serious doubt on that assumption by highlighting the trade deficit and regional imbalances resulting from a weak manufacturing sector in the UK. They blame ill-led capital flows, e.g. into a too big financial sector, for the distortions.

2.3.3.3 De-industrialization by the Dutch disease

'Dutch disease', a term originally coined by The Economist (2010; referring to The Economist, 1977), is a process in which the discovery of a natural resource (in the name-giving case of the Netherlands in 1959, it was natural gas) causes a country to switch from aiming at generating a trade surplus in manufacturing to aiming at a trade surplus in primary commodities (Palma, 2005). Normally, natural resources are a blessing and resultant reductions in manufacturing would be considered as a small collateral damage of a generally positive development. If taken to the Dutch disease, the consequences may well be subsumed in the 'negative de-industrialization' group. The phenomenon has been described well theoretically (Corden & Neary, 1982) and empirically (e.g. by Stijns, 2003).

There are two mechanisms subsumed as Dutch disease effects:

- increased demand for labour in the booming sector, drawing it away from the lagging manufacturing sector ('direct de-industrialization'),
- 'indirect de-industrialization', caused by extra spending on services on the basis of the natural resource revenues, resulting in a shift to the service sector. Service prices increase, while manufacturing prices are determined by international markets and thus cannot rise accordingly. Manufacturing becomes increasingly unattractive. This effect can be enhanced by currency effects, i.e. higher exchange rates leading to worse export chances also in manufacturing (Stijns, 2003).

Some economists (e.g. Ebrahim-Zadeh, 2003) even relate the term 'Dutch Disease' primarily to the phenomenon of a massive inflow of foreign currency due to a variety of reasons like natural resource price rises, but also foreign assistance and FDIs.

In the course of the Dutch disease, investments are shifted to the primary sector. Since the oil and gas industry are particularly capital intensive and normally highly profitable, especially highly qualified workforce is attracted and drawn away from manufacturing ('crowding out'). Lacking sufficiently qualified personal, the manufacturing sector eventually becomes permanently damaged, leading to rising unemployment (Krugman, 1987).

Palma (2005) identified one more form of the Dutch disease. He noticed that it was not brought about by sudden discovery of natural resources (these were long known), but by a drastic switch in the economic policy regime of South American countries (Brazil, Argentina, Chile, and Uruguay). After years of pursuing a state-led import-substituting industrialization agenda despite their well-known abundance of natural resources, they switched to trade and financial liberalization in the 1980s. Investors responded quickly, and within a decade the (artificially high) levels of manufacturing employment fell drastically to typical levels of countries of resource abundance.

2.3.3.4 'Premature' de-industrialization

In less developed countries, "industrial dynamism is normally accompanied by a rising share of manufacturing in employment" (Rowthorn & Wells, 1987, p. 6). But sometimes, the industrialization process stops before a country has reached a mature state of industrial development. 'Negative de-industrialization', as Rowthorn & Wells (1987) declare, can hit economies at all stages of development.

Dasgupta and Singh (2006) followed these developments more closely for a number of Asian and Latin-American countries. They compared the developments in these economies with the historical processes of today's advanced countries. As a key finding, they denoted that the point of inflection is sometimes as low as 3,000 USD (current) per capita.

But, unlike Rowthorn and Wells assumed, it is not necessarily an outflow of economic failure of these countries or extreme difficulties of the industry, as Dasgupta and Singh have discovered. To mark it in the Rowthorn and Wells terminology, there is also 'positive de-industrialization' that may occur prematurely. Dasgupta and Singh found proof for this possibility in India. The Indian development is characterized by two specific phenomena:

- According to their statistic regression analysis, KIBS, mainly software and computer programming (ICT) may replace manufacturing as the economic growth engine. Productivity rises in the service sector are, unlike the presumption of Kaldor (cf. section 2.3.3.1), in the region of those in manufacturing, while only agriculture falls behind.
- Much of the Indian labour in manufacturing is carried out in unregistered firms. The informal segment sheds unemployment by absorbing 83 % of total employment in manufacturing. Due to lacking labour protection, full flexibility is the norm. Rather primitive work is carried out, with productivity gains mostly achieved in the registered part of the economy (Dasgupta & Singh, 2006).

In addition to these actual developments, Dasgupta and Singh (2006) noted that the proto-industrial and largely informal (unregistered) Indian textile industry, working on a putting-out basis in Indian states, was swept away from the market when being exposed to industrial competition – in a way another form of 'premature' de-industrialization.

This recent Indian development had a predecessor in 19th century Germany, as Kieser (1994) reported. The German textile proto-industry that emerged from medieval guilds was based on a similar putting-out system. It involved division of labour among subcontractors that faced serious cost pressure by the few putter-outers that drove the system. But until the 1830s, this far-reaching system which employed high numbers of workforce (Henning, 1995) and that had dominated textile manufacturing over centuries had to give way to centralized industrial forms of production, driven by the steam engine (Kieser, 1994).

2.3.3.5 Reverse de-industrialization

After the end of the East-West controversy, the significantly industrialized economies of the former Soviet Union and East Europe experienced an economic downswing. Before 1989, these countries had levels of income per capita below the turning point of the curve. Their decline in GDP per capita led to a reduction in manufacturing employment that followed the same way down as it went up before (cf. Figure 2.12, p. 54). Palma (2005) thus denominated this specific form of backward development as 'reverse de-industrialization'.

According to the author, a similar parallel development was also experienced in Sub-Saharan Africa, namely in South Africa after the end of the Apartheid regime (ibid.).

2.4 Quantitative definitions and modelling of de-industrialization

Coherent definitions are required for a sound analysis of de-industrialization processes. In this section, existing definitions and their applications will be critically reviewed. Definitory gaps and inconsistencies will be identified. Their remedy is intended to serve as a basis for the actual research.

2.4.1 Definitions of de-industrialization

Before turning to available definitions, it needs to be stressed that de-industrialization is not a short-term development, but refers to permanent structural change (Klodt, 2014a; 2014b; 2014c).

2.4.1.1 Standard definitions and their inherent weaknesses

Starting with the pioneers of the idea of structural change, de-industrialization was defined as a relative decline in sectoral employment (Clark, 1940; Fourastié, 1949). Over time (Lewis, 1954; Kaldor, 1966), the manufacturing sector was recognized as the central indicator for (de-)industrialization.

Relative versus absolute figures

Following the traditional sociological path, Kollmeyer (2009, p. 1645) unmistakably stated:

> *De-industrialization* does not necessarily denote a decline in manufacturing output. In this study or elsewhere, it refers to a decline in the manufacturing sector's share of total national employment. If labor productivity increases rapidly, de-industrialization can occur even as manufacturing output increases or remains constant.

By this definition, de-industrialization rather becomes a quantitative descriptor of social change than of one of the economic significance of the manufacturing sector.

Yet, absolute figures of output and employment are meaningful indicators for distinguishing certain sub-phenomena of de-industrialization. E.g. 'jobless growth' is one that involves both indicators that combined stand for the sector productivity (Dasgupta & Singh, 2006).

Misuse fostered by definitions lacking precision

Quite often, statistical figures are (mis-)used intentionally to back up the opinion of an author. In this respect, the major options to belittle consequences of de-industrialization are:

- utilizing output instead of employment figures,
- utilizing absolute instead of relative output figures,
- using current instead of constant prices of output, i.e. excluding inflation,[*]

[*] Throughout this thesis, the value of all goods and services will be expressed in constant prices. Year 2010 USD will be utilized, if not indicated otherwise.

- emphasizing positive developments in other sectors resulting from the actual change.

On the other hand, in order to stress the dimension of de-industrialization and to emphasize the resulting societal danger, the following methods might be applied:

- utilizing relative employment figures, especially those of shrinking sub-sectors,
- presenting absolute decline in a setting that proves the dramatic extension of the adjustments,
- emphasizing negative developments in other sectors resulting from the actual change.

Either way, be it for the sake of proving 'positive' or 'negative' de-industrialization, the utilization of statistics might be traitorous for the hidden intentions of an author. In the course of this literature analysis, no systematic work on identifying these hidden agendas has been identified. To close this gap could be a starting point for further research.

Some additional vague definitions

Besides the rather exact definitions introduced so far, there are also definitions that offer only a vague economic setting. In the Farlex Financial Dictionary (2012), the following definition is rendered:

> **De-industrialization**
> A situation in which an economy begins producing more services than goods. An analyst may say that de-industrialization is occurring when decreases in manufacturing are accompanied by increases in consulting companies. This can be beneficial to some sectors; indeed, some investors look for evidence of de-industrialization to know what industries are likely to be profitable. However, de-industrialization can be detrimental to some workers and regions. For example, as the United States has de-industrialized, the city of Detroit, which is home to many automakers, has lost approximately half of its population, and consistently maintains a high unemployment rate relative to the rest of the country.

Instead of offering an exact definition, some positive and negative consequences of de-industrialization are discussed.

Another example for an insufficient definition is rendered by David L. Scott (2003):

> **De-industrialization**
> A shift in an economy from producing goods to producing services. Such a shift is most likely to occur in mature economies such as that of the United States. This shift has considerable impact on investors' view of the attractiveness of various industries.

Again, no accurate definition is rendered, but some consequences are mentioned – but again without an exact description (in this case one of the investors' view).

Summary of the findings from literature

Summarizing the findings, no cross-disciplinary standard definition of de-industrialization is utilized in the fields of sociology and macro-economy. Kollmeyer's (2009) definition that de-industrialization means a relative decline in manufacturing employment is quite common in sociology. Yet, it can neither be considered as complete nor universally adequate:

- It does not comprise a time frame for the structural changes.
- This definition only refers to the meaning of manufacturing within a society. It is not well-suited for making international comparisons of the impact of the manufacturing sector.

To illustrate the latter point by an example: If the number of manufacturing employees remains constant, a country of a growing total workforce de-industrializes, following Kollmeyer's (2009) terminology, since its share of manufacturing employment becomes reduced over time. But in comparison to other countries, it would (assuming similar productivity changes in these countries) have about the same economic impact. And simply, the manufacturing industry in this case will neither have reduced its output nor its number of employees. Is that really a case of 'de-industrialization'?

For international comparisons of the economic impact, the absolute output and the productivity of a national economy are of crucial relevance. In this respect, absolute employment figures are the reference parameter while relative employment is of minor interest.

A condensed summary of the findings is given in Table 2.13 (see below).

2.4.1.2 Conclusion on definitions of de-industrialization

There is no such thing as "the only true" definition of de-industrialization, but a variety of definitions. The basic and essential ones of which are listed in Table 2.13.

Table 2.13 Definitions of de-industrialization and their applicability

	Labour content	Employment	Output
absolute	**LAB CONT**: describing changes in total sectoral working hours, un-biased by changes in average individual workload	**ME (abs.)**: necessary for productivity considerations; sensitive to changes in average individual workload	**MO (abs.)**: relevant for comparing the power of different economic units, e.g. sectors of national economies
relative	n/a	**ME (rel.)**: sociological standard definition, showing the meaning of manufacturing for a society including its culture	**MO (rel.)**: relevant for describing the economic impact of manufacturing on an economic unit, e.g. a national economy

Source: Own compilation; ME = manufacturing employment, MO = manufacturing output

With labour content, a new definition is introduced. Labour content can be applied when sufficient information on productivity is available in addition to conventional data on output and employment. It describes the total hours worked in the manufacturing industry. Mathematically, it equals the product of the average individual workload of all employees, multiplied by their number.

While relative and absolute employment figures are altered by changes in individual workload which have an influence on the number of jobs required to carry out a specific amount of labour, labour content by definition is an indicator free from distortions caused by changing working conditions, i.e. increasing part-time employment or reductions of weekly working hours.

All definitions aim at specific targets. Moreover, they all are incomplete and require some further explanation rendered in the following. First of all, the time frame for analysing de-industrialization needs to be set appropriately. Since structural change is a long-term phenomenon, a minimum period of five years should be taken into consideration. This does not take away from the fact that sometimes unexpected incidents cause rapid changes (e.g. fall of Iron Curtain, 11 September 2001, world economic crisis 2008/9).

The following specific points require additional regard:

- Output measures may vary (e.g. turnover or gross value added).
- Employment figures are subject to definitions (e.g. average or minimum hours per job).
- Labour content is no statistical standard figure but needs to be calculated, involving productivity considerations. Often, there is no sufficient data base for these.

Choosing adequate parameters for describing de-industrialization requires mindful consideration of all these aspects.

2.4.2 Models of de-industrialization

On the basis of Rowthorn and Wells (1987), Alford (1997) listed three hypotheses (he calls them 'theses') that could explain de-industrialization phenomena. He emphasizes that these are not mutually exclusive and are rather a framework than already detailed. These explanations are:

1) The maturity hypothesis

   In a mature economy, i.e. a country with a high per capita income, an increasing share of income will be spent on services compared to labour. Moreover, productivity rises faster in industry than in other sectors. The share of manufacturing employment will fall. In absolute numbers, it is not determined to do so because of an eventually growing workforce, especially due to higher female participation and reduced hours of work.

2) The specialization hypothesis

   Comparative advantages in non-manufactured goods like KIBS or primary products[*] might shift labour into these sectors, shifting the pattern of external trade.

3) The failure hypothesis

   Poor economic performance in international comparison will lead to lacking competitiveness and finally to a shift of production to other countries.

With a different labelling, Palma (2005) got to similar results. He distinguished:

1) Upward de-industrialization

   That is Palma's diagnose equal to 'maturity' (Alford, 1997). It was found in continental Europe, Japan, and traditional primary commodity exporting industrial countries.

[*] In this thesis, primary products are understood as industrial goods from mining and quarrying (ISIC 4 sector B), strictly <u>not</u> including agricultural products (ISIC 4 sector A), cf. Appendix 4.

2) Dutch disease

‘Dutch disease’ is utilized by Palma (2005) in exactly the same sense as ‘specialization’ by Alford (1997). Dutch disease comes in two sub-types (cf. section 2.3.3.3, p. 60):

- normal Dutch disease (the Netherlands and countries with newly developed service export activities),
- downward Dutch disease (Latin America).

3) Reverse de-industrialization

Reverse de-industrialization can finally be attributed to ‘failure’ in highly competitive international markets, be it because of sudden exposure to competition that had been kept away before (e.g. former Eastern Bloc) or on the basis of eroded administrative structures leading to reduced performance (e.g. Sub-Saharan Africa and countries of the former Soviet Union, see Palma, 2005).

On the basis of the findings of the literature analysis, three sets of criteria for analysing de-industrialization phenomena were identified:

- mature vs. ‘premature’ de-industrialization (Dasgupta & Singh, 2006)
- positive vs. negative de-industrialization (Rowthorn & Wells, 1987)
- maturity vs. specialization vs. failure (Alford, 1997; drawing from Rowthorn & Wells, 1987)

Detailed explanations were identified for the latter phenomena, especially in Palma (2005) who basically uses the same segmentation, but with a different labelling (see above).

2.4.3 Actual macro-economic analyses

De-industrialization phenomena have been analysed by economists to some extent. Probably the most comprehensive comparative analysis was presented by Palma (2005) in a World Bank release on South-American development processes. Palma’s analysis suffers from the fact that especially for Latin America, only limited data of somewhat doubtful quality was available. Thus, his interpretations are interesting but need to be tested on the meanwhile extended database.

Kitson and Michie (2014) presented a very sound analysis of de-industrialization of the United Kingdom with some comparisons to other mature states. They also take the analysis further to judgments on industrial policies followed by the UK decision-makers of the 1970s until the Great Recession.

No comprehensive and very recent analysis is available, especially none that treats the definitory ambiguity.

2.5 Conclusions and research targets

While de-industrialization was for a long time seen as a natural consequence of societal modernization, a welcome and inevitable process, it became more and more menacing in the course of increased international competition and economic crises. A number of de-industrialization phenomena were described, but many of these analyses were lacking a sound basis both in the definition of de-industrialization and a suitable length of time of the investigations.

All available analyses have not been based on a coherent model of de-industrialization. Such a model needs to be put forward, comprising all stages of economic development. The respective basic knowledge is available, but the bits and pieces need to be put together to generate a sound picture of worldwide de-industrialization processes.

This research will explore the following gaps identified in the literature:

- Available definitions of de-industrialization will be evaluated. Definitions that serve as the basis for an in-depth analysis of de-industrialization forms and processes will be selected or newly created, if necessary.
- A comprehensive model of de-industrialization will be put forward, involving available descriptions of de-industrialization phenomena.
- A full macro-economic analysis will be performed, including necessary data for applying the partly new definitions and the comprehensive model.

Furthermore, the socio-economic analysis can serve as the basis for judging the success of certain political and economic measures by helping to identify best practices of policies in the manufacturing sector.

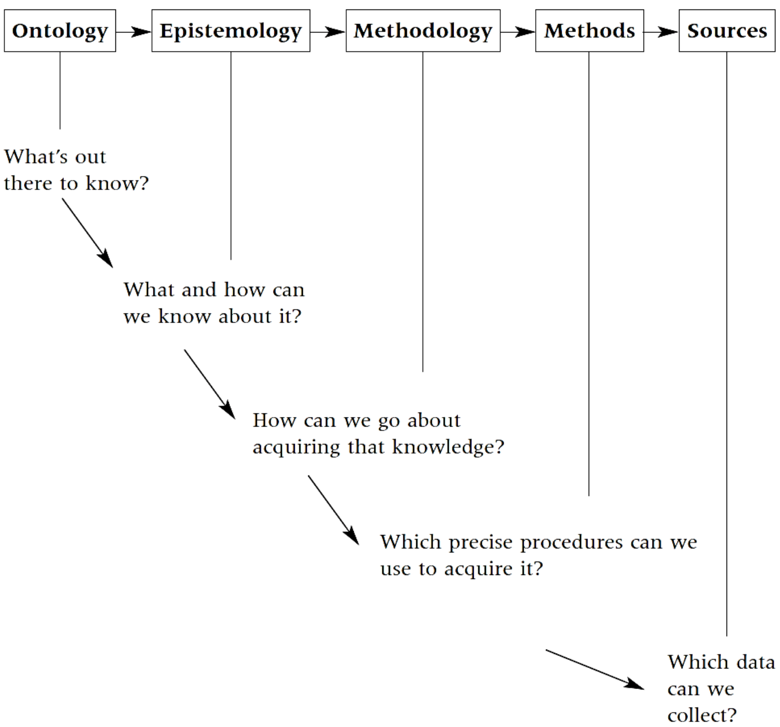
3 Methodology and methods

This research aims at modelling and evaluating the socio-economic change denominated as 'de-industrialization', brought about by political and economic developments between 1970 and 2010, and guidelines derived from identified best practices for industrial policies assuring sustainable development, both in mature and emerging countries.

In the first of the following sections, the philosophical underpinnings (ontology, epistemology) of this study will be expounded. In the two subsequent sections, the research objectives and the applied methodology and methods will be outlined.

3.1 Research philosophy

In this section, the personal philosophical stance chosen for this analysis will be introduced. As a starting point, the logical order suggested by Grix (2002, p. 180) to systemically describe a worldview and derive a research position is explained.



Source: Grix (2002, p. 180)

Figure 3.1 The hierarchy of layers for gaining knowledge through research

As outlined in Figure 3.1, Grix recommends to proceed by starting from ontology ("What's out there to know?") over epistemology ("What and how can we know about it?") to methodology ("How can we go about acquiring that knowledge?"), then finding adequate methods for collecting and analysing data ("Which precise procedures can we use to acquire it?") and the necessary sources ("Which data can we collect?") of data.

An alternative way to this approach is to proceed by selecting a research paradigm (Hunt, 1991; Ponterotto, 2005) involving basic beliefs (metaphysics) determining the whole research (i.e. each of its layers) as shown in Table 3.1.

Table 3.1 Metaphysics (basic beliefs) associated with research paradigms

Item	*Positivism*	*Postpositivism*	*Critical Theory et al.*	*Constructivism*
Ontology	naive realism—"real" reality but apprehendable	critical realism—"real" reality but only imperfectly and probabilistically apprehendable	historical realism—virtual reality shaped by social, political, cultural, economic, ethnic, and gender values; crystallized over time	relativism—local and specific constructed realities
Epistemology	dualist/objectivist; findings true	modified dualist/objectivist; critical tradition/community; findings probably true	transactional/subjectivist; value-mediated findings	transactional/subjectivist; created findings
Methodology	experimental/manipulative; verification of hypotheses; chiefly quantitative methods	modified experimental/manipulative; critical multiplism; falsification of hypotheses; may include qualitative methods	dialogic/dialectical	hermeneutical/dialectical

Source: Guba and Lincoln (1994, p. 109)

Although this approach is clear and appears to be convincing at first sight, consequently utilized, it limits the researcher to a quite narrow band of methods which may be a hindrance when striving for triangulation as intended in this thesis. Moreover, in the approach shown in Table 3.1, some of the headings of the first row reappear in the descriptive layers (mostly epistemology) in the rows below, thus being heading and content at the same time. Therefore, in the following section a stepwise proceeding on a top-down basis as shown in Figure 3.1 is preferred.

3.1.1 Ontology

Ontology in social research deals with “the nature of the social and political reality to be investigated” (Hay, 2002, p. 63). Two seemingly contradictory ontological perspectives are dealing with whether there are social entities that exist independently of social actors:

- “Objectivism is an ontological position that asserts that social phenomena and their meanings have an existence that is independent of social actors.” (Bryman & Bell, 2011, p. 32)
- “Constructionism is an ontological position […] which asserts that social phenomena and their meanings are continually being accomplished by social actors.” (Bryman & Bell, 2011, p. 33)

These two positions form the borders of a continuum in which the observer can deliberately move to and fro rather than being truly contradictory. This shall be illustrated by an example.

The notion of “organizational behaviour” attributes specific characteristics to a social entity (e.g. a company) quite independently from the individual actors working on behalf of it. For example, a phenomenon named “the buying behaviour of Volkswagen” is denoted by the sales force of suppliers to the automotive industry. Volkswagen suppliers perceived the “Lopez effect” in the 1990s, an abrupt change in the corporate buying behaviour caused by the new head of the Volkswagen purchasing unit, Mr. Ignacio Lopez (von Weizsäcker, 2004). His central pressure was so high that a quick streamlining of the members of the purchasing department was realized.

Do such social phenomena have an existence or meaning independent of persons involved? It is yes and no at the same time; the viewpoint taken (respective to the scale of time or space) makes the difference in perception and description. “All things must pass” (Harrison, 1970), “In the long run we are all dead” (Keynes, 1924, p. 80), so over time, things will be subject to change, and so their meaning and interpretation – notwithstanding that it may make sense to describe certain social entities as quasi-erratic blocks within a certain time frame. When going into the very detail, the constructivist element might become almost invisible compared to the objectivist one. When making a very generalist approach, details necessary for true understanding might be missed. Sometimes, the wood cannot be seen for the trees – but still, it remains an entity. And from outer space, the nature of a tree could not be examined – still, trees (or its cells? or its at-oms? or …?) remain the constituting elements of a forest.

Regarding this ontological stance and the envisaged research, it appears useful to follow Aristotle's (384 BC – 322 BC) advice (Aristotle, n.d.):

> It is the mark of an instructed mind to rest satisfied with the degree of precision to which the nature of the subject admits and not to seek exactness when only an approximation of the truth is possible.

Applied on this thesis, the term 'de-industrialization' stands for structural change, a macro-economic phenomenon. Still, apart from objective frame conditions (e.g. natural resources), this phenomenon is created by a vast number of individual decisions, those of policy makers setting regulative and institutional frame conditions for micro-economic decisions of industrial leaders, these again setting their frame conditions for industrial activities performed at all levels of the firm. It seems to make sense to zoom in and out to get an understanding of societal and economic interplay:

- Individual decisions need to be understood, both their quantitative and individual rationales, so constructionism is the ontological stance for explanation.
- Still, the macro-economic phenomena will be described in an abstract (economist) way, at least as if they existed independently of the social actors. In this respect, an objectivist stance is taken.

3.1.2 Epistemology

Over centuries, natural sciences had developed a tradition in which a neutral observer was out to describe an un-biased picture of the phenomenon under consideration. This tradition, so-called positivism, claimed to find undisputed truth. It was heavily shaken by the findings of quantum mechanics where the result is determined to be dependent on the observer (Heisenberg uncertainty principle). Resulting post-positivism still strives to be as neutral as possible, but acknowledges the necessity to clarify the individual viewing angle (Crossan, 2003).

Interpretivism stands at the other end of the epistemological continuum. "It is based on the view that a strategy is required that respects the differences between people and the objects of the natural sciences and therefore requires the scientist to grasp the subjective meaning of social action" (Bryman & Bell, 2011, p. 29).

Critical realism, unlike positivism, allows defining hypothetical social entities that account for certain observable phenomena. Unlike empirical realism which is directly trying to capture reality by choosing the adequate method for the purpose, critical realism seeks for structures behind observation (Bryman & Bell, 2011).

By the envisaged study, patterns within observed phenomena of structural change shall be identified. These patterns shall be related to policies, but also to national culture and societal pre-conditions. To describe the structures behind the visible phenomena and means to influence them is the aim of this study. The epistemological stance of a critical realist suits this research well. Yet, there are aspects which are related to a neutral standpoint (macro-economic statistics), others are clearly interpretivist (e.g. hermeneutics).

Like in the ontological stance, the epistemology of this study is not clear-cut but rather pragmatic. For such an approach, an adequate methodology needed to be defined. It was found in case study research.

3.1.3 The methodology of a comparative study involving cases

The central purpose of this study is to identify typical patterns of structural change and the most beneficial ways of industrial policies for a national economy. The basic design for achieving these goals is a cross-national comparative study (cf. section 3.3). It involves several cases (here: nations) for which similar data is collected within a cross-sectional design format (Bryman & Bell, 2011).

In this section, the fit between the basic case study research method and the chosen application will be discussed.

3.1.3.1 Case study research

Generally speaking, a case study is an in-depth study of a particular situation. Often it is utilized to make a very broad field of interest accessible for research (Shuttleworth, 2008). Verschuren (2003) added an important point by stating that in his view of true research utilizing case study, the research unit also has to be the observation unit. Thus, a case study is holistic rather than reductionist (Stake, 1995; Verschuren, 2003). Verschuren illustrated this by the example of a quantitative survey on persons in one company. Such a study does not become a company case study just by being carried out in that unit. If people from out of the firm might as well have been picked to come to similar results, so if the observed persons' characteristics are not being determined by the company environment but could as well have been detected in a random sample of persons outside the firm, there is no company case because there are no company-specific findings.

In the actual research, each country is of particular interest, writing its own story of industrial rise and decline. Each sub-case is unique and irreplaceable by a substitute. Thus, in the sense that Verschuren attributed to it, the actual study is genuine case study research.

Indirectly, Verschuren's argumentation was supported by several writers (Eisenhardt, 1989; Flyvbjerg, 2006) who stated that the selection of cases is not at random as in traditional (positivist) research aiming at statistical evidence. For case studies, often extremes are chosen to make processes and situations more visible, so the context is of crucial influence on the results.

Some authors like for example Voss, Tsikriktsis and Frohlich (2002) use the term 'case research' in the sense of research comprising one or more case studies, which are in return considered as "units of analysis of case research" (p. 15). This usage of case research is not universally accepted. Bonoma (1985, p. 199) applied case research to describe "the qualitative and field-based construction of case studies". Verschuren (2003) went beyond that by precisely <u>not</u> relating case research to case study. According to his definition outlined above, a case study always contains and maintains a holistic view on the case which thus remains the object of observation.

Case research for Verschuren only involves a certain area in which research is carried out and where the observed objects may be regarded separately from the research object (like the people in the company in the example above). He considers case study design as a research strategy of its own. In this respect, he followed Eisenhardt (1989) in her seminal paper on theory-building from case study research. So if research is built of one or more case studies, the more accurate term to be used would be case study research. The term case study research is also employed by the leading experts in the field (Baxter & Jack, 2008) Robert Stake and Robert K. Yin (cf. Stake, 1995; Yin, 2000).

According to Yin (Yin, 2000, p. 13), a case study is defined as follows:

1. A case study is an empirical inquiry that
   - investigates a contemporary phenomenon within its real-life context, especially when
   - the boundaries between phenomenon and context are not clearly evident. […]
2. The case study inquiry
   - copes with the technically distinctive situation in which there will be many more variables of interest than data points, and as one result
   - relies on multiple sources of evidence, with data needing to converge in a triangulating fashion, and as another result
   - benefits from the prior development of theoretical propositions to guide data collection and analysis.

The actual study is an empirical study that investigates the contemporary phenomenon of structural change within the context of a number of mature and emerging national economies, aiming at identifying forms of de-industrialization not clearly evident. This research needs to cope with a complex situation of a multitude of data from various sources. Moreover, prior to the analysis, a theoretical framework will be developed to guide data collection and analysis (modelling of de-industrialization, section 4).

On the basis of this comparison between theory and intended practice of case study research, it is concluded that this study is fully in line with the requirements for case study analysis as set out by Yin (2000).

3.1.3.2 Philosophical underpinnings of case study research

Baxter & Jack (2008, p. 545) claimed that Yin and Stake "base their approach to case study on a constructivist paradigm." From reading Yin (2000) and Stake (1995) thoroughly, only Stake's explicit commitment to the constructivist paradigm can be affirmed (Stake, 1995, p. 100). But contradicting the cited statement, in Yin's work, no epistemological paradigm is fixed. Both scientists share the point that triangulation is vital for case studies, but while Stake bases his research on qualitative methods, Yin considers neither qualitative nor quantitative methods as superior to the other, but as elements of "an all-encompassing method" (p. 13). According to him, "the contrast between quantitative and qualitative evidence does not distinguish the various research strategies" (p. 14). He sees "a strong and essential common ground between the two" (p. 15), so he advocates against the notion that researchers strictly have to adhere to a philosophical position, or, as he more pronouncedly puts it, “philosophical beliefs” (p. 14) that would hinder a multi-method approach including quantitative elements.

It is concluded that constructivism appears to be the natural choice for some case study researchers, but since it is not a constitutive element of the case study methodology in general, it is open for other stances and methods. The case study methodology has developed towards a pragmatic and eclectic approach, a bridge between positivism and constructivism (Johansson, 2003). In this sense, it will be utilized by this study.

3.2 Research objectives

The three research objectives are:

RO1: Modelling of de-industrialization

The study will tackle the existing definitional ambiguity of the term ‘de-industrialization’ by building a comprehensive quantitative model of its manifestations.

RO2: Evaluation of de-industrialization in mature and emerging economies

The model will serve as the basis for a comprehensive analysis of the socio-economic effects of de-industrialization in mature and emerging national economies.

RO3: Identifying best practices for industrial policies

Basing on the socio-economic analysis, suitable industrial policies for sustainable economic development will be identified.

3.3 Research methodology and methods

This research is a cross-national comparative study (Bryman & Bell, 2011) with case elements (Yin, 2000), hence nations. These are compared within a cross-sectional design format that involves a quantitative model conceived at an earlier stage. The comparative design (Bryman, 2012) involves a mixed-method approach with methods adapted to the research objectives. There is a specific methodology to meet each of these objectives.

RO1: Modelling of de-industrialization

On the basis of the findings of the literature analysis, three sets of criteria for analysing de-industrialization phenomena were identified:

- mature vs. 'premature' de-industrialization (Dasgupta & Singh, 2006)
- positive vs. negative de-industrialization (Rowthorn & Wells, 1987)
- maturity vs. specialization vs. failure (Alford, 1997; drawing from Rowthorn & Wells, 1987)

Detailed explanations were identified for the latter phenomena, especially in Palma (2005) who ostensibly uses the same categorization, but with a different labelling.

This research objective is intended to be reached by synthesizing the findings of the literature analysis into an eclectic model which, further to the general groupings, comprises quantitative macro-economic indicators and their expected behaviour. There will be a particular focus on productivity and the individual workload that may vary by country and point in time.

RO2: Evaluation of de-industrialization in mature and emerging economies

A secondary data analysis on the basis of official statistics will be performed. This macro-economic analysis will mainly draw from the following sources:

- Global data: WTO (2014), CIA (2015), World Bank (2014a), OECD (2014a), ILO (2014)
- European data: EU KLEMS database (2012), EUROSTAT (2014)
- National data: national statistical bureaus

The rationale for utilizing official statistics is that these "represent a form of unobtrusive method" (Bryman & Bell, 2011, p. 332) that is well-suited for assuring a rather neutral basis for the subsequent investigations. The availability of high-quality data and the opportunity for performing a long-term and cross-cultural analysis are also in favour of the methodology. The reliability, validity and comparability of available official data (e.g. on unemployment) will be scrutinized (Bryman & Bell, 2011).

The long-term analysis will mainly be performed on the time span from 1973 (OECD 1) to 2008 (Great Recession) with five-year cross-sections. 1973 was chosen as the first year to circumnavigate the distortions caused by the oil shock, 2008 was picked as the final year to avoid the impact of the Great Recession 2008/9. The years around 1990 that brought about the fall of the Iron Curtain and the opening of eastern markets mark a political and economic watershed.

- For mature states, a long-term (15 years) pre-globalization period (1973-1988) and globalization period (1993-2008) and a five-year transition period (1988-1993) will be examined separately.
- As preliminary research on emerging countries has shown, the data is rather limited in many cases, e.g. in relation to Latin America or Asia especially before the 1990s. Moreover, the successor states of the Soviet Union have only started to exist in the early 1990s. Thus, the investigations will focus on the globalization period, i.e. 1993-2008.

Long-term economic success is understood as sustainable growth and development (Economics Online, 2016). Industrial policies and resulting developments have an impact on the economy in general, largely influencing the bargaining position in international trade (necessary imports vs. production at home, possible exports), the (sectoral) employment situation (sectoral investments, degree of automation depending on available technology) and (as a result) the (real) sectoral and national income. To measure economic success corresponding to industrial policies, adequate key performance indicators (KPIs) will be calculated, e.g. trade balance, unemployment rate, income per capita, respective rates of change.

Economic input and output variables will be analysed by means of statistical analysis, specifically correlation analysis (James, Witten, Hastie, & Tibshiran, 2013).

RO3: Identifying best practices for industrial policies

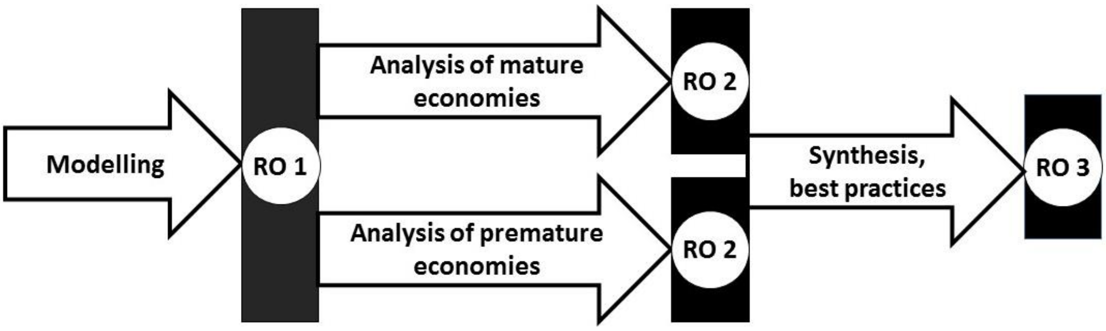
In parallel to the macro-economic analysis, relevant political and economic developments (world, Europe, national states) will be highlighted on the basis of literature analysis, utilizing techniques of historiography (Kieser, 1994), hermeneutics (Ludwig-Mayerhofer, 2006), and discourse analysis (Ludwig-Mayerhofer, 1999).

The cultural background for doing business will be analysed, following the cultural dimensions as introduced by Hofstede (1984; 2014), cf. section 2.2.1. Since Hofstede's model involves quantitative indicators, their alignment with (de-)industrialization indicators are ready to be analysed by correlation analysis (James, Witten, Hastie, & Tibshiran, 2013). The findings of the indicated quantitative and qualitative methods will be connected, allowing triangulation to create confidence in the results (Bryman, 2012; Wrona & Fandel, 2010).

The national findings will systematically be compared on the basis of categories utilized for the de-industrialization model. They will be interpreted connectively, relating the findings either to international trends, common grounds or national peculiarities (Hay, 2002). National culture (cf. section 2.2.1) and the varieties of capitalism (cf. section 2.2.2) will be put in relation to macro-economic data and such be used as an explanatory source.

Based on the comparative design, the common and differentiating factors of the industrial policies within the groups of mature and emerging countries are to be identified. These will be put into relation with the outlined KPIs of economic success. Best practices are those rendering the best perspective for sustainable economic development. Path dependency, as described by VoC theory and the smart specialization approach, will be taken into account.

In Figure 3.2, the analytical flow is outlined. The modelling is intended to be comprehensive, comprising a framework for the analysis of de-industrialization processes of national economies at all stages of development. As depicted in the literature analysis (chapter 2), partly different phenomena are known for mature and emerging economies. The model will contain adapted descriptors for both groups. The analyses of these groups will be performed separately, but on the basis of a largely commensurable framework. Thus, the grounds for the final synthesis of the findings, aiming at identifying best practices, are laid.



Source: Own graph

Figure 3.2 Course of analysis

4 Models of de-industrialization

For modelling de-industrialization processes, two different approaches were made:

- Based on the thorough literature analysis (cf. chapter 2), an eclectic model was conceived (sub-chapter 4.1).
- Own basic considerations led to the development of a model based on sectoral growth rates (sub-chapter 4.2).

These two models were developed rather independently. When pondering the results, they were found to be largely complementary and combinable (sub-chapter 4.3).

In the course of synthesizing the findings, certain additional influencing factors were highlighted, so an even more complete description of de-industrialization processes resulted.

4.1 Model 1: A literature-based eclectic approach

In chapter 2, the state of knowledge on de-industrialization was presented systematically. This state-of-the-art, with special regard to the findings in sub-chapter 2.3, was taken as the basis for a model on de-industrialization. It is aimed at the classical initial point of analysis, dealing with structural change in terms of relative sectoral employment.

The following sections have this content:

1) The basic model is derived.
2) A watershed between mature and emerging countries is fixed.
3) The procedure for analysing mature economies is defined.
4) The procedure for analysing emerging economies is defined.

4.1.1 Derivation of an eclectic model of de-industrialization

When going through the literature-based findings of chapter 2, a certain hierarchy of the described phenomena can be found.

1) The classical structuralists (Fisher, 1935; Clark, 1940; Fourastié, 1949) and modern sociologists (Kollmeyer, 2009) agree on the share of manufacturing employment in total employment as the central relevant indicator.

2) While the classical literature refers to de-industrialization as a natural step of development in mature societies, some authors also describe de-industrialization in emerging economies.
3) There is a difference between phenomena described as ‘positive’ and ‘negative’ de-industrialization, i.e. de-industrialization that goes along with economic improvement or worsening.
4) When de-industrialization occurs, there are different explanations on where the jobs go.

All of these phenomena go along with measurable macro-economic variables. In Table 4.1, the findings of the literature analysis are synthesized into a model, the comprehensive ‘eclectic model of de-industrialization’.

Table 4.1 Eclectic model of de-industrialization (comprehensive)

<table>
<tr><th>General indicator 1)</th><th>Type 2)</th><th>Indicator 3)</th><th>Subtype 4)</th><th>Indicators 5)</th><th>Reason 6)</th><th>Setting</th></tr>
<tr><td rowspan="9">long-term decline of relative manufacturing employment</td><td rowspan="4">mature</td><td rowspan="4">GDP p/c high (over threshold)</td><td>positive</td><td>GDP p/c ↑
unemployment →
trade balance →</td><td>maturity</td><td>shift to high-tech manufacturing 7)</td></tr>
<tr><td rowspan="2">(ambivalent)</td><td rowspan="2"></td><td rowspan="2">specialization</td><td>shift to KIS 8)</td></tr>
<tr><td>crowding out by primary products 9)</td></tr>
<tr><td>negative</td><td>GDP p/c ↓
trade balance ↓
unemployment ↑</td><td>failure</td><td>lacking competitiveness 10)</td></tr>
<tr><td rowspan="5">emerging</td><td rowspan="5">GDP p/c low (below threshold)</td><td>positive</td><td>GDP p/c ↑
trade balance →
unemployment →</td><td>specialization</td><td>shift to KIS 8)</td></tr>
<tr><td>(ambivalent)</td><td></td><td></td><td>crowding out by primary products 9)</td></tr>
<tr><td rowspan="3">negative</td><td rowspan="3">GDP p/c ↓
trade balance ↓
unemployment ↑</td><td rowspan="3">failure</td><td>reverse de-industrialization 11)</td></tr>
<tr><td>backshift to agriculture 12)</td></tr>
<tr><td>backshift to simple services 13)</td></tr>
</table>

Source: Own compilation, drawing from sources as described in:
1) section 2 (introduction); 2) section 2.3.3.4; 3) sections 2.3.1 and 2.3.3.4; 4), section 2.3.2; 5), sections 2.3.2 and 2.3.3; 6) section 2.4.2; 7) section 2.3.1; 8) section 2.3.3.2; 9) section 2.3.3.3; 10) section 2.3.3; 11) section 2.3.3.5; 12), 13) section 2.3.3.4

Further to the general groupings listed in Table 4.1 (type, subtype, reason), the model comprises macro-economic indicators and their expected behaviour. If these are fulfilled in a certain country, the situation can be characterized respectively in accordance with one of the scenarios of the model. This might involve more than one setting, e.g. a shift to knowledge-intensive services and a shift to high-tech manufacturing are mutually non-exclusive.

In the following, the distinction made between mature and emerging countries is described (section 4.1.2). On that basis, the detailed analysis of mature (section 4.1.3) and emerging (section 4.1.4) countries is delineated. It includes further macro-economic indicators for identifying the settings named in Table 4.1.

4.1.2 Evaluation of country maturity

The grouping of countries is carried out in accordance with the World Bank classification of 2010, based on GNI comparisons. GNI is defined as "the sum of a country's gross domestic product (GDP) and net income (labour compensation and property income) from abroad" (World Bank, 2011).

Table 4.2 World Bank Classification of countries

Indicator / **Economy group**	**GNI per capita**			
	minimum (USD)	maximum (USD)	log of minimum	log of maximum
Low income	0	1,005		6.91
Lower-middle income	1,006	3,975	6.91	8.29
Upper-middle income	3,976	12,275	8.29	9.42
High income	12,276	…	9.42	

Source: World Bank (2011), own calculations

For the major industrial countries, the GNI is only very slightly (<1%) above their GDP, so for practical reasons, the more common GDP will be taken into consideration for grouping the countries according to national income per capita.

The line between emerging and mature economies will be drawn along the line of high-income countries for two reasons:

- According to the World Bank, low-income and middle-income economies are sometimes referred to as developing countries, so this exactly suits the classification as 'premature', while the others are developed, i.e. 'mature'.

- It fits well with Rowthorn's and Palma's findings on the tipping point for de-industrialization of mature economies (see Figure 2.12, p. 54) which is always well above the high-income threshold, when expressed in 2010 USD prices.

4.1.3 The eclectic model of de-industrialization for mature economies

In this section, the design of the model for mature economies will be explained in detail. Limited to de-industrialization of mature economies, the eclectic model of de-industrialization is presented in Table 4.3. Compared to Table 4.1, p. 82, the wording and setting of (technological) maturity was slightly altered. Suitable macro-economic indicators for identifying the settings were added. KIBS was utilized instead of KIS because of better data identifiability and availability.

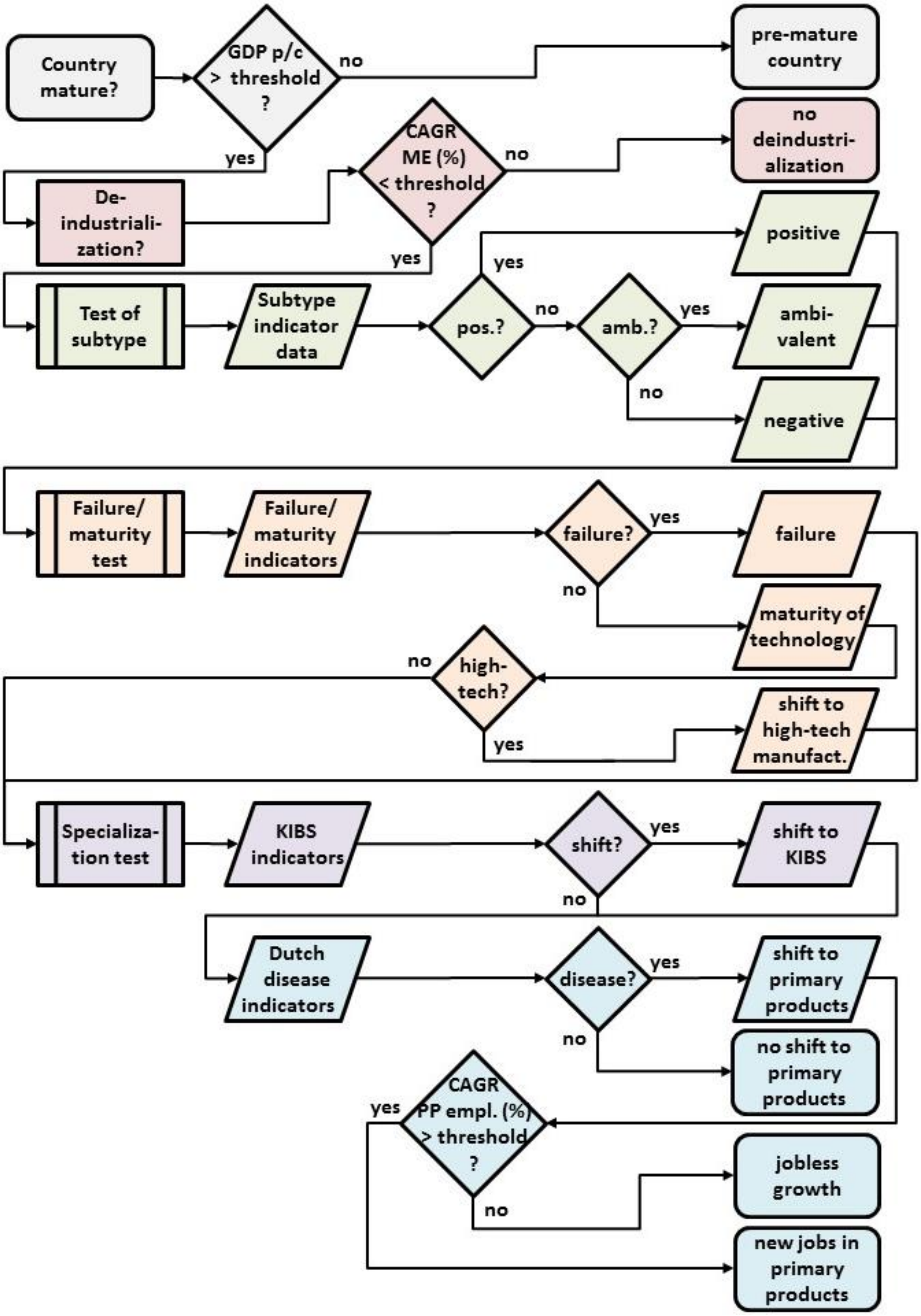
Table 4.3 Eclectic model of de-industrialization (mature economies)

General indicator	Type	Indicator	Subtype	Indicators	Reason	Setting	Indicators
long-term decline of relative manufacturing employment	mature	GDP p/c high (over threshold)	positive	GDP p/c ↑ trade balance → unemployment →	technological maturity	high productivity	manufacturing output → manufacturing productivity ↑
						shift to high-tech manufacturing	hi-tech manufacturing output ↑
			ambivalent		specialization	shift to KIBS	KIBS relative employment ↑
						crowding out by primary products	primary products GVA ↑↑ productivity >> manufacturing
			negative	GDP p/c ↓ trade balance ↓ unemployment ↑	failure	lacking competitiveness	manufacturing output ↓ manufacturing productivity →

Source: Own compilation

4.1.3.1 Evaluation algorithm for mature economies

With some amendments, the logic of Table 4.3 was implemented in an Excel-based tool for model-based testing of national economies (Figure 4.1). The evaluation steps will be further explained in section 4.1.3.2, including the choice of concrete criteria for assigning a country according to the categories rendered by the model.



Source: Own graph

Figure 4.1 Flow chart of the de-industrialization model

4.1.3.2 Evaluation criteria for mature economies

Country maturity

As the first step, a test is carried out whether the country falls within the group of mature countries according to the World Bank (2014a) classification (Table 4.2, p. 83). If not, the analysis process is stopped. An analysis according to the criteria and process of emerging economies might be performed instead (cf. section 4.1.4).

De-industrialization

Next, a test is carried out whether de-industrialization has taken place in the period under consideration. Typically, a minimum period of five years is analysed.

In this model, the only indicator for de-industrialization is relative manufacturing employment. Categories for employment growth or decrease are derived from GDP growth. As a benchmark, it might be considered that throughout the prosperous late 19th century, the GDP growth in Germany and Britain was around 2 % (Przywara, 2006). To give a second benchmark, EU annual growth between 2005 and 2010 was at 1.1 % (own calculation based on World Bank, 2014a). Taking into account the fact that rising productivity will reduce the impact of total economic growth on employment, and further with regard to equally broad middle categories, the following threshold levels (minima) of the compound annual growth rate (CAGR) of employment were established:

- Strong increase CAGR 3.00 %
- Medium increase CAGR 1.00 %
- Stagnant CAGR -1.00 %
- Medium decrease CAGR -3.00 %
- Strong decrease

Thus, for diagnosing de-industrialization, the CAGR must be below -1.00 %. If the share of manufacturing employment is stagnant (here: between -1.00 % and 0.99 %) or even rises, no de-industrialization is registered. In this case, no further steps of analysis are carried out for the respective period.

Subtype analysis

According to the model, there are three clear-cut indicators for distinguishing the subtypes denoted as ‘positive’ and ‘negative’ de-industrialization, as listed in Table 4.4. The categories for GDP per capita were defined in accordance with the aforementioned. For both other categories, the criteria were selected on the empirical basis of the actual data and aiming at effective segmentation.

Table 4.4 Subtype indicators

Column	**(1)**		**(2)**		**(3)**	
Indicator	**GDP per capita (USD)**		**Unemployment (% of active)**		**Change of trade balance (% of GDP)**	
Unit	CAGR (%)		change over period (% abs.)		change over period (% abs.)	
Trend	descriptor	min.	descriptor	min.	descriptor	min.
++	strong increase	3.00	strong increase	4.50	strong increase	4.50
+	medium increase	1.00	medium increase	1.50	medium increase	1.50
o	stagnant	-1.00	stagnant	-1.50	stagnant	-1.50
–	medium decrease	-3.00	medium decrease	-4.50	medium decrease	-4.50
– –	strong decrease		strong decrease		strong decrease	

Source: Own compilation

On the basis of these indicators, the following can be stated:

- *Positive* de-industrialization is given when income per capita rises and unemployment and the trade balance do not worsen (indicated by rising unemployment, falling trade balance).
- *Negative* de-industrialization occurs when unemployment rises, the GDP per capita (as a proxy for national wealth) stagnates or falls and the trade balance (as a proxy for international competitiveness) decreases.

There might be *ambivalent* situations, i.e. combinations of positive and negative de-industrialization trends:

- A typical one is characterised by improved international competitiveness (rising trade balance) in combination with rising unemployment and higher income per capita. In this case, a possible explanation is that the manufacturing productivity rise leads to higher total income, but also to labour displacements. The rising national income comes along with growing societal inequality, i.e. a growing disparity between the available financial resources of the employed versus the unemployed.

- Also the opposite situation where unemployment rates are kept low by "artificially" keeping workers employed, e.g. in state-owned enterprises, is thinkable. It can lead to both losses of national welfare (lower income per capita) and competitiveness (worsening trade balance).

Explaining ambivalent situations will require case-specific in-depth analyses.

Technological maturity vs. failure analysis

Under normal circumstances, that is in a rather homogeneous economy with a parallel state of development of its fields of manufacturing, technological maturity and failure are mutually excluding. Consequently, the indicators for both phenomena are the same:

- manufacturing productivity,
- manufacturing output.

From these two factors, the following can be derived:

- If productivity rises and output is at least stagnant, *technological maturity* is given.
- If output falls and productivity falls or stagnates, *failure* is diagnosed.

There might be two cases of ambiguity. The first occurs when sectoral productivity rises at falling manufacturing output. For this case, there are three possible explanations:

1) Failure

   Even with rising productivity, not enough marketable products can be produced.

2) Demand-side failure

   Potential customers are in an economic crisis, so demand is no longer given.

3) Maturity

   Shift to other sectors which promise higher returns on investment. These sectors may be high-tech manufacturing, knowledge-intensive services or primary products.

The second case of ambiguity is when output is constant and productivity is stagnant. In this case, since the share of manufacturing employment is decreasing, the average work-load in manufacturing is rising. This might be the case after a crisis when companies refrain from hiring new personnel in the short term. Or it might indicate a worsening bargaining position of workers versus their employers. This situation will be characterized as ambiguous, while market failure is not given.

Theoretically, effects described as failure and maturity can also occur in parallel in one country, for example in two different manufacturing sectors or in regions with large differences in development.

A combination of falling productivity, but constant output is impossible, since it would involve more personnel in the manufacturing sector. This is excluded, since in this case, no de-industrialization occurs.

In Table 4.5, the indicators for technology failure vs. maturity are listed. In addition to manufacturing productivity and output, high-tech manufacturing output was included in the list. It is required for analysing whether a shift within the manufacturing sector from rather simple to high technologies takes place. Such a shift may equally be considered as an expression of technological maturity and as a form of specialization (crowding out), see above.

Table 4.5 Technology failure vs. maturity indicators

Column	**(4)**		**(5)**		**(6)**	
Indicator	**Manufacturing output (USD)**		**Manufacturing productivity (USD/hour)**		**High-tech manufacturing output (USD)**	
Unit	CAGR (%)		CAGR (%)		CAGR (%)	
Trend	descriptor	min.	descriptor	min.	descriptor	min.
++	strong increase	3.00	strong increase	3.00	strong increase	3.00
+	medium increase	1.00	medium increase	1.00	medium increase	1.00
o	stagnant	-1.00	stagnant	-1.00	stagnant	-1.00
–	medium decrease	-3.00	medium decrease	-3.00	medium decrease	-3.00
– –	strong decrease		strong decrease		strong decrease	

Source: Own compilation

If in a mature economy, a shift from lower to high-tech manufacturing happens, this can be measured by comparing the growth rates of both. If either: i) the high-tech sector grows faster, ii) the high-tech sector grows while manufacturing shrinks or iii) the high-tech sector does not shrink as fast as total manufacturing, such a shift takes place. In all of these cases, the CAGR of the high-tech sectors is higher than that of total manufacturing.

In case of falling total manufacturing output at rising productivity, crowding out by high-tech manufacturing should be related to a positive trend of the latter.

Specialization

There are two types of specialization (notwithstanding a shift to high-tech manufacturing discussed in the previous section):

- a shift to knowledge-intensive services (KIS), mainly business services (KIBS),
- a shift to primary products.

De-industrialization by specialization may be caused by two mechanisms:

- shift of investments from the manufacturing sector to sectors with higher returns on investment,
- brain drain, i.e. direct move from employees in manufacturing to a better-paid sector.

While the first effect may apply for both KIS and primary products, the latter will mainly apply for knowledge-intensive services. These typically have a productivity not much higher than manufacturing, while industries like oil and gas production are characterized by a highly capital-intensive production with extreme productivity. Thus, the respective share of employment is typically very small and sectoral growth is not very influential on the total labour market. As a consequence, a brain drain by the primary products sector is hard to be diagnosed. If it is there, it does not come in large amounts, but rather condensed: A shift to primary products may be drawing key personnel like technical specialists from manufacturing to more attractive jobs. This might be disproportionally weakening to the manufacturing sector.

As a result of these considerations, the following might be stated in a case of de-industrialization:

- A shift to KIBS can safely be detected by measuring an increase in sectoral employment.
- A shift to primary services does not necessarily lead to an increase of scale in sectoral employment; in many cases, it does not.

Thus, a shift to primary products very often needs to be detected indirectly. Indicators might be:

- very high and/or strongly increasing sectoral productivity,

- high and/or strongly increasing sectoral output,
- high and/or increasing share of primary products among total merchandise exports.

All of these are showing the importance of the primary products sector for the national economy. Unfortunately, the informational value of all of these options is blurred by the high volatility of prices on the international commodity forward exchange. On the other hand, this volatility means insecurity for an investor, so it dampens the spill-over effect (Stijns, 2003).

As a very simple and easily accessible indicator for an eventual Dutch disease, the merchandise export share of primary products is chosen. * In cases where these rates exceed a certain threshold level, labour effects will be analysed. Nonetheless, it is well-known from literature that it remains a difficult task to prove the relationship between increasing natural resource revenues, the exchange rate, and a decline of the manufacturing sector (Stijns, 2003).

Table 4.6 Specialization indicators

Column	(7)		(8)		(9)		(10)		(11)			(12)		
Indicator	KIBS employment (%)		Primary products employment (%)		Primary products output (USD)		Primary products productivity (USD/hour)		Productivity ratio primary products / manufacturing (%)			Share of primary products in merchandise exports (%)		
Unit	CAGR (%)		CAGR (%)		CAGR (%)		CAGR (%)		(10)/(6), average			(% of ME)		
Trend	descriptor	min.	descriptor	min.	descriptor	min.	descriptor	min.	descriptor	min.	3 log2 (x)	descriptor	min.	log2 (x/6)
++	strong increase	3.00	strong increase	3.00	strong increase	15.00	strong increase	3.00	very high	200.00	3.00	very high	48.00	3.00
+	medium increase	1.00	medium increase	1.00	medium increase	5.00	medium increase	1.00	high	126.00	1.00	high	12.00	1.00
o	stagnant	-1.00	stagnant	-1.00	stagnant	-5.00	stagnant	-1.00	medium	79.35	-1.00	medium	3.00	-1.00
–	medium decrease	-3.00	medium decrease	-3.00	medium decrease	-15.00	medium decrease	-3.00	low	-50.00	-3.00	low	0.75	-3.00
– –	strong decrease		strong decrease		strong decrease		strong decrease		very low			very low		

Source: Own compilation

* In the case of MNEs, this indicator often does not reflect the true impact of a company for the national economy. E.g. Royal Dutch Shell are by far the biggest company in the Netherlands, but as a true global player, they only employ a minor fraction of their employees locally. Moreover, they only handle a minor part of their trade within the Dutch custom boundaries. Thus, the Royal Dutch Shell share in merchandise trade is low-key despite of their true impact on the Dutch economy. This has to be traced by the other mentioned indicators. In addition, sectoral investments could be investigated.

In Table 4.6, the possible macro-economic indicators for identifying a shift to KIBS or primary products are listed. The results are obtained as follows:

- A shift to knowledge-intensive services is diagnosed when there is an increase, medium or strong, in KIBS employment (indicator 7).
- Under the presumption of an at least medium contribution to exports (indicator 12), a shift to primary products is diagnosed when either the productivity in the primary products sector (indicator 10) by far supersedes the manufacturing productivity (indicator 6) so that indicator 11 is very high (++) or the primary products output (indicator 9) is strongly increasing (++) while the complementary sector (primary products output and productivity ratio, respectively) at minimum is high (+).

If there is a shift to primary products, a test is carried out whether this shift has an impact on sectoral employment (indicator 8). Brain drain is diagnosed when the sectoral employment in primary products increases.

4.1.4 The eclectic model of de-industrialization for emerging economies

Modelling of emerging economies (Table 4.7) was carried out on the basis of the theoretical background rendered in the footnotes of Table 4.1, p. 82.

Table 4.7 Eclectic model of de-industrialization (emerging economies)

<table>
<tr><th>General indicator</th><th>Type</th><th>Indicator</th><th>Subtype</th><th>Indicators</th><th>Reason</th><th>Setting</th><th>Indicators</th></tr>
<tr><td rowspan="5">long-term decline of relative manufacturing employment</td><td rowspan="5">pre mature</td><td rowspan="5">GDP p/c low (below threshold)</td><td>positive</td><td>GDP p/c ↑
trade balance →
unemployment →</td><td>specialization</td><td>shift to KIBS</td><td>KIBS relative employment ↑</td></tr>
<tr><td>ambivalent</td><td></td><td></td><td>crowding out by primary products</td><td>primary products exports ↑↑</td></tr>
<tr><td rowspan="3">negative</td><td rowspan="3">GDP p/c ↓
trade balance ↓
unemployment ↑</td><td rowspan="3">failure</td><td>reverse de-industrialization</td><td>way down = way up
manufacturing output ↓</td></tr>
<tr><td>backshift to agriculture</td><td>agriculture employment ↑↑</td></tr>
<tr><td>backshift to simple services</td><td>services employment ↑
KIBS employment ↓</td></tr>
</table>

Source: Own compilation

Suitable macro-economic indicators for identifying the settings were added. KIBS was utilized instead of KIS because of better data identifiability and availability.

In the following section, the eclectic model of de-industrialization will be specified for emerging economies. Then, additional background information for the analysis will be outlined.

4.1.4.1 Evaluation algorithm for emerging countries

Basically, the eclectic de-industrialization model for emerging economies follows the same logic that was applied for mature economies as described in the previous sub-chapter, namely the evaluation process based on an adapted Excel tool (Figure 4.1, p. 85).

In comparison to mature economies, some effects were excluded from the investigation. E.g. technological maturity comes only into play once a national economy has reached a certain maturity (level of GDP p/c), so it will not be analysed for emerging countries. In cases of reaching the maturity level within the investigated time frame, the model for mature economies would be applied from the time of transition, typically a rather smooth process. (As will be shown, Korea is an example for a country which reached maturity from the economic and technological standpoint in the investigated time period.)

On the other hand, for analysing ‘premature’ de-industrialization, also some additional phenomena of failure had to be taken into consideration (see below).

Moreover, due to limited availability of productivity data, crowding out by primary products had to be diagnosed on a different basis. The full process of analysis will be introduced briefly in the following.

4.1.4.2 Evaluation criteria for emerging economies

Country maturity

As the first step, a test is carried out whether the country falls within the group of emerging countries according to the World Bank (2014a) classification (Table 4.2, p. 83). If this is not the case, an analysis according to the mature criteria and process might follow.

De-industrialization and subtype analysis

The diagnosis of de-industrialization including subtype analysis is carried out in accordance with the procedures outlined for mature economies. Again, explaining ambivalent situations will require case-specific in-depth analyses.

Failure analysis

Since technological maturity is presumably not given and therefore not tested and productivity data are partly not available, this part of the analysis significantly differs from the analysis of mature states. Failure might result in three phenomena which are mutually non-exclusive:

- reverse de-industrialization,
- backshift to agriculture,
- backshift to simple services.

Reverse de-industrialization occurs when an economy moves backward on the same track it had taken on previous growth. Such a behaviour implies a combination of less national income per capita and normally also of reduced manufacturing output. Thus, if both is given, reverse de-industrialization will be considered as 'likely'. If only national income falls, it will be considered as 'possible'. The values applied follow those given in Table 4.4 (indicator 1) and Table 4.5 (indicator 4). For a full analysis of reverse de-industrialization, the actual development has to be compared with the upswing of previous years.

Table 4.8 Additional indicators for emerging states

Column	**(13)**		**(14)**	
Indicator	**Agricultural employment (%)**		**Services employment (%)**	
Unit	CAGR (%)		CAGR (%)	
Trend	Descriptor	min.	Descriptor	min.
++	strong increase	3.00	strong increase	3.00
+	medium increase	1.00	medium increase	1.00
O	stagnant	-1.00	stagnant	-1.00
–	medium decrease	-3.00	medium decrease	-3.00
– –	strong decrease		strong decrease	

Source: Own compilation

Backshift to agriculture means that significant growth in agricultural employment (criterion 13) is diagnosed. Only in cases were a strong increase in agriculture happens, this is the case (Table 4.8).

A backshift to simple services occurs when employment in services increases (criterion 14) while the share of KIBS employment goes down (cf. Table 4.6, indicator 7).

Specialization

There are two types of specialization (notwithstanding a shift to high-tech manufacturing discussed in the previous section):

- a shift to knowledge-intensive services (KIS), mainly business services (KIBS),
- a shift to primary products.

As for mature countries, a shift to KIBS can safely be detected by measuring an increase in sectoral employment.

As a very simple and easily accessible indicator for an eventual Dutch disease, the merchandise export share of primary products is chosen. Also, productivity consideration might be started on the basis of output per capita calculations. Manufacturing output per capita productivity might be calculated by dividing indicator 4 by the labour force in manufacturing (total labour force multiplied by indicator 1). In a similar fashion, the output per capita in the primary products sector can be calculated by dividing indicator 9 by the labour force active in this field (total labour force multiplied by indicator 8).

In cases where these rates exceed a certain threshold level, labour effects will be analysed. So if there is a shift to primary products, a test is carried out whether this shift has an impact on sectoral employment (indicator 8). Brain drain is diagnosed when the sectoral employment in primary products increases.

4.2 Model 2: De-industrialization scenarios

When considering employment changes as an indicator for de-industrialization, there is one statistical factor that may cast doubt on the precision and applicability of these changes: The average work carried out per employee may vary regionally and over time. Employment figures normally refer to the number of jobs in the industry, not to the average workload involved. Since working hours may vary largely from country to country and they may also change over time, this may lead to some statistical distortions. To illustrate that by an example: If from one day to the other all employees of an economic unit would start to work half-time, the number of employees would remain constant. In this situation, the absolute and relative employment figures would remain the same although only (roughly) half of the work would be done.

From a sociological standpoint, i.e. following Kollmeyer's (2009) definition, this would not mean too much of a change, since all employees remain in their social contexts. But economically, the difference is obvious and crucial, and it would also lead to a significant reduction in output.

In practice, workload changes do not occur at such high speed as in the example, but yet they happen in the one or the other direction, i.e. in reductions or increases of working hours. Such workload changes are not covered by conventional statistics on de-industrialization, and this fact can – at least in cases of significant average workload changes – be considered as a major shortcoming.

From an economic standpoint, de-industrialization should rather be understood as a decrease in the total labour content of the manufacturing sector than as a reduction of the number of sectoral jobs.

4.2.1 Basic considerations concerning economic growth rates

To calculate changes in the total labour content, some economic basic considerations are made. The following absolute variables are connected in the basic interrelations of de-industrialization:

- manufacturing output (USD),
- productivity (USD/hour),
- labour content (hours),
- employment (numbers of workers),
- workload per worker (hours worked per time unit and capita).

As absolute values, these variables can hardly be connected because of the different units they are expressed in. A way to overcome this obstacle is to normalize the values, i.e. relate them to a value in a similar unit so the respective units cancel each other out. When utilizing growth rates, i.e. percentage change over time, the units get normalized, i.e. a fraction of actual and past value is generated. The CAGR is the geometric progression ratio that delivers a constant rate of return over the time period. It is defined as (Investopedia, 2014):

$$\mathrm{CAGR} = \left(\frac{\text{End Value}}{\text{Start Value}}\right)^{\left(\frac{1}{\text{\# of years}}\right)} - 1 \tag{4.1}$$

The corresponding growth factor is

$$\mathrm{CAGF} = \left(\frac{\text{End Value}}{\text{Start Value}}\right)^{\left(\frac{1}{\text{\# of years}}\right)} = \mathrm{CAGR} + 1 \tag{4.2}$$

The following formulae for describing the demand and supply side of the total labour content can be applied, if growth factors are taken into consideration:*

Demand side:

$$\text{labour content (CAGR)} = \text{manufacturing output (CAGR)} - \text{productivity (CAGR)} \tag{4.3}$$

Supply side:

$$\text{labour content (CAGR)} = \text{workload (CAGR)} + \text{manufacturing employment (CAGR)} \tag{4.4}$$

Since all factors involved may have a positive or negative leading sign, there are each six scenarios of a national economy that can be identified for the demand side and the supply side, respectively. These scenarios are graphically displayed in Figure 4.2 (demand side, scenarios 1-6) and Figure 4.3 (supply side, scenarios a-f) and will be further explained in the following.

4.2.2 Demand-side scenarios

Industrialization means growth of labour content, de-industrialization means its reduction. Normally, productivity rises over time. Under these normal circumstances, the following scenarios are possible:

① Output growth exceeds that of productivity, so more labour is required.

④ Productivity growth exceeds that of output, so less labour is required.

* In this work, growth rates are calculated as discrete rates, not as continuous rates. Thus, the indicated results of growth rate additions and subtractions contain a small systematic error given by the product of the summed up rates. Since these rates are normally small (around 1 %), only the second decimal place is influenced. This error is neglected. For details see van Suntum (2006).

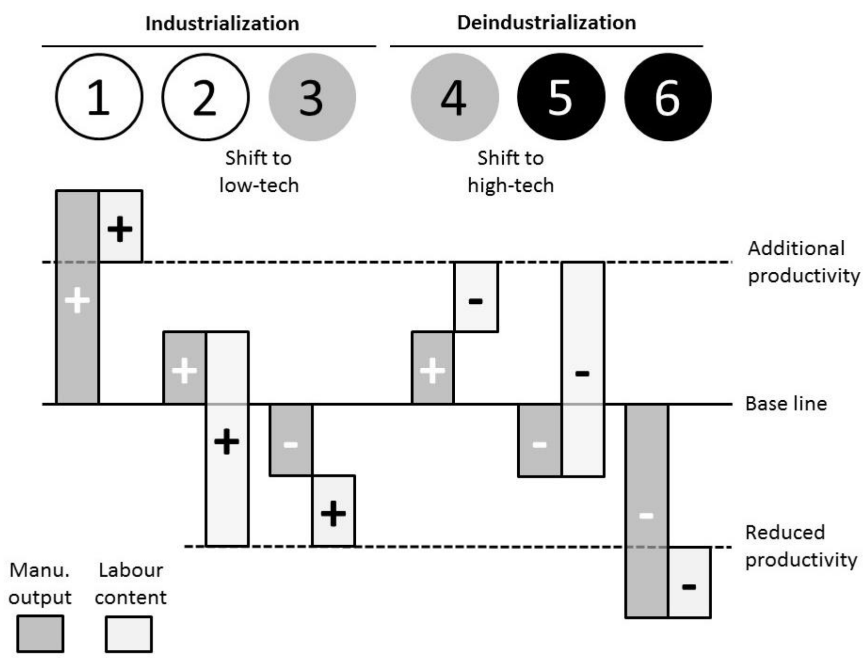
⑤ Output falls despite of rising productivity, so far less labour is required.

While scenario 1 is one of prosperity, scenario 5 is one of recession and/or sectoral decline. Scenario 4 is ambivalent. It means industrialization in terms of output, but de-industrialization in terms of labour content. A certain share of activity is shifted away from the manufacturing sector.

The remaining scenarios cannot be considered as worthwhile for a healthy national economy since they are all related to reduced productivity.

② Output grows despite of falling productivity, so much more labour is required.
③ Productivity reduction exceeds that of output, so more labour is required.
⑥ Output reduction exceeds that of productivity, so less labour is required.

Scenario 6 is one of recession and/or sectoral decline, leading to lower capacity utilization and in its course reduced productivity. Scenarios 2 and 3 are also characteristic for economic decline, when state efforts for reducing unemployment, e.g. sectoral subsidies, lead to job creations in previously unviable areas of the national economy. Since these are less productive, all in all this means a shift to low-tech sectors.



Source: Own graph

Figure 4.2 Demand-side view of (de-)industrialization

4.2.3 Supply-side scenarios

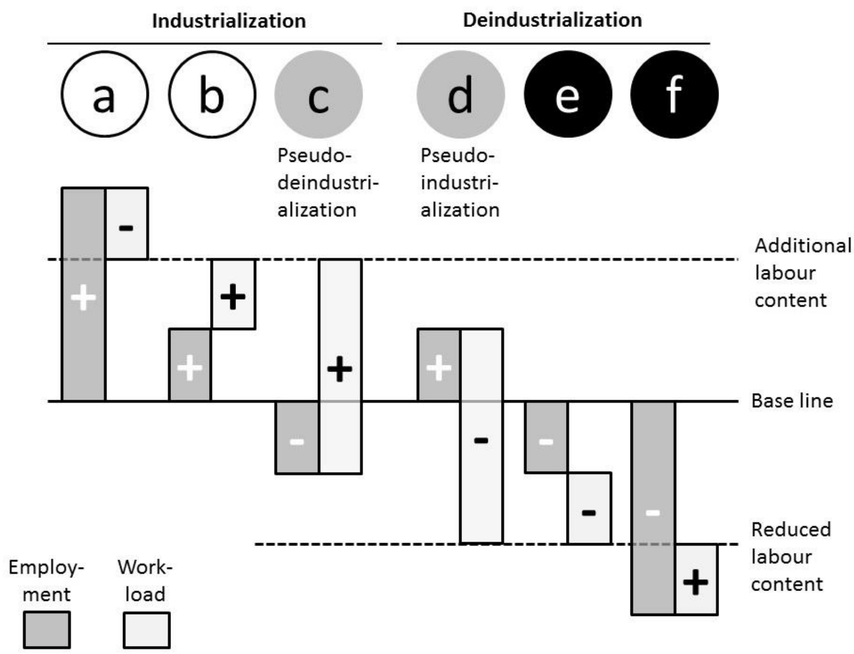
Additional labour might be covered by more workers or more work per employee. The following industrialization scenarios are possible:

(a) Employment growth exceeds that of labour content, so the workload is reduced.

(b) Labour content growth exceeds that of employment, so the workload rises.

(c) Employment is reduced despite of more labour, so the workload rises strongly.

Scenario (c) would be considered a de-industrialization scenario (shrinking employment) under the terminology of Kollmeyer (2009). In fact, it is a scenario of putting pressure on already employed personnel to avoid employing new staff. If the work would be distributed evenly, i.e. the workload would remain the same, no de-industrialization would occur. Thus, this process is named “pseudo-de-industrialization”.



Source: Own graph

Figure 4.3 Supply-side view of (de-)industrialization

Reduced labour content, i.e. a de-industrialization process, can be covered by reductions of sectoral employment or reduced workload per employee. The following scenarios are possible:

(d) Employment grows despite of reduced labour, so the workload falls rapidly.

(e) Labour content falls faster than employment, so the workload falls.

(f) Employment is reduced faster than the labour content falls, so the workload rises.

Scenario (d) under the terminology of Kollmeyer (2009) seems to boost the manufacturing sector (since employment grows) while in fact it is shrinking. Typically, this might happen if the state is involved in employment policies and issues laws for working time reduction. Since factually no industrialization occurs, this process is named “pseudo-industrialization”.

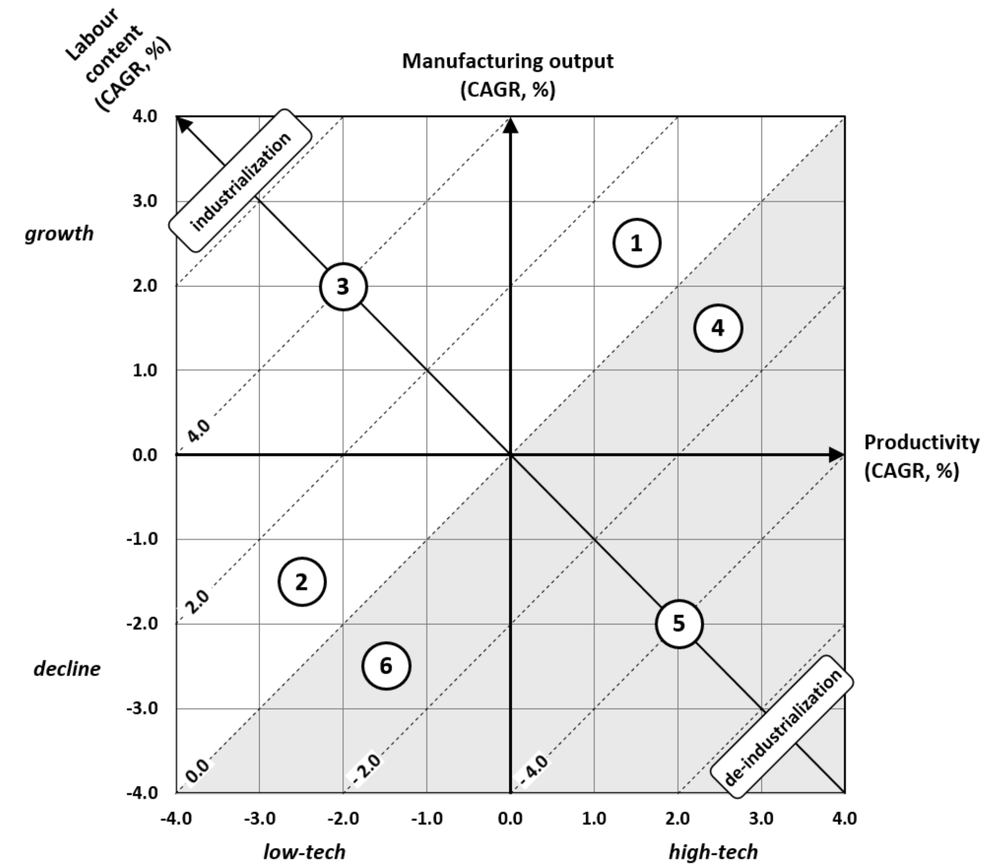
Scenario (e) is typical for a period of recession or transition, where some employees are retained in firms aiming at not to lose their know-how carriers for envisaged future prosperity. Scenario (f) is a scenario where firms are adding pressure on already employed personnel to avoid employing new staff.

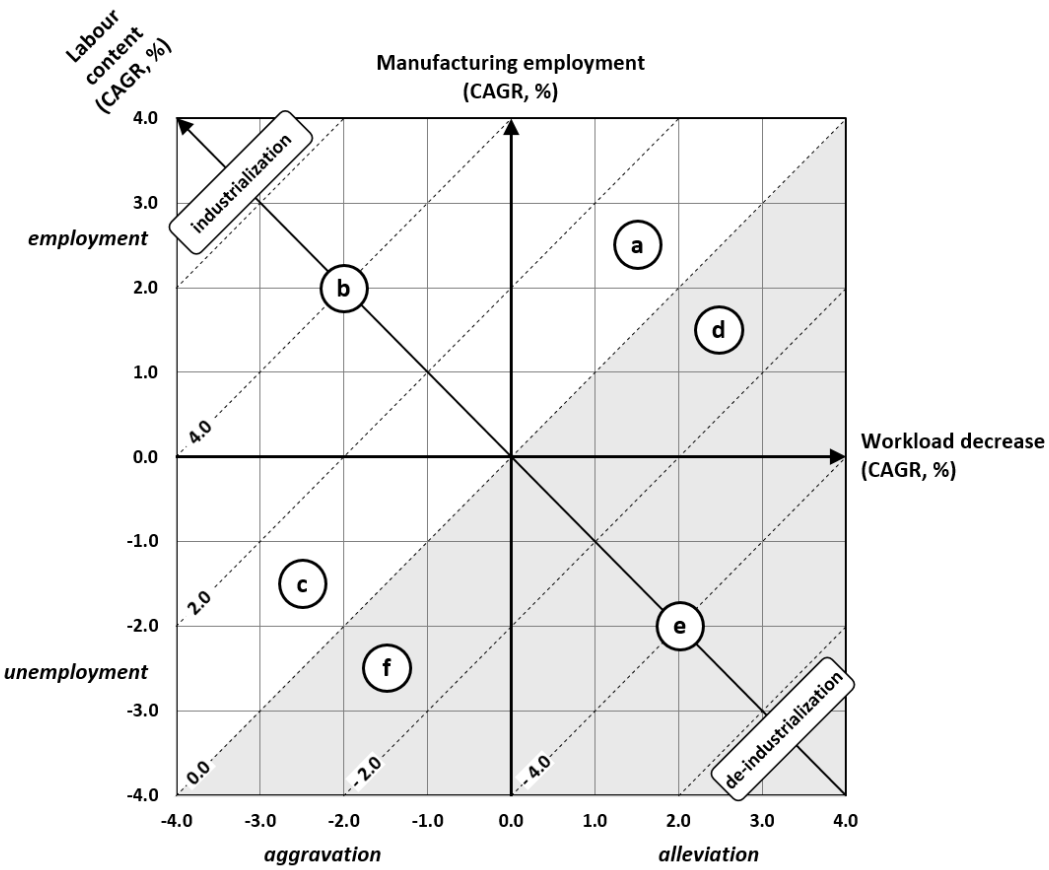
4.2.4 Combining labour demand and supply (scenario model)

Since both markets sides are in equilibrium, they are two sides of the same medal. These two sides can be combined to render a full market picture. Only combinations of industrialization scenarios (i.e. 1-3 with a-c), and de-industrialization scenarios (i.e. 4-6 with d-f), are possible. Thus, a total of nine industrialization scenarios as well as a total of nine de-industrialization scenarios is possible, rendering a total of 18 economic scenarios.

In Figure 4.4, the supply and demand side of the scenario model are graphically displayed in a stacked way. In the upper graph, the x-axis and y-axis correspond with the two growth rates that determine labour content on the demand side. Similarly, the lower graph deals with the demand side. The workload carries a negative algebraic sign, coding its decrease.

For both sides, labour content (CAGR, %) is the key indicator for diagnosing industrialization or de-industrialization. A diagonal additional axis in 45° north-east direction is drawn for labour content. The 0 % watershed between industrialization and de-industrialization runs orthogonally to this axis through the origin of the graph. The de-industrialization side is shaded in light grey. The combination of the respective x-axis and y-axis values determines the demand-side (1-6) and supply-side (a-f) scenarios. By definition, the position on the diagonal labour content axis is identical for both graphs, so only the aforementioned scenario combinations are possible.





Source: Own graph

Figure 4.4 Scenario model: demand side (up), supply side (low)

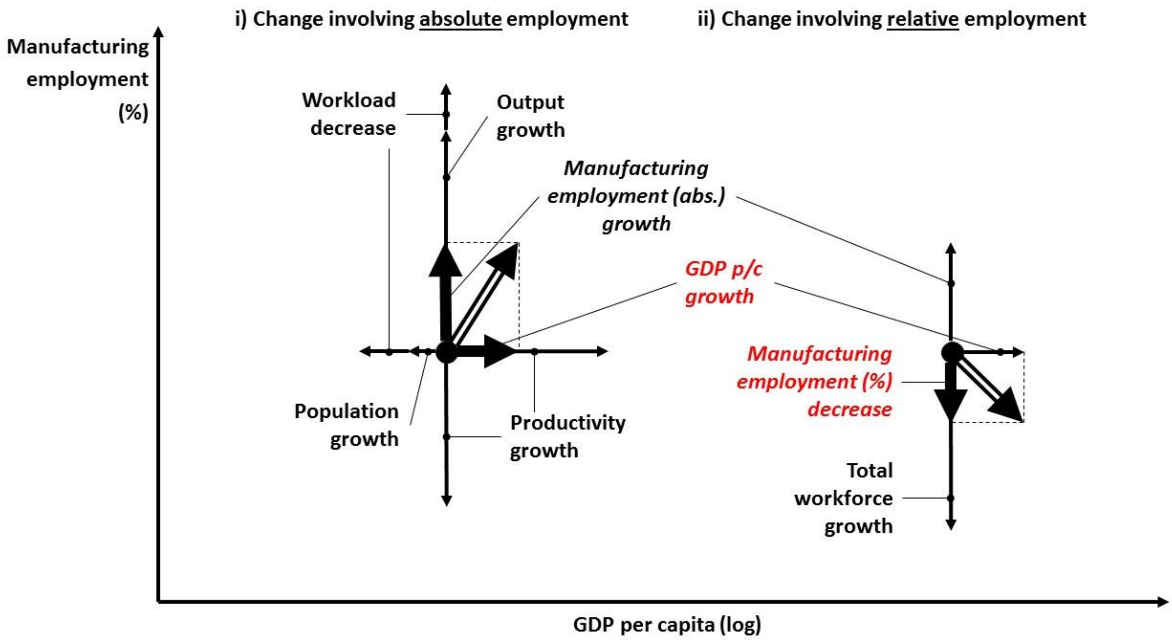
4.3 The connections between both models

While the eclectic model mainly utilizes relative descriptors of de-industrialization, the scenario approach utilizes absolute values. Accordingly, with reference to the explications in section 2.4, pp. 62, they have different inherent meanings:

- The eclectic model mainly aims at describing societal (socio-economic) change within a national economy.
- The scenario model mainly aims at describing phenomena of economic change that have an influence on the international competitiveness of a national economy.

Since both facets are not part of the respective other model, both models do hardly interfere but are to be seen as complementary tools for gaining a full picture of de-industrialization phenomena. Accordingly, both models will be applied in parallel for the following analyses on mature and emerging countries.

As pointed out in the literature review, in some cases absolute and relative values may deviate (e.g. in the case of strong population growth, a growing absolute manufacturing output may well go along with a relative sectoral decline of employment). Again, these results are not contradictory, but strictly complementary. Both analytical parts, eclectic and scenario model, flow into the graphical representation given in Figure 2.12, p. 54.



Source: Own graph

Figure 4.5 Influencing factors on the tipping point graph

The above graph (Figure 4.5) shows the interrelation between national wealth (GDP per capita, log plot) and the share of manufacturing employment and will be utilized for the analysis of mature and emerging economies in the following chapters. The x-axis and y-axis parameters of this graphic representation are influenced by certain sub-parameters illustrated in the figure. These sub-parameters are mostly elements of the presented de-industrialization models. The sketched relations of the graphic representation are explained in detail in the following.

Change involving manufacturing employment

When looking at change involving absolute employment (left side of the illustration), it becomes clear that the resulting change in absolute manufacturing employment positively correlates with output and negatively correlates with average workload and productivity. This result can be derived from equations (4.3) and (4.4), p. 97. When equating both expressions for labour content and subtracting the workload, the obtained result is exactly the one graphically displayed.

From absolute to relative employment (right side of the illustration), it is only a small step. The reference value is total employment, hence its growth. If it grows faster than manufacturing employment (or falls more slowly), a relative decline of manufacturing employment results.

Total workforce growth has several influencing parameters like the growth or decline of population and demography (age shares among population), unemployment and labour participation rate (specifically female participation).

Change involving gross domestic product per capita

The gross domestic product will rise with rising productivity while a workload decrease acts antagonistically. When calculating the change per capita, the reference value is total population. If it grows, the national wealth will be distributed among more people, so the GDP p/c value will fall.

Manufacturing productivity is only one part of the industrial productivity which again is only one part of the national productivity. Thus, there is no direct proportionality between manufacturing productivity growth and GDP growth. Yet, by trend the influence is as sketched, though it is limited to the sector. According to Kaldor (1966), changes of manufacturing productivity are central for a national economy and in this sense might be considered as a proxy for the total change of productivity.

Similar considerations apply for the average workload which differs from sector to sector, very often also regionally (cf. ILO (2014), topic 'Hours of Work').

Two antagonists: workload and productivity

As described above, productivity and workload have an influence on both axes of the manufacturing employment (%) vs. log GDP p/c graphic representation (cf. Figure 2.12, p. 54). Productivity rises, just like workload rises, lead to higher GDP and lower employment. The expectation in a developed society should be that while productivity is rising, the individual average workload may be lowered as sketched in the graph. This would correspond to a rising marginal utility of individual labour.

4.4 Key features of the developed models

By the modelling process, two complementary tools for a comprehensive and precise identification of the various forms of socio-economic structural change denominated as 'de-industrialization' were developed. The models are based on quantitative definition and categorization of de-industrialization phenomena by macro-economic data. Respective statistical data is utilized as the input of standardized algorithms implemented in an Excel-based calculation tool, delivering the desired output.

The following aspects are covered:

- (de-)industrialization of mature and emerging economies,
- structural change with a focus on sociological aspects, involving all forms of de-industrialization identified in the literature review (sub-chapters 2.1, 2.3.3),
- structural change with a focus on economic aspects, including all absolute and relative standard definitions of de-industrialization (cf. sub-chapter 2.4).

By developing the models, research objective 1 has been achieved, so the necessary input for the intended research aiming at objective 2 is available. In the following chapters, the developed models will be applied for evaluating the structural change of mature (chapters 5, 6) and emerging economies (chapter 7).

5 De-industrialization of mature economies

The analysis carried out in following chapters is in relation to the developments in mature and developing states clustered by global regions. Tests will involve selected definitions of de-industrialization (cf. Table 2.13, p. 66). Moreover, the eclectic comprehensive model of de-industrialization (cf. Table 4.1, p. 82) will be verified.

5.1 Country sample selection and data processing

5.1.1 Countries selected for analysis

The process of de-industrialization in mature economies is examined for twelve countries represented in the EU-KLEMS database (EU KLEMS, 2012). The EU KLEMS database aims at providing a statistical base for questions related to growth and productivity. Its accounts follow the ISIC 4 classification (see Appendix 4). A list of the examined countries is given in Table 5.1.

Table 5.1 List of analysed mature economies and some key features

	Indicator	**Population**	**GDP**	**GDP p/c**
Country	**Code**	(million)	(bn USD)	(k USD)
Austria	***AUT***	8.4	377.7	45.0
Belgium	***BEL***	10.9	471.1	43.2
Finland	***FIN***	5.4	236.7	44.1
France	***FRA***	65.0	2,565.0	39.4
Germany	*DEU* ***(GER)***	81.8	3,304.4	40.4
Italy	***ITA***	60.5	2,055.4	34.7
Japan	***JPN***	127.5	5,495.4	43.1
Netherlands	***NLD***	16.6	777.2	46.8
Spain	***ESP***	46.6	1,384.8	29.7
Sweden	***SWE***	9.4	462.9	49.4
UK	*GBR* ***(UK)***	62.7	2,285.5	36.6
USA	***USA***	309.3	14,958.3	48.4

Eurozone country

Source: Based on World Bank (2014a) data and codes (in brackets: codes utilized in this thesis)
Values for year 2010; in 2010 USD

The basis indicators utilized for all economic sectors are:

- gross value added at current basic prices (in millions of Euros),
- number of persons engaged (thousands),
- total hours worked by persons engaged (millions).

5.1.2 Data sources and processing

As a basis for the evaluations, certain data needs to be retrieved to provide evidence for the basic sectoral shifts from agriculture to industry to services. Then, data for the key indicators of de-industrialization and for testing the eclectic model of de-industrialization needs to be retrieved.

The investigations follow the outlined eclectic model of de-industrialization. Limited to mature countries, it reads as presented in Table 4.3. To evaluate de-industrialization in terms of the model, the variables listed in bold in Table 5.2 are to be tested. Some additional data is needed for calculating the de-industrialization indicators in Table 2.13, p. 66, which serve as the basis for determining de-industrialization scenarios according to section 4.2, p. 95. All required data listed below (including the data not in bold) are available.

The time frame set by the EU KLEMS database starts in 1970, so the whole period scheduled for this thesis (1970-2010) is ready to be investigated. The analysis will be carried out on three levels of aggregation:

- per country,
- per region (triadic comparison),
- worldwide.

Thus, global or regional trends can be differentiated from national or regional peculiarities.

In the following, the basic indicators and trends including their presentation and analysis will be explained. The yearly raw data will be compressed to key performance indicators (KPIs). This will be mainly achieved by utilizing the compound annual growth rate (CAGR) which will be used to identify long-term trends.

Table 5.2 Data for the eclectic model of de-industrialization

Data	ISIC code
Basic economic data	
- **GDP per capita** - **Unemployment rate** - **Trade Balance**	
Sectoral employment: i) **relative** (% of total), ii) absolute (persons)	
- Agriculture	A
- Industry - **Manufacturing** - High-tech manufacturing - **Primary products**	B-F **C** 20-21, 26-30 **B**
- Services - **Knowledge-intensive services (KIS)**	G-U **J-K, M-N**
Output: i) relative (% of total GVA), ii) **absolute** (GVA)	
- Agriculture	A
- Industry - **Manufacturing** - **High-tech manufacturing** - **Primary products**	B-F **C** **20-21, 26-30** **B**
- Services - Knowledge-intensive services (KIS)	G-U J-K, M-N
Productivity: i) per person (GVA per employee), ii) **per hour** (GVA per hour)	
- Agriculture	A
- Industry - **Manufacturing** - High-tech manufacturing - **Primary products**	B-F **C** 20-21, 26-30 **B**
- Services - Knowledge-intensive services (KIS)	G-U J-K, M-N

Source: Own compilation

Structural developments will be analysed over the following periods of time:

1) Full period (35 years)

Instead of using the full 1970-2010 period, 1973-2008 was chosen as the standard representation. This was done for reasons of data availability and to leave out the first oil crisis and the economic downturn initiated by the American housing crisis in 2008, the results of which fully visible in 2009.

In some cases, the starting and final dates had to be slightly moved due to lacking data for the early 1970s.

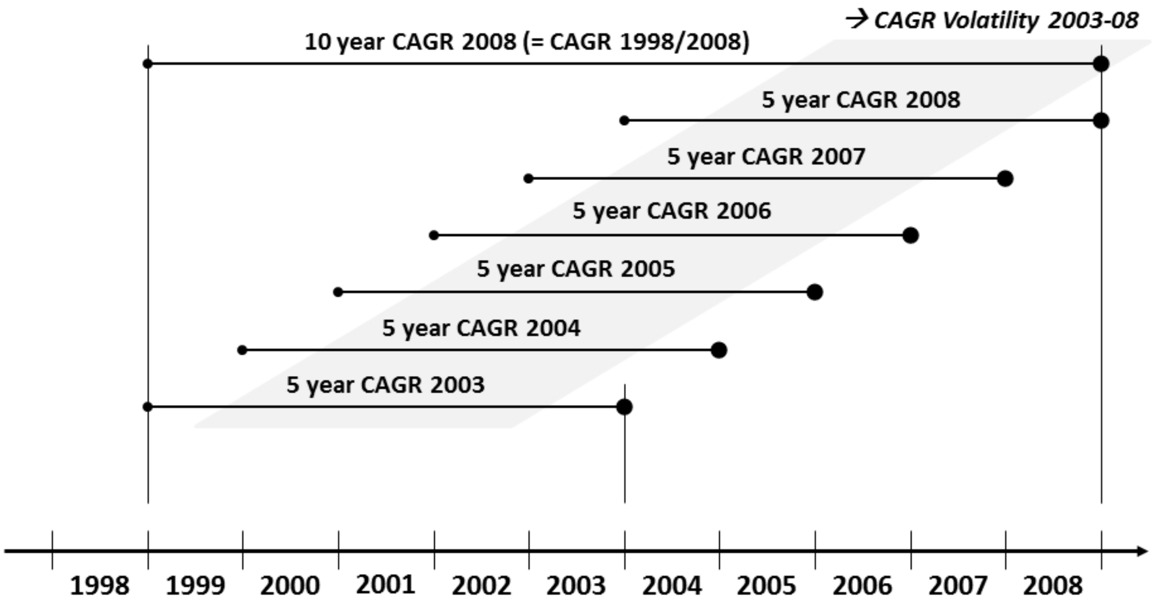
2) Long-term trends (15+5+15 years)

   The analysed period is divided by a historical caesura. The fall of the Iron Curtain in 1989/90 changed the political world. By opening the Eastern markets, it brought about the era of globalisation. Accordingly, the period from 1973 to 2008 was subdivided into 15 years of pre-transformation (1973-1988), five years of transition (1988-1993) and 15 years of post-transformative globalization (1993-2008).

   Also here, the starting and final dates in some cases had to be slightly moved due to lacking data for the early 1970s.

3) Semi-decades (7 x 5 years)

   As the shortest long-term indicator, seven five-year periods were investigated (1973-78, 1978-1983 … 2003-2008). In cases of lacking data for certain years, no calculation was carried out.



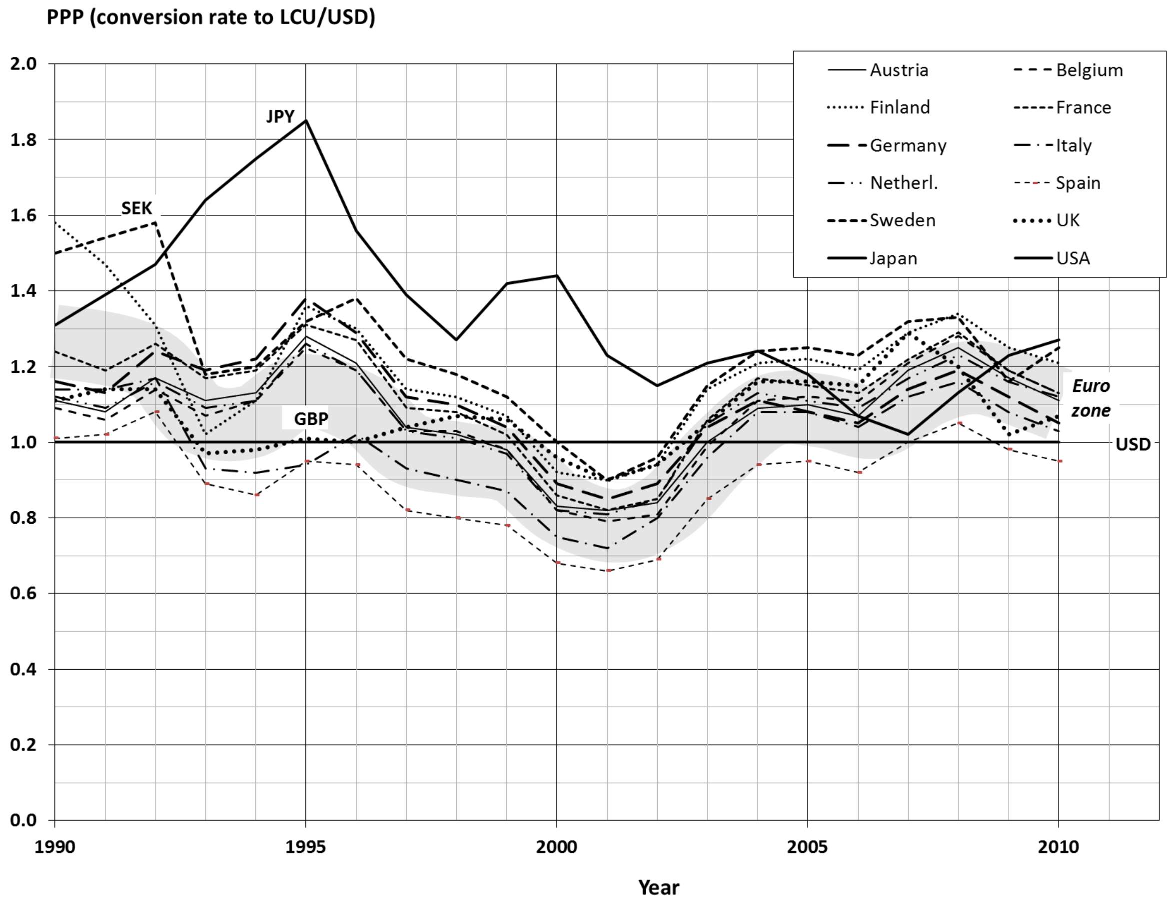
Source: Own graph

Figure 5.1 Illustration of CAGR calculation and naming, volatility calculation

The compiled data is listed in Appendix 1. It comprises all raw and processed macroeconomic data utilized in this section per country in alphabetic order. Annual data for GDP per capita, unemployment, and the trade balance is given. While the first two are complemented by CAGRs, the trade balance does not allow such calculations due to sometimes negative initial values. Thus, the absolute change over time is given.

In the tables, numbers with a negative influence on the economy are displayed in inverted colours, e.g. negative CAGR and a negative trade balance and change over time.

All monetary values have been transferred into 2010 US dollars on the basis of exchange rates as utilized by the World Bank (2014a) to assure international comparability over time. For the given purpose, it was found adequate to abstain from the use of purchasing power parities. Utilizing the plain exchange rate, i) is the "simplest option" (Maddison, 1995, p. 97), ii) was found to be sufficing since this analysis is mainly on structural shifts within an economy, iii) is the adequate method for following trade flows, iv) does not lead to big errors because in general, the parity has converged over time for the examined country group (see Figure 5.2).



Source: Own graphic, based on World Bank (2014a) data

Figure 5.2 Purchasing power parity conversion rates to USD exchange rates

Still, especially rapid changes in exchange rates can have an impact (e.g. on the GDP in USD), so they will be considered as an explanatory source.

5.2 Macro-economic trends and related de-industrialization

This section is based on the theoretical grounds of de-industrialization processes as explained in chapter 2, namely sub-section 2.3.1, pp.53. Rowthorn's (1994) theory on the course of economic maturing processes was tested for all economies of the sample. The share of employment in manufacturing was calculated as a variable depending on the GDP per capita (log of USD).

5.2.1 Theory-based expectations

The expectancy was that mature economies in the period 1970-2010 would be able to constantly increase their income per capita, so over time, they should move from the left to the right side of the graph. Concerning the share of manufacturing, they will show one of the following types of behaviour:

- Very rich and mature countries, first of all the USA, should have already passed the tipping point predicted by Rowthorn. Thus, a constant decline of the share of manufacturing employment should result over time and increasing income per capita.
- Some of the fairly rich countries may have not reached their tipping point by 1970. For the first years, there could be a parallel increase of manufacturing employment and GDP.

If the maximum employment point occurs at a GDP per capita of around 18.000 USD (2010 prices), as Rowthorn calculated, or at even higher values, as Palma (2005) determined, this is clearly above the entrance criterion for a high-income economy (see Table 4.2, p. 83). Compared to the GDP per capita for 1970 (Table 5.3), only Sweden, the USA and the Netherlands are clearly above the predicted tipping point, while in all other cases, both kinds of behaviour might be possible.

Spain, as the list shows, in 1970 was just closely over the edge of being a high-income country, with a level of maturity clearly below that of all other economies of the sample.

Table 5.3 GDP per capita (2010 k USD) in 1970

Region	Western Europe									others	
Country	**AUT**	**BEL**	**FIN**	**FRA**	**GER**	**ITA**	**NLD**	**ESP**	**SWE**	**UK**	**JPN**	**USA**
GDP p/c	18.8	20.1	18.0	20.1	18.9	17.1	22.5	13.3	25.1	16.3	17.9	23.3

Sources: World Bank (2014a), own calculations

5.2.2 Courses of de-industrialization

The plots for manufacturing employment over GPD per capita (log) are given in Figure 5.3, p. 113, and Figure 5.4, p. 116.

For reasons of clarity, countries showing similar behaviour (constant decrease versus tipping point) were each grouped in one graph. In some cases, this classification might be somewhat doubtful, because tipping has occurred either slightly before or after 1970. Nonetheless, for all countries represented in Figure 5.3, in 1970, the top value in manufacturing employment was reached compared to all subsequent years. This was not the case in all countries displayed in Figure 5.4, where the top employment ratio was reached a few years later. Thus, there is a descriptor for making the grouping decision.

The left half of the expected inverted-U shape over time is not present by definition in the group of countries with a continuous decrease in manufacturing. It is almost invisible also for the tipping point group. This means that the 1970 values for manufacturing employment are already close to the maximum level reached a few years later.

5.2.2.1 States beyond tipping

This group consists of Belgium, Germany, the Netherlands, Sweden, the United Kingdom, and the USA. It will be described according to Figure 5.3, p. 113, from top to bottom in the following, utilizing data compiled in Appendix 1.

Germany

Starting off with 34.3 % of employees in manufacturing, within the group of very mature states, Germany has remained the country depending on production the most. In 2010, there were 17.3 % employed in manufacturing (Δ –17.0 % abs., CAGR –1.66 %).

Also Germany's position in income per capita remained constant within this group of states. It started at 18.9 k USD in 1970 and reached 40.4 k USD in 2010 (Δ +21.5 k USD, CAGR 1.90 %).

Belgium

Belgium de-industrialized more rapidly than Germany, falling from 31.8 % to 12.3 % (Δ –18.5 % abs., CAGR –2.42 %).

Given the trend line (third-degree polynomial) and additional information (OECD, 2014a), the tipping point exactly was the starting point in 1970 when relative manufacturing employment stood at 31.8 % and GDP per capita was 20.1 k USD (log 9.91).

Belgium could maintain its advantage in average income per capita which rose from 20.1 k USD to 43.2 k USD (Δ +23.1 k USD, CAGR 1.87 %).

Sweden

Sweden's downward trend in manufacturing was not as grave as the Belgian or British. Sweden ended up being the second-most producing country among the group, with a decline from 27.8 % to 13.4 % (Δ –14.4 % abs., CAGR –1.57 %).

Sweden could maintain a relatively privileged second to the US position in average income which rose from 25.1 k USD to 49.4 k USD (Δ +24.3 k USD, CAGR 1.80 %)

United Kingdom

Britain's industrial decline was very rapid and unsteady, with two short periods of recovery after extreme job losses. Overall, employment in manufacturing fell from 24.6 % to devastating 7.1 %. The motherland of industrialization ended up as the most completely de-industrialized country among the whole sample of mature economies (Δ –17.5 % abs., CAGR –3.06 %).

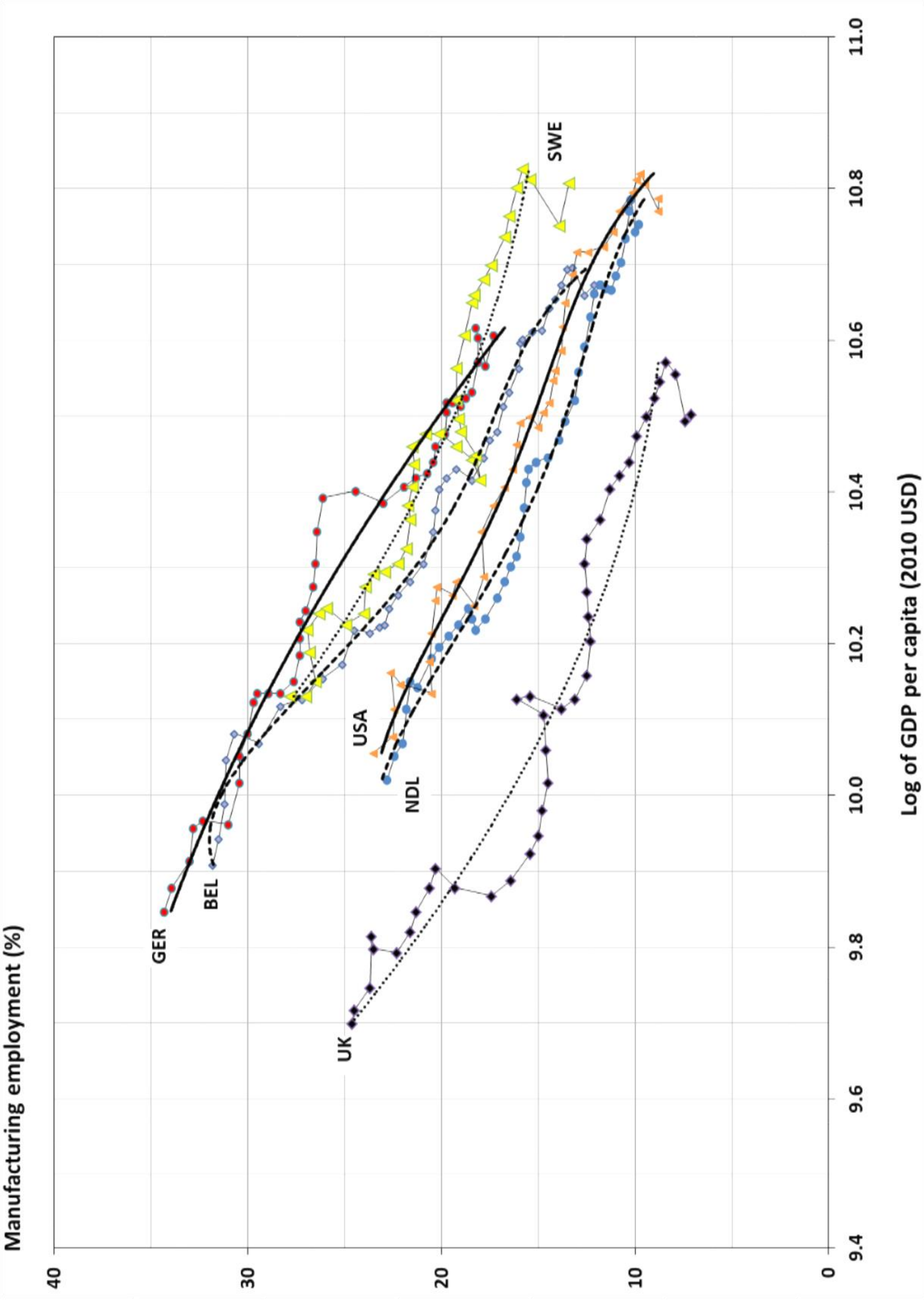
Yet, the average income rose quite rapidly with a shift from 16.3 k USD to 36.4 k USD (Δ +20.1 k USD, CAGR 2.13 %).

USA

The USA was the first country to reach its employment rate peak in manufacturing: an all-time peak in the late years of World War II, a relative peak of a good 30 % in 1953 according to own calculations based on US data (BLS, 2014).

Thus, it started at a relatively low level of 23.5 % to reach only 8.8 % in 2010. The downward trend was quite rapid (Δ–14.7 % abs., CAGR –2.36 %).

The USA stayed in second position in national income per capita. The gap to most of the European followers became a little smaller. GDP per capita rose from 23.3 k USD to 48.4 k USD (Δ +25.3 k USD, CAGR 1.86 %).



Sources: Own calculations, based on EU KLEMS (2012) and World Bank (2014a) data
Data for 1970-2010; polynomial trends

Figure 5.3 ME (%) vs. GDP p/c (log); mature states beyond tipping

Netherlands

The Netherlands' downswing was relatively slow in comparison to its Belgian neighbour and much in parallel to the USA, starting at 22.8 % and ending up at 9.8 % (Δ –13.0 % abs., CAGR –2.14 %).

Also the Netherlands have a high average income per capita which rose from 22.5 k USD to 46.8 k USD (Δ +24.3 k USD, CAGR 1.93 %).

Country-specific explanations, e.g. underlying political reasons and macro-economic shifts, for the phenomena encountered in this section will be regarded in specific country analyses in the course of applying the eclectic model of de-industrialization (section 5.3.7.3, p. 201).

5.2.2.2 States with a tipping point

This group consists of Italy, Japan, Austria, Finland, France and Spain. It will be described from top to bottom of Figure 5.4, p. 116 in the following, utilizing data compiled in Appendix 1.

Italy

Starting off with a large and still increasing share 26.8 % of employees in manufacturing, Italy has remained a country very much depending on production, actually even more than Germany due to its comparatively late structural development. In 2010, there were still 18.2 % employed in manufacturing (Δ –11.6 % abs., CAGR –0.98 %).

The absolute maximum in relative employment in manufacturing was reached in 1979-80 at 28.2 %. The related GDP per capita was 22.9 k USD (log 10.04).

Italy's position in income per capita remained constant within this group of states. Its income increase was relatively modest in comparison to other states. Italy started at 17.1 k USD in 1970 and reached 34.0 k USD in 2010 (Δ +16.9 k USD, CAGR 1.82 %).

Japan

Japan, starting off at 25.5 % manufacturing employment, has de-industrialized unsteadily and not very rapidly. In 2010, the actual account was 15.7 % (Δ –9.8 % abs., CAGR –1.20 %).

Japan reached its maximum in relative employment in manufacturing 1973 at 25.8 %. The related GDP per capita was 21.2 k USD (log 9.96).

Japan's average income per capita rose from 17.9 k USD to 43.1 k USD (Δ +25.2 k USD, CAGR 2.07 %).

Austria

The trend line of Austria is an excellent fit of the actual structural movement of the Austrian manufacturing sector. This indicates that the transition happened relatively smoothly without too heavy disruptions or turbulences. Austria share in manufacturing employment fell from 25.1 % to 14.6 % (Δ –10.5 % abs., CAGR –1.41 %).

Austria reached its tipping point was reached at a relative employment in manufacturing of 25.6 % in 1972. The related GDP per capita was 20.8 k USD (log 9.94).

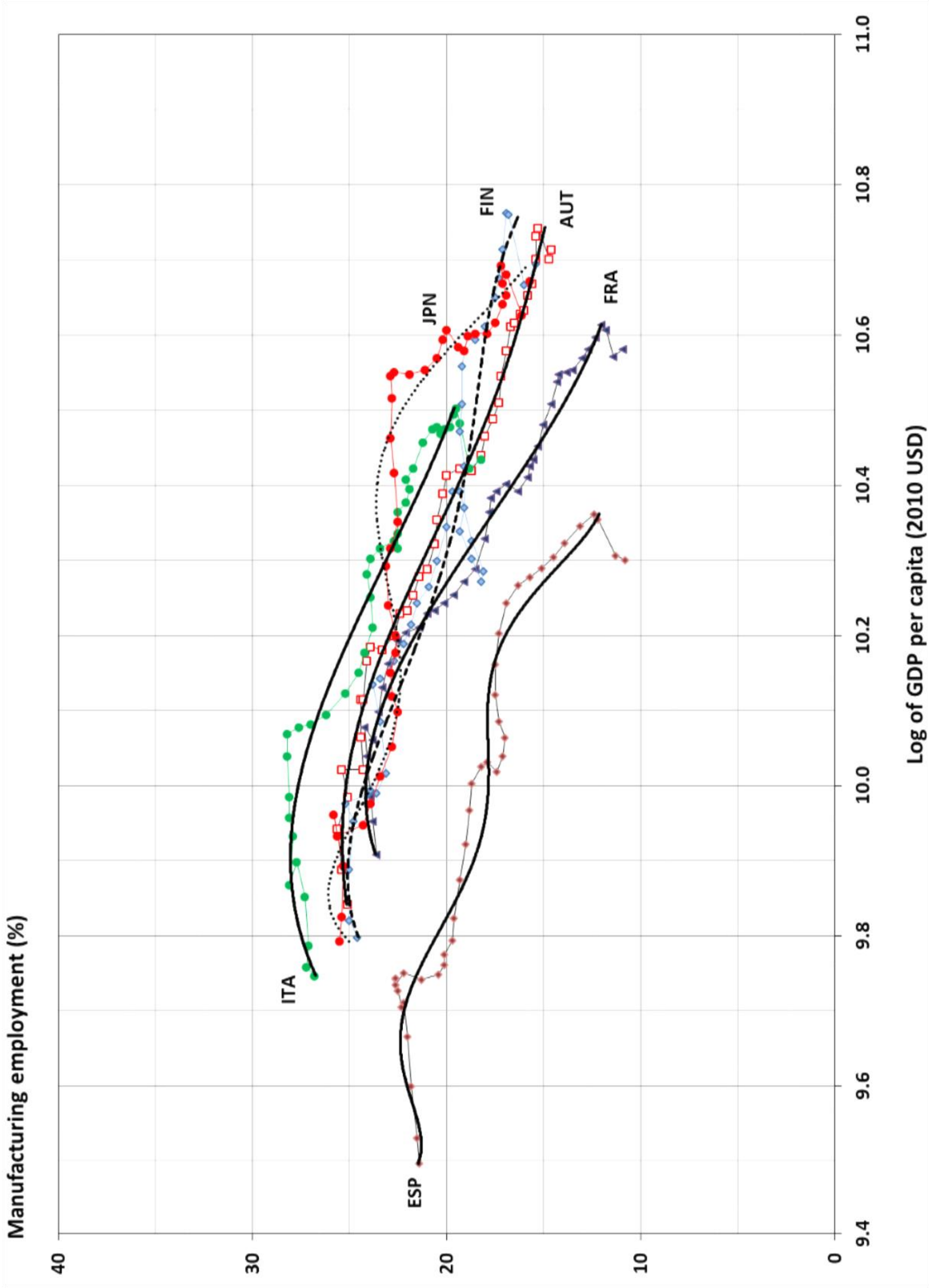
Austria could climb to an excellent position concerning its average income per capita which rose from 18.8 k USD to 45.0 k USD (Δ +26.2 k USD, CAGR 2.19 %)

Finland

Finland's industrial decline was very unsteady. Overall, employment in manufacturing fell from 24.6 % (exactly the British starting point) to 15.4 % (more than twice of the British equivalent in 2010). All in all, the total decrease was rather modest (Δ –9.2 % abs., CAGR – 1.10 %).

The Finnish absolute maximum in relative employment in manufacturing was reached in 1974 at 25.2 %. The related GDP per capita was 21.5 k USD (log 9.98).

Finland could well increase the average income per capita with a shift from 18.0 k USD to 44.1 k USD (Δ +26.1 k USD, CAGR 2.33 %), which is the best performance of the whole sample group.



Sources: Own calculations, based on EU KLEMS (2012) and World Bank (2014a) data
Data for 1970-2010; polynomial trends

Figure 5.4 ME (%) vs. GDP p/c (log); mature states with maxima

France

Developments in France occurred very much in parallel to those in Italy, though at lower rates of manufacturing employment and a higher income per capita.

France started at a relatively low level of manufacturing employment of 23.6 % and ended up at only 10.9 % in 2010 (Δ –12.7 % abs., CAGR –2.02 %).

It tipped at 24.2 % in manufacturing in 1974 at a GDP per capita of 23.8 k USD (log 10.08)

France could increase its income per capita, but at a relatively low rate. Starting from 20.1 k USD, it reached 39.4 k USD in 2010 (Δ +19.3 k USD, CAGR 1.64 %).

Spain

The Spanish development is very peculiar and requires detailed analysis. Some doubt has already been cast on whether Spain was really a truly mature economy in the early 1970s and even whether it is now. So the growth and decline path of Spanish manufacturing does not fit to the other countries of the mature tipping group.

Spain started at a level of 21.4 % in manufacturing which is the lowest position in the whole sample group of 12 countries. After various ups and downs, it landed at 10.8 % (Δ –10.6 % abs., CAGR –1.67 %).

The Spanish tipping point was reached in 1977-79 at a maximum manufacturing employment rate of 22.6 %. In 1978, Spain's GDP per capita stood at 17.0 k USD (log 9.74).

Spain, despite of a significant rise in income per capita, remained the poorest country of the sample over the whole period 1970-2010, with a development from 13.3 k USD to 29.7 k USD (Δ +16.4 k USD, CAGR 2.03 %).

Country-specific explanations, e.g. underlying political reasons and macro-economic shifts, for the phenomena encountered in this section will be regarded in specific country analyses in the course of applying the eclectic model of de-industrialization (section 5.3.8.4, p. 213).

5.2.2.3 Identification of tipping points

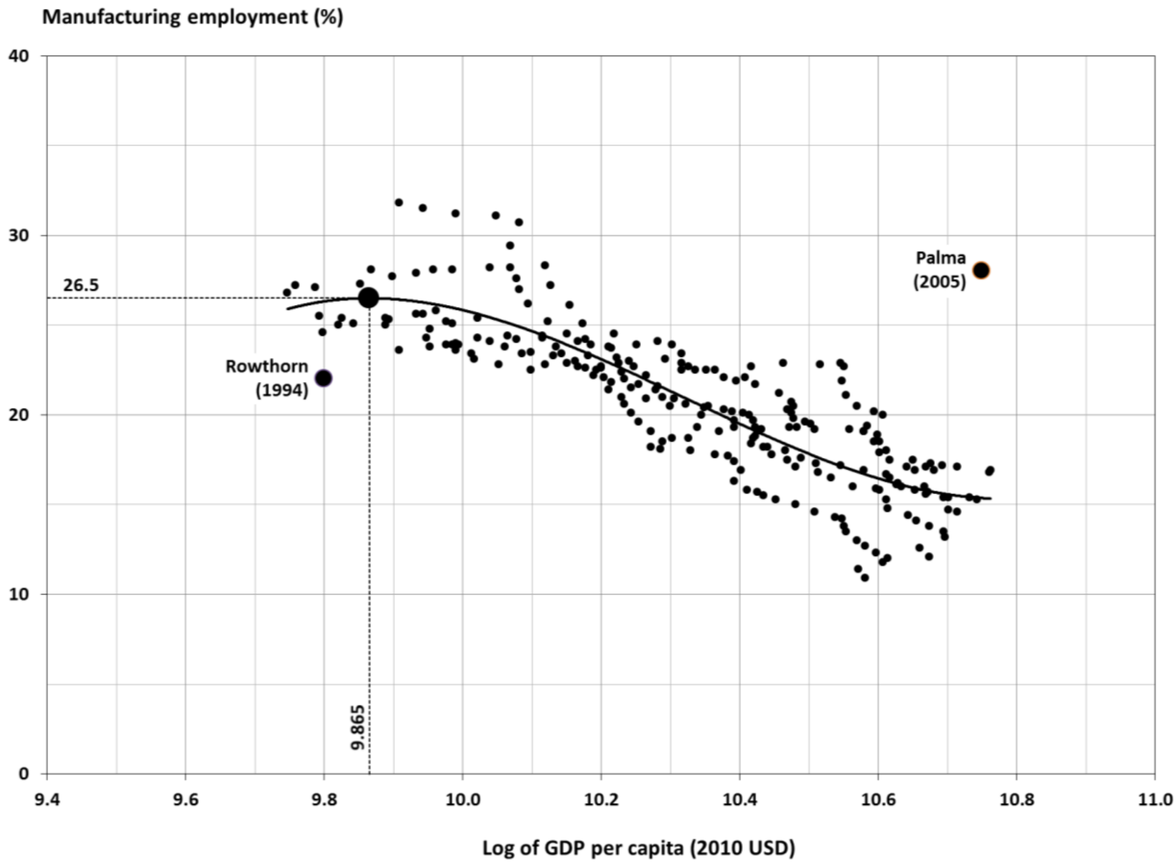
The tipping points of mature economies are quite similar, concerning GDP per capita (Table 5.4). The average is around 21.7 k USD (log ≈ 9.9) – higher than Rowthorn's (1994), but much lower than Palma's (2005) results for the 1970s.

Table 5.4 Tipping points: manufacturing employment (%) and GDP per capita

Country	AUT	BEL	FIN	FRA	GER	ITA	NLD	ESP	SWE	UK	JPN	USA
Year	**1972**	**1970**	**1974**	**1974**	**n/a**	**1980**	**n/a**	**1977**	**n/a**	**n/a**	**1973**	**n/a**
ME (%)	25.6	31.8	25.2	24.2	n/a	28.2	n/a	22.6	n/a	n/a	25.8	n/a
GDP p/c	20.8	20.1	21.5	23.8	n/a	23.6	n/a	15.7	n/a	n/a	21.2	n/a
Log	9.94	9.91	9.98	10.08	n/a	10.04	n/a	9.66	n/a	n/a	9.96	n/a

Sources: Own calculations on the basis of World Bank (2014a) data. In 2010 k USD.

By involving all mature countries with a tipping point, i.e. including Belgium, but excluding Spain, a trend line for the structural shift of mature economies was derived as displayed in the following graph (Figure 5.5) from a polynomial regression analysis.



Sources: Own calculations based on World Bank (2014a) data for AUT, BEL, FIN, FRA, ITA, JPN; Palma (2005). Regression: 3rd degree polynomial

Figure 5.5 Regression analysis of tipping points (mature economies)

The analysis leads to a result not far to that of Rowthorn (1994), but much lower both in income per capita and in share of manufacturing employment than the results delivered by Palma (2005).

Though the aforementioned finding casts some doubt on his analysis, there is also evidence that one of his key findings is correct, which is a shift over time to lower tipping points in terms of both: shares in manufacturing employment and national income per capita. Spain had reached a comparatively little level of maturity in 1970. Given Rowthorn's assumptions, it should have stayed on a growth path concerning manufacturing, but, as Figure 5.4, p. 116, shows, is was not able to follow this path consequently. This might partially be attributed to national developments (see country analysis), but can also be attributed to a more general observation.

Industrial late movers cannot use the full potential that the industrial pioneers could realize for two reasons:

- Technical progress

  Permanent process innovation constantly raises manufacturing productivity, leading to less employment for the same output. Thus, it is likely that national levels of manufacturing employment share will decrease over time.

- Increased competition

  Market pressure from globalization limits possible earnings of manufacturers.

The latter observance is in line with the product cycle hypothesis which shows that mature production is shifted to low-cost locations over time (cf. section A2.1.2). These countries will achieve less earnings from manufacturing than the pioneering group, even more so when multi-national firms utilize international competition to put growing pressure on their producers.

It might be concluded that in a globalized economy, manufacturing becomes increasingly unattractive for countries – but 'beggars can't be choosers'.

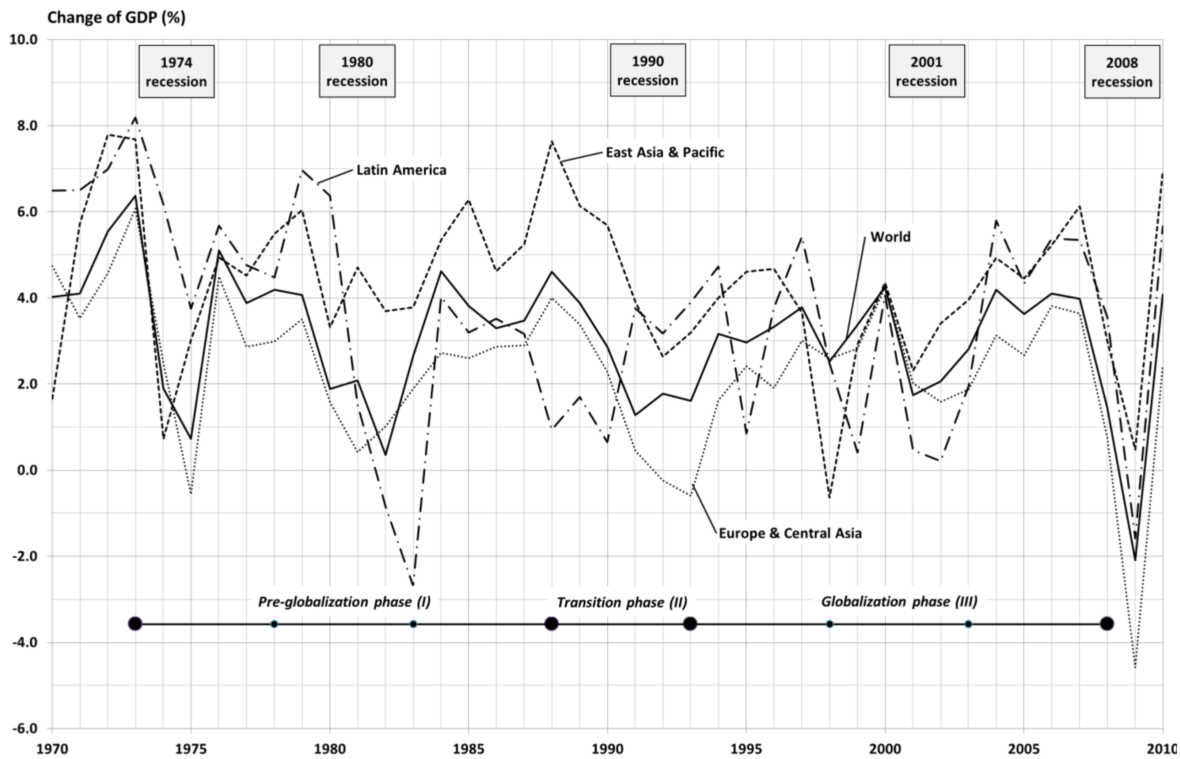
5.2.3 Background information for the analysis

The model is applied to all countries of the mature sample group. Further to macro-economic indicators, as background information for explaining structural shifts, the following information will be collected through the full period 1970-2010:

- world economic cycle,
- regional economic cycles, if deviant from world cycle,
- information on political background (government, i.e. political orientation, attitude towards business).

5.2.3.1 Economic cycles

The world, European and Asian economic cycles are graphically displayed in Figure 5.6. It shows that the world average and the regional economic cycles are closely correlated. The crises spread around the world (with the sole exception of the Asian crises 1998 which was rather regionally limited). These phenomena are proof for a globally linked economy where crises are highly infectious.



Source: Own graph, based on World Bank (2014a) data

Figure 5.6 Economic cycles

On a global scale, only the recession starting in 2008 and reaching its global minimum valley in 2009 led to net losses in total GDP. Throughout Europe & Central Asia, this also was the case in the 1974 oil-shock crisis and during the early 1990s recession. In the East Asia & Pacific region, these crises and even the 2008 recession did not lead to total income losses. Such losses only occurred in the 1998 Asian economic crisis.

Comparing European to world growth (Table 5.5) shows that Europe was at average almost one percentage point below world growth, so its economic development was not as rapid as in many other regions of the world, especially Asia. All growth rates over the last 20 years were smaller than in the double-decade before.

Table 5.5 Average growth rates (%, mean values, 2010 USD)

(%)	World	East Asia & Pacific	Europe & Central Asia	Latin America & Caribbean
1970-1990	3.48	4.87	2.87	3.99
1990-2010	2.71	3.79	1.80	3.03
1970-2010	3.10	4.30	2.34	3.58

Source: Own calculations, based on EUKLEMS (2012) and World Bank (2014a) data

A regression analysis was carried out between the world economic cycle and the given regional cycles. The results are given in Table 5.6.

The coefficient of determination R^2 between the income growth of Europe and the world is very high. It can be interpreted in the sense that more than 80 percent of the variation in the response variable can be explained by the explanatory variables. The remaining good 15 percent can be attributed to unknown, lurking variables or inherent variability. A certain fraction of this correlation might be attributed to the fact that Europe, like any regional economy, is part of the world economy, i.e. its GDP influences both variables. Moreover, by mutual trade Europe is economically linked with any other region and country in the world.

East Asia & Pacific cycle and world cycle are also well correlated, while Latin America & Caribbean show less bondage of the rest of the world. It is quite striking that absolutely no correlation was found between Asia & Pacific and Latin America & Caribbean between 1990 and 2010! This indicates very weak trade connections and a participation in totally different markets.

Table 5.6 Coefficient of determination between GDP growth rates

R^2 (%)	Year	World	East Asia & Pacific	Europe & Central Asia	Latin America & Caribbean
World	1970-1990	100.0	40.5	87.6	41.6
	1990-2010	100.0	43.7	79.1	19.7
	1970-2010	100.0	46.6	83.6	30.3
East Asia & Pacific	1970-1990	40.5	100.0	23.7	29.0
	1990-2010	43.7	100.0	18.0	0.0
	1970-2010	46.6	100.0	25.8	8.3
Europe & Central Asia	1970-1990	87.6	23.7	100.0	23.6
	1990-2010	79.1	18.0	100.0	25.2
	1970-2010	83.6	25.8	100.0	26.1
Latin America & Caribbean	1970-1990	41.6	29.0	23.6	100.0
	1990-2010	19.7	0.0	25.2	100.0
	1970-2010	30.3	8.3	26.1	100.0

Source: Own calculations, based on EUKLEMS (2012) and World Bank (2014a) data (in 2010 USD)

5.2.3.2 Phases of description

In the subsequent country analysis, country-specific developments will be compared with the world development in order to differentiate between local and regional phenomena and causes. The analysis will follow the phases indicated in Figure 5.6:

- Phase I: Pre-globalization phase (1973-1988), including three five-year sub-phases
- Phase II: Transition phase (1988-1993)
- Phase III: Globalization phase (1993-2008), including three five-year sub-phases

Also the long total (1973-2008) will be considered.

For the indicated periods, in the following Table 5.7, global and regional economic growth rates are given. Over the long total and for each long phase, East Asia & Pacific grew stronger than Latin America & Caribbean which grows stronger than Europe & Central Asia. Only for selected semi-decades, this order got altered by local short-term irritations like the Asian financial crisis of 1997/8.

Table 5.7 Economic growth (CAGR, %)

Year	World	East Asia & Pacific	Europe & Central Asia	Latin America & Caribbean
73-08	3.0	4.2	2.3	3.2
73-88	3.1	4.6	2.4	3.4
73-78	3.1	3.7	2.4	5.2
78-83	2.2	4.3	1.7	2.3
83-88	4.0	5.8	3.0	2.9
88-93	2.3	4.4	1.0	2.4
93-08	3.1	3.7	2.5	3.2
93-98	3.1	3.1	2.3	3.3
98-03	2.8	3.3	2.5	1.3
03-08	3.5	4.7	2.8	5.1

Source: Own calculation, based on World Bank (2014a) data

5.2.3.3 Political background

When describing the political orientation and attitude towards business, for the European countries, their affiliation within the European Parliament is taken as the basis. Currently, the following factions are present (European Parliament, 2015):

- Group of the European People's Party (Christian Democrats)
- Group of the Progressive Alliance of Socialists and Democrats in the European Parliament
- Group of the Alliance of Liberals and Democrats for Europe
- Group of the Greens/European Free Alliance
- European Conservatives and Reformists Group
- Confederal Group of the European United Left – Nordic Green Left
- Europe of freedom and direct democracy

A list of the national members of these factions is given in Appendix 3 (EU parliament factions in 2015).

In the following sub-chapters, country-specific results will be discussed. Starting with Austria, the full details of the analysis will exemplarily be described on a point by point basis. For the other countries, a more condensed version will be presented with details (graphs) supplemented in appendices, unless special points of interest are considered.

Finally, a comparative and conclusive evaluation of de-industrialization processes in the investigated group of mature economies will be carried out.

5.3 Country-specific analyses

The eclectic model of de-industrialization will be applied to all states of the sample group (Table 5.1, p. 105). Before turning to the results, the country-wise analysis of de-industrialization processes of mature national economies will start with a short introduction to the history and economic situation of each country. The further analysis will be carried out in the following order:

1) description of structural shifts,
2) identification of economic scenarios of structural change,
3) application of the comprehensive model of de-industrialization,
4) explanation of structural changes by economic and political developments.

The states of the sample group will be examined following their regional affiliation and alphabetic order. Details on the course and methods of this analysis will be introduced when describing the results for the first of the sample states, Austria. All other states were investigated accordingly.

5.3.1 Austria

After the two world wars, not much had remained of the former Habsburg Empire. Geographically reduced to its German-speaking origins, a large fraction of the infrastructure was destroyed, so international help was needed to rebuild Austria in the post-war years. Having declared its neutrality in 1955, Austria re-gained full sovereignty and, basing on the neutral status, established itself as a bridge between East and West during the Cold War. In this course, Vienna became a centre for international organizations like the UN, and the Austrian economy recovered (Benedikt, 2012).

From the 1970s, social democrat governments shaped Austria in a socialist tradition similar to Scandinavia. After the fall of the Iron Curtain, Austria had regained a privileged position at the heart and crossroads of Europe. It was allowed to join the EU in 1995 and introduced the Euro in 2002 (Benedikt, 2012).

5.3.1.1 Structural shifts

Some key facts

Austria is a small country in the heart of Europe. Due to its location in the Alp region, its population density is not very high (101.8/km² in 2010). In Table 5.8, Austria main economic indicators are compiled.

Table 5.8 Overview on the macro-economic development of Austria

Year	Population	GDP p/c	Exports	Trade	Unemployment	Agriculture	Manufacturing (VA)		Fuel exp.	Services	KIBS
	mn	*k USD*	*% of GDP*	*% of GDP*	*% of active*	*% of empl.*	*% of empl.*	*bn USD*	*% of ME*	*% of empl.*	*% of empl.*
1973	7.6	21.7	28.0	-0.4	1.0	17.2	25.1	38.8	2.2	47.5	6.6
1988	7.6	30.4	34.4	-0.2	4.7	10.7	20.6	43.9	1.3	60.1	10.4
1993	7.9	33.5	32.7	-0.1	4.2	9.5	18.7	45.2	1.1	62.7	11.2
2008	8.3	46.3	59.3	5.8	3.8	6.0	15.3	66.6	3.4	70.6	15.9
	CAGR (%)	*CAGR (%)*	*CAGR (%)*	*Δ 5 y*	*Δ 5 y*	*CAGR (%)*	*CAGR (%)*	*CAGR (%)*	*average*	*CAGR (%)*	*CAGR (%)*
73-88	0.0	2.3	1.4	0.1	1.2	-3.1	-1.3	0.8	1.7	1.6	3.1
88-93	0.8	2.0	-1.0	0.1	-0.5	-2.4	-2.0	0.6	1.1	0.9	1.5
93-08	0.4	2.2	4.0	1.9	-0.1	-3.0	-1.3	2.6	2.2	0.8	2.4
73-08	0.3	2.2	2.2	0.9	0.4	-3.0	-1.4	1.6	1.9	1.1	2.6

Sources Based on World Bank (2014a) data, constant 2010 prices

Austria is a highly mature economy with a relatively high export orientation and trade balance that turned to positive in the third phase under observation. Austria de-industrialized in terms of employment, while growing in terms of manufacturing output. Its workforce shifted to services, with an over-proportional increase of knowledge-intensive business services (KIBS).

Volatility of change

For describing the smoothness of sectoral transition, the volatility of change was calculated by evaluating the standard deviation of each variable displayed in the basic graph for evaluation (Appendix 5). To get a single indicator, the values per variable were simply added up (excluding high-tech manufacturing to avoid double-counting, since it is part of total manufacturing). Thus, the formula for calculating total volatility of change is:

$$\upsilon_T = \sum_{i=1}^{n} \sum_{t=t_0}^{t_e} \sigma_{X_i,t} \tag{5.1}$$

Since five-year growth rates were included, the first data point of the calculation is from 1978, indicating the CAGR since 1973. The last data point is from 2008, indicating the CAGR since 2003. To get the necessary amount of data for three sub-periods, the sub-periods i) 1973/8-1883/8, ii) 1983/8-1993/8, iii) 1993/8-2003/8 were formed in addition to the full period 1973/8-2003/8. For the sub-periods, the last of the preceding data points is the first of the following period. These periods represent the long-term phases indicated in section 5.1.2. While for the first and last phase, the earliest reference growth factor contains the starting date of the respective phase and the latest contains the end date, for the intermediate five-year period, it is just vice versa.

For Austria, the results listed in Table 5.9 are obtained. Since the graphs show no big amplitudes, the volatility values for Austria are low even in comparison with other mature countries.

Table 5.9 CAGR (%) volatility of de-industrialization indicators (Austria)

Years	υ_T	$\sigma_{1,T}$ manu. empl.	$\sigma_{2,T}$ unem-ployment	$\sigma_{3,T}$ trade balance	$\sigma_{4,T}$ GDP p/c	$\sigma_{5,T}$ manu. output	$\sigma_{6,T}$ primary prod. exp.	$\sigma_{7,T}$ agricult. empl.	$\sigma_{8,T}$ KIBS empl.
78-88	**6.26**	0.50	0.86	1.88	0.62	0.62	0.08	1.37	0.33
88-98	**4.69**	0.42	0.78	0.86	0.48	1.00	0.13	0.51	0.51
98-08	**5.29**	0.21	0.66	1.18	0.56	1.03	0.39	0.56	0.69
78-08	**7.05**	0.48	1.01	1.87	0.57	1.18	0.25	0.96	0.73

Source: Own calculation, evaluation based on (EU KLEMS, 2012) and World Bank (2014a) data

Sectoral changes

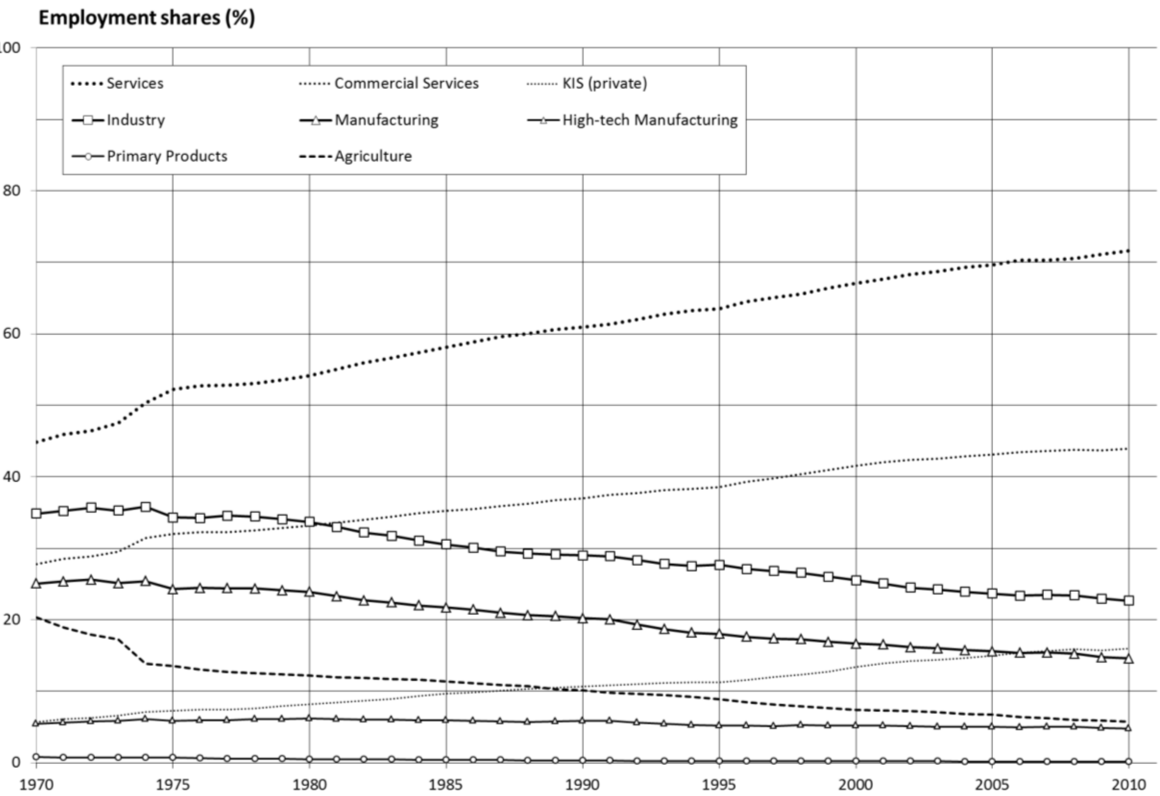
As meaningful indicators for i) societal structures, ii) sectoral state of technical development and iii) economic impact, sectoral changes are analysed in terms of

1) employment (relative, i.e. manufacturing employment in % of the total workforce),
2) productivity (in USD/hour),
3) output (value added, in USD).

Additionally, absolute employment and relative output were calculated for identifying economic scenarios. Productivity per capita, as biased by changes in individual workload, was not utilized since more reliable productivity per hour values were available. Anyhow, it was calculated for continuative computation.

Employment

When looking at the structural shift of Austria between 1970 and 2010 (Figure 5.7), a very smooth transition from industrial to service economy has happened. All lines are almost straight, which means that the course set in the era of the social democrat chancellor Bruno Kreisky has been followed until today.



Source: Own graph, based on World Bank (2014a) and national employment data

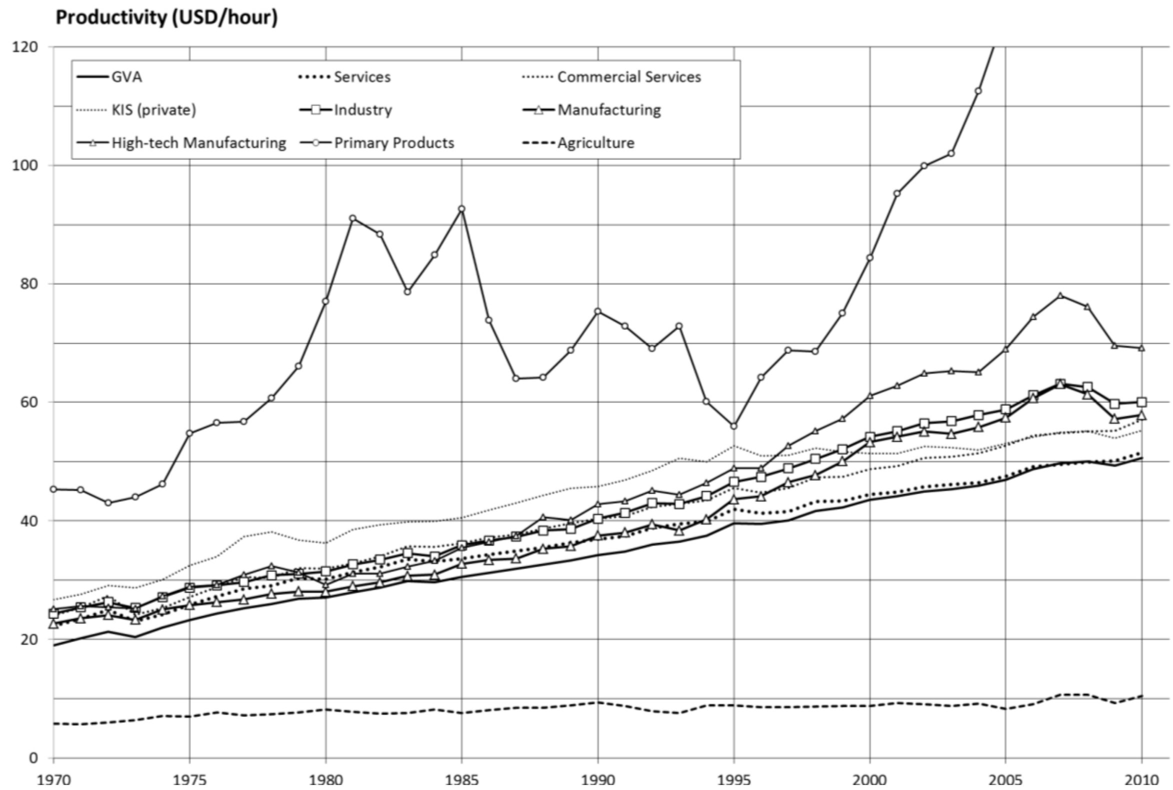
Figure 5.7 Structural change of Austria

The only bump occurred in around 1973/74 – probably (despite of the oil-shock) more a statistical artefact than expression of true abrupt change. The following major developments can be stated:

- Industry including manufacturing has constantly declined in parallel to agriculture. Both have lost a good 14 percent points of total employment.
- Employment in high-tech manufacturing has more or less remained constant.
- Service sectors have continuously absorbed the redundant workforce. Starting off with as many employees as those in high-tech manufacturing, the KIBS share has more than doubled.

Productivity

Over the investigated years, all Austrian branches have been able to raise their productivity (Figure 5.8).



Source: Own graph, based on EU KLEMS (2012) data

Figure 5.8 Sectoral productivity in Austria

The sectoral behaviour is as follows:

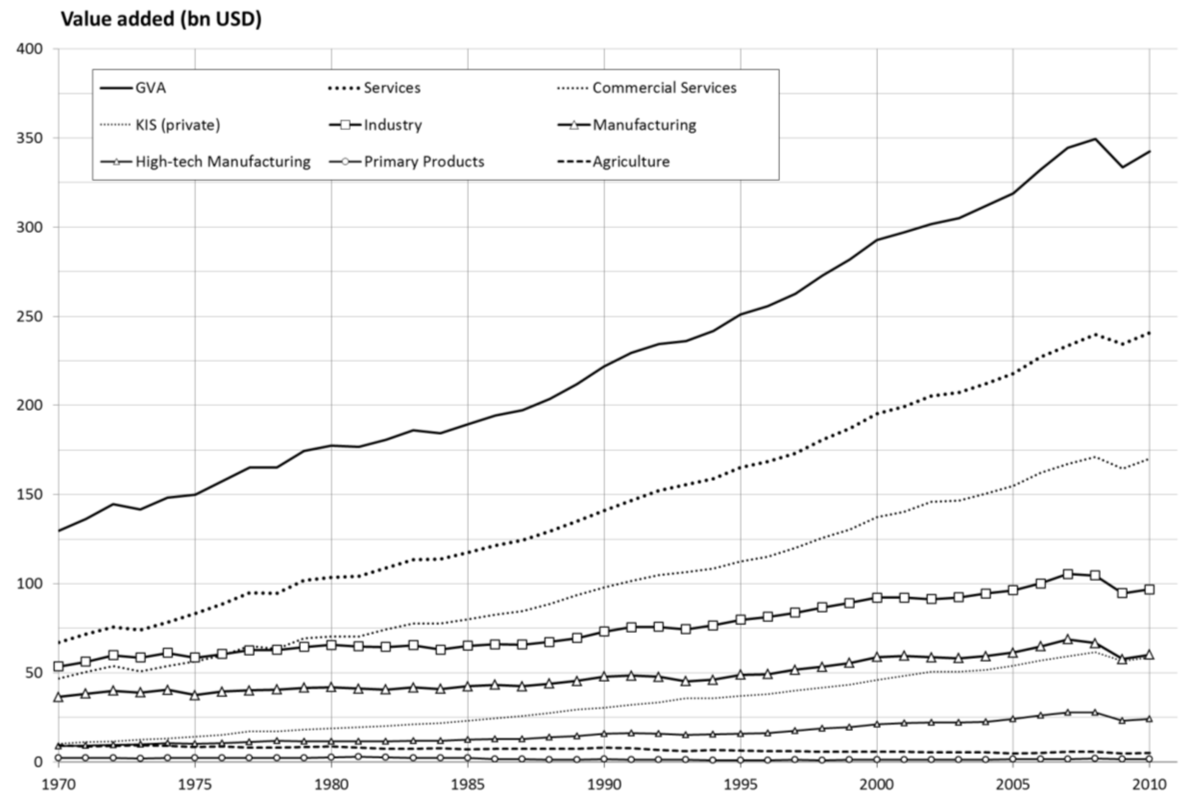
- Primary products play a prominent role at the upper end of the scale, with the oil and gas industry being highly capital-intensive and highly volatile due to changing world-market prices.
- On the other end, agriculture has been by far the least productive sector, also with the smallest growth rates from the 1970s.
- Manufacturing had higher increase rate than services. Especially high-tech manufacturing gained in productivity until the 2008 depression.
- Services grew almost in parallel to the national average GVA, but at lower rates than industry. Knowledge-intensive services were more productive than manufacturing in 1970 and developed well until a point of stagnation around 1995. They were passed

by manufacturing around millennium and could only get a little closer again due to the 2008 crisis.

Output

By bringing input (absolute employment) and efficiency (productivity per capita) together, an output (value added) as shown in Figure 5.9 is generated. The following Austrian developments are of major interest:

- Manufacturing output was rising from 1970 until the 2008 crisis.
- Output in knowledge-intensive services had much higher increase rates. Starting from less than half of the manufacturing output, it reached manufacturing in the 2008 recession which hit manufacturing harder than services.
- Mining and quarrying, like agriculture, have played only a marginal role in the Austrian economy.



Source: Own graph, based on EU KLEMS (2012) data

Figure 5.9 Sectoral gross value added in Austria

From these findings, it might well be concluded that Austria has de-industrialized in terms of relative and absolute employment and also in terms of relative output, but not in terms of absolute output which, on the basis of rising productivity, could be kept more than only constant.

The share of high-tech manufacturing is relatively small, but with growing success, probably due to co-operation with suppliers of former Eastern Bloc countries. By shifting labour-intensive production processes to low-cost countries, the productivity of the remaining workforce was lifted. These findings will be tested and examined more deeply in the following sections.

5.3.1.2 Economic scenarios

Key indicators

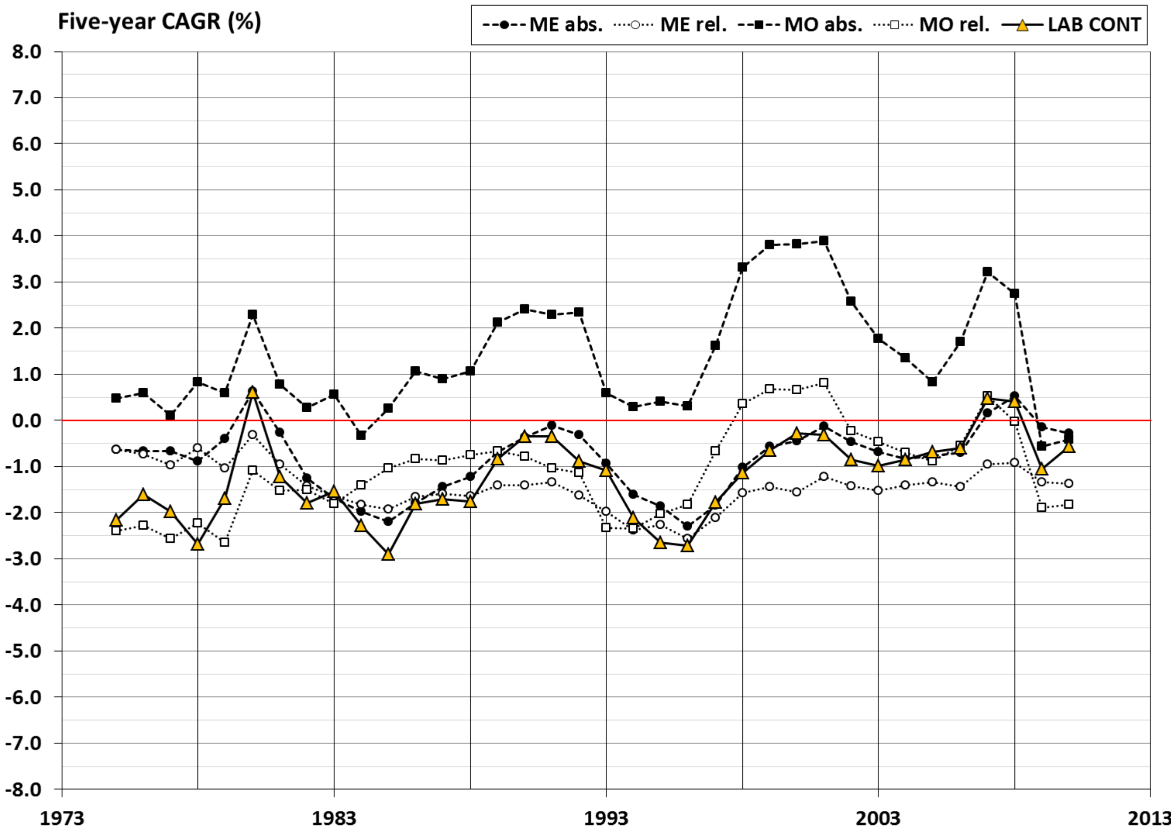
For identifying economic scenarios as described in section 4.2, pp. 95, the five-year growth rates of the absolute manufacturing output and productivity were calculated. From these, the growth rate of the total labour content was derived according to equation (4.4), p. 97. Since the basic data was available for 1970 to 2010, five-year growth rates could be calculated starting from 1975.

Also the other key indicators listed in section 2.4.1.2, pp. 65, were calculated accordingly. Furthermore, the correlations between these five indicators were tested (for results see Table 5.10 below). In Figure 5.10, all key indicators are graphically displayed.

From the chart and the correlation factors, the following conclusions can be drawn:

- **LAB CONT:** The total sectoral working hours have constantly decreased due to constantly rising productivity.
- **ME (abs.)**: Normally, the number of employees should correspond with the labour content, so both curves should correlate very well. This was the case in Austria since 1997; both curves are almost identical. Before, the workload often decreased faster than the number of workers, meaning that the individual workload was reduced. The respective R^2 factor is 68.8 %, which is not very high compared to other countries.
- **ME (rel.)**: Since other sectors grew why manufacturing shrank from around 1988, the decline of the relative sectoral employment even exceeded the absolute decline. Accordingly, the societal impact of classical industrial labour sank.

- **MO (abs.)**: Despite the sinking numbers of sectoral employment, the output could be constantly increased (apart from the 2008/9 crisis). Austria's industrial power rose.
- **MO (rel.)**: Rising output in absolute terms could not help the fact that the economic contribution of manufacturing to the Austrian economy fell constantly, apart from a short period around millennium. In accordance, the relevance of manufacturing for the national economy fell.



Source: Own graph, based on own calculations drawing from EU KLEMS (2012) data

Figure 5.10 Indicators of de-industrialization (Austria)

Table 5.10 Correlation of de-industrialization indicators (Austria)

R^2 of 5y CAGR (%)	ME (abs.)	ME (rel.)	MO (abs.)	MO (rel.)	LAB CONT
ME (abs.)	100.0	56.3	23.4	7.4	68.8
ME (rel.)	56.3	100.0	3.6	0.0	19.0
MO (abs.)	23.4	3.6	100.0	73.1	44.5
MO (rel.)	7.4	0.0	73.1	100.0	35.4
LAB CONT	68.8	19.0	44.5	35.4	100.0

Source: Own calculation of coefficients of determination, based on EU KLEMS (2012) data

From these findings, it is concluded that:

- Austria de-industrialized in a sociological sense. The impact of manufacturing on the Austrian society decreased significantly, though at a slow pace.
- Yet, Austria kept its industrial base and increased its output at an average growth rate that exceeded the one of the Austrian population (cf. Table 5.8, p. 125), so also per Austrian, the industrial output grew.
- The manufacturing sector has constantly modernized, so productivity increases yielded. Moreover, Austria's manufacturing industry increased its high-technology share and utilized it more and more for exports.

Scenarios

For diagnosing certain economic scenarios described in section 4.2, p. 95, a calculation on changes of the individual workload has to be adjoined to the CAGR indicators utilized before. This is carried out by calculating the distribution of the labour content on employment and workload, following equation (4.4), p. 97. This allows to then derive the five-year growth rate also of the workload.

The results generated are visualized in Figure 5.11. Austria's structural development has been remarkably constant. It has permanently and without any exception been driven by productivity rises which are characteristic for type 1, 4, and 5 scenarios. A shift to high-tech is also constantly indicated.

Most of the time, Austria's change process follows the 4e de-industrialization scenario. Manufacturing productivity rises exceed given rises in output, so the labour content becomes reduced. These labour content reductions are not fully compensated by workforce reductions, but also involve workload diminutions in most years.

Only in the f-type years, the workload rises. In Austria, this was rather the exception from the rule. In certain boom years, Austria has even industrialized, while in years of recession or crisis, lay-offs were partly avoided by reducing the average workload of employees.

As a resume, from the findings so far it might be concluded that the de-industrialization scenario of Austria is a good example for mindful state action, fostering constant improvement but yet avoiding social hardships.

Source: Own graph, based on own calculations drawing from EU KLEMS (2012) data
Categories as illustrated in Figure 4.4, p. 101

Figure 5.11 Economic scenarios (Austria)

5.3.1.3 Application of the eclectic model of de-industrialization

While for the economic scenarios, the labour content was utilized as the key indicator for de-industrialization, the literature-based eclectic model utilizes relative reductions in manufacturing employment as the key indicator. Other indicators are used to find out about the nature of the sociological process.

The eclectic model of de-industrialization was applied by transferring the required input data into a tailor-made Excel-tool which automatically carries out the steps of analysis. Moreover, a specific graphic display was developed to clearly visualize the key steps of analysis, i.e. to show whether the parameters are within certain limits defined in section 4.1, pp. 81. For space requirements, the respective charts were annexed. The key data for applying the de-industrialization model of Austria is graphically displayed in Appendix 5 (Austria).

In these graphs, the basic data for the following steps of analysis are illustrated:

1) a) de-industrialization (yes/no),
   b) type of de-industrialization (positive/ambivalent/negative)
2) failure/maturity test
3) specialization test (shift to KIS or primary products)

Type of de-industrialization

The key data for applying the de-industrialization model is graphically displayed in Annex 5 (Austria). For determining the type of de-industrialization, the development of manufacturing employment (five-years CAGR), unemployment (mean five years change with exchanged algebraic sign, so rising unemployment is displayed as a negative value), the trade balance (mean five years change) and the GDP per capita (five years CAGR) are shown. The crucial values are those measured at full five-year transits, i.e. 1978, 1983 etc. The year scale (y-axis) is set up accordingly.

If manufacturing employment falls by at least -1.00 %, the respective curve will be in the light red zone of the graph and de-industrialization is diagnosed.

Austria has constantly, but slowly de-industrialized, with CAGR values mostly a little below the threshold level, sometimes also slightly higher, so no de-industrialization is diagnosed in these cases (1978, 2008). For Austria, de-industrialization is found between 1982 and 2006 and from 2009. Thus, the subsequent steps of analysis are carried out for the five-year intervals 1983-2003.

GDP per capita is constantly in the green range besides of the years immediately after the 2008 world economic crisis. Therefore, the totally negative type of de-industrialization did not take place in Austria. A generally positive type of de-industrialization gets diagnosed when both change of unemployment and trade balance are at least in the neutral (white) zone in the middle. For the discrete five-year intervals, this was always the case from 1988 until 2003. Only in 1983, increasing unemployment created a more dimmish picture.

Technical maturity

The next step of analysis is that on technical maturity and eventual failure. The respective indicators are those of manufacturing output, high-tech manufacturing output and manufacturing productivity (five-years CAGR) are displayed.

From the beginning of de-industrialization around 1980 until the 2008 recession, all of these indicators were constantly positive or in the neutral zone which means that the Austrian economy is technologically mature and the manufacturing sector has not failed due to rising productivity and output.

Shift to high-tech manufacturing constantly took place with the exception of 1983 and 1995/6 when the total manufacturing output was rising a little faster than that of high-tech manufacturing. The 2008 crisis also hit the manufacturing sector, but even then, the indicators stayed in the neutral zone, so no failure was diagnosed.

Sectoral shifts

The last part of the analysis is on sectoral shifts to KIBS and/or to primary products.

- The KIBS indicator is straightforward: There is a constant growth of sectoral employment. Thus, a constant shift to the KIS sector is diagnosed for all phases of de-industrialization from 1982.
- The primary products sector has not played a very important role in Austria. Its indicator stays in the neutral zone for the whole investigated period. No significant shift to primary products is found.

In addition to the second finding, it was found that employment in this sector has even been shrinking (cf. Figure 5.7, p. 127) despite of the fact that the productivity of the Austrian primary products sector is very much higher than that of the manufacturing sector (cf. Figure 5.8, p. 128). Higher productivity is found to be a necessary, but insufficient indicator for a shift to primary production.

Summative assessment of results from the model

On the basis of the actual values, corresponding CAGRs or percentage changes are calculated. The model is applied accordingly. A summary of the findings is given in Table 5.11. A view on the whole period (1973-2008) and the three phases including sub-phases is rendered.

Very often, i.e. in the 1993-2008 period and in most (sub-)phases, de-industrialization in Austria was of the positive type, technically mature, with a shift to high-tech and KIBS and no shift to primary products. The smoothness of the continuous process is demonstrated by low volatility and also by the fact that in two sub-phases, the decline in manufacturing employment was smaller than the chosen de-industrialization diagnose level.

The 2008 recession also hit Austria, but today, the Austrian economy has returned to its long-term straight track.

Table 5.11 De-industrialization of Austria

Year	De-industriali-zation	Type	Technical maturity	Failure	Shift to		
					Hi-tech	KIBS	Primary products
73-08	yes	ambivalent	yes	no	yes	yes	no
73-88	yes	ambivalent	yes	no	yes	yes	no
73-78	no						
78-83	yes	ambivalent	yes	no	no	yes	no
83-88	yes	positive	yes	no	yes	yes	no
88-93	yes	positive	yes	no	yes	yes	no
93-08	yes	positive	yes	no	yes	yes	no
93-98	yes	positive	yes	no	yes	yes	no
98-03	yes	positive	yes	no	yes	yes	no
03-08	no						

Source: Own compilation, evaluation based on EU KLEMS (2012) and World Bank (2014a) data

5.3.1.4 Economic and political explanations for structural changes

National trends and influences

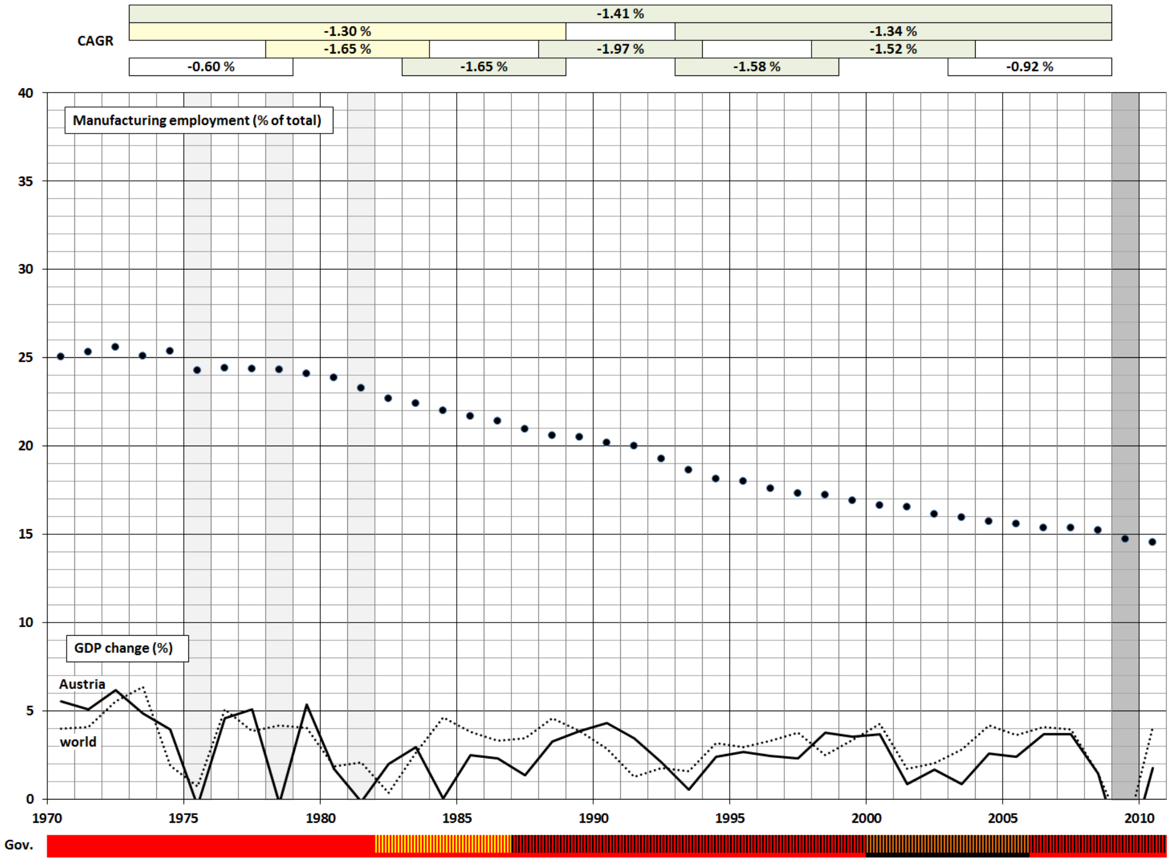
Since the 1950s, political Austria maintained a power balance between conservatives (ÖVP, black) and social-democrats (SPÖ, red). Sharing offices and power between one conservative and one social democrat helped to avoid harsh controversies of the inter-war period and “went through all layers of public and many private and social structures and persists in many areas until today (even though it is done more discretely these days)” (Benedikt, 2012). On this common ground, a stable and persistent government of the country was established.

From 1970, the social democrat Bruno Kreisky ruled the country for 14 years. In the last of these years, he was in a coalition with the third party in Austria, the liberals (FPÖ). This coalition was continued also by Kreisky’s successor Franz Vranitzky who ended it sharply when the ‘liberals’ were turned into a right-wing populist party under its newly-elected leader Jörg Haider.

The FPÖ party was remarkably successful in the 1990s (Benedikt, 2012) and was even part of the only Austrian government under a conservative chancellor, Wolfgang Schüssel, in the first post-millennium years.

The rest of the period envisaged, from the mid-1980s until today, Austria was governed by a great coalition under a social-democrat chancellor information (The Austrian Federal

Chancellary, 2014), so the old power balance *('Proporz')* between both factions remained in place and assured the great continuity of Austrian politics.



Sources: Based on World Bank (2014a) data, own calculations and political information (The Austrian Federal Chancellary, 2014)

Figure 5.12 Economic and political development of Austria

In Figure 5.12, the economic and political developments of Austria from 1970 are combined in one graphic display. From top to bottom, the following elements are included:

- Five-year CAGRs and classification of de-industrialization (white: no de-industrialization, green: positive, yellow: ambivalent, black: negative)
- Manufacturing employment rate (dots)
- GDP change (continuous line: national GDP change, dotted line: world economic cycle)
- Recessions are highlighted (medium dark grey: global, light grey: national recessions)
- Ruling political parties (red: social democrats, black: conservatives, yellow: liberals, light brown: right-wing liberals since 1986; see Appendix 3)
- Party of the chancellor (thin line below the political party).

The Austrian economy is tightly embedded in the world economy. This can be attributed to the fact that Austria is a dedicated exporting country. The export rate has almost doubled, starting from 28.5 % of the GDP in 1970 and reaching 54.4 % in 2010 (World Bank, 2014a).

Linkages to the world and regional economy

Besides the bump in 1978 which can be attributed to adaption processes of the East Austrian region which could not follow the increasing world economic pick-up (Graf & Schneider, 1979), the Austrian curve is more or less parallel to the world cycle.

To analyse the international economic linkages and the impact of globalization on the Austrian economy more thoroughly, a regression analysis from 1970 to 2010 was performed, rendering the coefficient of determination between annual GDP changes. Also two sub-phases (1970/90, 1990-2010) were calculated to differentiate the state before and after the fall of the Iron Curtain. The figures for Austria are summarized in Table 5.12.

Table 5.12 GDP (CAGR, %) coefficients of determination with Austria

R^2 (%)	World	Europe & Central Asia	USA	East Asia & Pacific	Latin America & Caribbean
1970-1990	22.8	48.8	2.4	1.7	14.0
1990-2010	59.2	67.7	38.4	17.6	16.4
1970-2010	40.9	59.2	14.6	8.8	19.9

Source: Own calculations, based on EUKLEMS (2012) and World Bank (2014a) data

The Austrian economy has closely and increasingly been linked to the world cycle. It is even linked more closely to the economic cycle of Europe & Central Asia – a finding that could be expected, given the location of Austria. While the links with Latin America have stagnated on a low level, they have increased significantly with East Asia.

In another test, the correlation between economic cycle, i.e. economic development (change of GDP), and de-industrialization (change of manufacturing employment) was evaluated. Only a very minor part of Austrian de-industrialization processes is explicable by actual economic change (R^2 = 23.1 %). Accordingly, the major part can be attributed to a structural shift to services and dislocation of highly labour-intensive steps of production to low-cost locations.

These economic processes were governed wisely and induced smoothly and mostly socially acceptable. They were guided by a political system that is, notwithstanding sometimes crude rhetoric in election campaigns and some sleaze, an excellent example for the beneficial effects of great continuity and the lack of abrupt policy changes.

5.3.2 Belgium

Belgium was one of the pioneers of European industrialization, with textile industry and coal and steel in the Liège area (Henning, 1995). Later in the 19th century, it built up a strong chemical industry. Already since the renaissance era, it was a leading trade connection. The port of Antwerp is the second-biggest in Europe.

After World War II, Belgium became a driving force of European unification. Brussels is the seat of many European institutions and also of the NATO (Embassy of Belgium in Portugal, 2014).

Belgium is divided by a cultural and language border between the Dutch-speaking Flemish in the North and the French-speaking Walloons in the South. By granting both regions a certain autonomy, the tensions between both could be limited. Belgium prospered as a member of the Eurozone and the Schengen customs union (Embassy of Belgium in Portugal, 2014).

5.3.2.1 Structural shifts

Some key facts

Belgium is a small, but densely populated (360.6/km² in 2010) country in the heart of Western Europe. In Table 5.13, Belgium's main economic indicators are compiled, revealing that Belgium is a highly mature economy with a very high export orientation and a positive trade balance.

Belgium de-industrialized very much in terms of employment, while still slightly growing in terms of manufacturing output. Workforce shifted to services with an over-proportional increase of knowledge-intensive business services (KIBS). This result reflects the privileged situation of Brussels as the main seat of European administration.

Table 5.13 Overview on the macro-economic development of Belgium

Year	Popu-lation	GDP p/c	Exports	Trade	Unem-ployment	Agri-culture	Manufacturing (VA)		Fuel exp.	Services	KIBS
	mn	*k USD*	*% of GDP*	*% of GDP*	*% of active*	*% of empl.*	*% of empl.*	*bn USD*	*% of ME*	*% of empl.*	*% of empl.*
1973	9.7	23.1	52.2	1.9	2.4	3.7	31.1	59.0	2.9	56.0	9.0
1988	9.9	31.2	64.6	2.3	8.8	2.6	20.4	62.2	3.5	70.0	13.2
1993	10.1	33.4	61.0	3.2	8.6	2.4	18.4	58.3	3.4	71.8	15.4
2008	10.7	44.2	84.4	0.9	7.0	1.6	13.2	63.3	9.2	78.1	22.0
	CAGR (%)	*CAGR (%)*	*CAGR (%)*	*Δ 5 y*	*Δ 5 y*	*CAGR (%)*	*CAGR (%)*	*CAGR (%)*	*average*	*CAGR (%)*	*CAGR (%)*
73-88	0.1	2.0	1.4	0.2	2.1	-2.2	-2.8	0.3	5.8	1.5	2.6
88-93	0.4	1.4	-1.1	0.9	-0.2	-1.8	-2.1	-1.3	3.5	0.5	3.2
93-08	0.4	1.9	2.2	-0.8	-0.5	-2.9	-2.2	0.6	4.7	0.6	2.4
73-08	0.3	1.9	1.4	-0.1	0.7	-2.4	-2.4	0.2	5.0	1.0	2.6

Sources Based on World Bank (2014a) data, constant 2010 prices

Volatility of change

The Belgian results listed in Table 5.14 were obtained. Shifts in unemployment and the trade balance account for a higher total volatility of the Belgian economy in comparison to the Austrian. Nonetheless, the volatility values for Belgium are relatively low, standing for a smooth transition from industrial to service society.

Table 5.14 CAGR (%) volatility of de-industrialization indicators (Belgium)

Years	υ_T	$\sigma_{1,T}$ manu. empl.	$\sigma_{2,T}$ unem-ployment	$\sigma_{3,T}$ trade balance	$\sigma_{4,T}$ GDP p/c	$\sigma_{5,T}$ manu. output	$\sigma_{6,T}$ primary prod. exp.	$\sigma_{7,T}$ agricult. empl.	$\sigma_{8,T}$ KIBS empl.
78-88	**10.28**	0.74	2.38	2.99	0.55	1.67	0.32	1.08	0.55
88-98	**6.91**	0.35	2.63	0.74	0.63	1.76	0.20	0.32	0.27
98-08	**6.72**	0.32	1.50	1.76	0.45	1.05	0.39	0.43	0.82
78-08	**9.45**	0.58	2.66	2.16	0.56	1.52	0.41	0.84	0.73

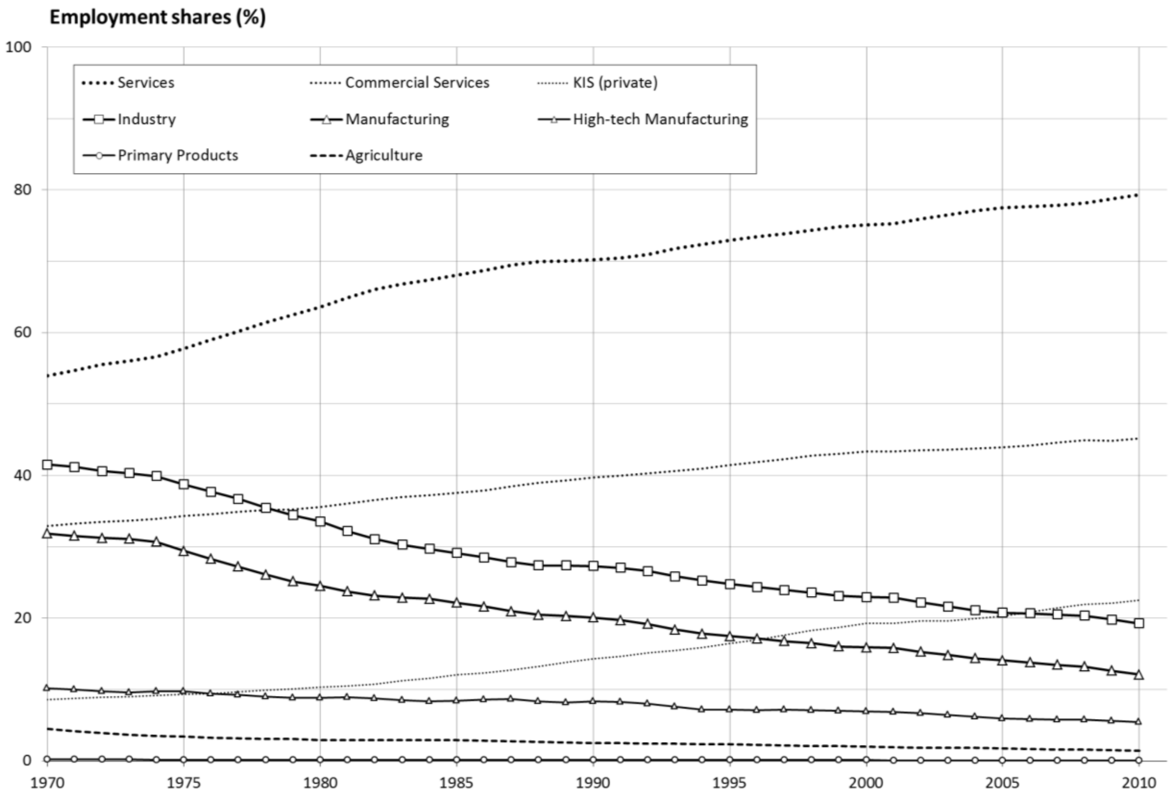
Source: Own calculation, evaluation based on (EU KLEMS, 2012) and World Bank (2014a) data

Sectoral changes

Employment

As shown in Figure 5.13, by 2010, four out of five Belgians were employed in services, a surplus of around 25 percent points, while industry and the manufacturing sector were facing serious losses in employment with relatively high gradients in the 1970s and a modest and constant decline since the early 1980s.

Unlike in Austria, also the Belgian high-tech manufacturing sector has reduced the number of jobs over time. Knowledge-intensive services have grown and now employ more persons than the whole industrial sector. Agriculture has been reduced to an almost negligible quantity.

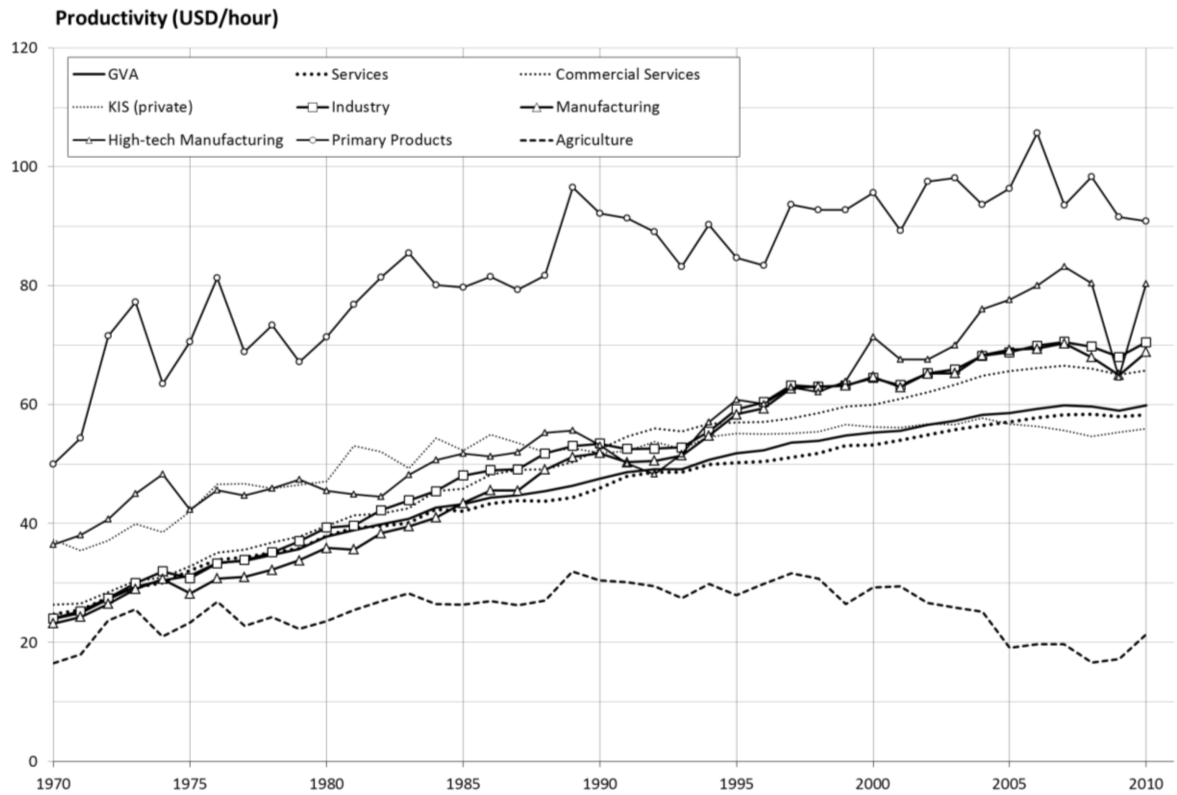


Source: Own graph, based on World Bank (2014a) and national employment data

Figure 5.13 Structural change of Belgium

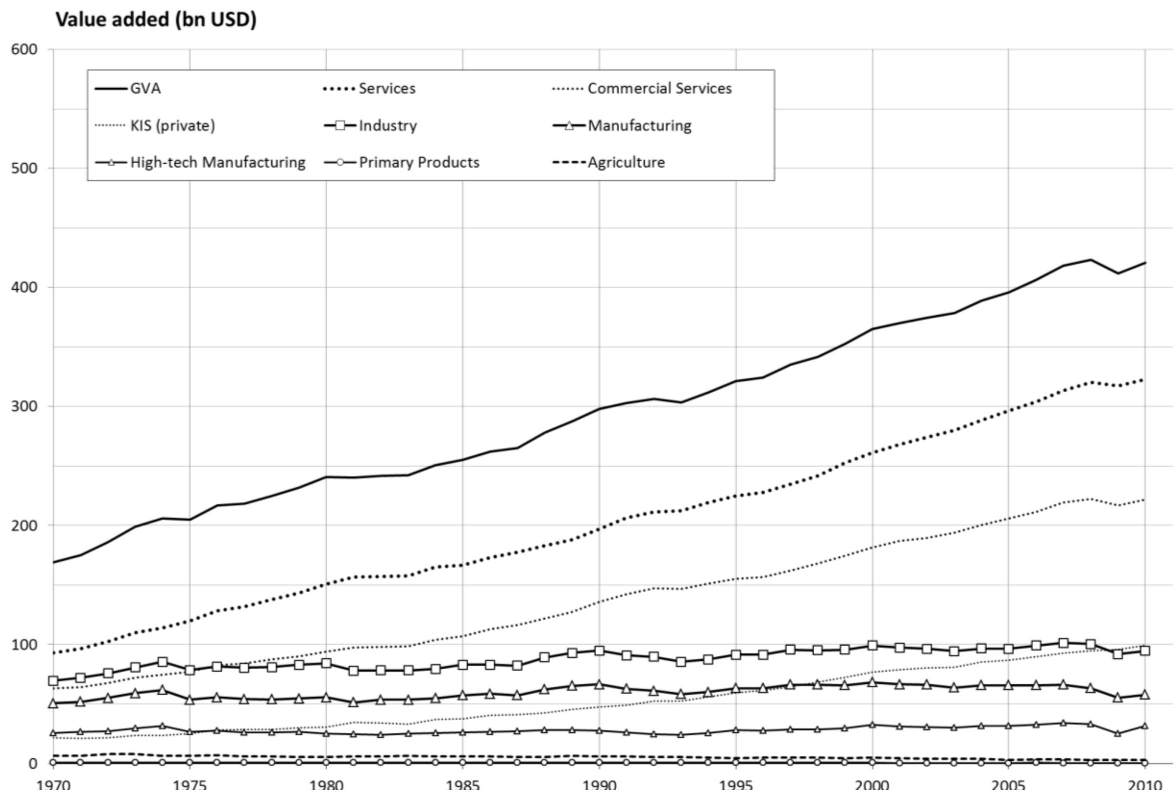
Productivity

Generally speaking, the trends of sectoral productivity (Figure 5.14) are not very different from those in Austria, but with more disquietude, small movements up and down. The agricultural sector could almost keep the pace of other sectors until the mid-1970s before falling behind and even losing productivity. KIBS were overtaken by manufacturing around 1990, so the productivity growth rate in services was lower than in industry, especially high-tech manufacturing. High-tech manufacturing decoupled from mainstream manufacturing in the late 1990s, most likely due to altered value chains with major elements of dislocation to low-cost countries.



Source: Own graph, based on EU KLEMS (2012) data

Figure 5.14 Sectoral productivity in Belgium



Source: Own graph, based on EU KLEMS (2012) data

Figure 5.15 Sectoral gross value added in Belgium

Output

The total value added gives a very poignant picture (Figure 5.15). Industry output stagnated over the full period and in all sectors including manufacturing, while services gained in importance. The agricultural sector, though starting at a very low level, was even facing a decrease.

In the heart of Europe, full of administrative institutions, the shift from an industrial to a service economy has been implemented more rapidly and consequently than in other European countries like Austria and Germany.

5.3.2.2 Economic scenarios

Key indicators

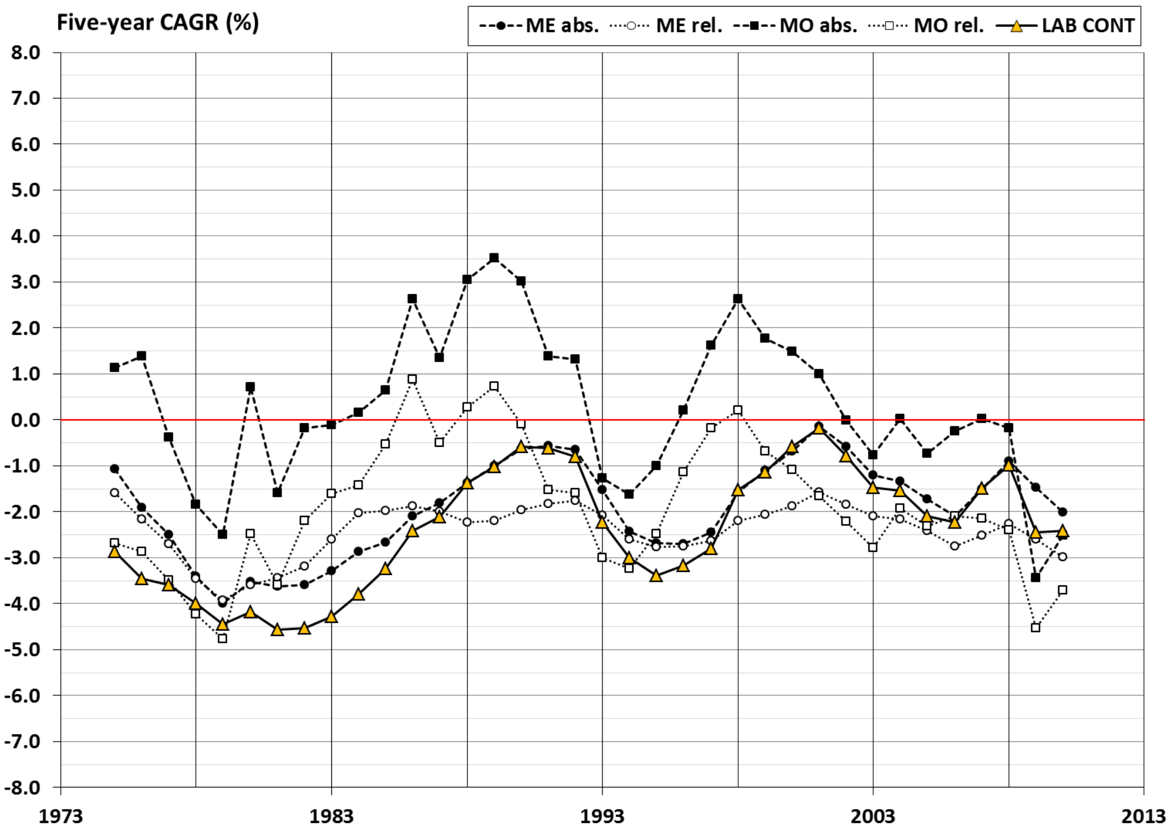
Key indicators for Belgium are graphically displayed in Figure 5.16. The correlation factors between these indicators are given in Table 5.15.

All indicators followed a more or less common direction over time, with a mid-term recession period corresponding to the five years after the fall of the Iron Curtain, followed by a recovery that ended with the 2008/9 crisis.

From the chart and the correlation factors, the following conclusions can be drawn:

- **LAB CONT:** The total sectoral working hours have constantly decreased due to constantly rising productivity.
- **ME (abs.)**: The number of employees correlates well with the labour content, so both curves should correlate very well. Until 1988, the total workload (labour content) decreased somewhat faster than the number of workers, meaning that the individual workload was reduced.
  The respective R^2 factor is 90.6 %, which is in the high range compared to other countries.
- **ME (rel.)**: Most of the time, the decline of the relative sectoral employment even exceeded the absolute decline. Accordingly, the societal impact of classical industrial labour sank.
- **MO (abs.)**: Over the whole period, the output growth meandered around zero, with phases of growth and of decline.

- **MO (rel.)**: The economic contribution of manufacturing to the Belgian economy fell almost constantly. In accordance, the relevance of manufacturing for the national economy declined.



Source: Own graph, based on own calculations drawing from EU KLEMS (2012) data

Figure 5.16 Indicators of de-industrialization (Belgium)

Table 5.15 Correlation of de-industrialization indicators (Belgium)

R^2 of 5y CAGR (%)	ME (abs.)	ME (rel.)	MO (abs.)	MO (rel.)	LAB CONT
ME (abs.)	100.0	68.2	19.4	12.3	90.6
ME (rel.)	68.2	100.0	32.3	29.9	52.6
MO (abs.)	19.4	32.3	100.0	80.7	22.2
MO (rel.)	12.3	29.9	80.7	100.0	19.9
LAB CONT	90.6	52.6	22.2	19.9	100.0

Source: Own calculation of coefficients of determination, based on EU KLEMS (2012) data

From these findings, it is concluded that:

- Belgium significantly de-industrialized in a sociological sense. The impact of manufacturing on the Belgian society decreased accordingly.
- Belgium's manufacturing output stagnated just like its population. The output per Belgian kept more or less constant (cf. Table 5.13, p. 140).

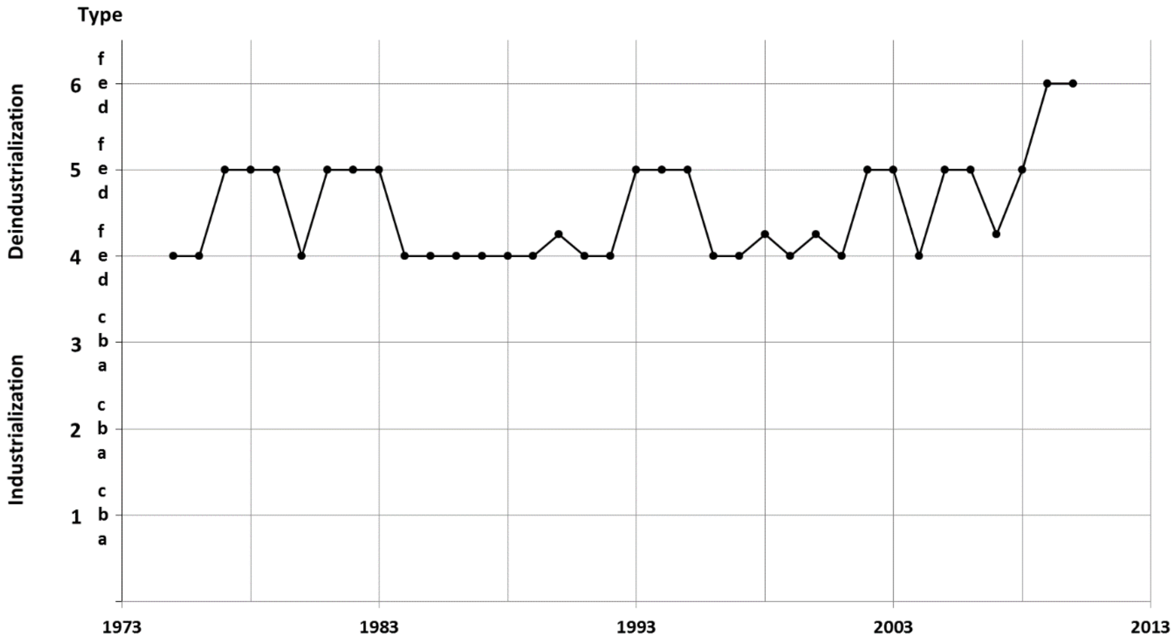
- The Belgian manufacturing sector has constantly modernized, so productivity increases yielded. Also the Belgian manufacturing industry increased its high-technology share. High technology is largely utilized also for exports.

Scenarios

The Belgian path of de-industrialization, just like the Austrian, is very stable. It is driven by constant productivity growth and resulting reduction of the total labour content. Depending on whether the corresponding output rose or fell, it is rather of the 4e or 5e type (see Figure 5.17).

The 2008/9 recession hit the Belgian industry very hard. Jobs were retained despite of lacking orders, so the productivity fell despite of reduced output and individual workload reductions (6e type).

Only in selected boom years, the individual workload increased (4f type).



Source: Own graph, based on own calculations drawing from EU KLEMS (2012) data
Categories as illustrated in Figure 4.4, p. 101

Figure 5.17 Economic scenarios (Belgium)

5.3.2.3 Application of the eclectic model of de-industrialization

The key data for applying the de-industrialization model is graphically displayed in Appendix 5 (Belgium).

The results from applying the model are given in Table 5.16. Belgium has, in terms of relative manufacturing employment, de-industrialized over the whole investigated period and in each sub-period. Belgium has started its shift to high-tech when globalization gained momentum after the fall of the Iron Curtain. After 1993, the development might be explained by the fact that some more simple elements of industrial value chains were transferred while the more sophisticated parts were retained and refined.

The Belgian manufacturing sector went through a crisis in the political transition 1988-93. Despite of the sectoral crisis indicated by lacking technical maturity, no shift to high-tech and even market failure, the five-year indicators of the national economy concerning unemployment, trade and national income were neutral with one positive, so the positive type of de-industrialization was registered.

Table 5.16 De-industrialization of Belgium

Year	De-industriali-zation	Type	Technical maturity	Failure	Shift to		
					Hi-tech	KIBS	Primary products
73-08	yes	ambivalent	yes	no	yes	yes	no
73-88	yes	ambivalent	yes	no	no	yes	no
73-78	yes	ambivalent	ambiguous	ambiguous	no	yes	no
78-83	yes	ambivalent	yes	no	no	yes	no
83-88	yes	positive	yes	no	no	yes	no
88-93	yes	positive	no	yes	no	yes	no
93-08	yes	ambivalent	yes	no	yes	yes	no
93-98	yes	positive	yes	no	yes	yes	no
98-03	yes	positive	ambiguous	no	yes	yes	no
03-08	yes	ambivalent	ambiguous	no	yes	yes	no

Source: Own compilation, evaluation based on EU KLEMS (2012) and World Bank (2014a) data

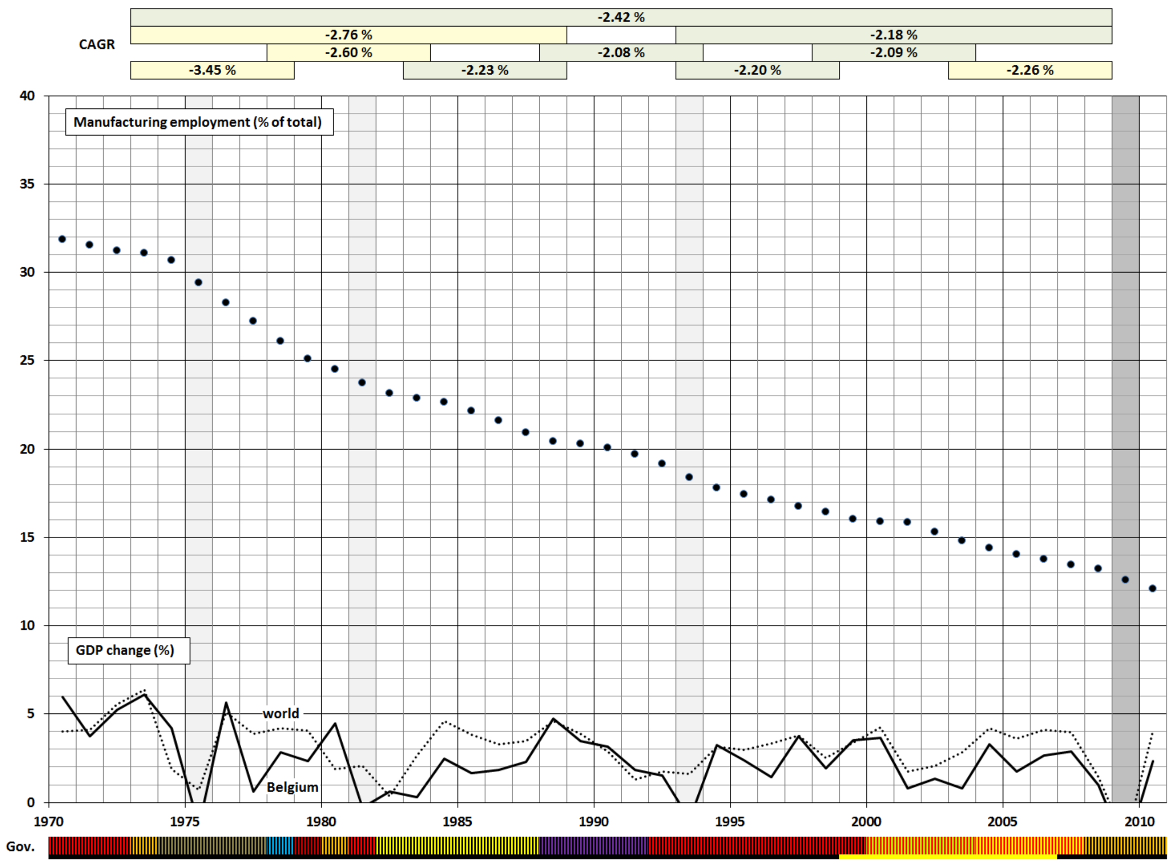
While the total period (1973-2008) was characterized by a growing income per capita, the change of the trade balance was negative, but only due to a negative outlier in the critical year 2008. Also, unemployment rose significantly. Due to the very high exposition of Belgium to international markets, the overall bright picture of Belgian manufacturing became somewhat clouded.

5.3.2.4 Economic and political explanations for structural changes

National trends and influences

Belgium's political spectrum is very complicated to understand, since there are Flemish and Walloon parties for all political colours and a lot of coalitions between all of these colours, sometimes even involving nationalist parties from the Northern or Southern part of the country (Figure 5.18).

Still, great continuity has prevailed: Except of an eight-year liberal intermezzo, the president was always a conservative. Because of so many small parties, none of them could develop an influence that would have altered the mean direction of government. So also in Belgium, despite of the changes in political colours, political continuity, paired with the necessity for compromise, helped to keep the country on an economically constant course, at least after the national conflicts had been resolved by adequate political measures in the late 1970s (Embassy of Belgium in Portugal, 2014).



Source: Based on World Bank (2014a) data, own calculations and political information (collected starting from Wikipedia, 2014a)

Figure 5.18 Economic and political development of Belgium

Linkages to the world and regional economy

Links between the Belgian economy and regions are illustrated by the co-alignment of their economic growth (Table 5.17).

Table 5.17 GDP (CAGR, %) coefficients of determination with Belgium

R^2 (%)	World	Europe & Central Asia	USA	East Asia & Pacific	Latin America & Caribbean
1970-1990	41.0	69.9	7.9	2.6	31.8
1990-2010	72.9	74.3	46.7	23.8	21.6
1970-2010	55.7	69.8	21.3	12.0	32.5

Source: Own calculations, based on EUKLEMS (2012) and World Bank (2014a) data

The international bondages of Belgium point in the same direction as the Austrian, but are generally stronger. This can be attributed to the stronger Belgian exposition to foreign trade. With Latin America, there has been a backward trend from the first to the second twenty-year period.

There is a very high and rising correlation with global markets, especially with Europe. This very tight relation is almost perfectly reflected by the high Belgian export rate which rose from 48.9 % of GDP in 1970 to 79.8 % in 2010 (World Bank, 2014a). The main trade is within the EU, so the high correlation coefficient is due to this economic interdependence.

Hence, there is only little need for further explanation of national peculiarities. Even the economic downturn that showed in 1993 with a notch can be explained by the 1990s downturn which was more prominent throughout the EU than on a world scale (cf. Figure 5.6, p. 120) and thus was no Belgian specialty.

5.3.3 Finland

Finland gained independence from Russia in the aftermath of the October Revolution in 1917. Being a democracy with individual property rights ever since, the relations to the big neighbour in the east remained delicate, especially after the World War II atrocities between the two nations. Finland manoeuvred between the Western and the Eastern Bloc, officially being neutral and a non-NATO member until today. From 1948 until 1992, the relations to the Soviet Union were governed by the Agreement of Friendship, Cooperation, and Mutual Assistance (YYA Treaty) which gave Moscow a certain influence on Finnish domestic politics (Singleton, 1998).

However, Finland could pursue an independent economic course and even made a free trade agreement with the European Community in 1973. Its economy grew rapidly, and Finland turned from an agrarian society into a country of technological leadership that assures a high standard of living. Like its Scandinavian neighbours, the Finnish state guarantees high standards of social security for its citizens (Singleton, 1998).

The Finnish affluent society was facing a first and serious economic crisis from 1991 to 1993. It was caused by a mix of negative influences like the economic downturn of the Soviet Union, the consequences of an economic overheating fostered by the liberalization of financial markets and a fixed currency. The crisis could finally be overcome by bailing out banks on the basis of increased public debt. After the end of the Soviet Union, the doors were open to join the European Community in 1995 (Kiander & Virtanen, 2002).

5.3.3.1 Structural shifts

Some key facts

Finland is a sparsely populated Scandinavian country (17.6/km²) in the very North of Europe. Despite being adversely situated at the outskirts of the continent, it managed to become one of the wealthiest nations worldwide with a very high income per capita (Table 5.18).

Table 5.18 Overview on the macro-economic development of Finland

Year	Population	GDP p/c	Exports	Trade	Unemployment	Agriculture	Manufacturing (VA)		Fuel exp.	Services	KIBS
	mn	*k USD*	*% of GDP*	*% of GDP*	*% of active*	*% of empl.*	*% of empl.*	*bn USD*	*% of ME*	*% of empl.*	*% of empl.*
1975*	4.7	21.8	22.4	-2.8	2.6	15.0	24.0	23.4	0.4	50.1	6.8
1988	4.9	31.1	24.0	-0.6	4.2	9.9	20.0	30.9	1.7	60.7	10.1
1993	5.1	28.9	31.8	4.6	16.3	8.5	18.2	27.8	2.7	65.2	11.0
2008	5.3	47.1	46.8	3.8	6.4	4.8	16.8	47.1	7.0	69.6	14.7
	CAGR (%)	*CAGR (%)*	*CAGR (%)*	*Δ 5 y*	*Δ 5 y*	*CAGR (%)*	*CAGR (%)*	*CAGR (%)*	*average*	*CAGR (%)*	*CAGR (%)*
75-88*	0.4	2.8	0.5	0.8	0.6	-3.2	-1.4	2.2	3.1	1.5	3.1
88-93	0.5	-1.5	5.8	5.2	12.1	-2.8	-1.9	-2.1	2.2	1.4	1.7
93-08	0.3	3.3	2.6	-0.3	-3.3	-3.8	-0.5	3.6	3.6	0.4	2.0
75-08*	0.4	2.4	2.3	1.0	0.6	-3.4	-1.1	2.1	3.2	1.0	2.4

Sources Based on World Bank (2014a) data, constant 2010 prices.
* No complete data available for 1973/4.

On the basis of high-technology products in traditional sectors (e.g. paper) and latest technologies (ICT, e.g. NOKIA), Finland, despite of lacking natural resources which are mainly imported from Russia (gas and oil) managed to turn from an import to an export nation with a clear trade surplus.

Table 5.18 clearly indicates the effects of the 1990s crisis, with a downturn in GDP per capita and manufacturing output, accompanied by a serious rise of unemployment. These problems could be overcome in the following years.

Volatility of change

The Finnish results listed in Table 5.19. Strong shifts in unemployment, the trade balance and also manufacturing output account for a relatively high total volatility of Finland in comparison to Austria and Belgium. The transition to a service economy is not smooth, but rather comes in waves. This is very much due to the overwhelming success of Finland's economy around the year 2000 which caused a very high tide after the serious problems around 1990. More and more, Finland has returned to a standard path of transition.

Table 5.19 CAGR (%) volatility of de-industrialization indicators (Finland)

Years	υ_T	$\sigma_{1,T}$ manu. empl.	$\sigma_{2,T}$ unem-ployment	$\sigma_{3,T}$ trade balance	$\sigma_{4,T}$ GDP p/c	$\sigma_{5,T}$ manu. output	$\sigma_{6,T}$ primary prod. exp.	$\sigma_{7,T}$ agricult. empl.	$\sigma_{8,T}$ KIBS empl.
78-88	**9.18**	0.65	2.12	2.55	0.62	1.41	0.29	0.96	0.58
88-98	**20.80**	1.35	6.34	4.52	2.08	3.55	0.18	1.56	1.21
98-08	**11.71**	1.12	1.80	3.19	0.71	2.35	0.40	1.55	0.60
78-08	**17.11**	1.04	5.08	3.90	1.61	2.71	0.37	1.48	0.93

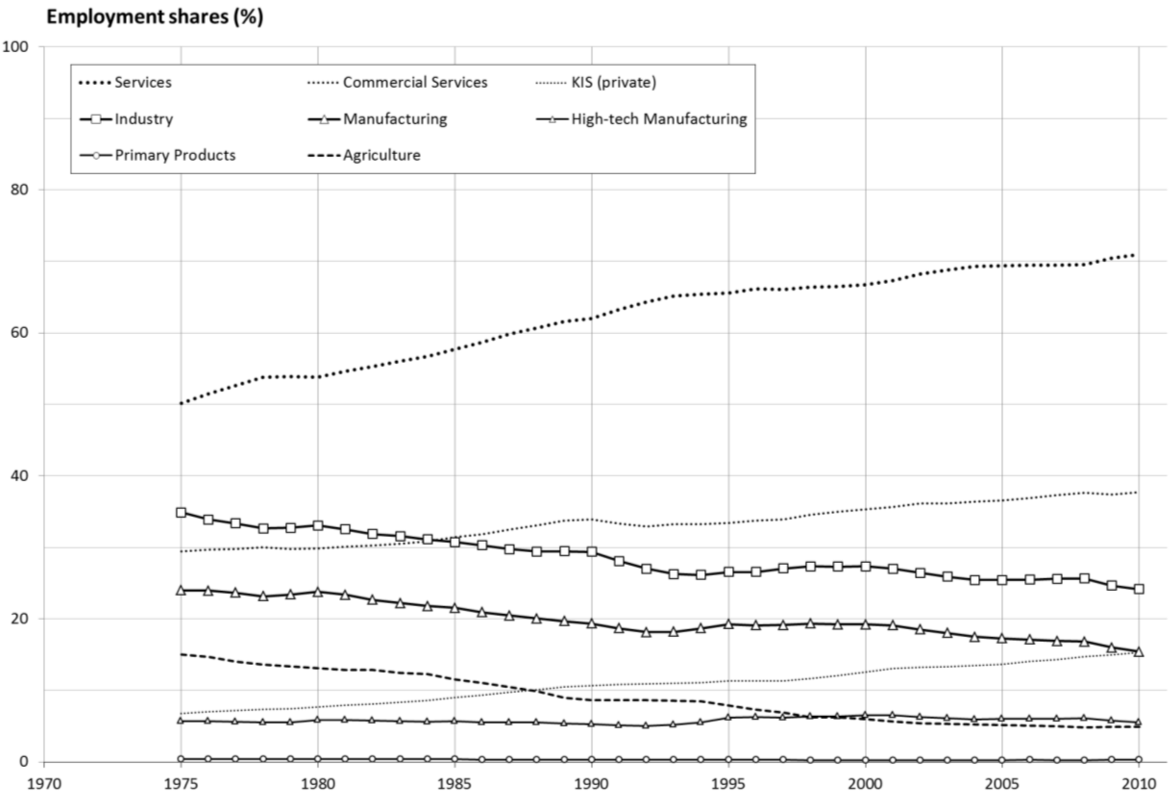
Source: Own calculation, evaluation based on (EU KLEMS, 2012) and World Bank (2014a) data

Sectoral changes

Employment

As Figure 5.19 shows, the transition of the Finnish society has continuously proceeded since the 1970s.

Besides of the 'ditch' in the early 1990s, the trends are almost linear. Downward is the trend for industry and manufacturing, upward for services including KIBS. The agricultural sector has rapidly decreased until 2000, with a tendency to stabilize somewhere slightly below 5 % of the population. This stabilization is astounding, given that sectoral productivity is less than half than those of the other sectors of the Finnish national economy (cf. Figure 5.20).



Source: Own graph, based on World Bank (2014a) and national employment data

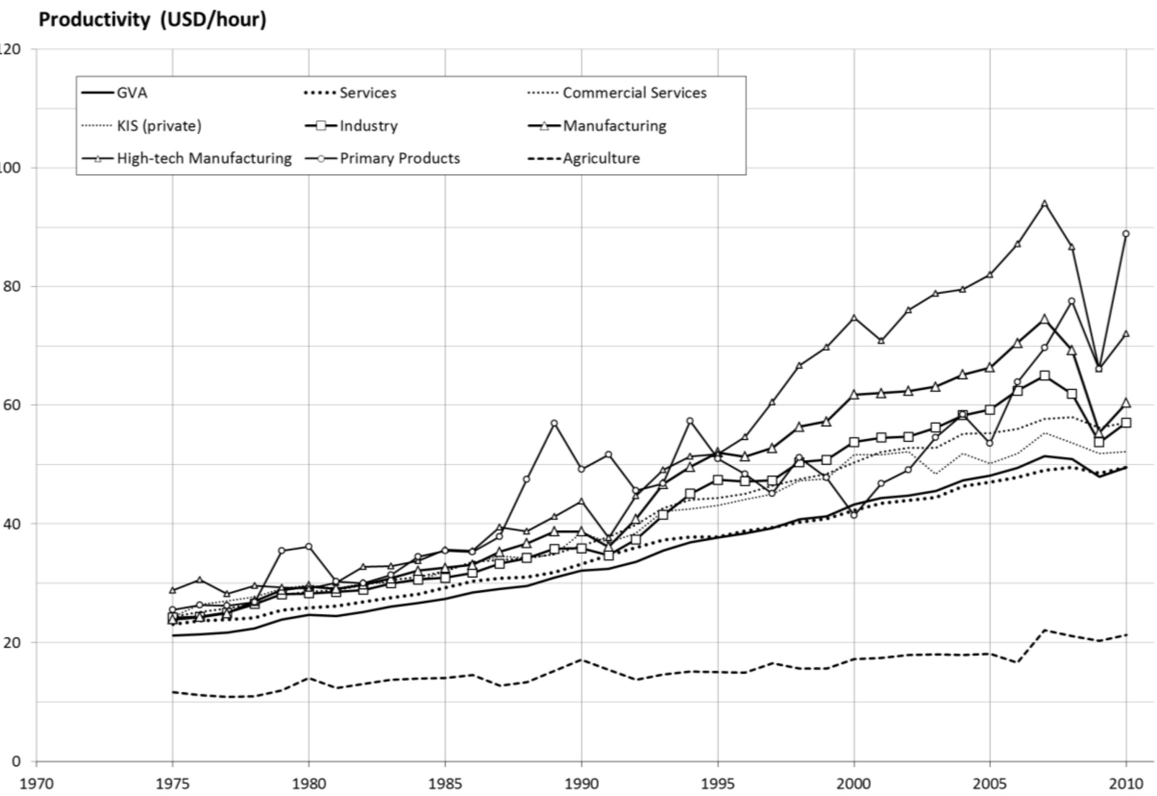
Figure 5.19 Structural change of Finland

The export-oriented high-tech manufacturing sector is special, with a constant until 1993, moving up a plateau in 1995 which was left as a consequence of the 2008 world economic crisis. Most likely, the latter change is induced by reduced international demand rather than by a domestic downturn.

Productivity

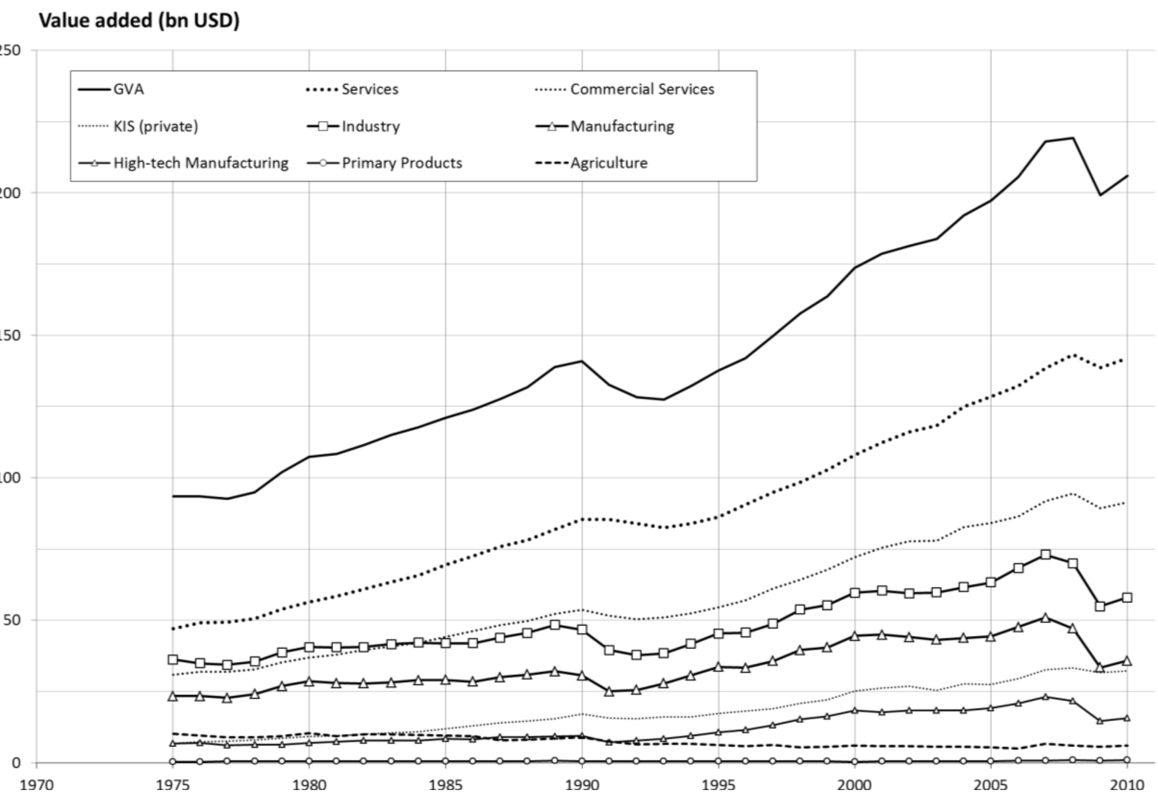
Sectoral productivity of Finland (Figure 5.20) has reached extreme heights for manufacturing, especially high-tech manufacturing, also in comparison to Austria and Belgium. The extreme notch in 2009 is most likely caused by lacking capacity utilization as a consequence of the 2008 crisis.

The service sector has not that much been influenced by the 2008 crisis, presumably due to its orientation towards the domestic markets, so the crisis could only have a minor effect resulting from reductions in export-oriented firms.



Source: Own graph, based on EU KLEMS (2012) data

Figure 5.20 Sectoral productivity in Finland



Source: Own graph, based on EU KLEMS (2012) data

Figure 5.21 Sectoral gross value added in Finland

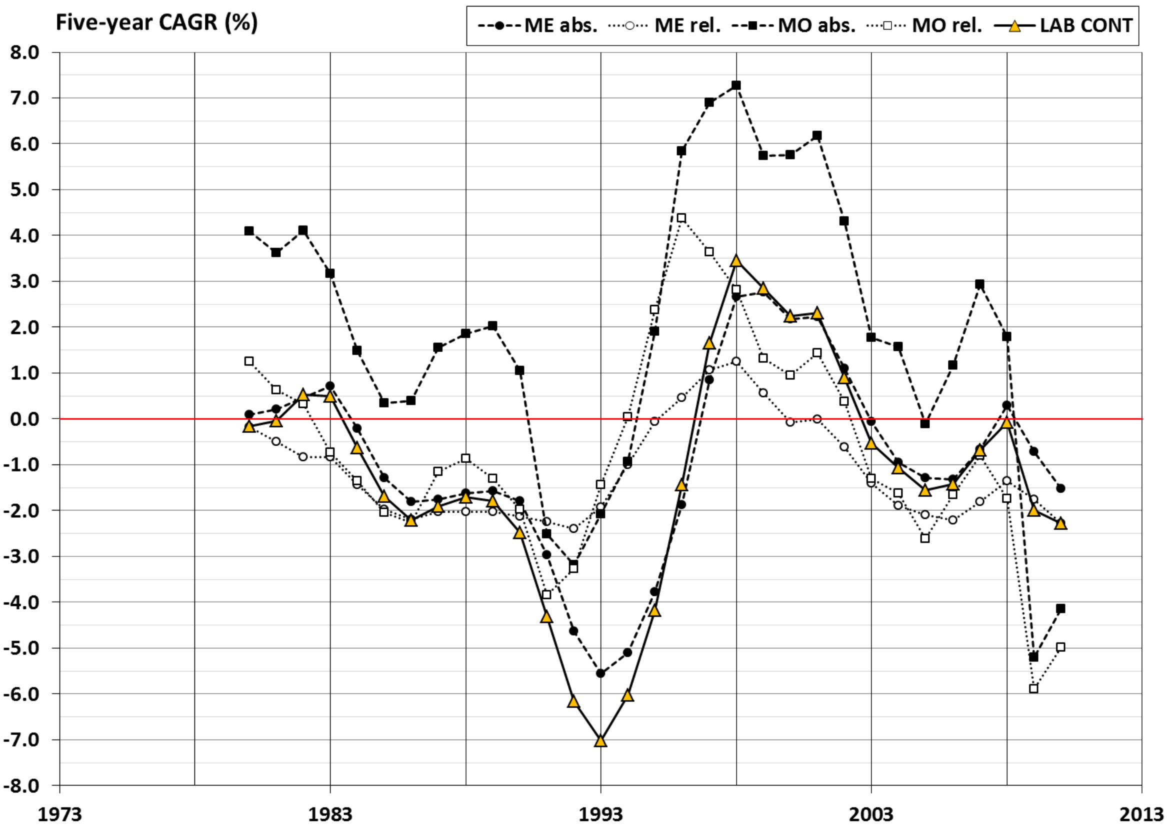
Output

The total value added has increased in all sectors apart from agriculture (Figure 5.21). The constant increase also included manufacturing and high-tech manufacturing output. Both suffered in the 1990s crisis and even more badly in the 2008 crisis which caused some serious temporal losses of welfare.

5.3.3.2 Economic scenarios

Key indicators

The key indicators presented in Figure 5.22 show the extremely high volatility of Finnish manufacturing. Years of great success, even of industrialization, took turns to years of deep recession and industrial decline. These extremes are owed to the small size of the Finnish economy and a certain dependency on cutting-edge technology. A pioneering position offers great chances for monopolistic profits if it is successful, but it also involves big commercial risks. The rise and fall of NOKIA's business is perceptible in the curves.



Source: Own graph, based on own calculations drawing from EU KLEMS (2012) data

Figure 5.22 Indicators of de-industrialization (Finland)

Table 5.20 Correlations of-industrialization indicators (FIN)

R^2 of 5y CAGR (%)	ME (abs.)	ME (rel.)	MO (abs.)	MO (rel.)	LAB CONT
ME (abs.)	100.0	33.2	49.9	13.3	97.5
ME (rel.)	33.2	100.0	64.4	75.3	39.5
MO (abs.)	49.9	64.4	100.0	78.1	61.6
MO (rel.)	13.3	75.3	78.1	100.0	22.0
LAB CONT	97.5	39.5	61.6	22.0	100.0

Source: Own calculation of coefficients of determination, based on EU KLEMS (2012) data

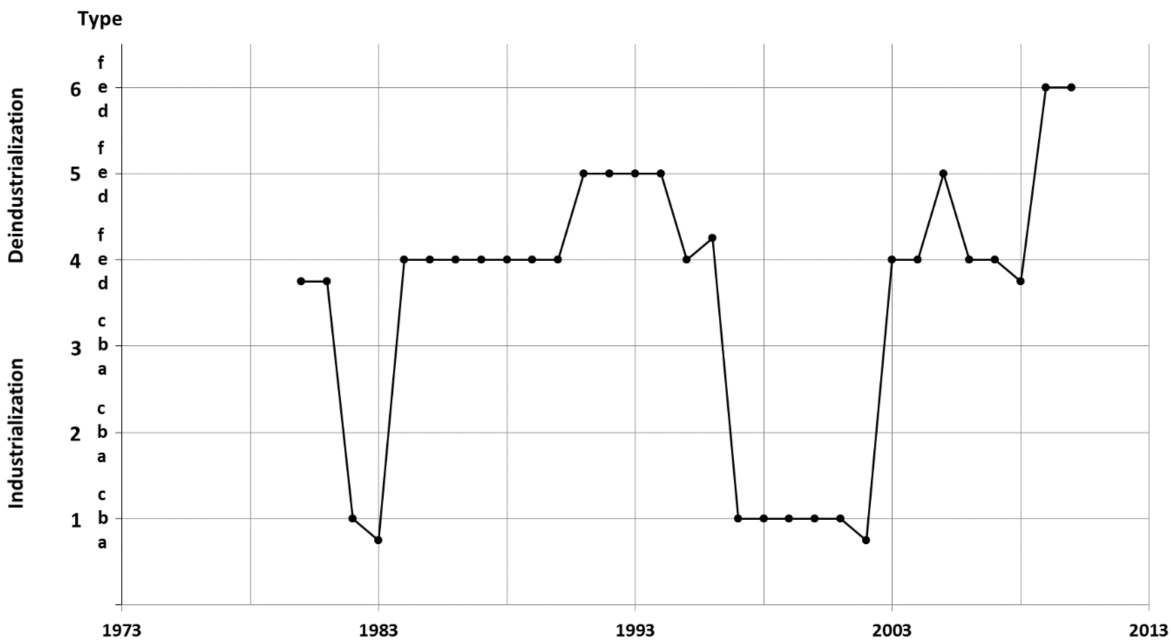
From these findings, it is concluded that:

- Finland de-industrialized very slowly in a sociological sense. The impact of manufacturing, especially of high-technology, on the Finnish society is still big.
- Finland's manufacturing output grew much faster than its population. Thus, the output per Finnish person has significantly grown (cf. Table 5.18, p. 149).
- The Finnish manufacturing sector has been aiming at latest technology, so very high productivity increases yielded. It was largely utilized for exports, but in recent years, the record high-tech export values of around millennium were reduced to less than a half.

Scenarios

Finland's development of the manufacturing sector is characterized by constant improvements in productivity, indicated by alternating 1b type industrialization during the boom years around millennium and 4e type de-industrialization. In the recession around 1990, Finland kept increasing its productivity despite of job losses (5e type).

The individual workload was decreased in normal times (prevailing e-type), while in boom phases, it was elevated (b-type). Thus, the individual workload was used as a buffer to avoid hire and fire policies. Also during the 2008/9 crisis, some more workforce than necessary seems to have been retained, indicated by productivity losses (6e type).



Source: Own graph, based on own calculations drawing from EU KLEMS (2012) data
Categories as illustrated in Figure 4.4, p. 101

Figure 5.23 Economic scenarios (Finland)

5.3.3.3 Application of the eclectic model of de-industrialization

The key data for applying the de-industrialization model is graphically displayed in Appendix 5 (Finland). In the very long term (1975-2008), the de-industrialization process in Finland had an ambivalent character, i.e. it was characterized by an increased income per capita and a better competitive position (export surplus), but significant increases in unemployment (Table 5.21).

Table 5.21 De-industrialization of Finland

Year	De-industriali-zation	Type	Technical maturity	Failure	Shift to		
					Hi-tech	KIBS	Primary products
73-08	yes	ambivalent	yes	no	yes	yes	no
73-88	yes	ambivalent	yes	no	yes	yes	no
73-78	yes	ambivalent	yes	no	no	yes	no
78-83	no						
83-88	yes	positive	yes	no	yes	yes	no
88-93	yes	ambivalent	ambiguous	ambiguous	no	yes	no
93-08	no						
93-98	no						
98-03	yes	positive	yes	no	yes	yes	no
03-08	yes	ambivalent	yes	no	yes	yes	no

Source: Own compilation, evaluation based on EU KLEMS (2012) and World Bank (2014a) data

Apart from growing unemployment, the rising share of high-technology sectors in manufacturing and a shift to KIBS are further ingredients of a process that, in the long run, could almost be characterized as a role model for felicitous de-industrialization. But this exemplar can be questioned when taking a closer look at medium-term developments.

All in all, the de-industrialization process was slow, but continuous. The decrease rate of -1.1 % is so close to the defined limit that in several sub-periods, this limit was not reached and (virtually) no de-industrialization was diagnosed (78-83, 93-98, 93-08).

The 1990s crisis years were characterized by negative growth rates in output, but still growing productivity. Unemployment rates were rising sharply. This ambivalent situation was thus characterised by improved international competitiveness (rising trade balance) in combination with rising unemployment. Failure was on the demand side, i.e. the final crisis of the Soviet Union and a temporal weakness also of Western markets. Capitalist Finland solved the problems 'the hard way', i.e. by accepting job losses, but not making compromises in terms of competitiveness. This drastic treatment paid off in subsequent years when Finland's economy went from record to record (Kiander & Virtanen, 2002).

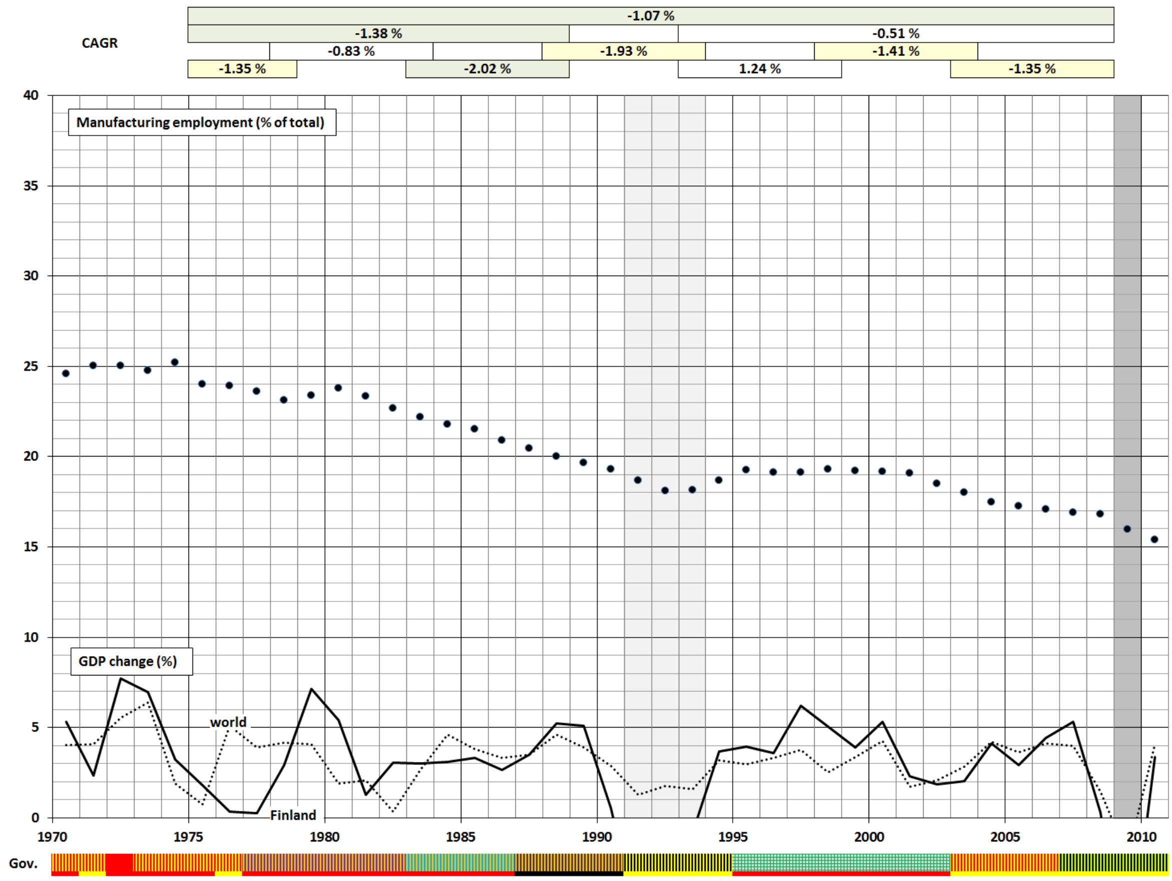
5.3.3.4 Economic and political explanations for structural changes

National trends and influences

Finland's system of political parties is quite confusing in the first place, though not as complicated as the Belgian one. There are three big parties: social democrats, liberals and conservatives (Figure 5.24).

The conservative party has only set the prime minister for a short four years period from the late 1980s. They were responsible for introducing the hazardous financial liberalization elements that made the Fins over-borrow on the basis of mortgage securities that melted like butter in the sun of the forthcoming crisis (Singleton, 1998). Once bitten, twice shy – the conservatives never returned to power.

The baton was just handed over from social democrats to liberals in all elections since 1991, and no government seriously tried to touch the welfare state, though some corrections were made (Kiander & Virtanen, 2002).



Source: Based on World Bank (2014a) data, own calculations and political information (gathered starting from Wikipedia, 2014b)

Figure 5.24 Economic and political development of Finland

Linkages to the world and regional economy

A correlation analysis between the world and the Finnish economic cycles shows that in recent years, the Finnish economy has been very much linked with Europe and also the world cycle (Table 5.25), also to the USA. The correlation with East Asia and Latin America is comparatively small, probably due to limited economic links like mutual trade.

Table 5.22 GDP (CAGR, %) coefficients of determination with Finland

R^2 (%)	World	Europe & Central Asia	USA	East Asia & Pacific	Latin America & Caribbean
1970-1990	14.5	24.6	1.3	10.6	15.8
1990-2010	74.2	79.8	54.9	8.9	19.3
1970-2010	46.7	61.3	21.7	13.5	16.3

Source: Own calculations, based on EUKLEMS (2012) and World Bank (2014a) data

Summarizing the findings, Finland as a small country found a unique way for being successful in a globalizing environment. It was very successful in the new economy, with its flagship company NOKIA, but on the other hand, it also became highly dependent on this success and thus vulnerable to changes in these markets.

5.3.4 France

After World War II, the political class in France realized that the country had to find a way to overcome its insufficient industrial structures. “Modernization or decadence” was the motto of Jean Monnet, one of the fathers of European unification. Under state auspices, a modern administration, renewed agricultural and industrial structures and a social security system were built up. This state-induced catch-up process was so successful that even in 1981, President Mitterand first tried to overcome the economic crisis by nationalising even more industries. He had to learn soon that this was not the way to change things for the better (Hesse, 2004).

From 1983, the relationship between the state and the industrial sector were step by step put on a new basis. Privatization, market liberalisation and in their course continuous rationalization efforts, e.g. in the steel, ship-building and automotive industries, have more and more replaced governmental programs to develop and control whole industrial sectors.

These policies, also supported by the European Union, until around 2003 changed the face of the French national economy (Hesse, 2004):

- Export surpluses testify international competitiveness.
- Shareholder value also matters for French enterprises.
- Services have become more and more important.

As the downside of these developments, social problems tightened. High unemployment rates, especially youth and long-term unemployment, segregated the French society which also suffers from poor integration of French with an ethnical background of former colonies in North and Central Africa (Vogel, 2005).

5.3.4.1 Structural shifts

Some key facts

With a density of 118.7/km², France is medium-densely populated. Its increase in population was quite high in the last decades (Table 5.23), especially for a European country.

Table 5.23 Overview on the macro-economic development of France

Year	Population	GDP p/c	Exports	Trade	Unemployment	Agriculture	Manufacturing (VA)		Fuel exp.	Services	KIBS
	mn	*k USD*	*% of GDP*	*% of GDP*	*% of active*	*% of empl.*	*% of empl.*	*bn USD*	*% of ME*	*% of empl.*	*% of empl.*
1973	53.2	22.9	17.6	0.8	2.0	10.9	24.1	243.0	2.1	54.5	9.5
1988	57.8	30.6	20.8	-0.8	10.1	6.2	18.0	282.3	2.1	67.3	13.9
1993	59.1	32.6	21.2	1.6	11.8	4.9	16.3	279.9	2.7	71.1	15.3
2008	64.4	40.4	26.9	-2.1	7.4	3.0	11.8	263.7	5.1	77.2	19.3
	CAGR (%)	*CAGR (%)*	*CAGR (%)*	*Δ 5 y*	*Δ 5 y*	*CAGR (%)*	*CAGR (%)*	*CAGR (%)*	*average*	*CAGR (%)*	*CAGR (%)*
73-88	0.5	1.9	1.1	-0.5	2.7	-3.7	-1.9	1.0	3.2	1.4	2.6
88-93	0.4	1.3	0.4	2.4	1.7	-4.6	-2.0	-0.2	2.4	1.1	2.0
93-08	0.6	1.5	1.6	-1.2	-1.5	-3.2	-2.1	-0.4	3.0	0.6	1.6
73-08	0.5	1.6	1.2	-0.4	0.8	-3.6	-2.0	0.2	3.0	1.0	2.1

Sources Based on World Bank (2014a) data, constant 2010 prices.

Having just caught up industrially, it started to de-industrialize in the 1970s at a relatively high pace. Since 1988, even its manufacturing output fell. Accordingly, the French trade balance which had been positive since 1992 returned to negative values since 2005.

With export rates below 30 %, France was not exposed very much to the world economy. Nonetheless, it suffered from the economic crisis after 2008 which led to recent welfare losses.

Volatility of change

The French results are listed in Table 5.24. The economic trends in all sectors including the downward trend in manufacturing were followed in a stable way, i.e. without big amplitudes. This is presumably due to the high state influence and the big size of the French economy.

Table 5.24 CAGR (%) volatility of de-industrialization indicators (France)

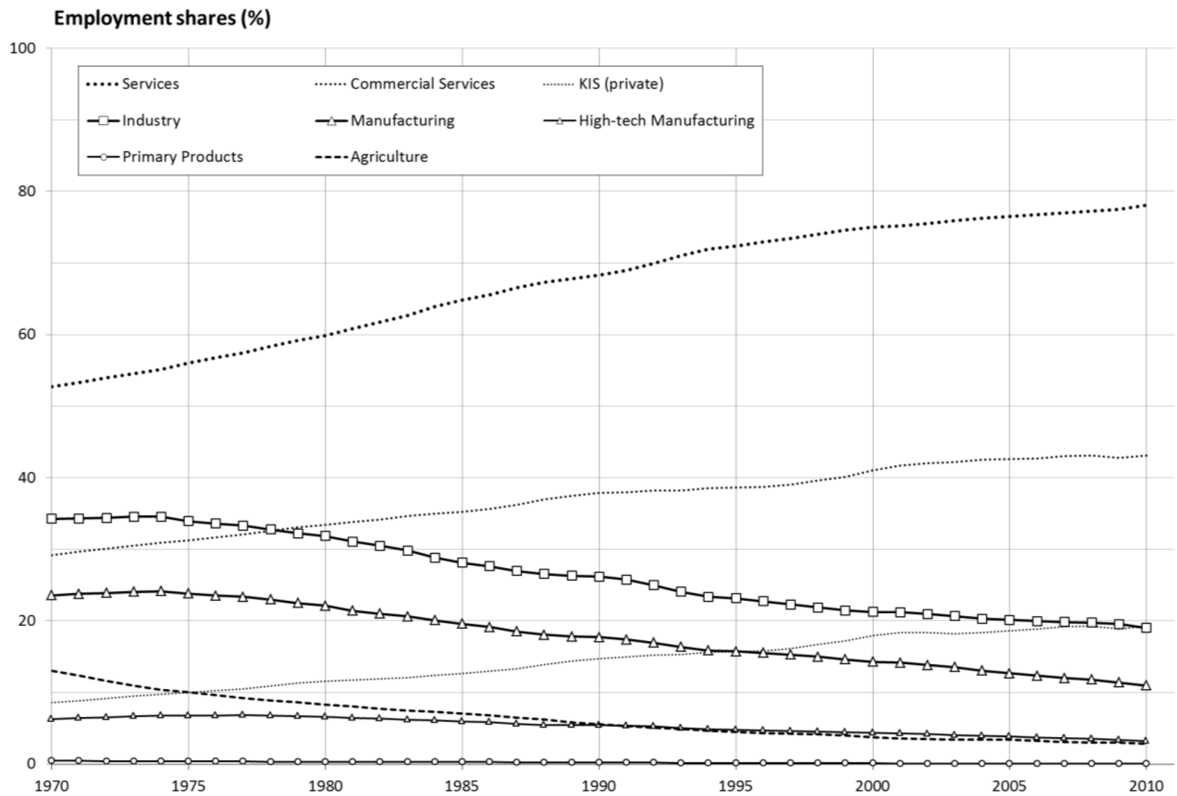
Years	υ_T	$\sigma_{1,T}$ manu. empl.	$\sigma_{2,T}$ unem-ployment	$\sigma_{3,T}$ trade balance	$\sigma_{4,T}$ GDP p/c	$\sigma_{5,T}$ manu. output	$\sigma_{6,T}$ primary prod. exp.	$\sigma_{7,T}$ agricult. empl.	$\sigma_{8,T}$ KIBS empl.
78-88	**5.16**	0.50	0.87	1.43	0.64	0.81	0.24	0.24	0.43
88-98	**5.91**	0.28	1.38	1.26	0.69	0.97	0.10	0.50	0.73
98-08	**6.86**	0.41	1.39	1.27	0.49	1.57	0.33	0.61	0.79
78-08	**8.12**	0.41	2.41	1.67	0.64	1.27	0.28	0.70	0.75

Source: Own calculation, evaluation based on (EU KLEMS, 2012) and World Bank (2014a) data

Sectoral changes

Employment

The French shift towards services has been carried out quite consequently (Figure 5.25). At the end, almost four out of five French were employed in services, with one out of five employed in KIBS. All lines are pretty smooth, so no abrupt policy changes are noticeable.



Source: Own graph, based on World Bank (2014a) and national employment data

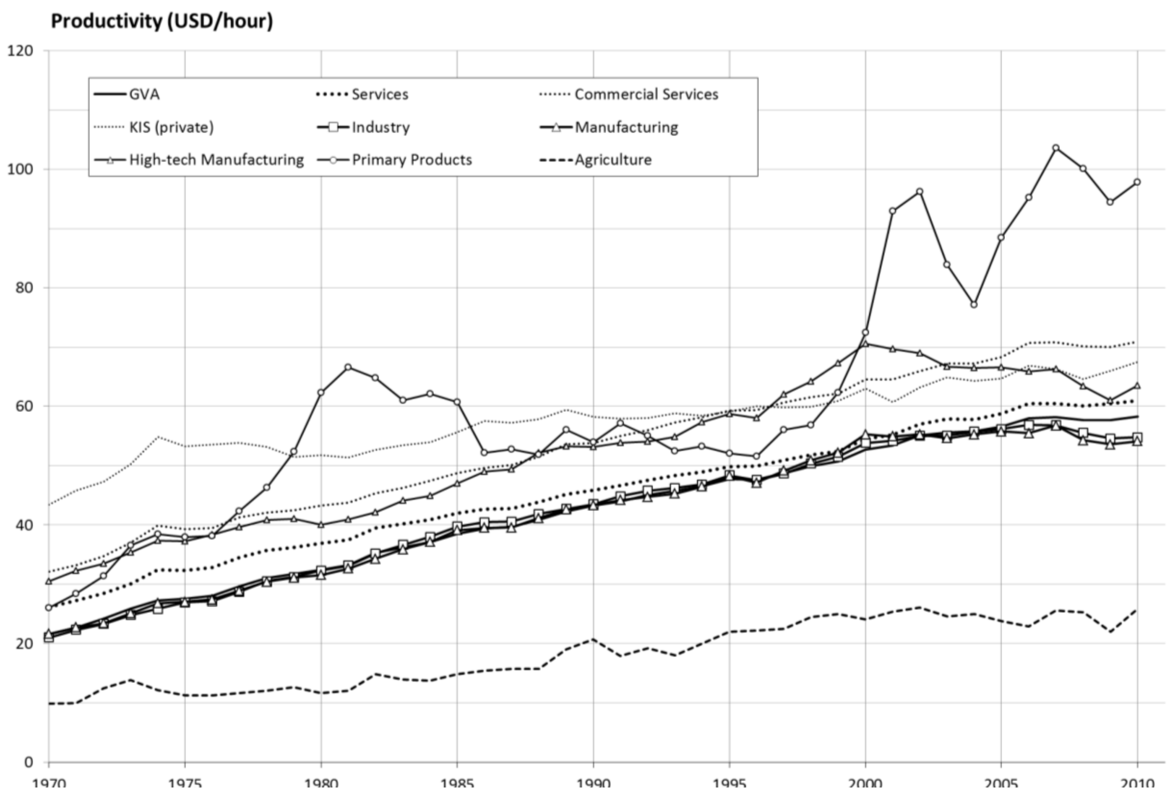
Figure 5.25 Structural change of France

The decline of manufacturing was constant, almost a straight downward line, with no actual signs of recovery. The share of high-tech manufacturing was relatively small in comparison to the countries discussed so far (3.5 % of employees in France e.g. compared to 6.1 % in Finland).

Productivity

When turning to the development of productivity over time (Figure 5.26), the following observations are made:

- Productivity of all sectors has continuously risen, with a slightly lowering gradient. In manufacturing, there have only been very small, virtually no, productivity rises since year 2000. A significant decline of the productivity of high-tech manufacturing was accounted.
- Agriculture has only a little less than half the productivity of the other sectors.
- The productivity of manufacturing was lower than in services, especially commercial services.
- Knowledge-intensive business services started with a far higher productivity than all other sectors in the 1970s but had lower increase rates and were outperformed by other commercial services.



Source: Own graph, based on EU KLEMS (2012) data

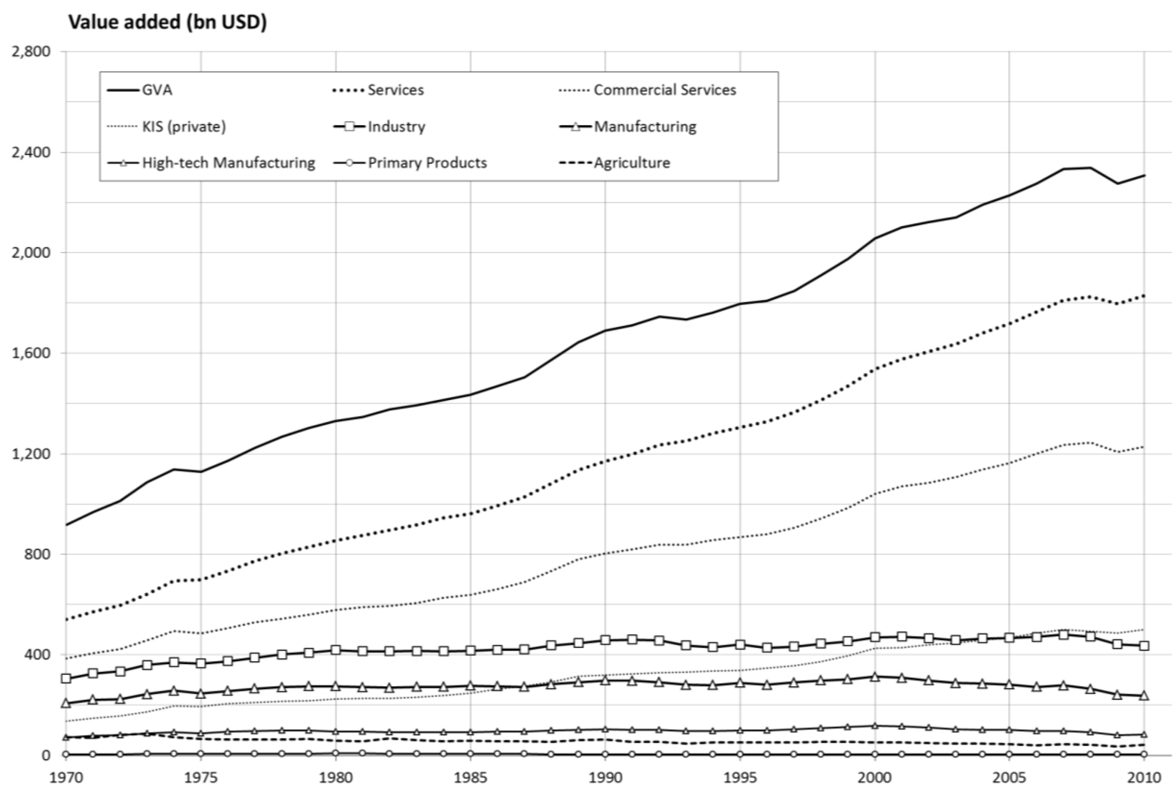
Figure 5.26 Sectoral productivity in France

Especially the last two observations are extraordinary. In other examined countries, labour productivity is generally higher in producing than in services. This indicates that the French manufacturing industry was not able to work as productively as their European competitors, which is a key to its quite rapid decline. Especially in the last decade, this picture manifested.

An explanation for the second irregularity might be that knowledge-intensive services like the ICT business are more exposed to international competition than other service sectors which are performing on a rather personal and domestic basis. More intense competition will lead to reduced price levels and – if this cannot be compensated on the cost side, e.g. by reducing personnel, – reduced productivity rises in the respective sector.

Output

The total value added (Figure 5.27) is mainly created by services which have increased over time while the other sectors have stagnated, even slightly decreased over time.



Source: Own graph, based on EU KLEMS (2012) data

Figure 5.27 Sectoral gross value added in France

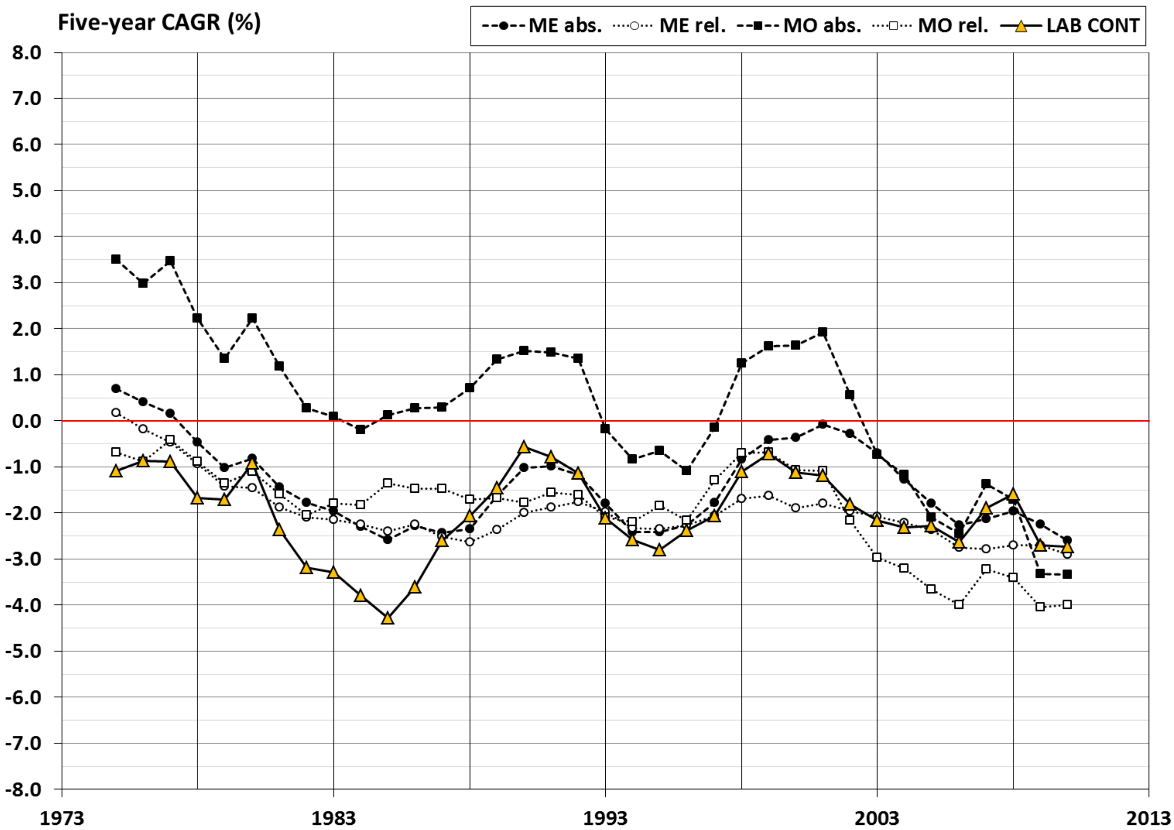
The contraction rate of manufacturing since 1988 is too low to speak of a true decline in absolute output within the given definition, but yet, a tendency becomes visible. Industry, and even more so the manufacturing sector, play a rather small and diminishing role in the French national economy.

The question arises whether these partly peculiar developments were in favour of the French society or whether this supposed 'modernization' was only a verbal camouflage of the erosion of the productive basis of the country.

5.3.4.2 Economic scenarios

Key indicators

When looking at the key growth rates concerning manufacturing (Figure 5.28), a common downward trend is noticeable. While at the beginning of the analysis, the French manufacturing sector still grew in terms of output and relative employment, the germinal of decline was traceable in the labour content which already fell.



Source: Own graph, based on own calculations drawing from EU KLEMS (2012) data

Figure 5.28 Indicators of de-industrialization (France)

Table 5.25 Correlations of de-industrialization indicators (France)

R^2 of 5y CAGR (%)	ME (abs.)	ME (rel.)	MO (abs.)	MO (rel.)	LAB CONT
ME (abs.)	100.0	72.9	58.3	31.1	56.7
ME (rel.)	72.9	100.0	68.1	48.4	29.6
MO (abs.)	58.3	68.1	100.0	83.6	34.0
MO (rel.)	31.1	48.4	83.6	100.0	14.6
LAB CONT	56.7	29.6	34.0	14.6	100.0

Source: Own calculation of coefficients of determination, based on EU KLEMS (2012) data

Most of the time, labour content fell much faster than absolute employment, meaning that the average individual workload was reduced. Only from 1984 to 1996, both curves were well in line, so the individual workload remained constant. This high discrepancy, unusual in international comparison, shows in a low coefficient of determination between both indicators (56.7 %, see Table 5.25), the lowest of the investigated sample. It is the result of workload reductions and finally the introduction of the 35-hours workweek under prime minister Lionel Jospin in 2000 (Gubian, Jugnot, Lerais, & Passeron, 2004).

Further to what has already been stated, the following is concluded from the chart and the correlation factors.

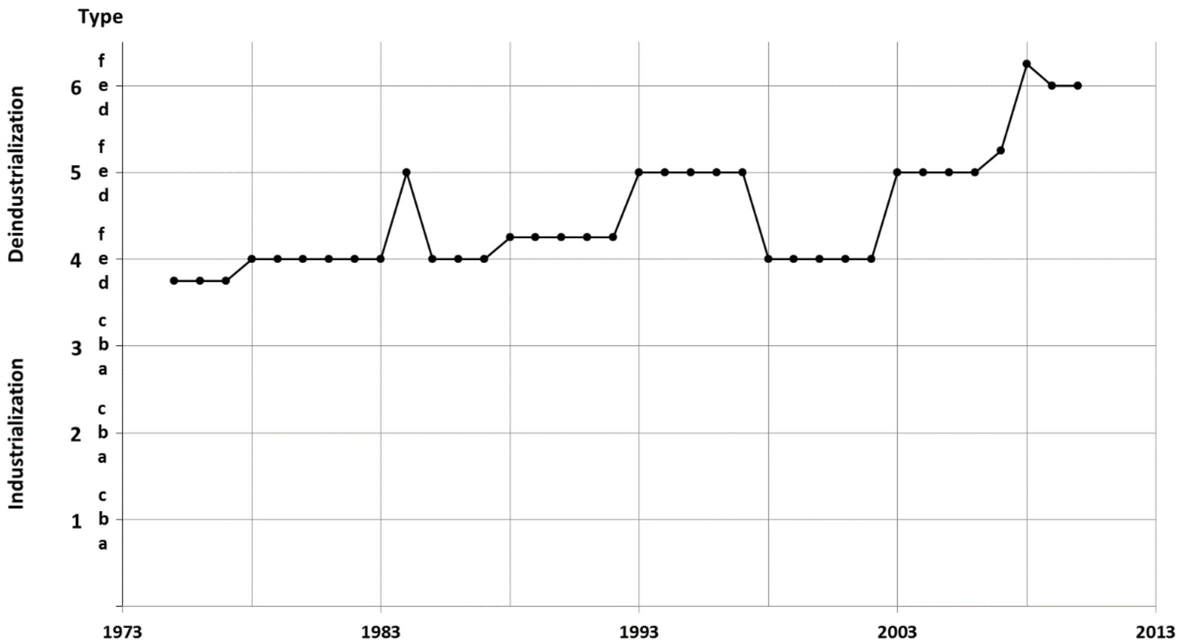
- **LAB CONT:** The total sectoral working hours constantly fell at comparatively high rates of decline.
- **ME (abs.)**: After reaching the tipping point in the 1970s, employment figures were in constant decline, although France tried to keep up the number of jobs by workload reductions (see above).
- **ME (rel.)**: Since other sectors of the economy grew in absolute terms while manufacturing shrank, the relative employment figures sank at an even higher velocity than the absolute figures. In a sociological sense, France de-industrialized rapidly.
- **MO (abs.)**: In the years until around millennium, France gained economic power in terms of output. After the introduction of the 35-hours week, the industry more and more lost its momentum. For the last ten years of the investigation, rapid de-industrialization also in terms of output is found.
- **MO (rel.)**: Already in times of rising absolute output, the contribution of manufacturing to the national economy declined due to fast-growing-services. In recent years, this trend intensified.

From these findings, it is concluded that:

- France de-industrialized fast in a sociological sense. The impact of manufacturing on the French society is dwindling.
- The French manufacturing output diminished while the population grew. Thus, the output per French person has become significantly reduced (cf. Table 5.23, p. 159).
- The French manufacturing sector has lost on its international competitiveness with regard to its productivity which suffered from the introduction of the 35-hour week. Also in terms of technology, France lost ground. High-tech manufacturing only played a minor and even decreasing role.

Scenarios

When turning to the scenarios, it becomes again clear that France has constantly de-industrialized. In the very first years, manufacturing even seemed to grow (4d scenario), though due to high increases in productivity, the labour content was already shrinking. Over the whole period until 2006, the individual workload became reduced without exceptions.



Source: Own graph, based on own calculations drawing from EU KLEMS (2012) data
Categories as illustrated in Figure 4.4, p. 101

Figure 5.29 Economic scenarios (France)

In the early 1990s boom years, the employment was reduced even faster than the total labour content, so the individual workload rose (f-type).

During the world economic crisis, i.e. 2008-2010, France lost some manufacturing productivity, probably because of keeping unutilized workforce in their positions for social reasons.

5.3.4.3 Application of the eclectic model of de-industrialization

The key data for applying the de-industrialization model is graphically displayed in Appendix 5 (France).

The analysis (Table 5.26) of de-industrialization gives a very heterogeneous picture. While over the whole period examined, de-industrialization even was of the ambivalent type, the detailed analysis shows that things changed for the worse even before the economic crisis of 2008. Especially in the last examined decade, culminating in the final five-year period (2003-08), the French manufacturing industry lost competitiveness, so even industrial failure is diagnosed. Additionally, there has been no determined shift to high-tech manufacturing.

Table 5.26 De-industrialization of France

Year	De-industriali-zation	Type	Technical maturity	Failure	Shift to		
					Hi-tech	KIBS	Primary products
73-08	yes	ambivalent	yes	no	no	yes	no
73-88	yes	ambivalent	yes	no	no	yes	no
73-78	no						
78-83	yes	ambivalent	yes	no	no	yes	no
83-88	yes	positive	yes	no	yes	yes	no
88-93	yes	ambivalent	yes	no	no	yes	no
93-08	yes	ambivalent	yes	no	no	yes	no
93-98	yes	positive	yes	no	yes	yes	no
98-03	yes	ambivalent	yes	no	no	yes	no
03-08	yes	ambivalent	no	yes	no	yes	no

Source: Own compilation, evaluation based on EU KLEMS (2012) and World Bank (2014a) data

An explanation could be that in France, manufacturing was considered to be a phase-out model, not requiring much emphasis any more. Such *laissez-faire*-policies have an effect in the long run. Loss in competitiveness can be compensated by currency devaluation – but what if this is not possible anymore? The Euro was introduced in 1999, and the old loophole henceforth was closed.

In addition, the 35-hour week seems to have been a major hindrance of the French industry. One very simple explanation could be the risen share of start-up time. No matter how long the daily working hours, the respective absolute start-up time stays the same. So the reduction from 39 to 35 hours could have easily meant an instant loss of productivity and also a signal for foreign capital to eschew the country. So under rising global competition, it was just the wrong signal at the wrong time – with still-lasting effects.

5.3.4.4 Economic and political explanations for structural changes

National trends and influences

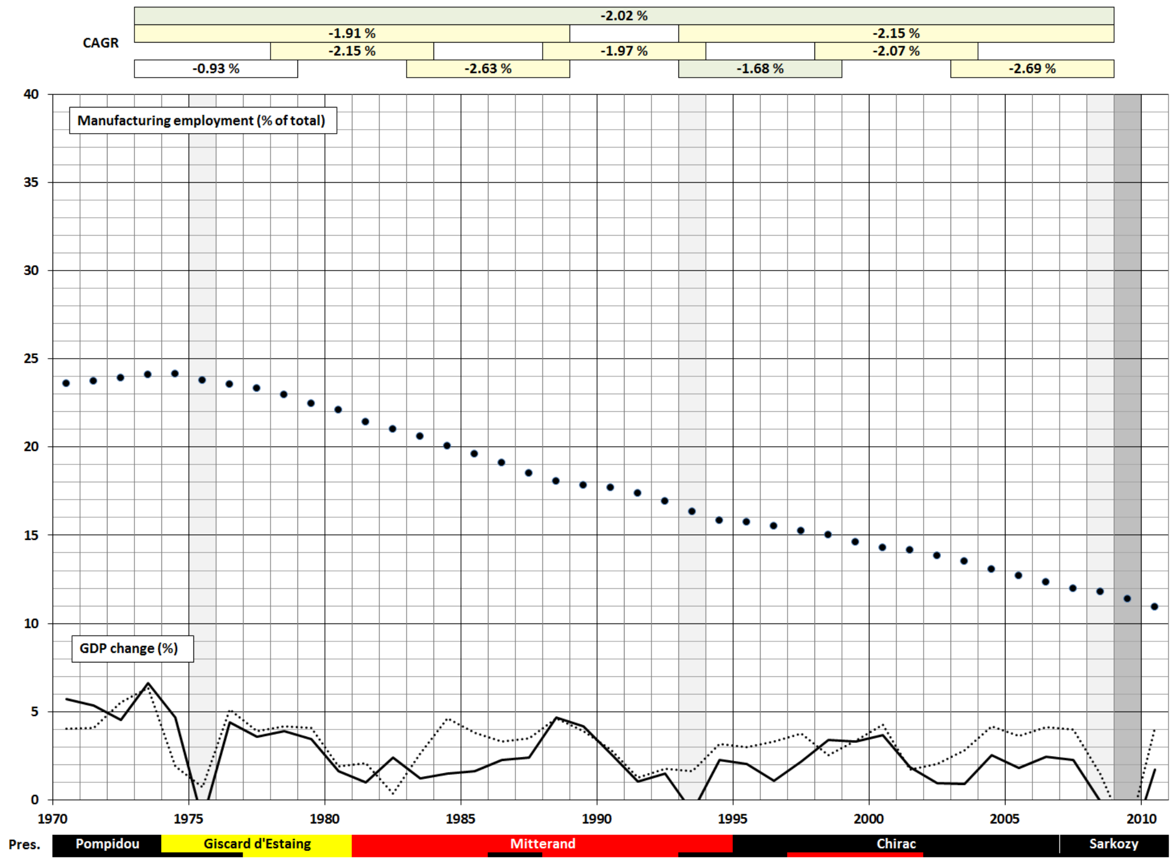
The French political culture is characterized by a unique combination of individual patterns of behaviour and deeper significations:

- Citizens have an ambivalent relationship towards the state, a crude mixture of blind trust and the constant need for insurgency. The state is responsible for solving all social problems, while being encountered with great suspicion.
- Mediating authorities like parties, unions and associations are rather weak, so the self-organizational ability of the society in order to solve problems is underdeveloped.
- A high plurality of opinion and a high readiness for conflict are traditional attributes of the French society, resulting from the old conflict line between Left and Right since 1789.
- Laicism *(laicité)* is a core value of the French republic.
- 'Nation' *(La Grande Nation)* is a frame to endow unity and identity.

According to the French constitution, the government is responsible for determining and guiding the politics of the nation. The practice is different: The president, directly elected by the people, determines the political guidelines, while the prime minister is the link between him and the parliamentary majority. Prime ministers are appointed and eventually discharged by the president, so they are dependent on his trust. Thus, the state executive is 'double-headed': The president is chairing the council of ministers, foreign and security policy are his domain, he influences European policies and he gets involved in everyday politics. While nearly all political actors rate this double executive as a deadlock of the political process, a large part of the French population see it rather positively (Vogel, 2005).

The impression can be gained that in France, fruitless controversy at the top somehow corresponds with irresponsible revolt at the bottom.

The French system only works out when the president, the prime minister and the parliamentary majority are from the same political camp. As Figure 5.30 shows, this has not always been the case. Due to differing election periods of five (parliament) versus seven years (president), from 1986, the socialist president François Mitterrand had to work for two years with a Gaullist government (under prime minister Chirac), a situation that also existed from 1993 to 1995. The longest cohabitation existed between (then) president Chirac and the socialist prime minister Lionel Jospin (1997-2002). Finally, the issue was solved by reducing the presidential election period to five years *(quinquennat)* (Vogel, 2005).



Source: Based on World Bank (2014a) data, own calculations and political information (République Française, 2014)

Figure 5.30 Economic and political development of France

French modernization policies since 1944 chiefly were catch-up industrialization policies. Industrial employment peaked in the early 1970s (see Table 5.4, p. 118). A good 1.5 million of industrial jobs have been lost since then due to several reasons:

- Traditional sectors like textile and leather industries, also iron and steel production, could not compete with low-cost countries.
- Productivity rises in machine building, electronic devices and automotive industries limited sectoral employment.
- Also in France, split value chains led to statistical artefacts, e.g. outsourcing of R&D, design, marketing and administrative activities to service suppliers was counted as a sectoral shift.

While until shortly after millennium, French companies like Peugeot-Citroën and Renault (automotive), the French-dominated EADS (European Aeronautic Defence and Space Company) and EDF (Electricité de France) created a picture of industrial world-class (Uterwedde, 2005), in recent years, the French problems have become more and more visible.

Around 2010, France was suffering from high unemployment, especially youth unemployment (higher than 25 %), lowering purchasing power and staggering consumption. As Rohr (2013) points out, the state influence in the French economy is still very high (57 % of the national income is created by government-controlled activities) and the social security system puts too much burden on enterprises and separates the spheres of tenure job owners from those of the unemployed. In combination with unassertive president and a discordant left government, France is in an economic gridlock.

Nationalist tendencies are gaining ground in elections, but also the president appeals to the glory of the nation. As Rohr (2013, p. 1) summarizes:

> France has an illustrious past, of which it is justifiably proud, but its historic success also prevents it from clearly recognizing the need for reforms. The omnipotent, bloated central government, which also controls the economy, should have been reformed long ago. The privileges of the Paris political elite are so outdated that they have become intolerable, and many bribery and corruption scandals are undermining an already fragile political legitimacy.

The data from the manufacturing sector, especially concerning productivity, is a fine indicator for the creeping transition into economic misery. Comparatively high social standards have made France increasingly unattractive for international investors. Moreover, high state influence might certainly be appropriate to administer catch-up processes, like more recent examples in East Asia have shown. These catch-up processes are based on existing technologies. High state influence is even more certainly inadequate to stay at the forefront of innovation. Innovative processes rely on the blossoming creativeness of the individual rather than on precast solutions, so they can hardly be enforced by direct administrative order (Daum, Greife, & Przywara, 2014).

Ironically, this is history repeating: Also the famous French predecessors following Colbert in the $17^{th}/18^{th}$ century lost their technological leadership. The fate of the elites in 1789 should be a warning sign for today's persons in power (c.f. section 2.1.1, p. 9).

Linkages to the world and regional economy

A correlation analysis between the world and the French economic cycles shows that the French economy is largely in line with the world cycles (Table 5.27). Moreover, despite of the French nationalist tendencies, the correlation of France's economy with the European is astoundingly high.

Table 5.27 GDP (CAGR, %) coefficients of determination with France

R^2 (%)	World	Europe & Central Asia	USA	East Asia & Pacific	Latin America & Caribbean
1970-1990	42.6	77.2	9.4	4.1	23.7
1990-2010	68.7	80.7	57.6	8.2	10.7
1970-2010	55.9	77.0	26.2	11.1	21.9

Source: Own calculations, based on EUKLEMS (2012) and World Bank (2014a) data

The French economy is very closely linked to the European economy. In fact, since also being the major trade partner of Germany, it is the very heart of it. If the French manufacturing sector is in trouble, the French economy is, too, and in its course Europe.

5.3.5 Germany

The Federal Republic of Germany is the most populated state of the European Community. After World War II, the victorious Allied powers formed two German states in 1949: the western Federal Republic of Germany (FRG) and the eastern German Democratic Republic (GDR). While West Germany over the years became embedded in key western organizations, e.g. EC and NATO, the communist GDR was a member of the Soviet-led Warsaw Pact (Kästle, 2014).

On the basis of the currency reform of 1948 and the US Marshall Plan, West Germany experienced a rapid economic upturn. In contrast to this "economic miracle", East Germany fell farther and farther behind economically. It even had to build a wall to prevent its people, especially its elites, from fleeing the country to the West. In the late 1980s, the decline of the USSR in combination with growing pressure by the GDR population culminating in a peaceful revolution, enabled Germany's re-unification in 1990. On the contractual basis of the Two Plus Four Agreement signed in Moscow on 12 September 1990, united Germany gained full sovereignty by ending the Allies´ territorial rights on 3 October 1990 (Schayan, 2009).

Even a good twenty years later, despite of vast transfers to the east, the alignment of living conditions is not fully accomplished (Kästle, 2014). Nevertheless, Chancellor Helmut Kohl’s picture of ‘flourishing landscapes’ (Kohl, 1990) in Eastern Germany has more and more become reality.

5.3.5.1 Structural shifts

Some key facts

In Table 5.28, the macro-economic developments of Germany are summarized. East and West Germany were simply summed up until 1990. With a population density of 234.6/km², Germany is densely populated.

Table 5.28 Overview on the macro-economic development of Germany

Year	Population	GDP p/c	Exports	Trade	Unemployment	Agriculture	Manufacturing (VA)		Fuel exp.	Services	KIBS
	mn	*k USD*	*% of GDP*	*% of GDP*	*% of active*	*% of empl.*	*% of empl.*	*bn USD*	*% of ME*	*% of empl.*	*% of empl.*
1973	78.9	21.1	16.7	-1.0	0.8	5.7	32.8	482.5	2.3	48.5	8.4
1988	78.1	29.0	22.9	-0.2	5.7	3.4	26.6	574.5	1.3	59.5	11.3
1993	81.2	32.4	22.0	0.2	7.8	2.5	23.0	542.5	1.3	63.8	13.0
2008	82.1	40.8	48.2	6.3	7.5	1.7	18.2	666.3	2.6	72.9	18.4
	CAGR (%)	*CAGR (%)*	*CAGR (%)*	*Δ 5 y*	*Δ 5 y*	*CAGR (%)*	*CAGR (%)*	*CAGR (%)*	*average*	*CAGR (%)*	*CAGR (%)*
73-88	-0.1	2.1	2.1	0.2	1.7	-3.3	-1.4	1.2	3.0	1.4	2.0
88-93	0.8	2.2	-0.8	0.4	2.1	-5.9	-2.9	-1.1	1.3	1.4	2.9
93-08	0.1	1.6	5.4	2.0	-0.1	-2.8	-1.5	1.4	1.6	0.9	2.3
73-08	0.1	1.9	3.1	1.0	1.0	-3.5	-1.7	0.9	2.2	1.2	2.3

Sources Based on World Bank (2014a) data, constant 2010 prices

Over the evaluated four decades, Germany has more and more turned into a service economy. Its growing economic success has increasingly been based on exports. Starting with a negative trade balance throughout the 1970s and 1980s, exports became of key importance since the German re-unification in 1990.

In the early 1990s, due to eastern markets falling out of business, de-industrialization was characterized by serious job losses especially in East Germany and even by a falling output. This negative trend could be reversed, and new all-time peak levels were reached in 2007. In 2008, already a slight decline caused by the world economic crisis became visible.

Volatility of change

The German results are listed in Table 5.29. The total volatility is higher than in France. This indicator of unrest can be attributed to the adjustment processes required by the German reunification, causing significant unemployment. Moreover, the trade balance changed a lot. Given the big challenge of the German society from 1990, the volatility values are relatively low. They indicate that the transition from industrial to service society, which was partly accompanied by a transition from socialism to western free market economy respectively capitalism, was managed well under the given circumstances.

Table 5.29 CAGR (%) volatility of de-industrialization indicators (Germany)

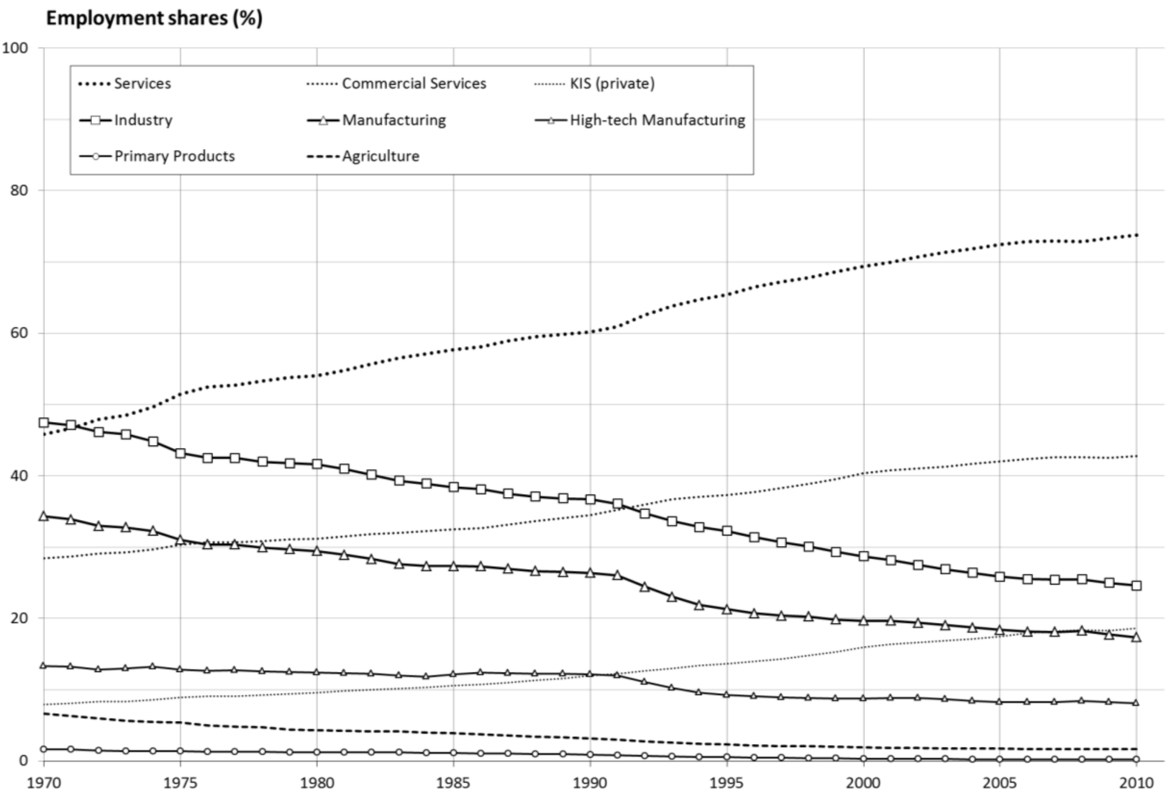
Years	υ_T	$\sigma_{1,T}$ manu. empl.	$\sigma_{2,T}$ unem-ployment	$\sigma_{3,T}$ trade balance	$\sigma_{4,T}$ GDP p/c	$\sigma_{5,T}$ manu. output	$\sigma_{6,T}$ primary prod. exp.	$\sigma_{7,T}$ agricult. empl.	$\sigma_{8,T}$ KIBS empl.
78-88	**7.71**	0.34	1.97	2.42	0.67	1.07	0.33	0.75	0.16
88-98	**8.75**	1.43	2.05	0.94	0.86	2.20	0.07	0.99	0.22
98-08	**6.43**	0.46	1.60	1.53	0.44	0.78	0.28	0.81	0.55
78-08	**9.60**	1.02	2.02	1.99	0.78	1.60	0.36	1.35	0.49

Source: Own calculation, evaluation based on (EU KLEMS, 2012) and World Bank (2014a) data

Sectoral changes

Employment

When taking a closer look at the structural change over time in Germany (Figure 5.31), it becomes clear that all services have constantly risen while all other sectors have permanently declined. The (negative) gradient of high-tech manufacturing employment is relatively low. In the years after re-unification, the pace of de-industrialization accelerated due to adaptation processes of the eastern part of Germany.



Source: Own graph, based on World Bank (2014a) and national employment data

Figure 5.31 Structural change of Germany

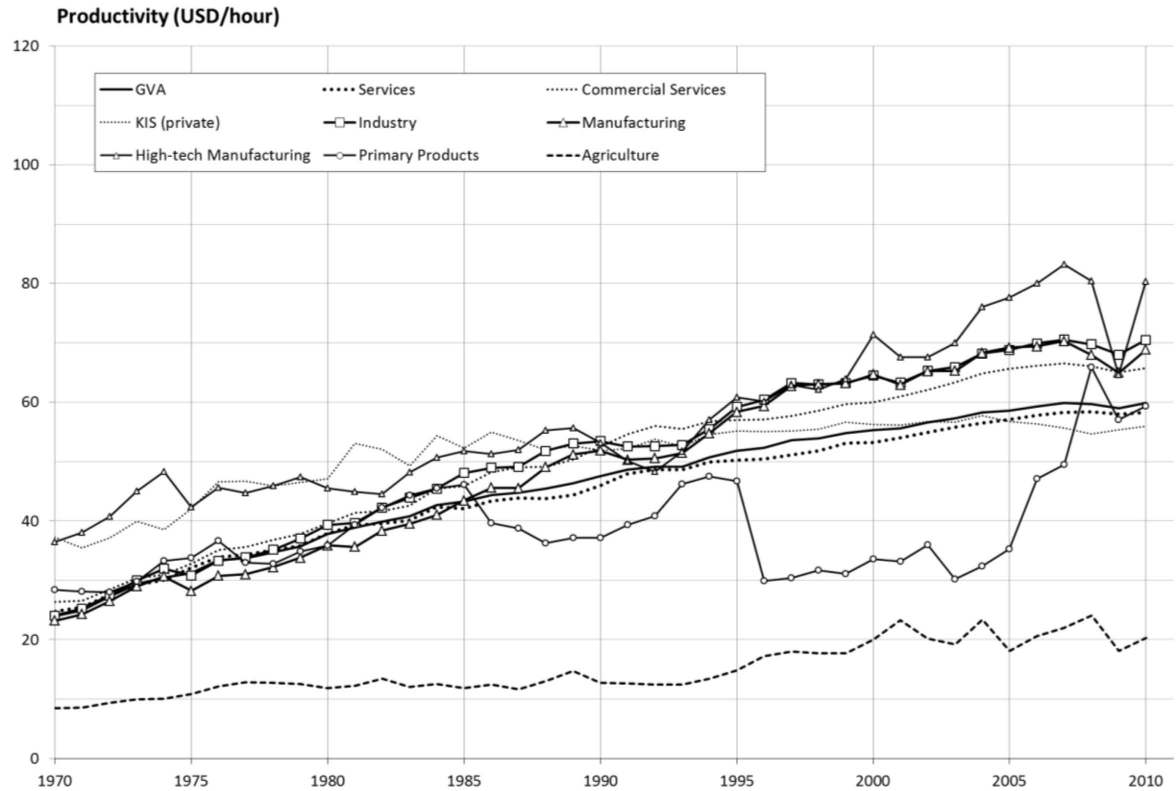
Productivity

The trends of sectoral productivity (Figure 5.32) are as follows:

- Constant growth of most sectors, slowly decreasing gradient.
- Germany's industry is a little more productive than its services.
- KIBS have been stagnating since 1995.
- High-tech manufacturing was by far most productive.
- Agriculture has a relatively low productivity compared to other sectors, but also to other countries (e.g. France).

The German economy is apparently more focussed on (and successful in) manufacturing than on KIBS.

The 2008 crisis hit the economy hard in 2009 but was overcome in 2010.



Source: Own graph, based on EU KLEMS (2012) data

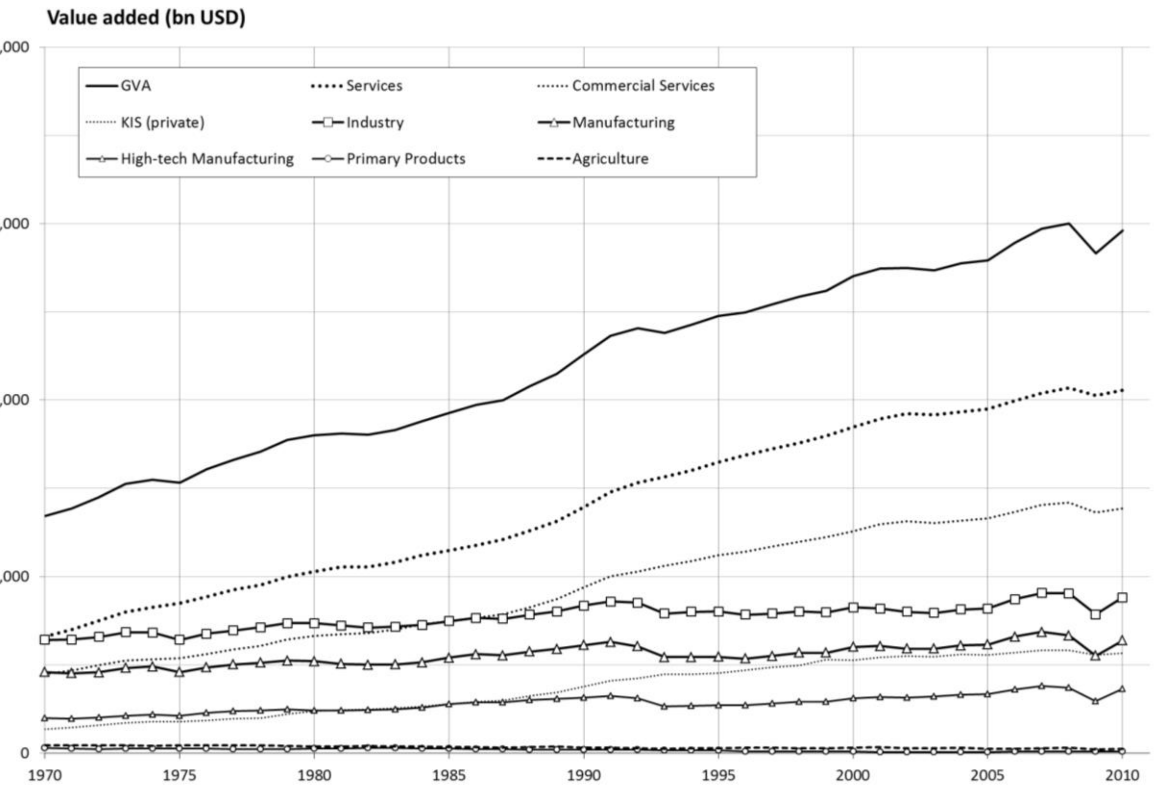
Figure 5.32 Sectoral productivity in Germany

Output

The resulting total value added of all sectors in Germany is shown in Figure 5.33. It becomes clear that agriculture and primary products are almost negligible quantities in the German economy. Services have grown constantly over time, with rising employment and productivity multiplying to a strongly growing contribution to the German national income.

Manufacturing output also developed positively over time. But it was facing a serious downturn after the re-unification in 1990 because of the collapse of the eastern markets of the former GDR. The analysis of Smyzer (1995, pp. 247-248) exactly hits the mark:

> The East German economy had been a powerhouse in East Europe, where Moscow had relied on it to produce machine tools, chemicals, and electronics. But it had grown increasingly inefficient, and its currency had become worthless outside its own borders. East Germans had felt frustrated at their lack of true material well-being, as well as their lack of freedom. They joined their economy enthusiastically with that of West Germany in 1990. The merger gave them a rude shock, however, in part because of the simultaneous collapse of East Germany's markets in the Soviet empire and in part because of the inefficiencies that the communist system had left behind.



Source: Own graph, based on EU KLEMS (2012) data

Figure 5.33 Sectoral gross value added in Germany

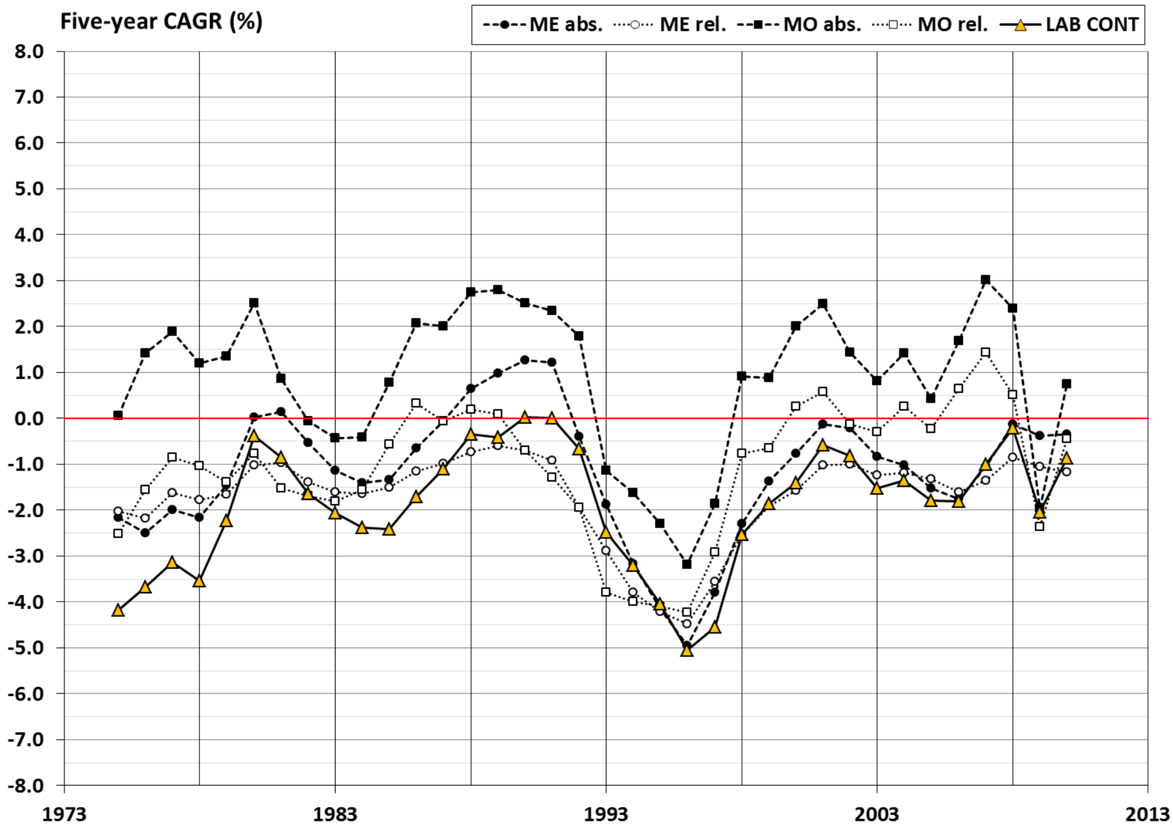
Whether this collapse had to be that hard and whether the re-unification was really a merger or an unfriendly takeover is part of a still ongoing debate. Transfer payments to the east were extraordinarily high: Between 1990 and 1995 some 400 billion € were paid. While East Germany was an extra market for highly productive West German firms and led to boom years there (Solsten, 1995), most of the East German industry was privatized and then often simply shut down instead of trying to preserve existing trade connections to East Europe for making business in the future. Mainly, this can be attributed to the fact that the East German former conglomerates were active in the same technological fields as the western companies (Solsten, 1995), so they were deactivated before they could have lived up to be threatening competition.

It is easier to kill them as long as they are weak – that might have been the idea behind many of the so-called ‘privatization’ activities.

5.3.5.2 Economic scenarios

Key indicators

When turning to the growth rates of employment and output (Figure 5.34), an overall stable trend with a deep notch in the 1990s becomes visible. The notch may safely be attributed to the adaptation processes in the course of German reunification that were already described in the previous section.



Source: Own graph, based on own calculations drawing from EU KLEMS (2012) data

Figure 5.34 Indicators of de-industrialization (Germany)

Apart from the 1990s recession, the output of the German manufacturing industry has not only been stable over time, it has constantly increased. Due to constant productivity growth especially in the high-tech sector, Germany could maintain its position in the world, and from 2000, the manufacturing sector could even defend its relative position in the German economy.

In the 1970s and 1980s, labour content sank significantly faster than absolute employment, so the individual workload became reduced. This process only stopped after 1992 when the curves were more in line, so the individual workload remained constant. Thus, the coefficient of determination between both indicators is pretty high, though not in the top range of the sample group (87.1 %, cf. Table 5.30). Relative employment followed the absolute figure and the labour content very much.

Table 5.30 Correlations of de-industrialization indicators (Germany)

R^2 of 5y CAGR (%)	ME (abs.)	ME (rel.)	MO (abs.)	MO (rel.)	LAB CONT
ME (abs.)	100.0	83.8	53.6	38.9	87.1
ME (rel.)	83.8	100.0	60.5	62.6	67.7
MO (abs.)	53.6	60.5	100.0	73.0	54.8
MO (rel.)	38.9	62.6	73.0	100.0	45.0
LAB CONT	87.1	67.7	54.8	45.0	100.0

Source: Own calculation of coefficients of determination, based on EU KLEMS (2012) data

The relatively high coefficient of determination between the CAGRs of labour and relative employment is due to the generally slow German transition process towards services. Though also the German society has undergone a significant structural change, the process has not been as radical as in other states. Thus, relative employment in the industry (especially in the manufacturing sector) is still comparatively high.

Further to what has already been stated, the following might be concluded from the chart and the correlation factors.

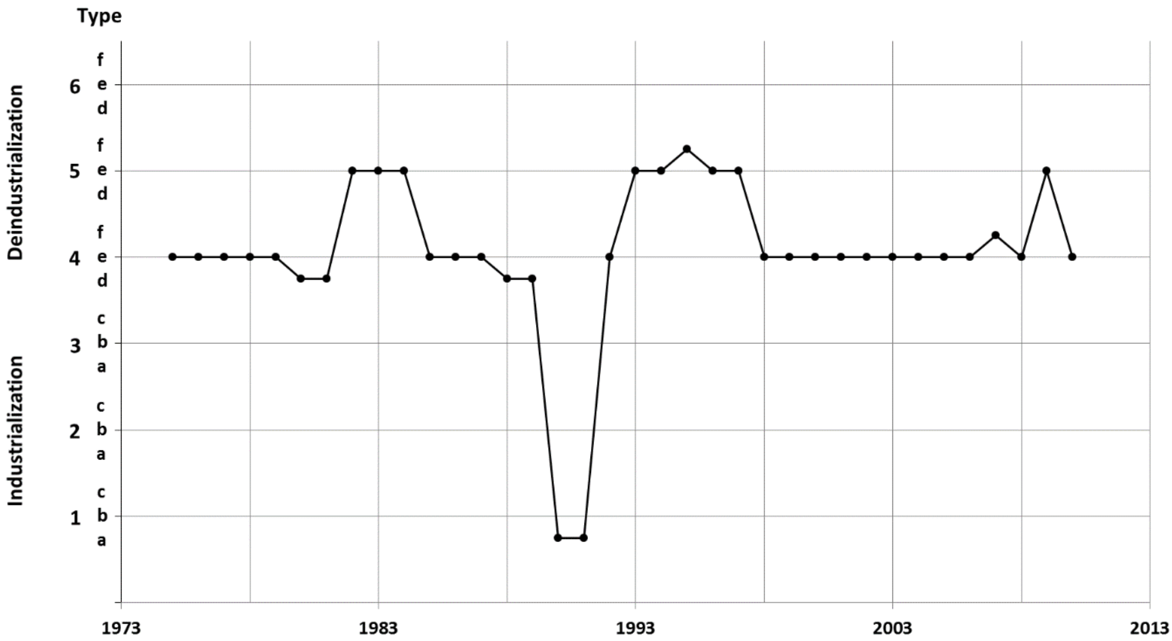
- **LAB CONT:** The total sectoral working hours constantly fell at generally moderate rates of decline, apart from the 1990s notch.
- **ME (abs.)**: Apart from a few exceptional years, employment figures were in constant, but very moderate decline.
- **ME (rel.)**: In a sociological sense, Germany de-industrialized at a modest speed.
- **MO (abs.)**: The German industry managed to continue to play a leading role in the world, with continuous growth rates, high productivity and increasing output especially in high-tech fields.
- **MO (rel.)**: Due to the high global success of German technology, the contribution of German manufacturing to the German national economy remained unaltered.

From these findings, it is concluded that:

- Germany de-industrialized slowly in a sociological sense. Since the industry grew in output and celebrated its export success, the manufacturing industry is still a lead sector for the German society and economy.
- The German manufacturing output grew significantly, while the population grew hardly at all. Thus, the output per German person has increased (cf. Table 5.28, p. 171).
- The German manufacturing sector has kept its international position on the basis of productivity rises and latest technology. High-tech manufacturing has played an ever-increasing role.

Scenarios

Most of the time, the German manufacturing sector has been on a remarkably stable '4e' course characterized by productivity and output rises with labour content reductions that were distributed on reductions in employment and individual workload. Only some years were crisis years with sinking output. These crises were counteracted 'the hard way', i.e. by continued productivity rises and reduced labour content. These measures proved to be successful, since each time, the German economy was put back on its old track.



Source: Own graph, based on own calculations drawing from EU KLEMS (2012) data
Categories as illustrated in Figure 4.4, p. 101

Figure 5.35 Economic scenarios (Germany)

Rising workload (f-type) was only encountered in very few years. In 1995, it was used to increase the sectoral productivity, in 2007, it was the mere outflow of an economic boom.

All in all, Germany seems to have found a good balance of increased economic tension on the one hand while retaining or even improving the working conditions in the manufacturing industry.

5.3.5.3 Application of the eclectic model of de-industrialization

The key data for applying the de-industrialization model is graphically displayed in Appendix 5 (Germany).

In Table 5.31, the results from applying the de-industrialization model on Germany are given. For the total period under investigation as well as for the fifteen years from 1993, de-industrialization has taken place. It was of the ambivalent type: National wealth rose significantly and international competitiveness was strengthened, but unemployment increased greatly.

Table 5.31 De-industrialization of Germany

Year	De-industri-alization	Type	Technical maturity	Failure	Shift to		
					Hi-tech	KIBS	Primary products
73-08	yes	ambivalent	yes	no	yes	yes	no
73-88	yes	ambivalent	yes	no	yes	yes	no
73-78	yes	positive	yes	no	yes	yes	no
78-83	yes	ambivalent	yes	no	yes	yes	no
83-88	no						
88-93	yes	ambivalent	ambiguous	ambiguous	no	yes	no
93-08	yes	positive	yes	no	yes	yes	no
93-98	yes	ambivalent	yes	no	yes	yes	no
98-03	yes	positive	yes	no	yes	yes	no
03-08	no						

Source: Own compilation, evaluation based on EU KLEMS (2012) and World Bank (2014a) data

This notwithstanding, by looking at half-decades, a far more differentiated picture is rendered. A very big influence is given by the unifications process of both German states. Parts of the East German industry were not viable after 1990, so some market failure resulted; the diagnosis is ‘ambiguous’, just like for technical maturity. Moreover, the continuous shift to high-tech made a stopover.

In the years after, these difficulties could be overcome and the development, due to only stagnating or even decreasing unemployment, was overall positive. Especially in economic boom phases when Germany was economically very successful, it did not de-industrialize at all, i.e. employment reduction rates were below 1 %.

The indicators of the model proved to be successful in capturing the specific German developments. The political context of these developments will be analysed in the following.

5.3.5.4 Economic and political explanations for structural changes

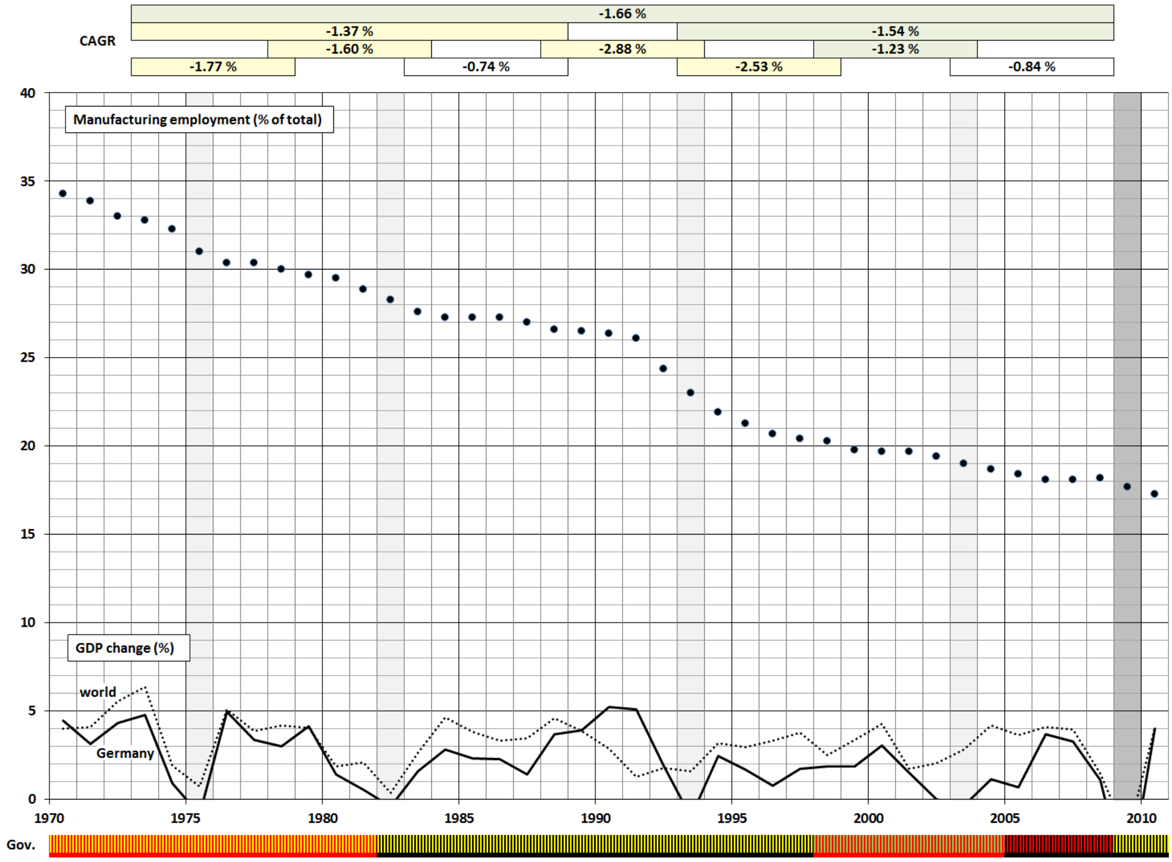
National trends and influences

After two decades of conservative chancellorship, a social democrat became chancellor for the first time in October 1969: Willy Brandt lead a social-liberal government which implemented a number of domestic reforms like expanding the social welfare system and improvements of education. Brandt laid the foundations for a new peace architecture, formalized by a series of treaties with East Europe. In 1973, the Federal Republic and the GDR agreed to establish "normal neighbourly relations". Both became members of the United Nations (Schayan, 2009).

Brandt's successor Helmut Schmidt had to struggle with the oil crisis and a fierce terrorist gang. The Red Army Faction (RAF) tried to destabilize the government, economy and society with attacks and kidnappings. In 1977, the worst part of it was overcome with the suicide of the leading terrorists in prison.

Yet, the world economy and even more the German national economy were in a crisis at the beginning of the 1980s (Solsten, 1995). The liberal party under their foreign minister Genscher swiftly changed political sides and henceforth formed a coalition with the conservative party under Helmut Kohl, the man that later managed the German re-unification and stayed in power until 1998.

In the 1990s, Germany was struggling with the economic consequences of unification and the necessary reconstruction of its eastern part. A special solidarity tax has been levied since (Schayan, 2009). Before reunification, West Germany had created a system of high wages and high social benefits, a system that was expected to be carried over to the former east. These social burdens had put the national economy at the risk of, due to too high price levels, losing out against the increasingly intense global competition of the 1990s and beyond (Solsten, 1995). Facing unprecedented unemployment rates and the threats of global competition, Federal Chancellor Gerhard Schröder as the head of a coalition of social democrats and greens implemented reforms of the welfare system and formed a more flexible employment market in 2003. He acted courageously against his clientele, i.e. the trade unions and a serious number of his party members (Astheimer, et al., 2013).



Sources: Based on World Bank (2014a) data, own calculations and political information (Deutsche Welle, 2011)

Figure 5.36 Economic and political development of Germany

Although the effect of certain elements of Schröder's 'Agenda 2010' were strongly disputed and even are today, it might well be assumed that they significantly contributed to turning Germany from Europe´s 'sick man' into its 'economic draught horse' over the following ten years (Astheimer, et al., 2013). In this course, the German economy became more and more export-oriented (Halevi & Kriesler, 2004).

The recent policies of the governing German political parties very much reflect the society's constant strive for consensus. The achievements of the political opponent in foreign (e.g. eastern policies under Helmut Kohl) as well in domestic policies (e.g. social system) are rather slightly modified than radically reformed. The current chancellor Angela Merkel is renowned for the ‘social democratization’ of the conservative party (Euchner, 2010).

Economically, the German power balance between the political camps is visible in employee participation in company management (something almost unthinkable in the UK) (Smyzer, 1995). This participation has led unions to act more responsible. Their policies are generally more oriented towards long-term welfare than short-term benefits for the employees. In return, employers do not practice hire-and-fire policies but try to retain their highly qualified personnel even in an economic crisis like in 2009 which, despite of serious shortfalls in terms of output (Figure 5.33), did not result in higher unemployment and cuts in manufacturing personnel (Figure 5.31).

When regarding the economic cycles and the government of certain parties, it is concluded that political changes very often were the consequences of economic downturns. Only Chancellor Schmidt politically survived an economic crisis, presumably because of his success in fighting terrorism and because the oil crisis just did not hit Germany near enough to elections. So also in Germany, as campaign strategist James Carville coined it for then-candidate Bill Clinton, “it’s the economy, stupid” (Galoozis, 2014).

Linkages to the world and regional economy

A correlation analysis between the world and the German economic cycles shows that the German economy was very much in line with the European and the world cycles in the first investigated double-decade (Table 5.32). The correlation values are much lower in the second period. The values are much lower than e.g. for France.

Table 5.32 GDP (CAGR, %) coefficients of determination with Germany

R^2 (%)	World	Europe & Central Asia	USA	East Asia & Pacific	Latin America & Caribbean
1970-1990	67.6	69.5	39.6	22.9	10.5
1990-2010	39.7	44.3	11.2	32.7	18.8
1970-2010	57.0	59.7	27.3	30.7	20.7

Source: Own calculations, based on EUKLEMS (2012) and World Bank (2014a) data

A reasonable explanation for this unusual behaviour is the special course that Germany underwent after re-unification. To integrate an economy with approximately a fifth of the population and also productivity was a giant task which naturally changed the growth path of the whole national economy.

Germany’s high export rate involving much trade to China is testified by the comparably high correlation with the East Asian development. It is by far the highest correlation of all investigated western countries in the sample group.

5.3.6 Italy

Italy did not industrialize largely before the 1950s, very late in comparison to other European nations. Today, industry provides a strong contribution to the national income. Manufacturing is mainly centred in the North around Milan and Turin, focusing on machinery, iron and steel, chemicals; motor vehicles, clothing and footwear, and ceramics. Many of Italy's important industries are (at least partly) state-owned, but in recent years, the trend has been towards privatization.

Although Italy has some mineral resources, produces petroleum (especially in Sicily), and possesses resources in natural gas and hydroelectricity, Italy is still greatly dependent on oil imports.

Especially in Italy's south, a substantial part of the economy functions outside government control. Criminal organizations (e.g. Mafia, Camorra) continue to exert a strong influence in Southern Italy, hindering the region to fully integrate into the national economy (Columbia University Press, 2012a).

5.3.6.1 Structural shifts

Some key facts

Italy has about three quarters of the German population, so it is a major player in the EU. With a population density of 201.5/km², Italy is quite densely populated. While in about the first half of the analysed period, the income per capita grew sizeably, growth rates were only very modest in the last two decades.

Concerning the development of exports and trade, the Italian development was in parallel to the French. Export rates have constantly increased, the trade balanced turned from negative to positive, but in recent years, it moved back to negative values.

Table 5.33 Overview on the macro-economic development of Italy

Year	Popu-lation	GDP p/c	Exports	Trade	Unem-ployment	Agri-culture	Manufacturing (VA)		Fuel exp.	Services	KIBS
	mn	*k USD*	*% of GDP*	*% of GDP*	*% of active*	*% of empl.*	*% of empl.*	*bn USD*	*% of ME*	*% of empl.*	*% of empl.*
1973	54.8	19.0	16.8	-1.9	6.3	17.7	27.3	261.4	5.7	44.2	4.9
1988	56.6	28.3	18.3	0.1	9.7	8.4	23.9	350.2	1.9	59.3	9.7
1993	56.8	30.2	21.3	3.2	9.7	6.5	22.5	322.7	2.2	62.5	11.2
2008	59.8	35.7	28.5	-0.8	6.7	3.9	19.3	339.2	4.6	67.7	16.0
	CAGR (%)	*CAGR (%)*	*CAGR (%)*	*Δ 5 y*	*Δ 5 y*	*CAGR (%)*	*CAGR (%)*	*CAGR (%)*	*average*	*CAGR (%)*	*CAGR (%)*
73-88	0.2	2.7	0.6	0.7	1.1	-4.8	-0.9	2.0	5.2	2.0	4.6
88-93	0.1	1.3	3.0	3.1	0.0	-5.1	-1.2	-1.6	2.1	1.1	2.9
93-08	0.3	1.1	2.0	-1.3	-1.0	-3.3	-1.0	0.3	2.2	0.5	2.4
73-08	0.3	1.8	1.5	0.2	0.1	-4.2	-1.0	0.7	3.6	1.2	3.4

Sources Based on World Bank (2014a) data, constant 2010 prices

Volatility of change

The Italian results listed in Table 5.34. The volatility values for Italy are a little higher than in Germany or France, but much lower than for example in Finland.

Table 5.34 CAGR (%) volatility of de-industrialization indicators (Italy)

Years	υ_T	$\sigma_{1,T}$ manu. empl.	$\sigma_{2,T}$ unem-ployment	$\sigma_{3,T}$ trade balance	$\sigma_{4,T}$ GDP p/c	$\sigma_{5,T}$ manu. output	$\sigma_{6,T}$ primary prod. exp.	$\sigma_{7,T}$ agricult. empl.	$\sigma_{8,T}$ KIBS empl.
78-88	**9.94**	1.19	0.72	2.63	0.67	2.07	0.44	0.77	1.44
88-98	**7.96**	0.39	1.17	1.99	0.85	1.27	0.22	0.73	1.34
98-08	**6.76**	0.33	1.36	0.99	0.65	0.87	0.48	1.05	1.02
78-08	**10.89**	0.76	1.76	2.54	0.93	1.61	0.59	1.11	1.59

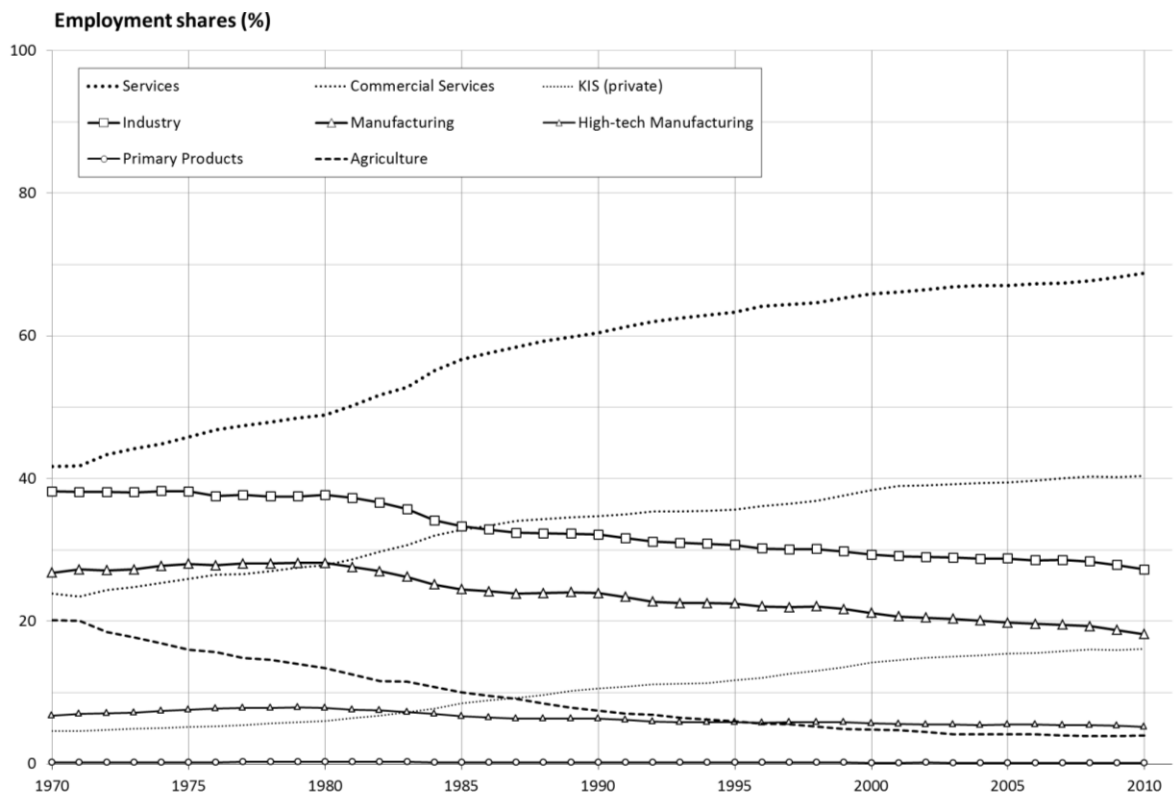
Source: Own calculation, evaluation based on (EU KLEMS, 2012) and World Bank (2014a) data

Sectoral changes

Employment

Agriculture has more and more lost its importance in the labour market, while manufacturing employment only decreased at very modest constant rates. The trend towards a service economy is visible, but not as pronounced as for example in France (Figure 5.37).

The downturn of manufacturing employment only started around 1980 with some five years of massive change towards services. Afterwards, sectoral change occurred rather smoothly and constantly.



Source: Own graph, based on World Bank (2014a) and national employment data

Figure 5.37 Structural change of Italy

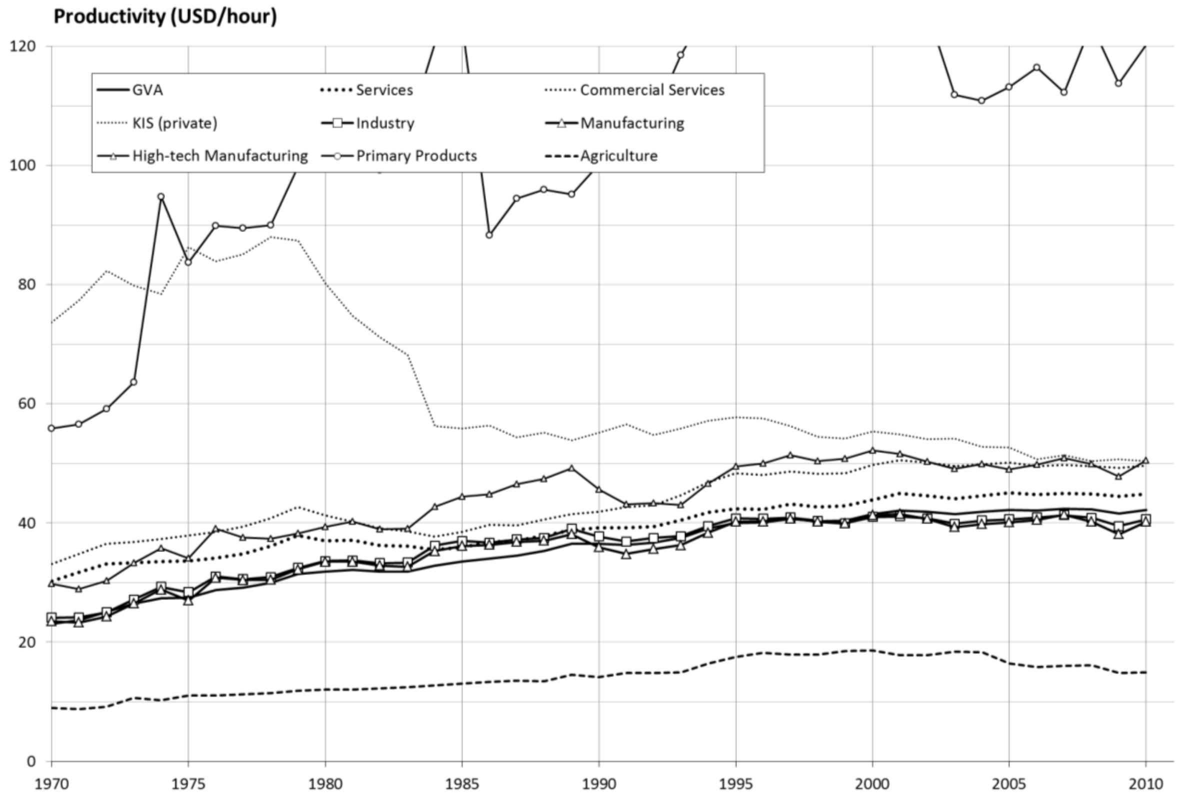
Productivity

When turning to productivity (Figure 5.38), the sectoral development of primary products plays a special role. Since there are certain resources and industry in Italy unlike in all other states analysed so far, a short comment will be given here.

Productivity in the primary products sector is generally high because of the high capital demands e.g. for oil and natural gas exploration and production. The income is highly volatile because it depends on the movements of international markets (e.g. concerning the crude oil price) which tend to show high amplitudes.

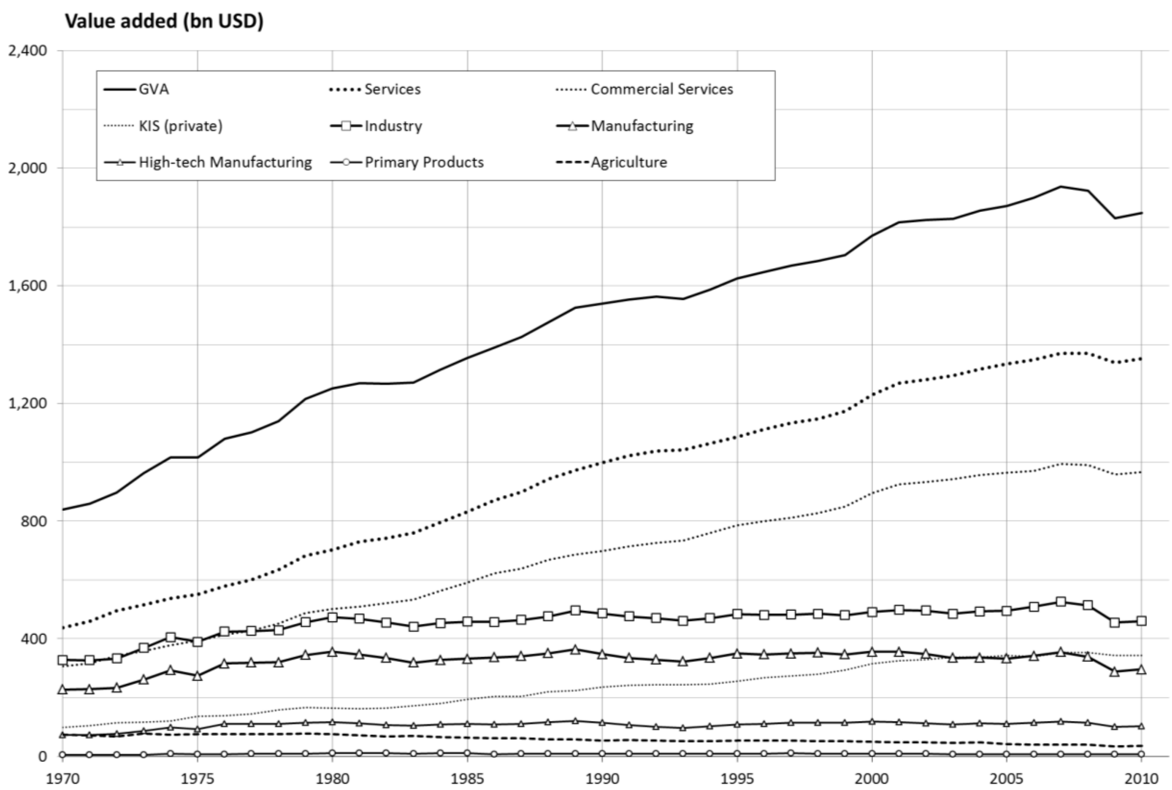
Agriculture is much less productive than all other sectors and has even lost in productivity during the last decade. This decade was characterized by stagnation in all other sectors which had recorded constant increases in the years before. High-tech industries were more productive than services, while manufacturing in general was not.

KIBS play a very special role. Italy had enormous productivity in the 1970s and early 1980s, resulting from pioneering profits of then-leading ICT companies like Olivetti. Meanwhile, sectoral productivity has phased into the normal range of commercial services.



Source: Own graph, based on EU KLEMS (2012) data

Figure 5.38 Sectoral productivity in Italy



Source: Own graph, based on EU KLEMS (2012) data

Figure 5.39 Sectoral gross value added in Italy

Output

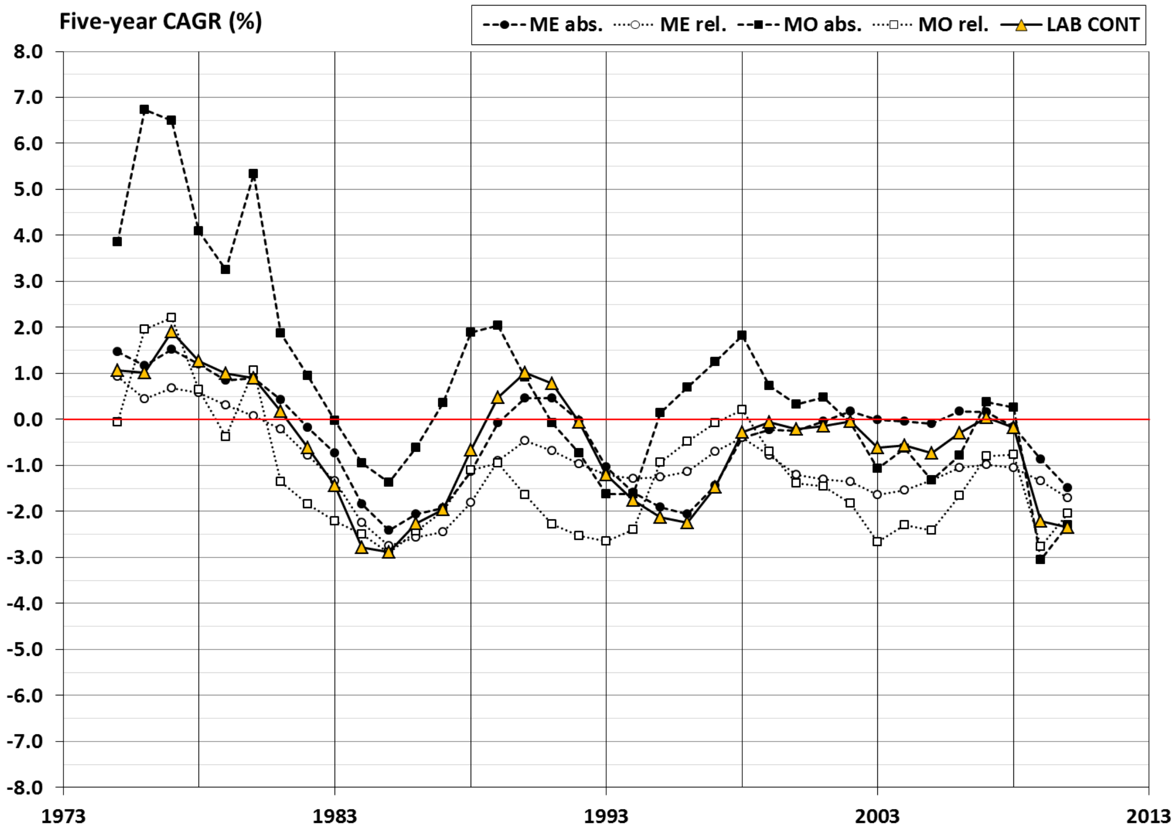
The total value added resulting from labour input and productivity is shown in Figure 5.39. While all service sectors were able to enhance their contribution until the 2008 crisis, the agricultural output fell constantly.

Industry and manufacturing increased until around 1980 and since then stagnated. A small shift towards high-tech manufacturing is visible.

5.3.6.2 Economic scenarios

Key indicators

When turning to the growth rates of employment and output (Figure 5.34), an overall stable slight downward trend becomes visible. This declining trend is not as steep as for example the French.



Source: Own graph, based on own calculations drawing from EU KLEMS (2012) data

Figure 5.40 Indicators of de-industrialization (Italy)

In the first investigated decade, Italy managed to create very high rises in manufacturing output. The Italian economic performance as a whole was very fine. Since 1983, the manufacturing output remained roughly stable; the small ups and downs evened up. Since the economy grew as a whole, the manufacturing sector lost in relative importance.

The labour content was followed by manufacturing employment, with only slight workload reductions in recessions and increases in boom years. The comparably high coefficient of 90.2 % (Table 5.35) between the two indicators demonstrates these findings.

After 1980, relative employment was more and more reduced, but at very modest rates which were kept only slightly below zero.

Table 5.35 Correlations of de-industrialization indicators (Italy)

R^2 of 5y CAGR (%)	ME (abs.)	ME (rel.)	MO (abs.)	MO (rel.)	LAB CONT
ME (abs.)	100.0	69.5	42.1	29.9	90.2
ME (rel.)	69.5	100.0	60.3	59.2	68.3
MO (abs.)	42.1	60.3	100.0	84.5	52.5
MO (rel.)	29.9	59.2	84.5	100.0	38.3
LAB CONT	90.2	68.3	52.5	38.3	100.0

Source: Own calculation of coefficients of determination, based on EU KLEMS (2012) data

Further to what has already been stated, the following might be concluded from the chart and the correlation factors.

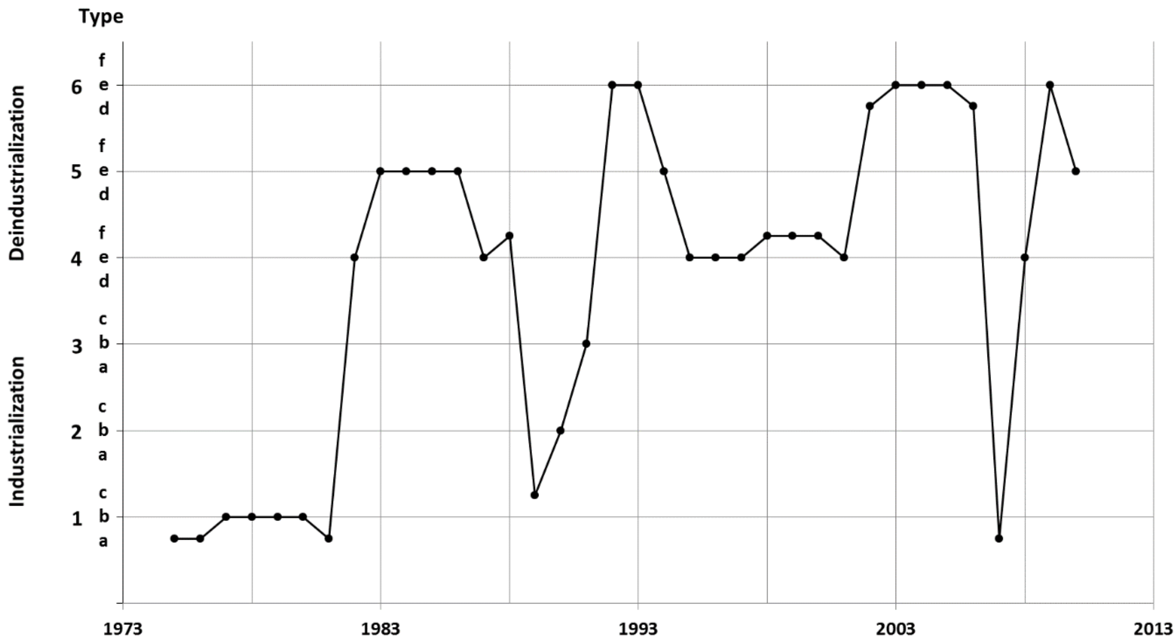
- **LAB CONT:** Most of the time, the total sectoral working hours fell at very moderate rates of decline; in the 1990s boom phase, the total working hours involved even rose.
- **ME (abs.)**: From 2003, employment figures were stabilized despite of reductions in labour content and falling output. This probably caused sectoral productivity stagnation.
- **ME (rel.)**: In a sociological sense, Italy de-industrialized at a very low rate.
- **MO (abs.)**: Italy managed to stabilize its total output and achieve significant high-tech shares on the basis of high productivity. In recent years, this position was endangered by stagnating productivity in all fields of manufacture.
- **MO (rel.)**: As aforementioned, the relative importance of manufacturing for the Italian economy somewhat declined.

From these findings, it is concluded that:

- Italy de-industrialized very slowly in a sociological sense. Since Italy is not so dependent on trade as e.g. Belgium or Germany, the manufacturing industry as a driver of exports is not as much in the focus of the Italian society and economy, although there is a big discrepancy between the industrialized North and the less developed South of the country.
- The Italian manufacturing output grew a little, while the population grew a little less. Thus, the output per Italian person has slightly increased (cf. Table 5.33, p. 184).
- The Italian manufacturing sector strengthened its international position on the basis of productivity rises and latest technology until around millennium. In recent years, this trend could not be followed and more; productivity became stagnant.

Scenarios

The course of the Italian economy shows a very heterogeneous picture at first glance (Figure 5.41). Starting with several years of industrialization (type 1), it went into a very ambitious de-industrialization mode with employment reductions the exceeded those of the labour content (5e type). From 1990 until 1993, the Italian economy continuously lost in productivity but returned to a healthier path in the mid-1990s.



Source: Own graph, based on own calculations drawing from EU KLEMS (2012) data
Categories as illustrated in Figure 4.4, p. 101

Figure 5.41 Economic scenarios (Italy)

From 2002, it went again into a mode where it lost productivity (type 6); yet, in 2002 and 2006, even additional workers were hired – probably in the course of state-supported employment programs. In 2007, the patience on the labour market seemed to have paid off, Italy went even back for a short intercourse in industrialization – until the world recession took its toll.

The economic turbulences do not show too much, so they were not that grave in international comparison. The long-term downward tendency in manufacturing was pursued in a quite stable mode.

5.3.6.3 Application of the eclectic model of de-industrialization

The key data for applying the de-industrialization model is graphically displayed in Appendix 5 (Italy).

When looking at the eclectic model of de-industrialization applied on Italy (Table 5.36), the discontinuous characteristic of the de-industrialization process in the last decades is illustrated. Tipping as late as 1980 (cf. section 5.2.2.2, p. 114), with a total CAGR of only -0.98 %, there is even no de-industrialization diagnosed, when regarding the full period 1973-2008.

Similarly, in the first fifteen years and the semi-decades from 1973 and 1993, employment reduction in manufacturing did not strike the -1 % hurdle.

Table 5.36 De-industrialization of Italy

Year	De-industriali-zation	Type	Technical maturity	Failure	Shift to		
					Hi-tech	KIBS	Primary products
73-08	no						
73-88	no						
73-78	no						
78-83	yes	ambivalent	yes	no	no	yes	no
83-88	yes	ambivalent	yes	no	yes	yes	no
88-93	yes	positive	no	yes	no	yes	no
93-08	yes	ambivalent	ambiguous	no	yes	yes	no
93-98	no						
98-03	yes	ambivalent	no	yes	no	yes	no
03-08	yes	ambivalent	ambiguous	no	yes	yes	no

Source: Own compilation, evaluation based on EU KLEMS (2012) and World Bank (2014a) data

A very strange situation was given between 1988 and 1993. Manufacturing declined in terms of output and employment, even more so high-tech manufacturing. Nonetheless, the trade balance improved significantly, the five years change in unemployment was neutral and the GDP per capita rose, so the type of de-industrialization was diagnosed as positive, despite of the clearly negative sectoral developments.

At least a good part of this result in manufacturing can be attributed to the automotive company FIAT. After a record year 1988, FIAT was in a serious crisis already in 1993, caused by increased competition. This situation was ignited by the main competitor FORD that, on a low-price policy, bought shares in FIAT's traditionally dominated Italian home market and was followed fast by Japanese competition (Camuffo & Volpato, 1994).

In the last ten years, the trade balance worsened and there were hardly any rises in national income. The manufacturing sector struggled hard and improved its situation before the 2008 crisis hit the Italian economy hard.

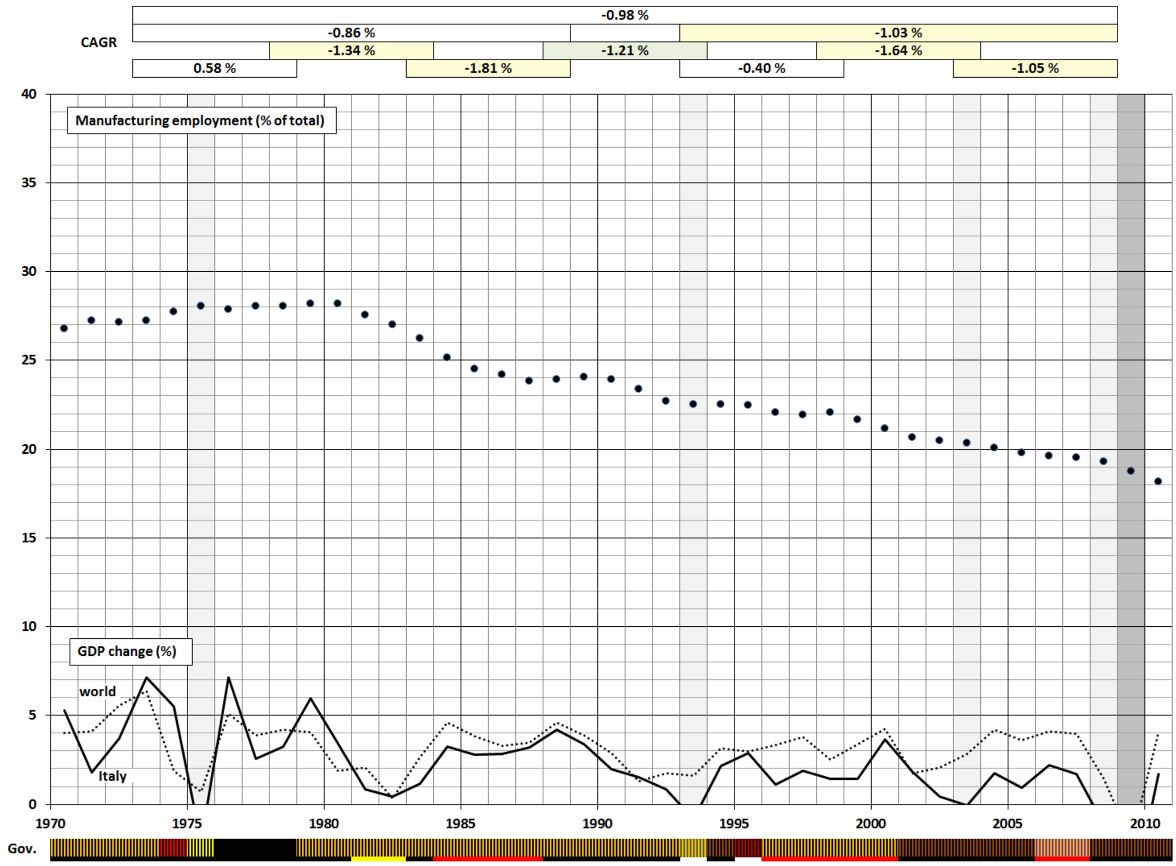
5.3.6.4 Economic and political explanations for structural changes

National trends and influences

Italian politics are renowned for their little continuity concerning the government. But, just like in Belgium which also appears to be quite confusing at first sight, a certain continuity can be spotted when not looking at the various coalitions and parties, but at the prime ministers and their political imprint. The situation is illustrated in Figure 5.42.

The coalitions of the 1970s and early were headed by Christian Democrats who even cooperated with the communist party around 1980, but none of these coalitions lasted very long. The country's situation was rather chaotic and, like in Germany, a left-wing terror group ('Red Brigade') tried to destabilize the country, culminating in the murder of premier Moro in 1978.

In 1983, the first socialist-led coalition ever governed the country for four years in a row (an extraordinarily long span under Italian circumstances). Then again, Christian Democrats took over. After the 1992 elections, a political earthquake was caused by corruption investigations headed by the socialist premier Giuliano Amato. In its aftermath, several party leaders and formers premiers were arrested and the Christian Democratic Party had to change names to finally become the United Christian Democratic party.



Sources: Based on World Bank (2014a) data, own calculations and political information (Bayerische Landeszentrale für politische Bildung, 2007)

Figure 5.42 Economic and political development of Italy

In 1994, the billionaire industrialist Silvio Berlusconi won the elections with his newly-formed conservative party Forza Italia. Though his right-wing coalition did not last long and was replaced by rather technocratic centre-left governments, his political star was ready to rise again in the post-millennium decade. Despite of various law suits and scandals, Berlusconi remained in power from 2001, with a short centre-left intermezzo 1996-98. (Columbia University Press, 2012b).

It is interesting to see that neither the political parties seem to have influenced the Italian economy very much, nor have economical ups or downs had a traceable influence on political change. Despite of the political scandals and (partly almost obscene) links between the spheres of big business and politics, the economy has developed quite independently, a fact that can be attributed to the large number of small and medium-sized companies that drive especially the Northern-Italian economy (Columbia University Press, 2012a). Yet it has to be stated that especially after millennium, the Italian performance was significantly worse than the world average.

Linkages to the world and regional economy

A correlation analysis between the world and the Italian economic cycles confirms the aforementioned. It shows that, despite of the partly chaotic political circumstances, Italy's economy is largely in line with the world and even more the European cycles. Italy was also very active in Latin America which is demonstrated by a comparatively high correlation in the 1970s and 1980s. Yet, this link seems to have weakened in recent years.

Table 5.37 GDP (CAGR, %) coefficients of determination with Italy

R^2 (%)	World	Europe & Central Asia	USA	East Asia & Pacific	Latin America & Caribbean
1970-1990	46.9	70.1	16.2	1.9	32.3
1990-2010	70.2	76.7	46.2	23.8	16.4
1970-2010	58.0	71.8	28.1	15.4	28.0

Source: Own calculations, based on EUKLEMS (2012) and World Bank (2014a) data

By more than 70 %, the Italian developments can be explained by their European surrounding. This is due to the close trade relations with the European Union, especially with Germany and France (Columbia University Press, 2012a).

5.3.7 Netherlands

During the 17th century, on the basis of private business initiative, the Netherlands became a leading seafaring and commercial power with settlements and colonies around the world (Expatica, 2012). Until today, this tradition is traceable in the Dutch liberal social policies, maritime trading traditions, battles to hold back the sea, robust multiculturalism and leading technological communications. They make the Netherlands a country with high rankings for life satisfaction and work-life balance (Expatica, 2014).

After German occupation in World War II, the Netherlands recovered rapidly and are now one of the wealthiest countries in the world. As a founding member of NATO in 1949 and the EEC (now the EU) in 1957 and also as a participant in the introduction of the Euro and a member of the Schengen Area without border controls, the Netherlands have been a driving force towards a prosperous and open European community (Expatica, 2012).

5.3.7.1 Structural shifts

Some key facts

With a population density of 492.6/km² (2010), the Low Countries are the most densely populated country in Europe. The Dutch wealth (as national income per capita) has doubled in the last forty years. Following the country's tradition, trade is the basis of national wealth. The trade balance is clearly positive and the export rate is very high.

Although the Netherlands are on the leading edge in their transition towards a service economy and have more than halved their manufacturing employment, their manufacturing output has constantly risen (Table 5.38).

Table 5.38 Overview on the macro-economic development of the Netherlands

Year	Population	GDP p/c	Exports	Trade	Unemployment	Agriculture	Manufacturing (VA)		Fuel exp.	Services	KIBS
	mn	*k USD*	*% of GDP*	*% of GDP*	*% of active*	*% of empl.*	*% of empl.*	*bn USD*	*% of ME*	*% of empl.*	*% of empl.*
1973	13.4	24.7	46.8	3.9	2.0	5.4	21.8	69.5	2.3	62.0	11.1
1988	14.8	31.0	53.7	2.5	6.2	4.4	15.9	75.9	1.3	72.2	15.9
1993	15.3	34.4	54.6	5.4	5.5	4.0	14.5	78.8	1.3	74.3	17.2
2008	16.4	48.3	76.3	8.3	3.1	2.7	10.2	90.5	2.6	80.5	23.0
	CAGR (%)	*CAGR (%)*	*CAGR (%)*	*Δ 5 y*	*Δ 5 y*	*CAGR (%)*	*CAGR (%)*	*CAGR (%)*	*average*	*CAGR (%)*	*CAGR (%)*
73-88	0.6	1.5	0.9	-0.5	1.4	-1.4	-2.1	0.6	3.0	1.0	2.5
88-93	0.7	2.1	0.3	2.9	-0.7	-1.9	-1.8	0.7	1.3	0.6	1.5
93-08	0.5	2.3	2.3	1.0	-0.8	-2.7	-2.3	0.9	1.6	0.5	2.0
73-08	0.6	1.9	1.4	0.6	0.2	-2.0	-2.1	0.8	2.2	0.7	2.1

Sources Based on World Bank (2014a) data, constant 2010 prices

Fuel exports did not seem to play a major role, but the figures are somewhat deceptive because of the decisive role that the company Royal Dutch Shell plays in the Dutch economy. As a true MNE, Shell had revenues of 451.2 bn USD (current) in 2013, which was more than half of the Dutch GDP. Only a small fraction of these revenues and related sales in fuels accounted for the Dutch GDP since just a little less than 0.4 bn USD were reported as earnings at corporate level (Royal Dutch Shell, 2013, p. 18).

Volatility of change

The Dutch results are listed in Table 5.14. The strong shifts in unemployment and the trade balance and also the turmoil in manufacturing around 1980 account for a higher total volatility of change of the Netherlands than its neighbour Belgium. From the second period, the volatility values for the Netherlands are relatively low, standing for a smooth transition from an industrial to a service society.

Table 5.39 CAGR (%) volatility of de-industrialization indicators (Netherlands)

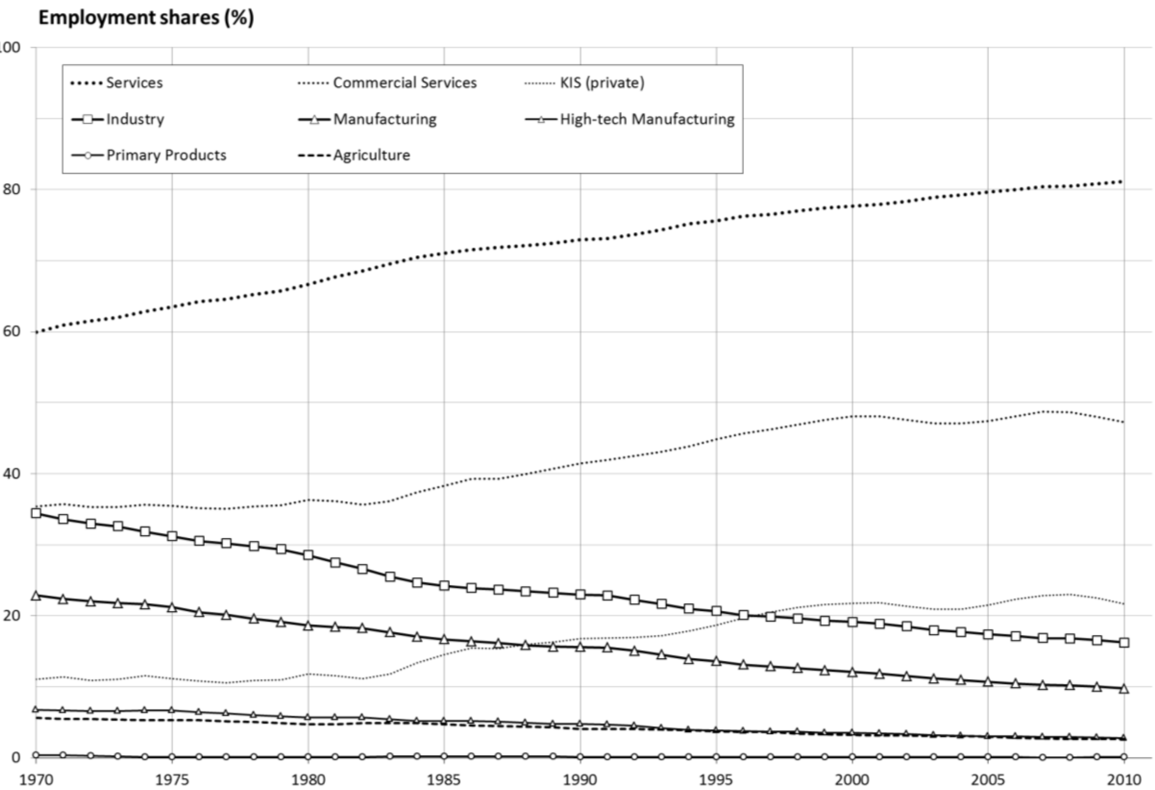
Years	υ_T	$\sigma_{1,T}$ manu. empl.	$\sigma_{2,T}$ unem-ployment	$\sigma_{3,T}$ trade balance	$\sigma_{4,T}$ GDP p/c	$\sigma_{5,T}$ manu. output	$\sigma_{6,T}$ primary prod. exp.	$\sigma_{7,T}$ agricult. empl.	$\sigma_{8,T}$ KIBS empl.
78-88	**12.46**	0.18	2.33	3.17	0.66	2.45	0.31	0.78	2.58
88-98	**7.62**	0.72	1.49	1.57	0.40	1.48	0.13	0.45	1.37
98-08	**8.07**	0.23	2.14	1.40	0.89	0.92	0.28	0.59	1.62
78-08	**10.93**	0.46	2.38	2.27	0.81	1.83	0.41	0.81	1.96

Source: Own calculation, evaluation based on (EU KLEMS, 2012) and World Bank (2014a) data

Sectoral changes

Employment

When turning to employment shares (Figure 5.43), the continuous decline of industry and manufacturing becomes clear. It also involves high-tech manufacturing. Primary products do not <u>seem</u> to play a significant role.



Source: Own graph, based on World Bank (2014a) and national employment data

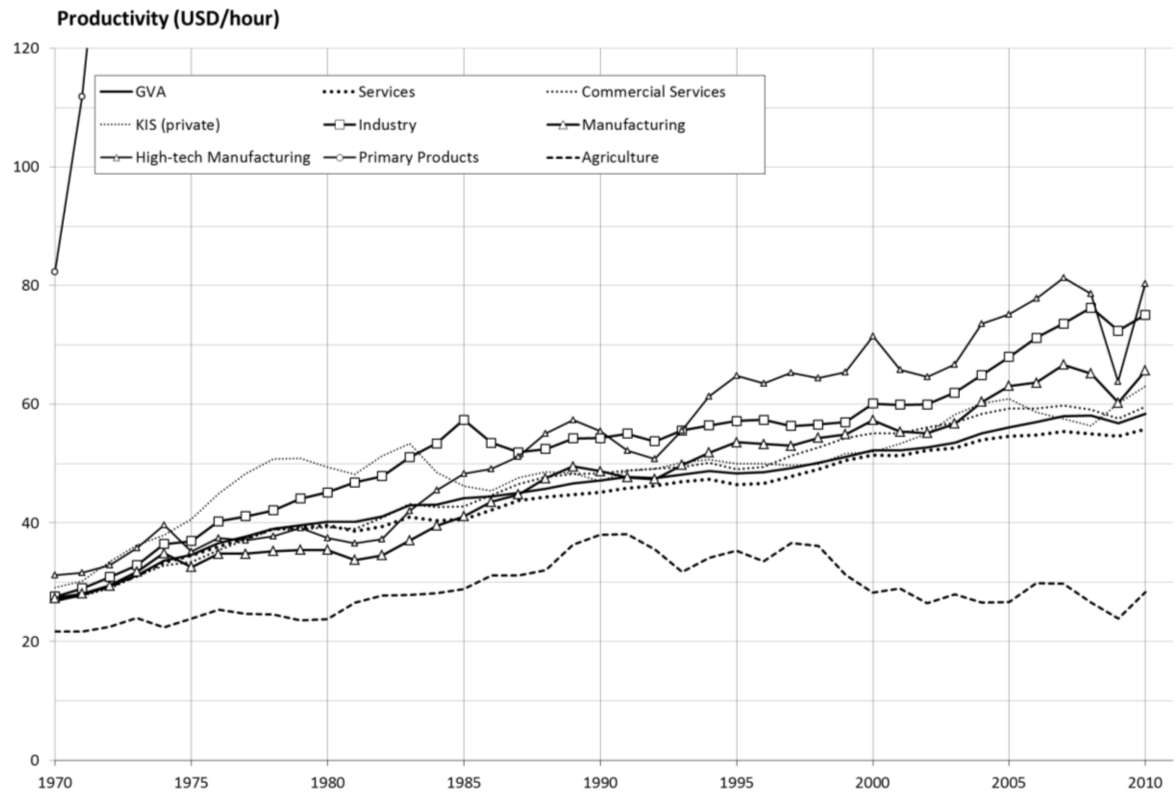
Figure 5.43 Structural change of the Netherlands

While services constantly expanded their position, commercial services including KIBS have stagnated since about 2000.

Despite of the fact that the Low Countries are famous for their agricultural products which are produced by modern methods, the employment share in agriculture went down continuously.

Productivity

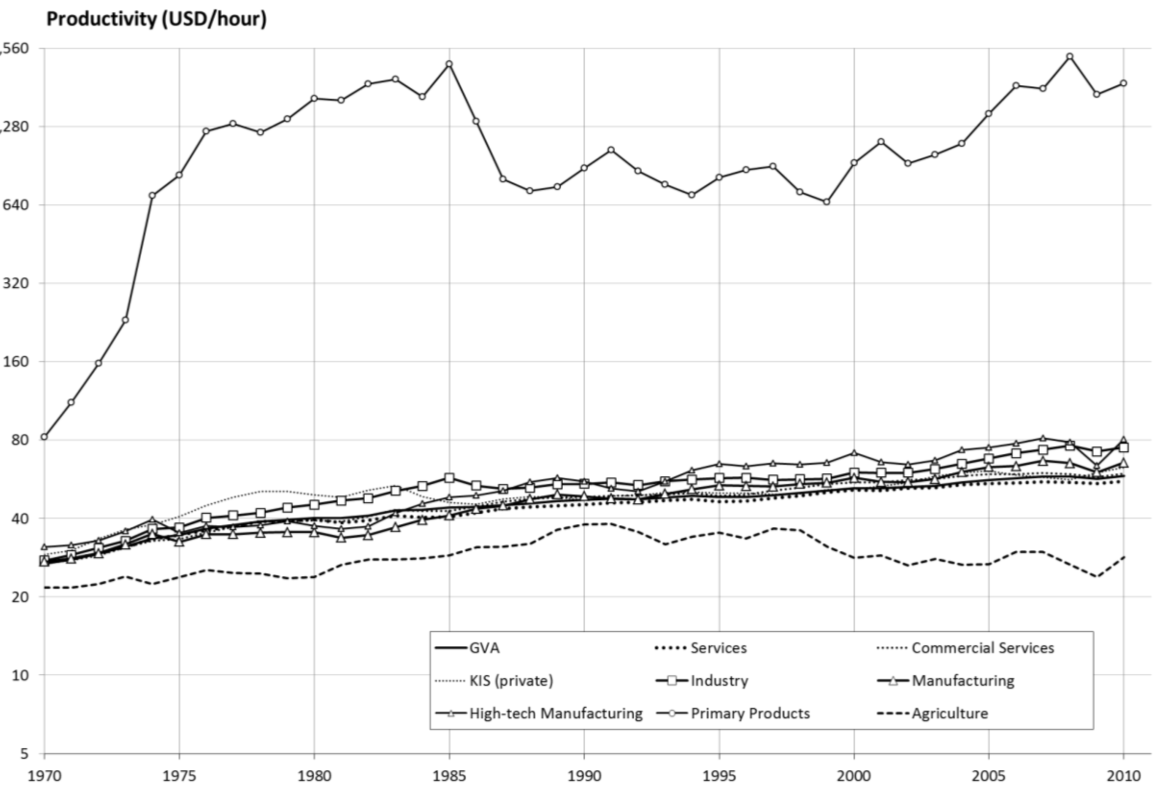
When looking at agricultural productivity (Figure 5.44), this is easily understandable: Agricultural productivity has, after having almost doubled the 1970 value in 1990, returned to its point of departure. This phenomenon can surely be attributed to increased international competition after the political changes around 1990.



Source: Own graph, based on EU KLEMS (2012) data

Figure 5.44 Sectoral productivity in the Netherlands

The industry was more productive than services, with high-tech manufacturing in the lead. Primary products played a very special role. Due to the location of The Royal Dutch Shell headquarters in The Hague, productivity figures in the primary sector are mainly related to that company and the little personnel it has gathered in his headquarter. Thus, productivity in primary products is around fifty times higher than in other industries and services. To capture these relations, a y-axis log plot (Figure 5.45) was added to the standard graph on productivity.



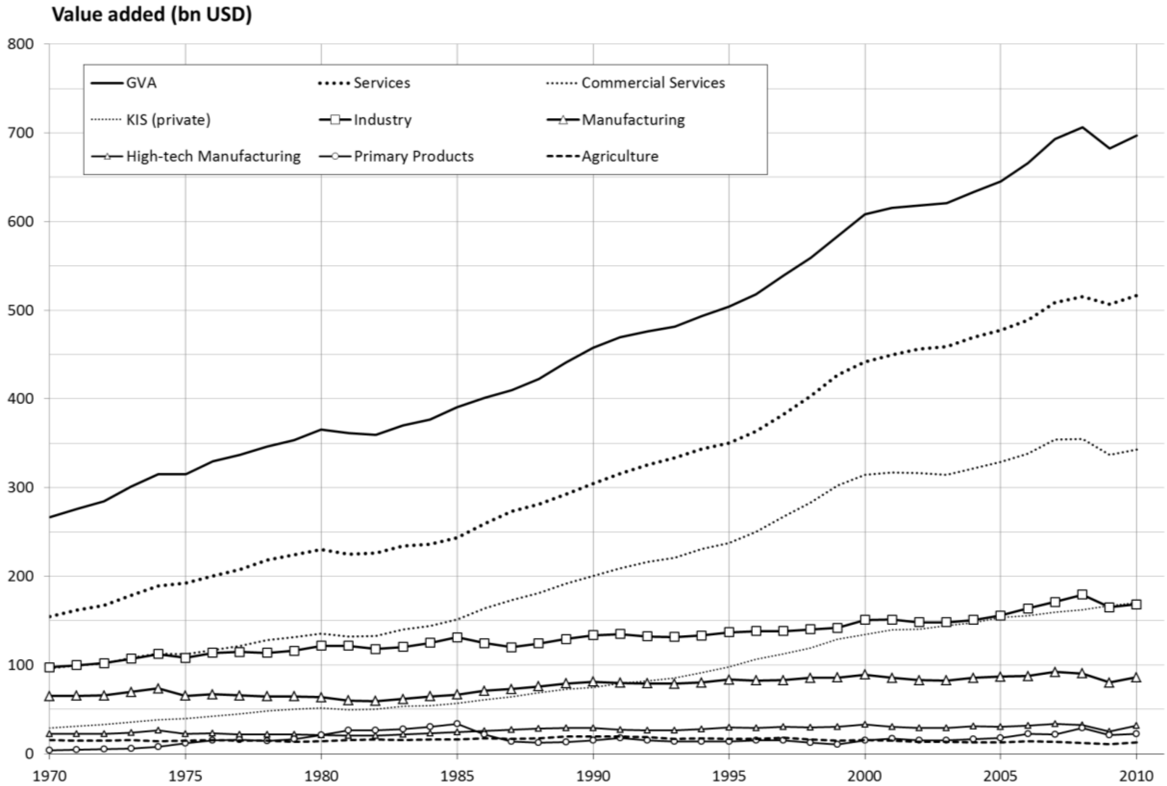
Source: Own graph, based on EU KLEMS (2012) data

Figure 5.45 Sectoral productivity in the Netherlands (log y-axis)

Output

On the outlined basis, primary products account for a GDP contribution that in 2010 was even higher than that of agriculture and high-tech manufacturing (Figure 5.46). Still, it is quite small in comparison to the size of the Royal Dutch Shell company.

The sectoral contributions of all services were constantly rising. Also, the Netherlands did not de-industrialize in terms of output of industry and manufacturing which both constantly grew over time, but at low growth rates.



Source: Own graph, based on EU KLEMS (2012) data

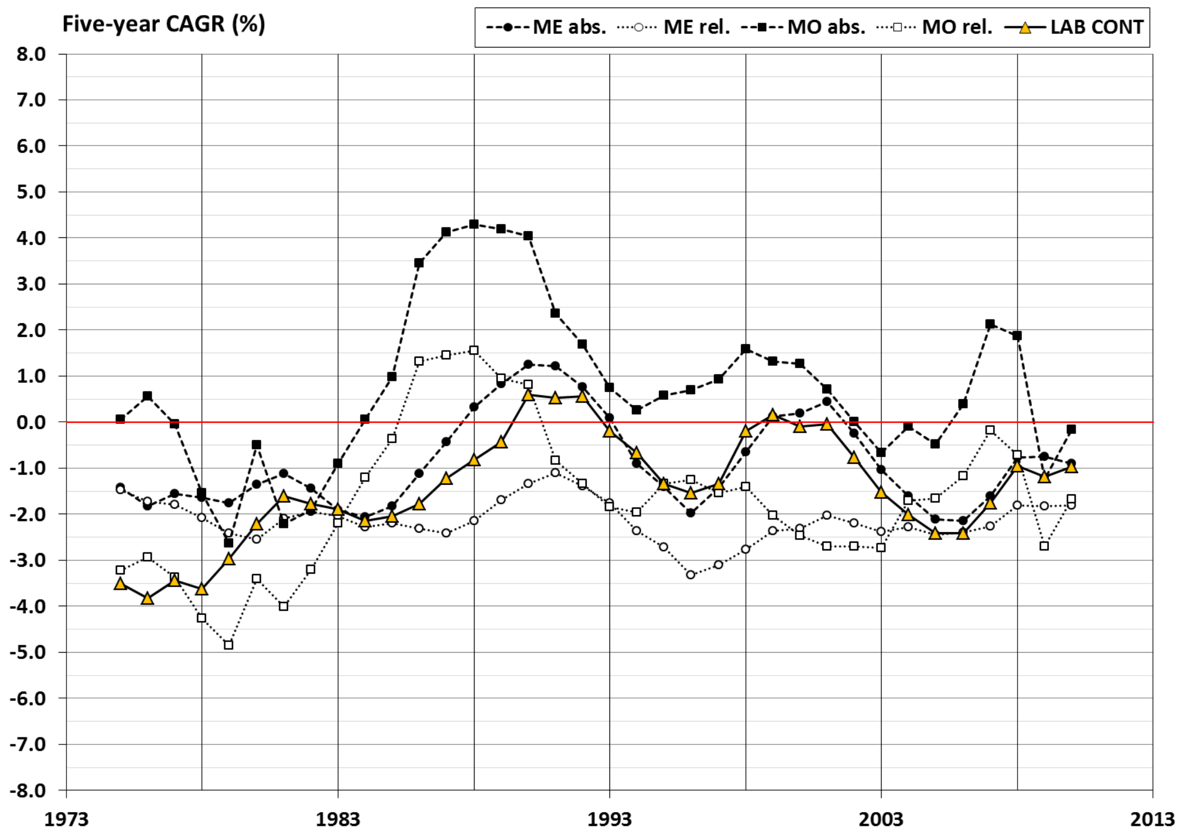
Figure 5.46 Sectoral gross value added in the Netherlands

5.3.7.2 Economic scenarios

Key indicators

The key indicators shown in Figure 5.47 reveal that the most critical years for Dutch manufacturing were the early years of the investigated period. In the 1970s, the Netherlands de-industrialized in every respect including output.

From then on, the Dutch manufacturing sector managed to increase its output, at high growth rates in the late 1980s and then at fair rates just above (sometimes below) zero. Until 1990, there is an overall improvement trend of manufacturing, while from then on, there is a very slight downward tendency.



Source: Own graph, based on own calculations drawing from EU KLEMS (2012) data

Figure 5.47 Indicators of de-industrialization (Netherlands)

Table 5.40 Correlations of de-industrialization indicators (Netherlands)

R^2 of 5y CAGR (%)	ME (abs.)	ME (rel.)	MO (abs.)	MO (rel.)	LAB CONT
ME (abs.)	100.0	26.0	34.9	13.1	69.5
ME (rel.)	26.0	100.0	2.3	0.1	2.8
MO (abs.)	34.9	2.3	100.0	81.5	25.5
MO (rel.)	13.1	0.1	81.5	100.0	18.6
LAB CONT	69.5	2.8	25.5	18.6	100.0

Source: Own calculation of coefficients of determination, based on EU KLEMS (2012) data

The following is concluded from the chart and the correlation factors:

- **LAB CONT:** The total sectoral working hours constantly fell apart from the boom around 1990. The rates of decline were significant in the 1970s and 1980s; they were moderate from 1993.
- **ME (abs.)**: Until 1993, the employment reductions were well below those of the total labour content. The individual workload was constantly reduced. From 1992, these policies were changed, and the employment situation followed the available work quite accurately. A likely cause would be deregulations in employment protection.

Due to the early years, the overall coefficient of determination between labour content and manufacturing employment is comparably low (69.5 %).

- **ME (rel.)**: Other sectors grew fast while employment decreased, so in a sociological sense, the Netherlands de-industrialized quite rapidly.
- **MO (abs.)**: The Dutch manufacturing industry could keep its position on the basis of high productivity and a good share of output in high-tech fields. Yet, in the very last years of the survey, this position seems to have been endangered, if not somewhat eroded.
- **MO (rel.)**: Due to the high sectoral productivity which was well beyond Dutch average, relative sectoral output fell not as fast as the relative employment figures. This in combination with the high impact of manufacturing on the trade balance has helped to maintain the position of Dutch manufacturing as a vital part of the Dutch economy.

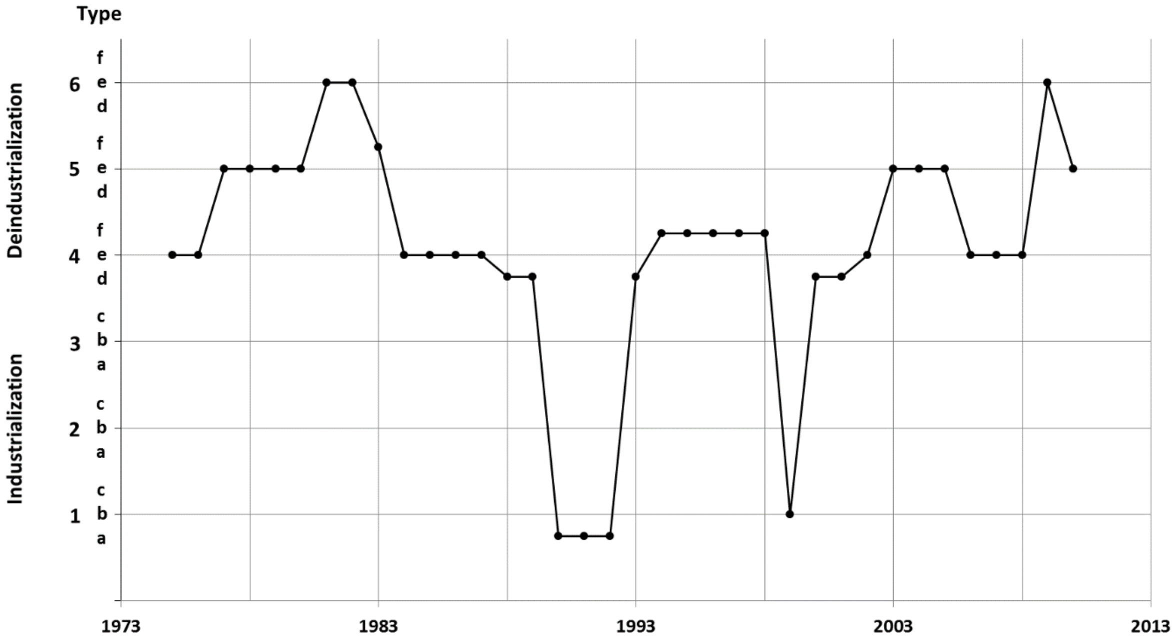
From these findings, it is concluded that:

- The Netherlands de-industrialized rapidly in a sociological sense. Since the industry grew in output and celebrated its export success, the manufacturing industry is still important for the Dutch economy.
- The Dutch manufacturing output grew a little faster than its population, so the output per person has increased (cf. Table 5.38, p. 194).
- The Dutch manufacturing sector has kept its international position on the basis of productivity rises and latest technology. High-tech manufacturing has played an important role.

Scenarios

In the late 1970s and early 1980s, the Dutch manufacturing industry shrank in terms of output and employment (5e type). In 1981/2, it even lost productivity (6e type).

In subsequent years managed to return on a growth path in terms of output. From 1988 until 1993, the absolute employment figures were higher than five years before, so depending on the labour content, pseudo- (4d type) or real (1a type) industrialization is diagnosed.



Source: Own graph, based on own calculations drawing from EU KLEMS (2012) data
Categories as illustrated in Figure 4.4, p. 101

Figure 5.48 Economic scenarios (Netherlands)

In the following years, there was a reverse trend. Productivity increased very much, so there was a squeezing-out of jobs due to increased workload (4f type, 1994-98, 1b in 1999). Afterwards, the individual workload was always reduced (e-types), no matter what the circumstances were, probably to put some relief on unemployment statistics.

5.3.7.3 Application of the eclectic model of de-industrialization

The key data for applying the de-industrialization model is graphically displayed in Appendix 5 (Netherlands). The overview on de-industrialization processes (Table 5.41) shows that the Netherlands constantly de-industrialized over all investigated periods.

As a whole (35 years), the process was of the positive type. This is not diagnosed for the rather problematic first fifteen years, but is also found for the last fifteen years period and the transition period before. Though there were semi-decades with less clear findings, the overall picture remains very positive, with an almost continuous shift to high-tech and also to KIBS.

As a Dutch specialty, the 'Dutch disease' comes into play, i.e. a shift to primary products. Surely, Royal Dutch Shell influences capital flows and investments in the Netherlands and thus keeps money away from other sectors. Thus, it indirectly influences the employment situation in other sectors. Concerning the number of jobs, not too many are left in the Netherlands to have a real impact on the employment situation. And only for a very short time interval (1979-1987), five years changes in primary products employment were positive, so that (despite of the almost negligible absolute numbers), a shift to employment in primary products was diagnosed.

Table 5.41 De-industrialization of the Netherlands

Year	De-industriali-zation	Type	Technical maturity	Failure	Shift to		
					Hi-tech	KIBS	Primary products
73-08	yes	ambivalent	yes	no	yes	yes	jobless growth
73-88	yes	ambivalent	ambiguous	ambiguous	no	no	jobless growth
73-78	yes	ambivalent	ambiguous	no	yes	yes	new jobs
78-83	yes	positive	yes	no	yes	yes	no
83-88	yes	positive	ambiguous	no	no	yes	no
88-93	yes	positive	yes	no	yes	yes	jobless growth
93-08	yes	positive	yes	no	yes	yes	no
93-98	yes	positive	ambiguous	no	no	no	jobless growth
98-03	yes	positive	yes	no	yes	yes	jobless growth
03-08	yes	ambivalent	yes	no	yes	yes	jobless growth

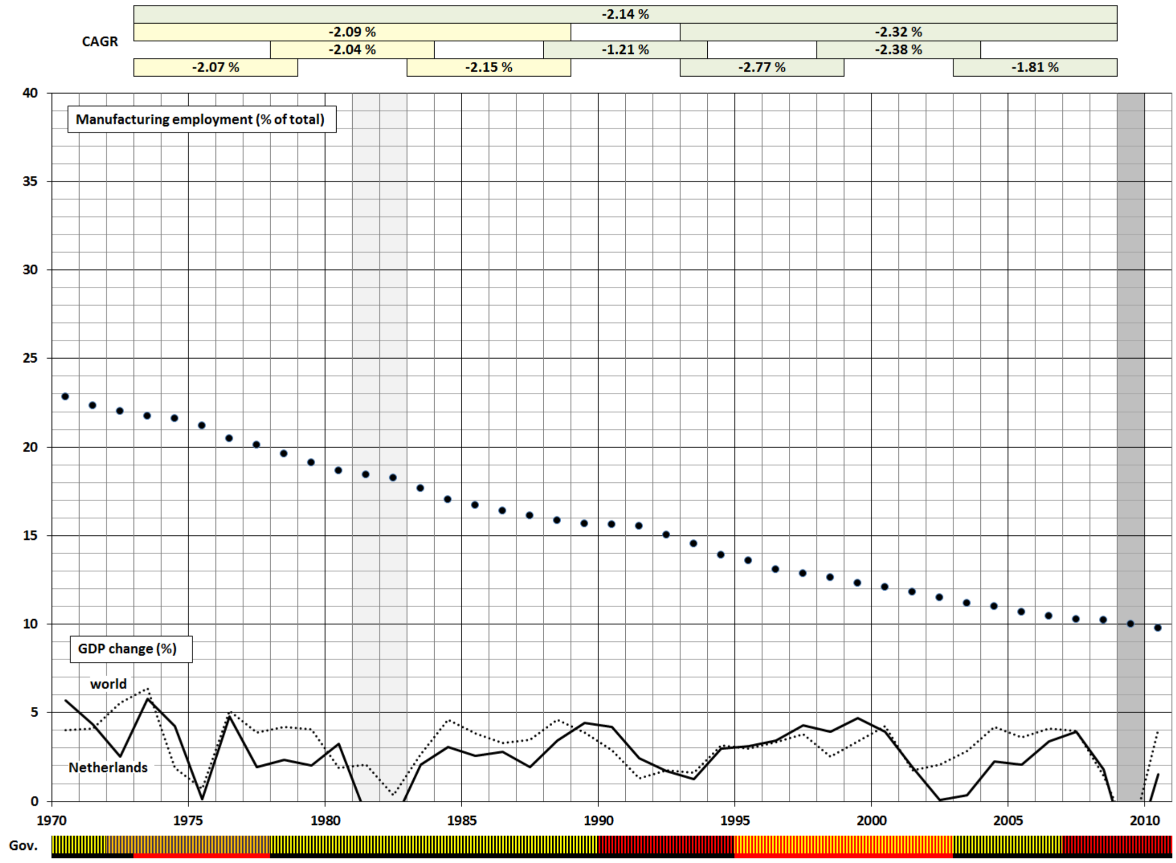
Source: Own compilation, evaluation based on EU KLEMS (2012) and World Bank (2014a) data

Clearly, the crowding out happens on the capital side, not directly at the work front. And it is even hidden in the export balance: Royal Dutch as a truly global player seems to trade only a very minor share of its natural resources via the Netherlands, so the major share does not appear in the Dutch trade balance.

5.3.7.4 Economic and political explanations for structural changes

National trends and influences

When looking at the political landscape of the Netherlands (Figure 5.49), it becomes clear that the Dutch, just like the Germans, have been governed by conservative or social chancellors that had to seek compromise in a coalition for the whole covered forty years. The country even gained the nickname ‘land of compromise’ (Expatica, 2014).



Sources: Based on World Bank (2014a) data, own calculations and political information (collected starting from Wikipedia, 2014d)

Figure 5.49 Economic and political development of the Netherlands

In recent years, right-wing outsiders have gained some ground in opposition to traditional values of tolerance and balanced policies, but the Dutch people so far has overcome these irritations with the support of their royals (Expatica, 2014).

The smooth transitions and mostly positive results speak for a good governance of the country over the full period, maybe with the exception of the early 1980s crisis that hit the Netherlands comparatively hard. The Dutch consistency may be attributed to the constant support of all governments from the national bureau for economic policy analysis CBP. It limits itself to analysing the effects of proposed policy measures rather than proposing these measures (CPB Netherlands Bureau for Economic Policy Analysis, 2014).

The highest gains in productivity were achieved from 1995, i.e. at times were the social-democrats were in power. Like in Germany under chancellor Schröder, they increased the pressure on their very own clientele. When they started to relax these policies in 2001/2, the economic bill followed straightaway in the form of a recession and their release from power.

This last short period of social-democrat power is a very fine example for the immense pressure on high-cost economies. If they withstand from strict measures to increase productivity, they get punished immediately by losing market ground. In comparison to France, the Netherlands learned their lesson fast and well.

Linkages to the world and regional economy

Given the high export rates and resulting integration in global capital flows, it comes as a surprise that the economic cycle of the Netherlands is not as closely correlated with world and European economic cycles as e.g. those of France and Italy.

Table 5.42 GDP (CAGR, %) coefficients of determination with the Netherlands

R^2 (%)	World	Europe & Central Asia	USA	East Asia & Pacific	Latin America & Caribbean
1970-1990	38.5	59.5	14.2	0.2	20.9
1990-2010	57.1	64.4	48.0	9.5	16.2
1970-2010	49.2	62.0	29.3	3.8	22.8

Source: Own calculations, based on EUKLEMS (2012) and World Bank (2014a) data

Especially the connections to Asia are remarkably poor. Probably, the Netherlands have been suffering from their problematic former role as a colonial power.

5.3.8 Spain

Portugal and Spain were the countries that discovered the world and flourished on the basis of imported spices and precious metals. Constant warfare and a nobility that, unlike the British, never engaged in business but preferred to remain in its traditional structures drew Spain away from the forefront of European nations (Vilar, 1967).

Although starting some industrialization pretty early, already in the late 18th century, the industrial society never really succeeded in altering the social reality of the country. The bourgeoisie feared the upcoming working class so much that, instead of changing the political structures, adopted the worldview and attitudes of the nobility (in this respect a process that almost exactly equated the German circumstances). Agricultural and industrial progress and innovation were (very much unlike in Germany) realized slowly. Spain was a laggard in comparison to most European countries, even to Italy. A sharp contrast between conservatives and liberals, between rural and urban society, already led to political turmoil in the 19th century (Shubert, 2003).

This contrast between the two factions resulted in the Spanish civil war in the 1930s from which the Spanish state embarked on forty years of dictatorship under General Franco. When the dictator died in 1975, his desired successor, the young Bourbon monarch Juan Carlos I, supported the reform process towards a Western democracy (Green, 2014). Today, Spain is a member of the NATO since 1982 (Centre Virtuel de la Connaissance sur l'Europe, 2012), the EU (since 1986) and the Eurozone (since 2002) (Euro Challenge, 2012).

5.3.8.1 Structural shifts

Some key facts

With its 93.4/km² (2010) inhabitants, Spain is quite sparsely populated. Its export rate has increased, but is still modest in comparison to Germany or the Benelux states. Spain's trade balance is clearly negative and unemployment rates traditionally high, so the economy is not really stable (Table 5.43). The average income per capita is a little below that of the West European countries introduced so far.

Table 5.43 Overview on the macro-economic development of Spain

Year	Population	GDP p/c	Exports	Trade	Unemployment	Agriculture	Manufacturing (VA)		Fuel exp.	Services	KIBS
	mn	*k USD*	*% of GDP*	*% of GDP*	*% of active*	*% of empl.*	*% of empl.*	*bn USD*	*% of ME*	*% of empl.*	*% of empl.*
1973	34.8	15.8	13.7	-0.8	2.6	21.7	22.0	164.6	4.7	44.2	4.2
1988	38.7	20.4	17.8	-1.2	18.7	12.2	19.0	182.6	4.5	58.8	7.4
1993	39.2	22.4	18.2	-0.6	20.8	8.4	17.4	153.4	2.7	64.1	10.1
2008	46.0	31.4	26.5	-5.8	11.3	3.9	12.2	183.3	6.4	71.4	15.1
	CAGR (%)	*CAGR (%)*	*CAGR (%)*	*Δ 5 y*	*Δ 5 y*	*CAGR (%)*	*CAGR (%)*	*CAGR (%)*	*average*	*CAGR (%)*	*CAGR (%)*
73-88	0.7	1.7	1.8	-0.1	5.4	-3.8	-1.0	0.7	5.3	1.9	3.9
88-93	0.2	1.9	0.5	0.6	2.1	-7.2	-1.7	-3.4	3.9	1.7	6.4
93-08	1.1	2.3	2.5	-1.7	-3.2	-4.9	-2.3	1.2	3.1	0.7	2.7
73-08	0.8	2.0	1.9	-0.7	1.2	-4.8	-1.7	0.3	4.2	1.4	3.7

Sources Based on World Bank (2014a) data, constant 2010 prices

The transition from an industrial or even still largely agricultural society in the early 1970s towards a service economy with significant shares of KIBS has changed the economic face of the country.

The primary products sector is based on the rich mineral resources of the Cantabrian Mountains where e.g. iron, coal, and zinc are exploited; petroleum is found near Burgos (Pearson Education, 2014).

Volatility of change

The Spanish results are listed in Table 5.14. The unrest resulting in abrupt changes of economic scenarios is also expressed by the sectoral volatility.

Table 5.44 CAGR (%) volatility of de-industrialization indicators (Spain)

Years	υ_T	$\sigma_{1,T}$ manu. empl.	$\sigma_{2,T}$ unem-ployment	$\sigma_{3,T}$ trade balance	$\sigma_{4,T}$ GDP p/c	$\sigma_{5,T}$ manu. output	$\sigma_{6,T}$ primary prod. exp.	$\sigma_{7,T}$ agricult. empl.	$\sigma_{8,T}$ KIBS empl.
78-88	**10.29**	1.02	2.88	1.83	0.96	1.44	0.47	0.89	0.82
88-98	**15.22**	0.57	3.94	3.49	1.13	2.39	0.35	1.48	1.87
98-08	**9.98**	1.77	2.92	1.24	0.85	1.13	0.36	0.77	0.94
78-08	**16.95**	1.35	6.06	3.09	1.20	1.72	0.47	1.57	1.49

Source: Own calculation, evaluation based on (EU KLEMS, 2012) and World Bank (2014a) data

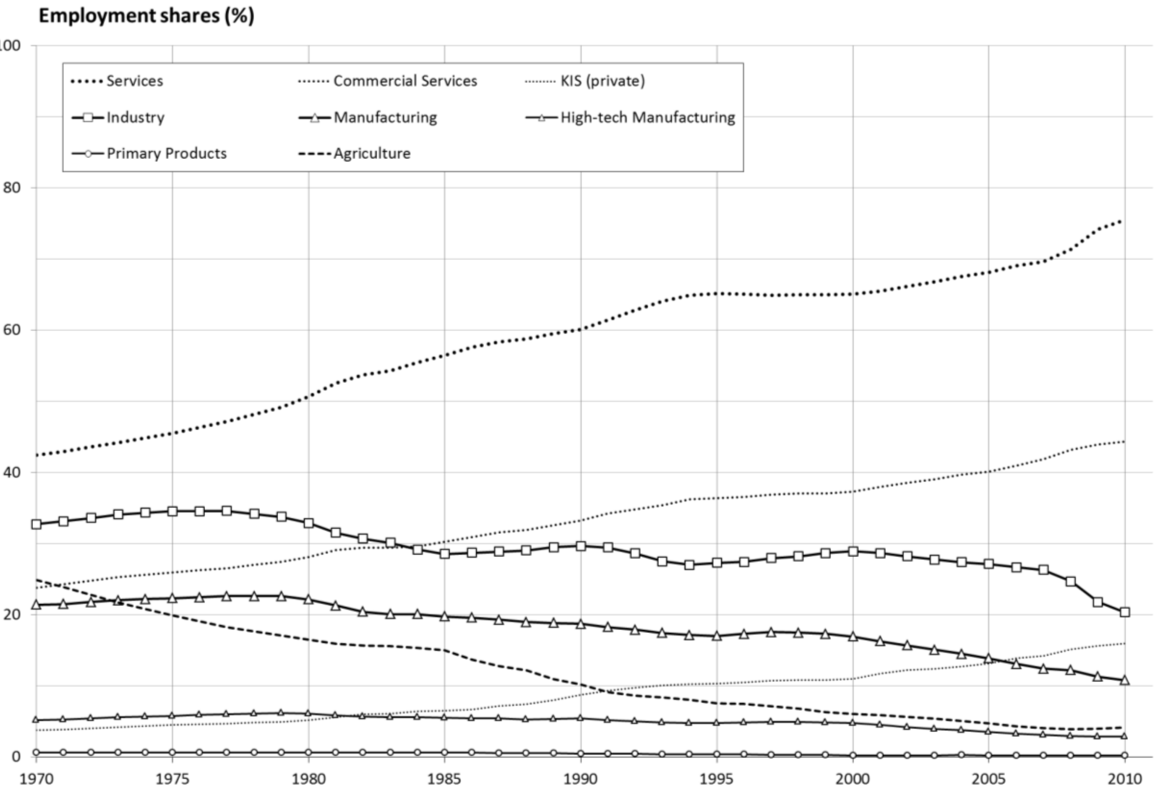
Unemployment is the most serious problem in Spain. Since this problem is so big, it seems to prevent Spanish governments from making decisions that would, in the short term, even create higher unemployment figures. That is probably the main reason why the Spanish productivity stagnated for such a long time (see below).

Sectoral changes

Employment

A detailed view on sectoral employment (Figure 5.50) shows that the Spanish structural change is characterized by a certain degree of unrest and discontinuity compared to North European states. In industry as a whole and in manufacturing, periods of constant employment shares have alternated with periods of rapid decline.

Before the 2008 crisis, de-industrialization had gained in pace, with a CAGR of -4.1 % in the last semi-decade. This process was augmented by a long boom in construction works. The civil engineering sector which employs roughly the difference between industry as a whole and manufacturing (employment in primary products is almost negligible) has played an over-proportional role in the Spanish economy. Resulting bubbles in the Spanish housing sector (Euro Challenge, 2012) led to booms and afterwards periodically extremely high unemployment rates.



Source: Own graph, based on World Bank (2014a) and national employment data

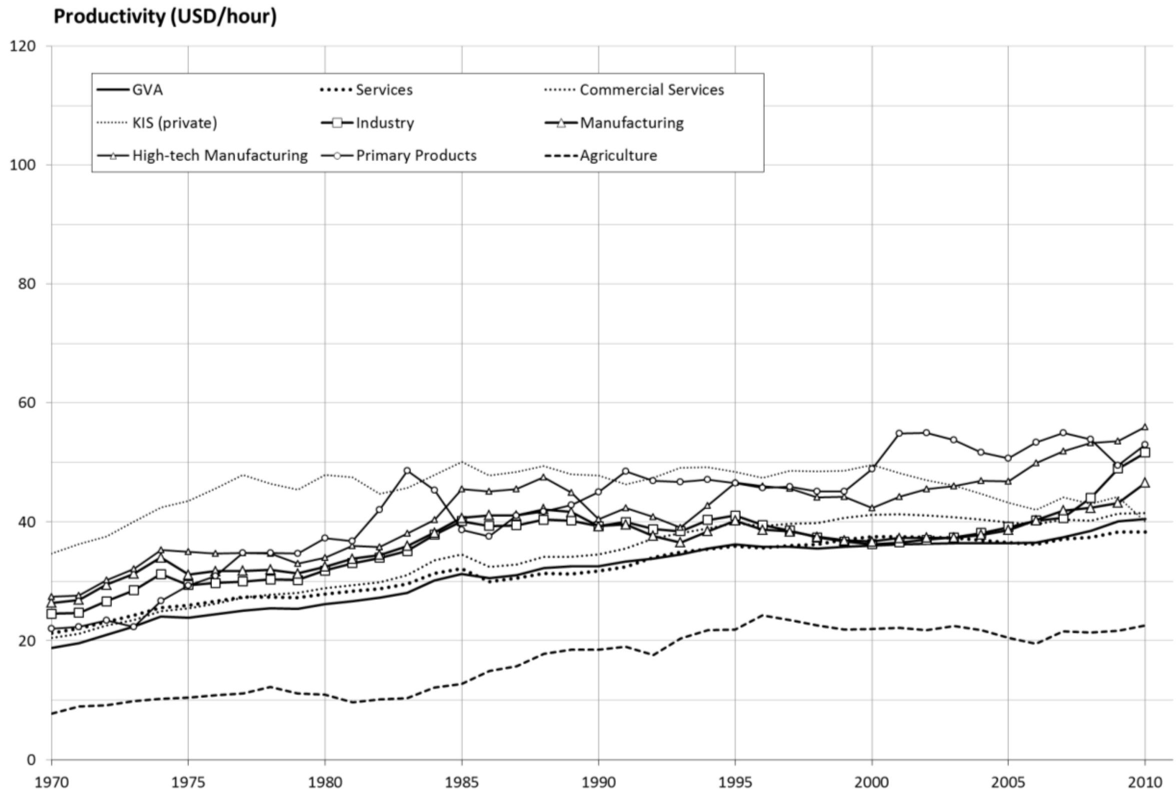
Figure 5.50 Structural change of Spain

Productivity

Productivity of all sectors in Spain is rather small and has, with serious ups and downs in the medium term, in the long run almost stagnated (Figure 5.51) and is clearly below European average. Industrial productivity is a little higher than in services.

KIBS, following their pioneering role in the 1970s and 1980s, had a higher productivity than average then but finally phased into the services mainstream.

Agriculture could increase its productivity and has meanwhile arrived in the European midfield.



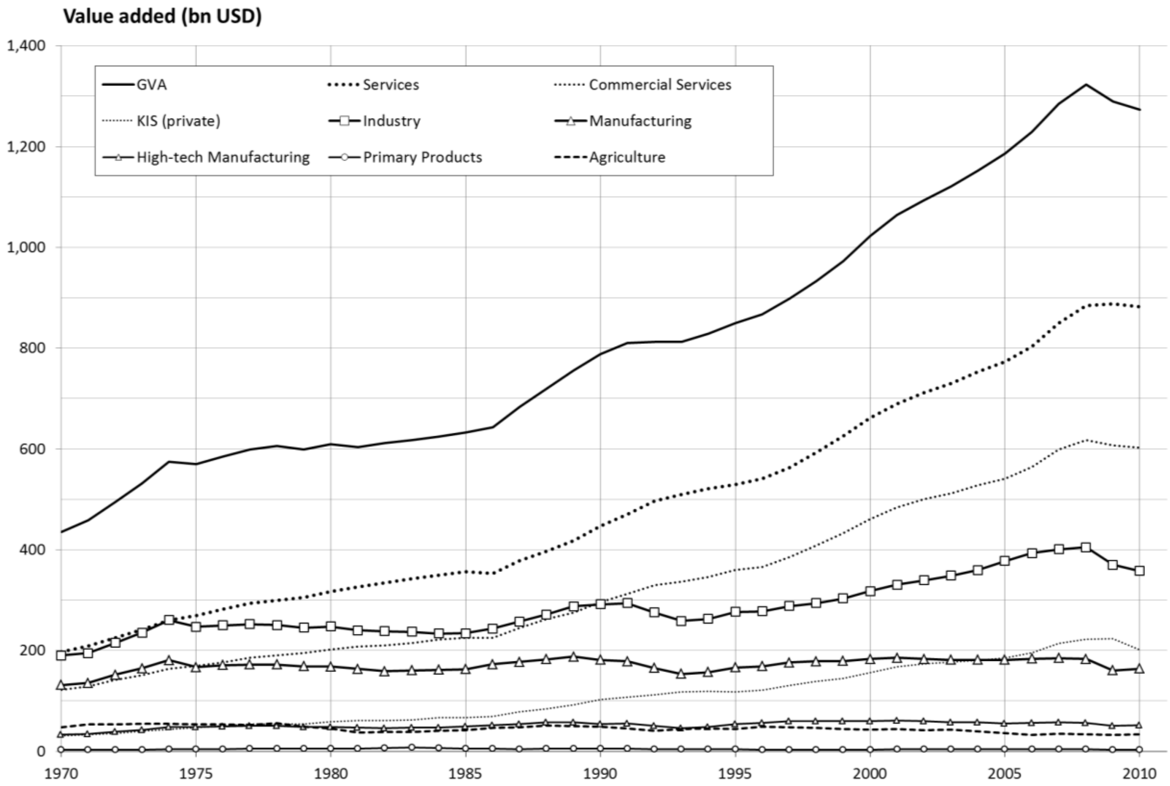
Source: Own graph, based on EU KLEMS (2012) data

Figure 5.51 Sectoral productivity in Spain

Output

The total value added (Figure 5.52) shows a constant and accelerating increase in all services until the 2008 crisis while agriculture slowly loses in total value added.

The Spanish industrial sector is very different to that of all other countries investigated. The total industrial output increased strongly between 1995 and 2008, but this growth is neither driven by a stagnating manufacturing sector or the almost negligible contribution of primary products. It is just driven by construction activities, a sector that had been bloated partly by ill-led capital streams, partly EU subsidies, into over-developed resorts and largely oversized traffic infrastructure through the vast plains of Castile (Euro Challenge, 2012).



Source: Own graph, based on EU KLEMS (2012) data

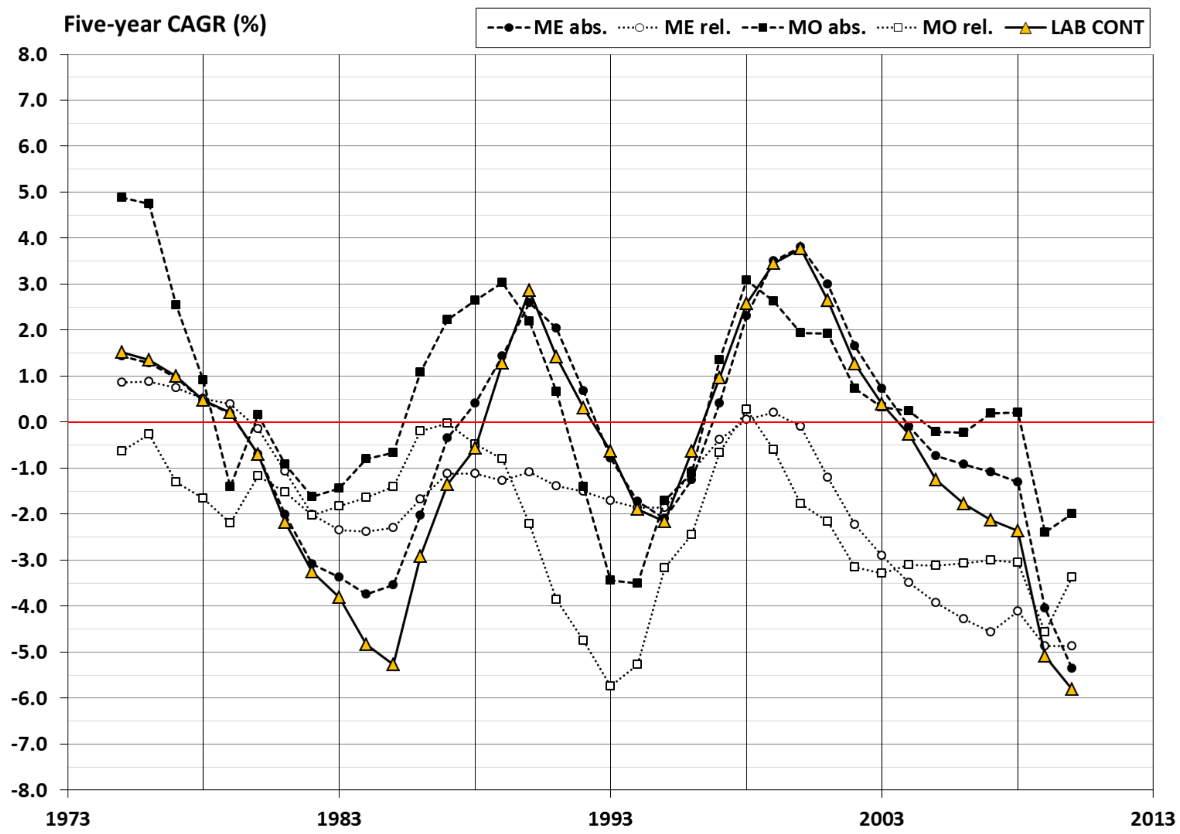
Figure 5.52 Sectoral gross value added in Spain

5.3.8.2 Economic scenarios

Key indicators

The development of Spanish manufacturing is characterized by very high cyclical amplitudes of its growth indicators (Figure 5.53). At average, absolute output, employment and labour content were hovering around the zero line. While through the early two decades, productivity increases showed in CAGR absolute output figures well above absolute employment and labour content, from 1990, these lines followed a virtually identical trend. In the first five years, the labour content even grew faster than the output. This means that the sectoral productivity even sank and then stagnated until 2003.

Only after 2003, Spain started to make economic progress in the manufacturing sector, i.e. it raised its productivity. The world economic crisis hit Spain particularly hard, as indicated by the crashing 2009/10 figures.



Source: Own graph, based on own calculations drawing from EU KLEMS (2012) data

Figure 5.53 Indicators of de-industrialization (Spain)

Table 5.45 Correlations of de-industrialization indicators (Spain)

R^2 of 5y CAGR (%)	ME (abs.)	ME (rel.)	MO (abs.)	MO (rel.)	LAB CONT
ME (abs.)	100.0	35.2	47.2	6.8	96.5
ME (rel.)	35.2	100.0	30.1	31.4	42.3
MO (abs.)	47.2	30.1	100.0	56.1	41.9
MO (rel.)	6.8	31.4	56.1	100.0	6.2
LAB CONT	96.5	42.3	41.9	6.2	100.0

Source: Own calculation of coefficients of determination, based on EU KLEMS (2012) data

The following is concluded from the chart and the correlation factors (Table 5.45):

- **LAB CONT:** The total sectoral working hours followed the economic cycle. Unlike in other countries, this content grew over several periods despite of only limited output growth. This fact was caused by the very low productivity rises in Spanish manufacturing.
- **ME (abs.)**: Absolute manufacturing employment almost exactly followed the labour content, as indicated by a correlation coefficient of 96.5 %. This means that no big

changes in working hours were made, i.e. the individual workload remained constant.

- **ME (rel.)**: Apart from the 1970s and two years in the 1990s, relative manufacturing employment constantly declined.
- **MO (abs.)**: The Spanish manufacturing industry could over a long time keep its position despite of its low productivity and only a limited share of output in high-tech areas. By serious improvements in the very last years of before the 2008/09 crisis, a downward tendency could be stopped.
- **MO (rel.)**: Since the output of other sectors grew while Spanish manufacturing stagnated, the relative sectoral output most of the time fell fast. Only in peak years, it scratched the zero line.

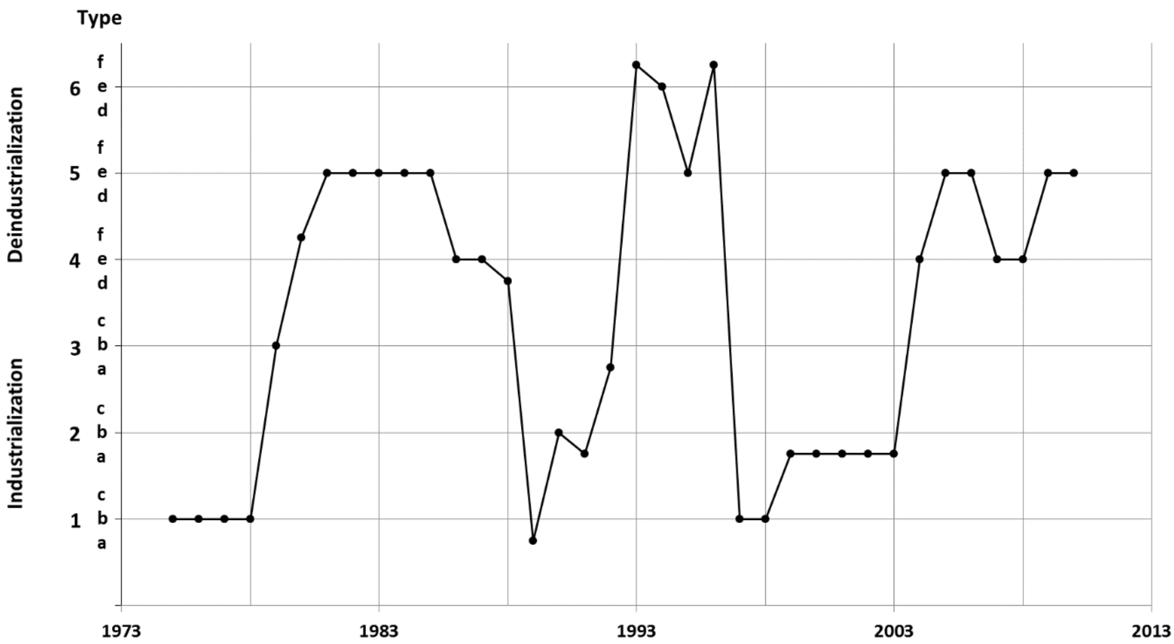
From these findings, it is concluded that:

- Spain de-industrialized rapidly in a sociological sense. Since the industry grew in output and had some export success, the manufacturing industry is still important for the Spanish economy.
- The Spanish manufacturing output grew a little slower than its population, so the output per person decreased (cf. Table 5.43, p. 205).
- Only in recent years, serious efforts were made to improve the Spanish bargaining position in the international manufacturing sector by productivity rises and latest technology. Before, Spain seemed to rely on its wage level which is low in comparison to Western Europe – but high in comparison to emerging countries.

Scenarios

The course of Spanish manufacturing is quite unusual, compared to classical industrial nations like Austria or Germany. Their economically healthy standard scenario ‘4e’, characterized by rising output and productivity and a distribution of labour content reductions on employment and individual workload, is almost absent in Spain!

Spain started in a still industrializing stage (1b type) to then almost immediately turn to harsh de-industrialization (5e type). After a short ‘healthy’ intermezzo, Spain entered more than a decade of stagnation and even setback. These times are characterised as type 2, type 3 and type 6 episodes. Only in 2004, Spain returned to the track that can be considered as normal for developed economics, but again very strict and probably too radical in its course (5e instead of 4e).



Source: Own graph, based on own calculations drawing from EU KLEMS (2012) data
Categories as illustrated in Figure 4.4, p. 101

Figure 5.54 Economic scenarios (Spain)

5.3.8.3 Application of the eclectic model of de-industrialization

When applying the model of de-industrialization (Table 5.46), the changeful course of the process becomes clear:

- De-industrialization changed face and pace from half-decade to half-decade.
- The process started in the 1980s.
- Due to high and rising unemployment rates, a positive picture was not rendered.
- Technical maturity was rather the exception then the rule, as was a shift to high-tech production (though in the very long run, i.e. 1973-2008, it happened).
- For two out of three periods, failure I diagnosed.
- A shift to KIBS is clearly given.

The model contributes to a sound picture of Spanish de-industrialization and is well in line with the findings of the previous sections.

Table 5.46 De-industrialization of Spain

Year	De-industriali-zation	Type	Technical maturity	Failure	Shift to		
					Hi-tech	KIBS	Primary products
73-08	yes	ambivalent	ambiguous	no	yes	yes	no
73-88	no						
73-78	no						
78-83	yes	negative	ambiguous	ambiguous	no	yes	no
83-88	yes	ambivalent	yes	no	yes	yes	no
88-93	yes	ambivalent	no	yes	no	yes	no
93-08	yes	ambivalent	ambiguous	no	yes	yes	no
93-98	no						
98-03	yes	ambivalent	ambiguous	no	no	yes	no
03-08	yes	ambivalent	yes	no	no	yes	no

Source: Own compilation, evaluation based on EU KLEMS (2012) and World Bank (2014a) data

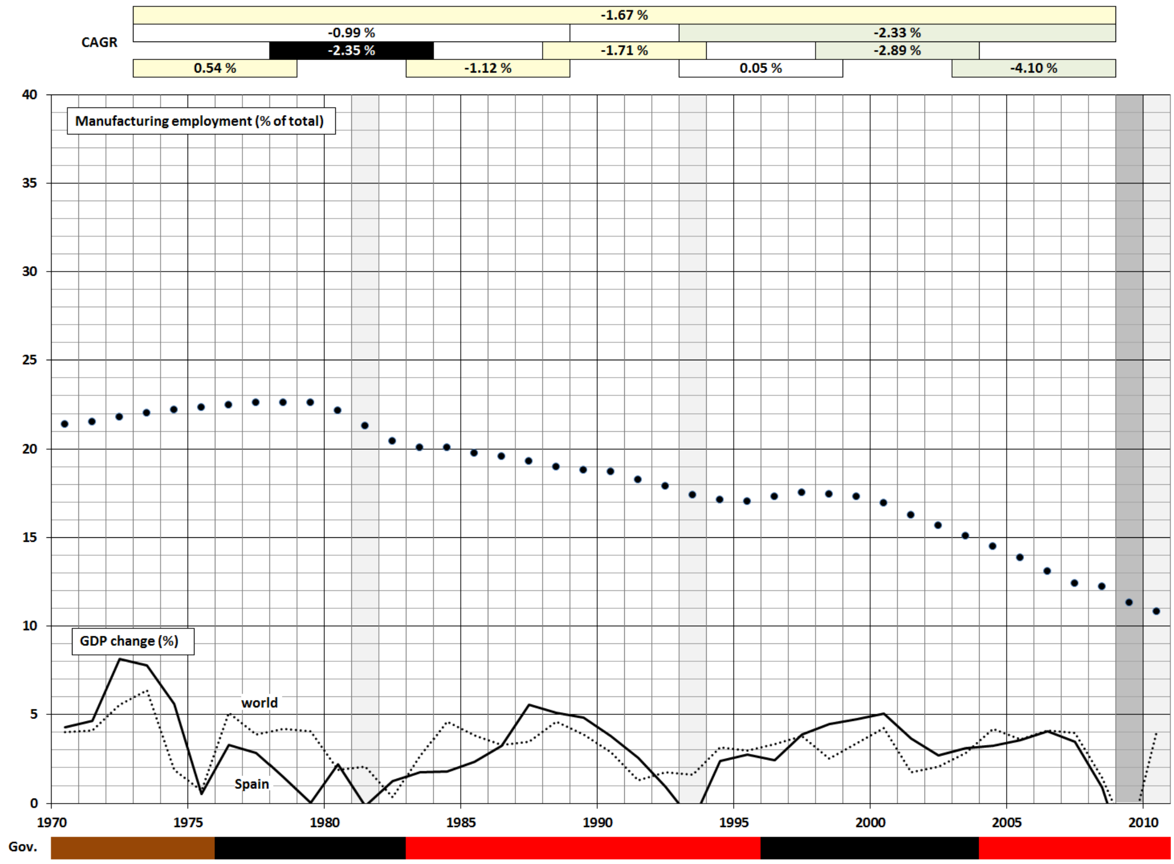
5.3.8.4 Economic and political explanations for structural changes

National trends and influences

Spain had a strong steel industry in the North at Vizcaya, Cantabria, and Asturias, and in the south near Valencia. After reaching record output levels in the mid-1980s, due to increased EU and global competition the steel plants lost in output and profitability and were largely nationalized already in the late 1980s.

Although Spain's automotive industry only started in the 1950s, it was quite successful especially in the production of small cars. Subsidiaries of foreign firms dominated the automobile industry, e.g. SEAT (owned by Volkswagen), Ford, GM. In the late 1980s, also Japanese investors sought to use Spain as a bridgehead to penetrate the West European market and to follow the example of Ford Espana and General Motors Espana (Solsten & Meditz, 1988). While in the late 1980s, the Spanish success was based on earnings of about half as high as in West Germany, the competitive advantage was soon lost to East European manufacturers after the opening of the Iron Curtain.

What about the connection between economy and politics? The Spanish electoral system has a tendency to favour the more traditional, rural, and thinly populated parts of Spain and also the larger parties (Solsten & Meditz, 1988). Though not a majority system, the results have thus been clear and favoured either the socialist or conservative political camp without the need to form coalitions (Figure 5.55). For this reason, policy changes were abrupt, if not self-indulgent.



Sources: Based on World Bank (2014a) data, own calculations and political information (collected starting from Wikipedia, 2014e)

Figure 5.55 Economic and political development of Spain

As Figure 5.55 shows, economic downturns were punished by the voters:

- After the early 1980s crisis, the socialists under Felipe Gonzales came to power and stayed there for a good decade (Green, 2014).
- Their government was punished late for the deep crisis around 1993 with its record unemployment rates of over 20 % even by ILO measurement.
- And the swing back to social democrats was in the course of a small reduction in economic growth, but very fast structural change, with de-industrialization rates of almost 5 %. Presumably, this change overcharged the capacity of many.

High unemployment rates especially for young people have remained a constant problem for the Spanish society. A major part of these Spanish problems is based on policies that, applied at the wrong time (e.g. socialist policies in times of increased market pressure from East European countries), helped to create economic problems. With a youth unemployment of around 50 %, only by ambitious labour market reforms and competition-enhancing efforts, growth could be restored and very high rates of unemployment be reduced (Euro Challenge, 2012).

Linkages to the world and regional economy

Compared to Western European economies, Spain is less linked by international trade, though it very much depends on its European neighbours. Since these form a major part of the world economy, also the correlation with the world trend becomes explicable.

Table 5.47 GDP (CAGR, %) coefficients of determination with Spain

R^2 (%)	World	Europe & Central Asia	USA	East Asia & Pacific	Latin America & Caribbean
1970-1990	31.4	50.3	5.9	8.7	13.9
1990-2010	51.8	76.5	39.4	3.3	3.5
1970-2010	42.9	63.5	18.7	7.8	11.3

Source: Own calculations, based on EUKLEMS (2012) and World Bank (2014a) data

Connections with Asia and Latin America are remarkably poor. Probably, just like the Netherlands, also Spain suffers from its problematic former role as a colonial power.

5.3.9 Sweden

Sweden has a very long democratic tradition. After Sweden's defeat against Russia in the Great Northern War and the death of the warrior king Karl XII in 1718, the Swedish parliament and council were strong enough to introduce a new constitution that abolished royal absolutism and put power in the hands of parliament.

Sweden industrialized late, industry did not begin to grow until the 1890s. Then it developed very rapidly between 1900 and 1930. Sweden became one of Europe's leading industrial nations after World War II. The labour movement, like the women's movement, gained ground early and shaped the Swedish society. Plans for a welfare state were conceived already in the 1930s after the Social Democrats rose to power, and put into effect after World War II (Swedish Institute, 2014a).

Since 1814, Sweden has not been involved in any war. Although basing its security on a strong national defence, Sweden pursued a policy of non-alignment in peacetime and neutrality in wartime also in both world wars. Nonetheless, Sweden joined the UN in 1946 and has participated in various NATO peacekeeping missions.

Sweden joined the EU on 1 January 1995. In a national referendum in 2003, a majority of the country's voters voted not to join the Euro (Swedish Institute, 2014a).

5.3.9.1 Structural shifts

Some key facts

With a population density of only 22.9/km² (2010), Sweden is a sparsely populated country and one of the world's northernmost states (Swedish Institute, 2014b).

While in the late 19th century, still more than 90 % of the Swedes were employed in agriculture and poverty led to emigration of a two-digit percentage of the population, the primary sector does not play a prominent role in the Swedish economy anymore, and Sweden has become one of the richest countries in the world. Meanwhile, it has transformed into a service society, but it also has retained a sizeable share in manufacturing employment (Table 5.48).

Table 5.48 Overview on the macro-economic development of Sweden

Year	**Popu-lation**	**GDP p/c**	**Exports**	**Trade**	**Unem-ployment**	**Agri-culture**	**Manufacturing (VA)**		**Fuel exp.**	**Services**	**KIBS**
	mn	*k USD*	*% of GDP*	*% of GDP*	*% of active*	*% of empl.*	*% of empl.*	*bn USD*	*% of ME*	*% of empl.*	*% of empl.*
1973	8.1	26.6	26.9	3.5	2.5	6.8	26.8	40.9	0.9	57.4	6.3
1988	8.4	34.9	32.1	2.2	1.8	3.9	21.5	57.1	2.1	67.6	9.5
1993	8.7	33.4	32.7	3.7	9.1	3.8	18.0	47.0	3.4	71.8	10.4
2008	9.2	49.6	53.5	6.8	6.2	2.2	15.4	70.5	7.2	75.2	15.0
	CAGR (%)	*CAGR (%)*	*CAGR (%)*	*Δ 5 y*	*Δ 5 y*	*CAGR (%)*	*CAGR (%)*	*CAGR (%)*	*average*	*CAGR (%)*	*CAGR (%)*
73-88	0.2	1.8	1.2	-0.4	-0.2	-3.5	-1.4	2.3	3.1	1.1	2.8
88-93	0.7	-0.9	0.4	1.5	7.3	-0.8	-3.5	-3.8	2.9	1.2	1.9
93-08	0.4	2.7	3.3	1.0	-1.0	-3.7	-1.0	2.7	3.4	0.3	2.4
73-08	0.4	1.8	2.0	0.5	0.5	-3.2	-1.6	1.6	3.2	0.8	2.5

Sources Based on World Bank (2014a) data, constant 2010 prices

Volatility of change

The Swedish results are presented in Table 5.49. The big notch around 1993 results in a very high volatility in the transition period, while in both other sub-periods, the values are relatively low, standing for a smooth transition from industrial to service society. The notch requires deeper causal analysis in the following sub-chapters.

Table 5.49 CAGR (%) volatility of de-industrialization indicators (Sweden)

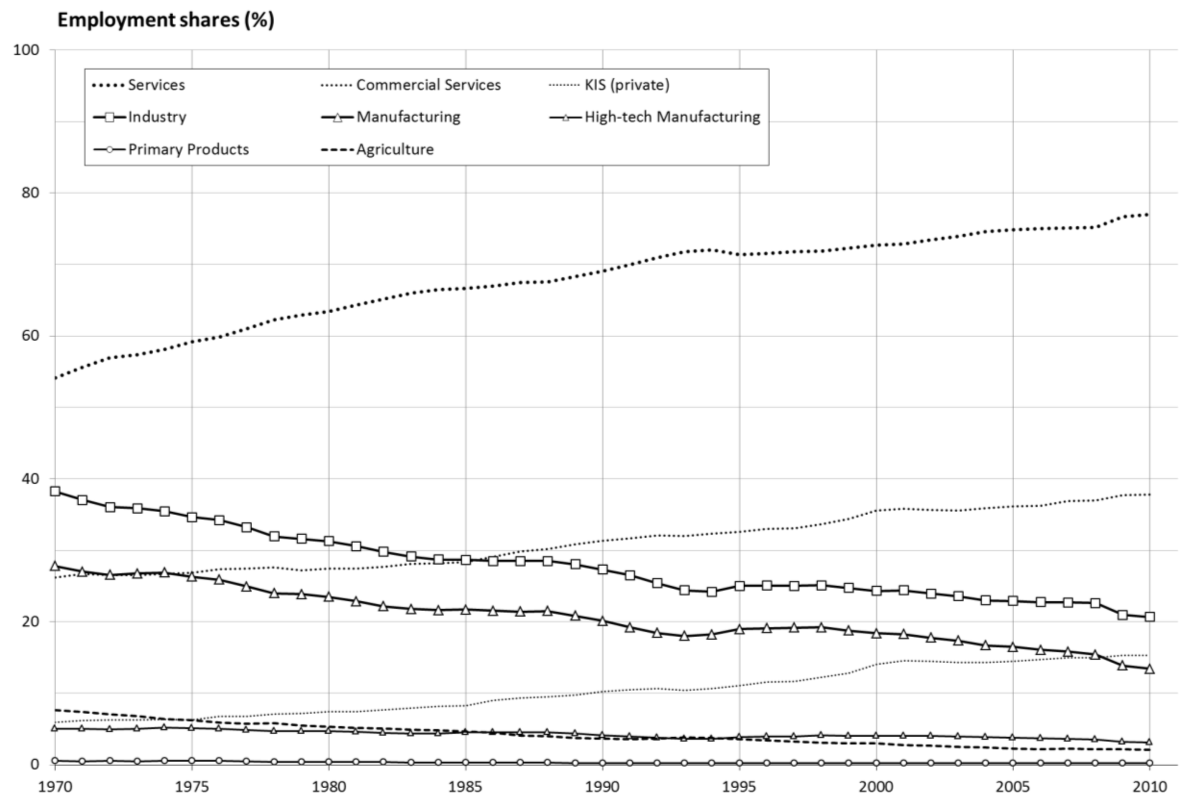
Years	υ_T	$\sigma_{1,T}$ manu. empl.	$\sigma_{2,T}$ unem-ployment	$\sigma_{3,T}$ trade balance	$\sigma_{4,T}$ GDP p/c	$\sigma_{5,T}$ manu. output	$\sigma_{6,T}$ primary prod. exp.	$\sigma_{7,T}$ agricult. empl.	$\sigma_{8,T}$ KIBS empl.
78-88	**7.81**	0.70	0.98	1.88	0.61	2.03	0.30	0.62	0.68
88-98	**16.47**	1.47	3.79	3.07	1.26	3.81	0.20	1.95	0.91
98-08	**9.39**	1.25	1.99	1.10	0.37	1.91	0.42	0.66	1.69
78-08	**13.16**	1.12	3.06	2.21	1.14	2.68	0.37	1.39	1.20

Source: Own calculation, evaluation based on (EU KLEMS, 2012) and World Bank (2014a) data

Sectoral changes

Employment

Structural shifts have altogether been realized rather smoothly, with a certain discontinuity, especially a downward bump in manufacturing employment, in the transition years after 1990 (Figure 5.56). The extreme size of the public service sector, i.e. the difference between total and commercial services, is a Swedish peculiarity.

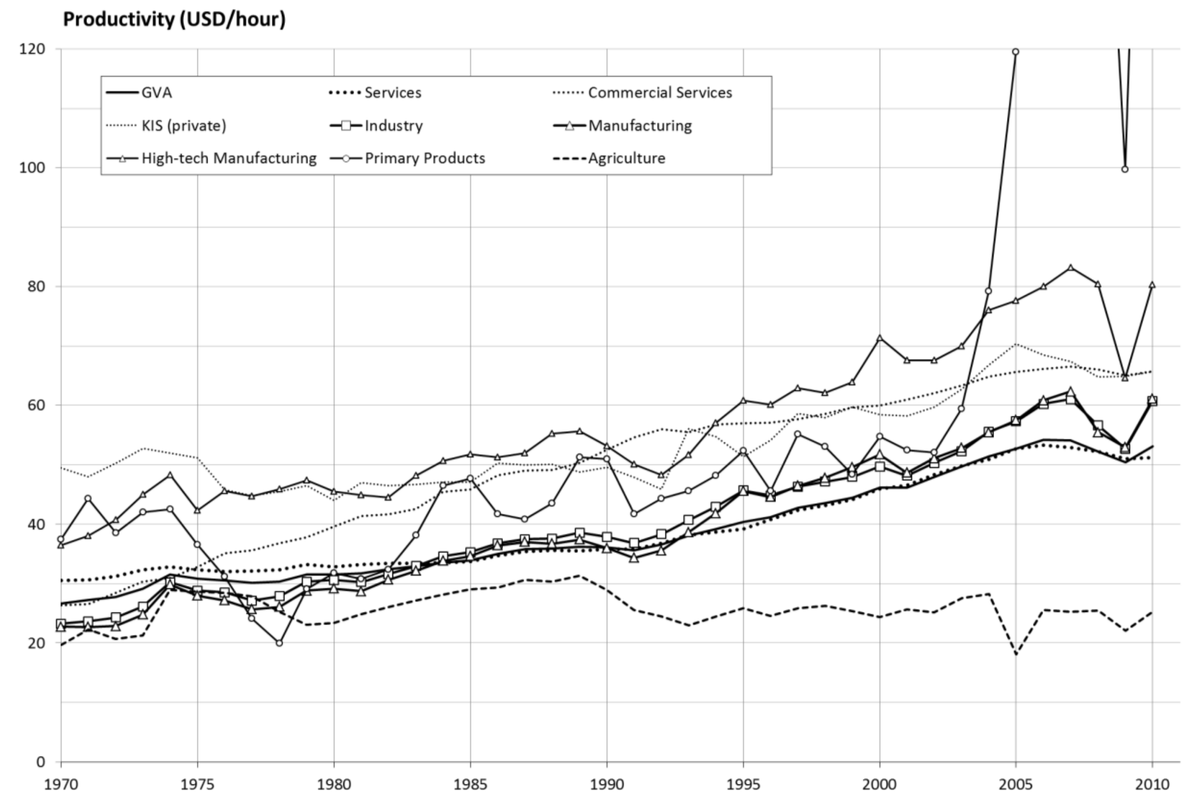


Source: Own graph, based on World Bank (2014a) and national employment data

Figure 5.56 Structural change of Sweden

Productivity

Also very peculiar with respect to industry and services is the Swedish development of productivity (Figure 5.57). Industrial productivity increased rapidly and constantly since the 1970s. High-tech manufacturing has clearly topped the already very high average sectoral productivity. As the authors of a McKinsey study put it: “It is primarily the international sector, and especially the manufacturing industry, that has been the main engine of growth in the Swedish economy” (Nauclér, Tyreman, & Roxburgh, 2013, p. 9).



Source: Own graph, based on EU KLEMS (2012) data

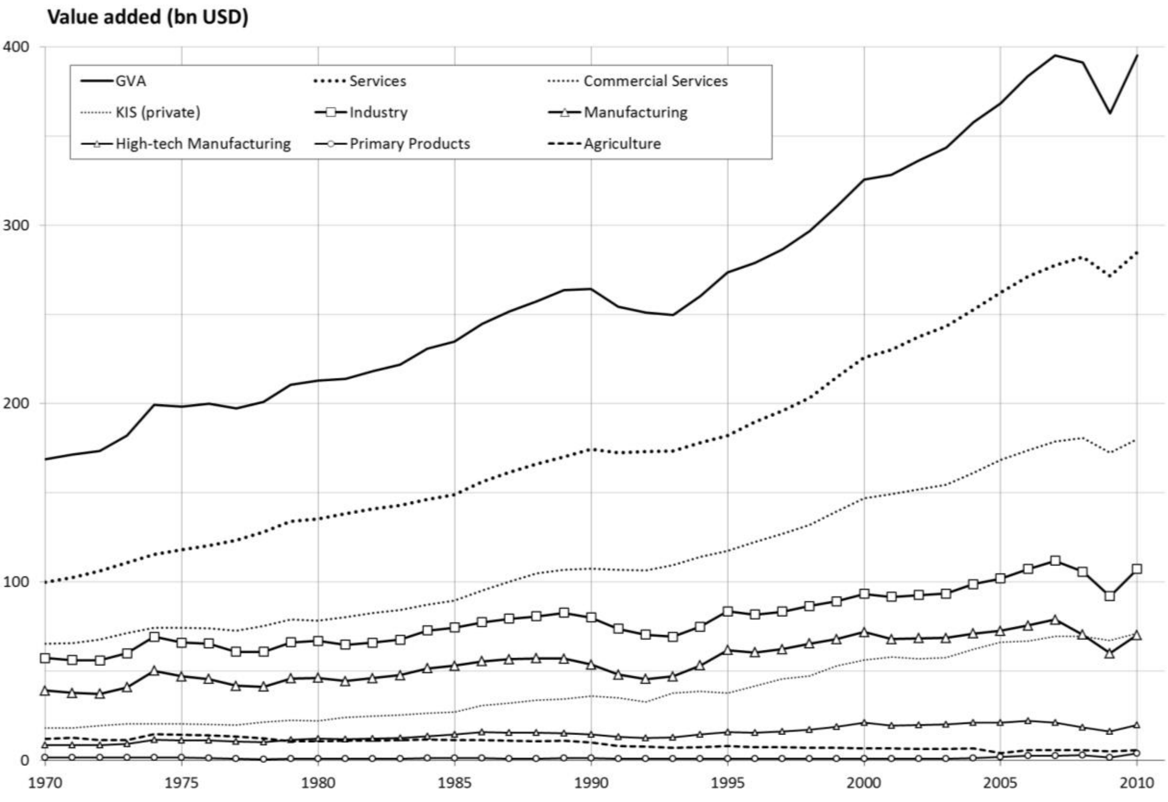
Figure 5.57 Sectoral productivity in Sweden

The productivities of government and commercial services are very far apart. While commercial services including KIBS are highly productive (between manufacturing and high-tech manufacturing), the service total is below manufacturing. This means that the public service sector is far less productive than manufacturing. The large public services sector had a productivity of only 36.5 USD/hour in 2010, so it ranked between manufacturing and agriculture. This situation is unique among the analysed mature country group. And it is not just over-ambitious management speak when the afore-mentioned McKinsey authors state the following: “With an ambitious approach, there are good reasons to believe that productivity in the public sector could be raised by 25-30 per cent over the next ten years (while maintaining the same level of quality)" (Nauclér, Tyreman, & Roxburgh, 2013, p. 9).

Yet, the question remains whether the Swedish society will decide to stick to their traditions or move to a more rigid style of government with a streamlined public sector.

Output

The graph presenting the sectoral total value added (Figure 5.58) shows a constant increase of all economic sectors except agriculture. Only in crisis years around 1975 (oil crisis), after the end of the Soviet Union which was a sizeable trade partner of Sweden, and in the world economic crisis from 2008, Sweden had to face small drawbacks.



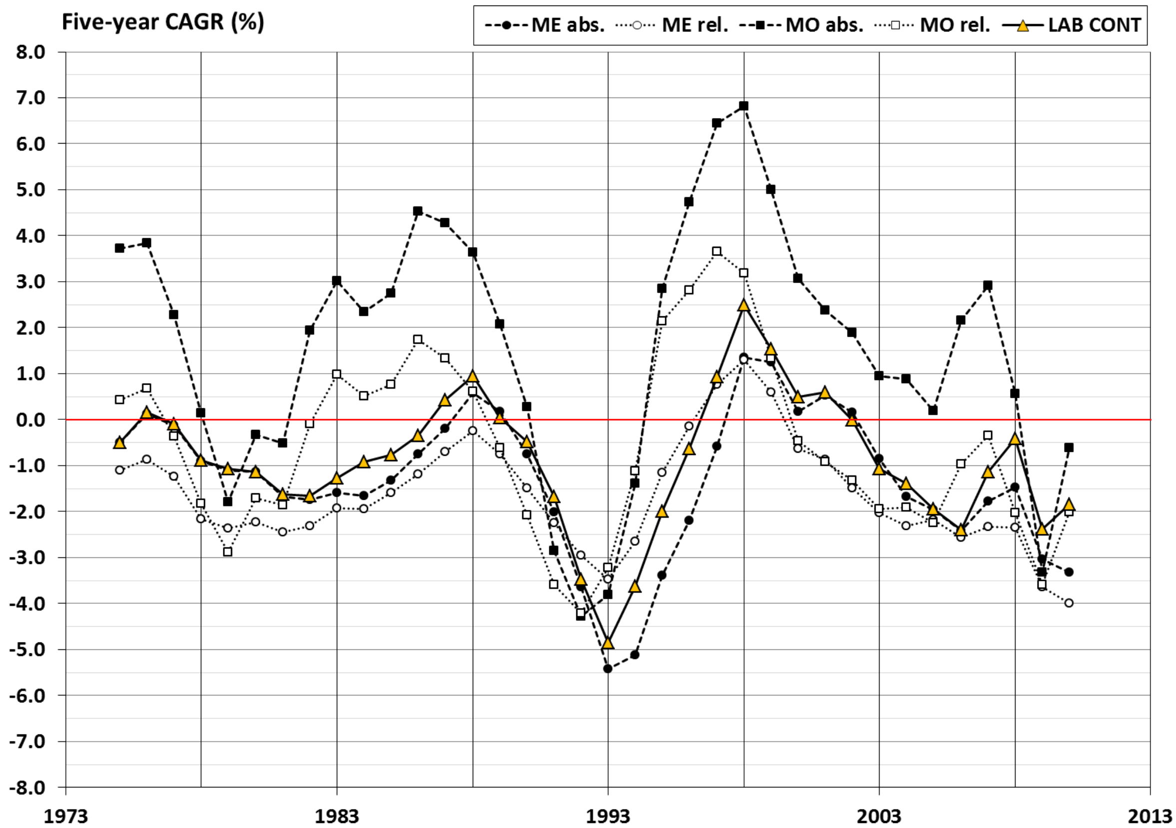
Source: Own graph, based on EU KLEMS (2012) data

Figure 5.58 Sectoral gross value added in Sweden

5.3.9.2 Economic scenarios

Key indicators

When turning to the development of Sweden's indicators of de-industrialization (Figure 5.59), the first thing that strikes the observer is the very deep notch in the middle, a deep recession of the manufacturing sector. Apart from this phase, the Swedish industry performed fairly well, with a positive development of output almost over the full investigated period.



Source: Own graph, based on own calculations drawing from EU KLEMS (2012) data

Figure 5.59 Indicators of de-industrialization (Sweden)

Table 5.50 Correlations of de-industrialization indicators (Sweden)

R^2 of 5y CAGR (%)	ME (abs.)	ME (rel.)	MO (abs.)	MO (rel.)	LAB CONT
ME (abs.)	100.0	55.6	44.7	18.8	88.6
ME (rel.)	55.6	100.0	71.9	63.8	71.9
MO (abs.)	44.7	71.9	100.0	86.8	62.5
MO (rel.)	18.8	63.8	86.8	100.0	38.4
LAB CONT	88.6	71.9	62.5	38.4	100.0

Source: Own calculation of coefficients of determination, based on EU KLEMS (2012) data

The labour content was well below the output figures, so the productivity, apart from only a few critical years, rose very much.

The following is concluded from the chart and the correlation factors (Table 5.50).

- **LAB CONT:** The total number of working hours followed the economic cycle. In boom years, they even increased despite of ever-rising productivity, so there were periods of industrialization.
- **ME (abs.)**: Unlike in most other countries, the factor of absolute manufacturing employment was most of the time a little below the labour content, so the average workload slightly increased over time. Since the direction of change correlated well, the respective coefficient of determination reached 88.6 %.
- **ME (rel.)**: Apart from the short boom period 1997-99, relative manufacturing employment constantly declined due to parallel stronger growth of the service sector.
- **MO (abs.)**: Over many years, the Swedish manufacturing industry could even increase its position by its high productivity and a high share of high-tech output. In the years from 1998, the manufacturing growth slowed down.
- **MO (rel.)**: In boom years, Swedish manufacturing even increased its relative value for the Swedish economy. Only over the last decade of the investigated period, this position became eroded.

Summarizing these findings, this is concluded:

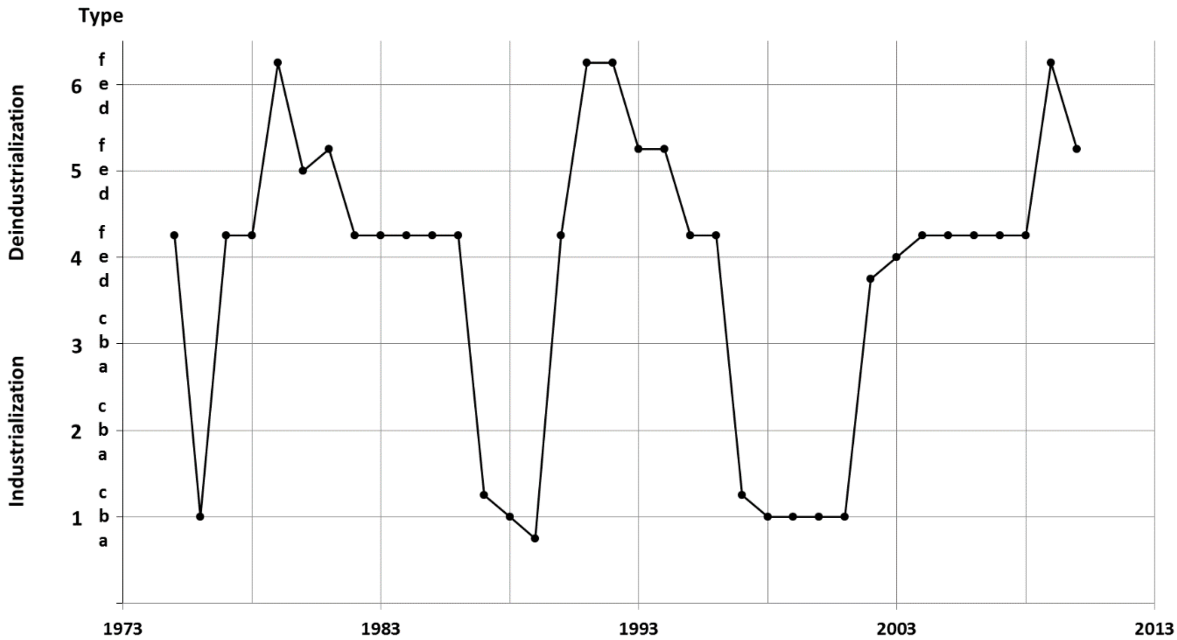
- Sweden de-industrialized in a sociological sense, but since its industry grew in output at the same pace and was successful in exporting, it is still of high importance for the Swedish economy.
- The Swedish manufacturing output grew clearly faster than its population, so the output per person increased (cf. Table 5.48, p. 216).
- The Swedish manufacturing sector has kept its international position on the basis of productivity rises and latest technology. High-tech manufacturing played an increasing role. This notwithstanding, already in the years before the world recession 2008/9 which also hit the Swedish economy, productivity rises had more and more faded, so the bright picture became somewhat troubled.

Scenarios

When analysing the Swedish scenarios of de-industrialization (Figure 5.60), there is one unique tendency not observed in any other country of the sample group. Apart from very rare exceptions, the individual workload was always raised! In phases of de-industrialization, f-type scenarios were pursued with the sole exception of 1980 (5e type). In phases of industrialization, this was also the case, since 1b type scenarios or even the 1c type were pursued, also with one single exception (1a type in 1989).

Sweden was a country with exceptionally low individual workload before 1970. Only on this basis, the outlined development was possible.

In crisis years, even 6-type scenarios occurred, meaning that the output fell faster than the labour content, so productivity was reduced. But even then, the Swedes raised the workload per employee!



Source: Own graph, based on own calculations drawing from EU KLEMS (2012) data
Categories as illustrated in Figure 4.4, p. 101

Figure 5.60 Economic scenarios (Sweden)

5.3.9.3 Application of the eclectic model of de-industrialization

A summary of the Swedish results is rendered in Table 5.51. It confirms that Sweden has de-industrialized most of the time and with overall ambivalent and quite often positive results. Yet, there were certain industrial boom years when Sweden did not de-industrialize and certain critical years when no more shift to high-tech could be achieved. Moreover, also no shift to KIBS was found in the last semi-decade.

During the early 1990s recession, there were even warning signs of market failure and lacking technical maturity and a negative type development. These could be overcome in subsequent years.

Table 5.51 De-industrialization of Sweden

Year	De-industriali-zation	Type	Technical maturity	Failure	Shift to		
					Hi-tech	KIBS	Primary products
73-08	yes	ambivalent	yes	no	yes	yes	no
73-88	yes	positive	yes	no	yes	yes	no
73-78	yes	ambivalent	yes	no	yes	yes	no
78-83	yes	positive	yes	no	yes	yes	no
83-88	no						
88-93	yes	negative	ambiguous	ambiguous	no	yes	no
93-08	yes	positive	yes	no	yes	yes	no
93-98	no						
98-03	yes	positive	yes	no	no	yes	no
03-08	yes	positive	ambiguous	no	no	no	no

Source: Own compilation, evaluation based on EU KLEMS (2012) and World Bank (2014a) data

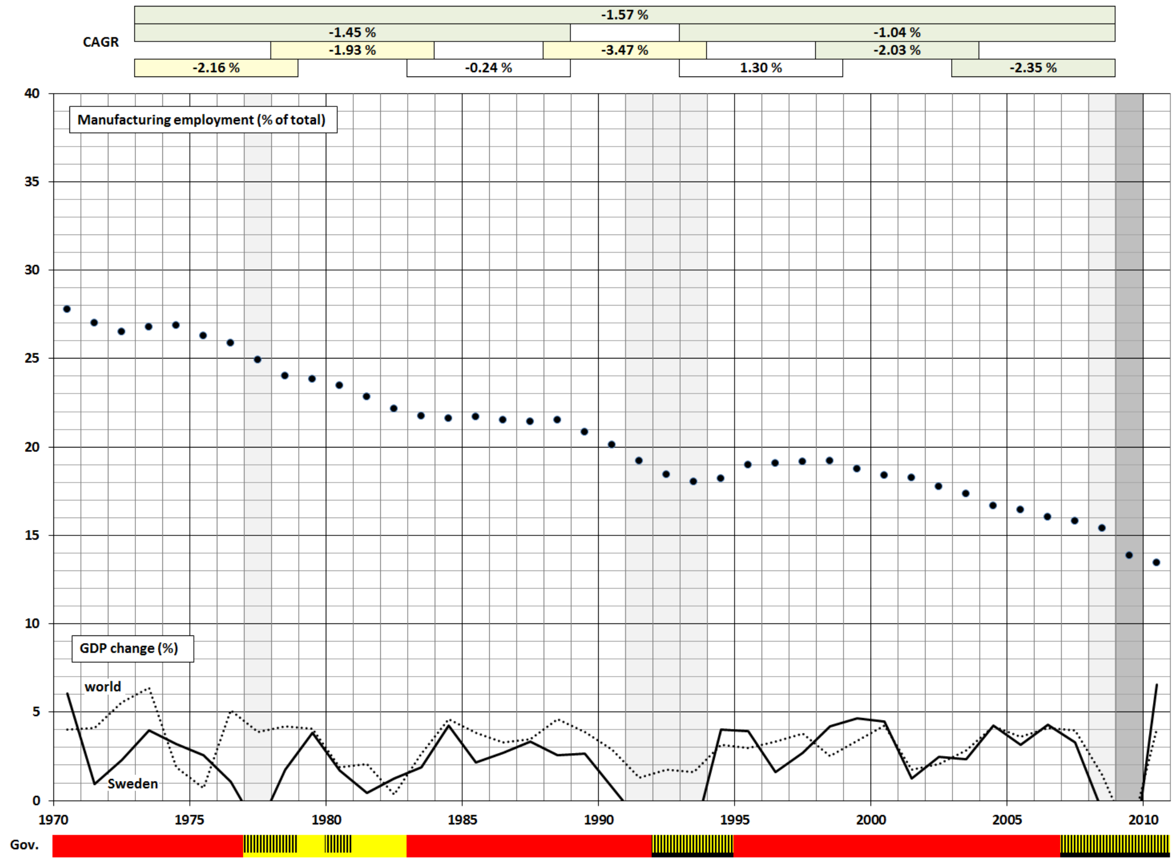
5.3.9.4 Economic and political explanations for structural changes

National trends and influences

After the long post-war period in which the social democrats turned Sweden into a welfare state, this continuity was interrupted for the first time in 1976. According to the assessment of the Swedish Institute, a public agency aiming at promoting Swedish issues worldwide: “The economic crisis of the early 1970s broke the long hegemony of the Social Democrats.” (Swedish Institute, 2014a).

After a six-year non-socialist coalition, the social democrats returned to power in late 1982 under Olof Palme as prime minister. He was killed in the streets of Stockholm on February 28, 1986, an assassination still unsolved (Walker, 2014). It shocked the Swedish society which had not known such actions of political violence for 200 years and had also been omitting warfare.

Also the second change for a non-socialist government in 1991 followed an economic down-swing (cf. Figure 5.61). But the leader of the Moderate Party, Carl Bildt, did not succeed in overcoming the crisis, so after three years, his government was replaced by a social democrat minority government. The social democrats remained in power another twelve years and made Sweden part of the European Union in 1995 (Swedish Institute, 2014a).



Sources: Based on World Bank (2014a) data, own calculations and political information (gathered starting from Wikipedia, 2013)

Figure 5.61 Economic and political development of Sweden

In 2006, a centre-right coalition with the Moderate Party as the main winner for the first time succeeded in a non-critical state of the Swedish national economy.

When analysing the findings from Figure 5.61, it becomes clear that the economic downswings led to shake-out effects in the manufacturing sector which could not fully be recovered after the crisis. Since the crisis years were managed by centre-right governments – even (by coincidence) the 2008 crisis saw no socialists in power – there is a clear correlation between their rule and high rates of de-industrialization. These intervals interrupted the relatively smooth transition from industrial to knowledge society that took place in Sweden over the last forty years.

Linkages to the world and regional economy

Table 5.52 reveals that while “no man is an island, entire of itself” (John Donne), the Swedish economy was very peculiar throughout the first two decades under investigation.

In fact, it was (almost) an economic island, with very little correlation to the world and regional economies, even the European.

Table 5.52 GDP (CAGR, %) coefficients of determination with Sweden

R^2 (%)	World	Europe & Central Asia	USA	East Asia & Pacific	Latin America & Caribbean
1970-1990	5.1	13.6	1.4	1.0	9.9
1990-2010	75.6	75.9	47.9	16.8	17.7
1970-2010	35.8	47.3	17.4	5.2	11.2

Source: Own calculations, based on EUKLEMS (2012) and World Bank (2014a) data

After Sweden joined the EU in 1995, this situation changed completely. Very soon, Sweden became a dedicated export country, with an economy highly correlated with the economic circles of the world and Europe.

5.3.10 United Kingdom

The United Kingdom, the home country of the industrial revolution, today is the most de-industrialized country among the investigated group of mature states. While one might suspect at first glance that this is a natural outflow of the industrial life cycle, a closer look at British industrial development reveals a different reality. The United Kingdom had already lost global industrial leadership over the last half of the 19th century when it could not follow the momentum of the US economy and the refined methods of German engineering that emerged before World War I (Przywara, 2006). After World War II, the United Kingdom experienced decades of full employment, but of comparative economic decline (Greasley & Oxley, 1997). In the second phase of growing globalization starting from the 1970s, Britain found itself lacking competitiveness mainly in terms of productivity in most of its industrial sectors (Francis, 1992). The societal stakeholders could not agree on a cure and the controversy became more and more radical (cf. the scenario described by Smith, Speed, Tucker, & June, 1986). Finally, this situation escalated in a radical shake-out executed under prime minister Margret Thatcher after her coming to power in 1979 (van Wyngaarden, 2012).

A number of societal pre-conditions contributed to these developments:

- lacking connection of industry and technical science (Przywara, 2006),
- remaining class character of the British society (Niedhart, 1995),

- strong connection of landed and moneyed interests (Niedhart, 1995),
- majority voting system, supporting strong controversy and radical policy swings.

The early phase of industrialization, i.e. development of steel and textile industries, was driven by inventors that were working on a mere trial-and-error basis. Some were craftsmen, sometimes pure amateurs with an interest in mechanics and a good business instinct. While all of this sufficed in the early years of machine building focusing on heavy industries, the more sophisticated tasks of mechanical engineering required a sound understanding of mathematics and physics, e. g. for calculating the pitch lines and loads of gearings. Such knowledge was available only at technical universities, a French tradition immediately and consequently picked up especially in Germany, but not in the United Kingdom (Przywara, 2006).

In a country with a class structure, F. W. Taylor's seed of consequent separation of planning and thinking units and those that only carried out tasks without putting additional thought on it fell on very fruitful soil. With the paradigm shift towards 'lean production', more intellectual participation was required on all levels of a company. For this, British workers (unlike e.g. the German with their traditionally strong dual education system) were neither prepared by training nor culturally (Bailey, Kobayashi, & MacNeill, 2008).

Moreover, the interests of the British elites were not tied to industry, but to profitable investment in general. Without state pressure or subsidies, they would not back ailing branches of national industry but rather invest abroad and/or in more prosperous sectors like North Sea oil and gas or ICTs (Backhouse, 2002). Finally, the shift from labour to conservatives in 1979 opened these gates.

5.3.10.1 Structural shifts

Some key facts

With a population density of 259.4/km² (2010), the United Kingdom is relatively densely populated. The UK has very consequently turned into a service economy, with a high share of KIBS, very little manufacturing and only a tiny fraction of agricultural employment (Table 5.53). On this basis, the UK could raise its living standard significantly over the last four decades.

Industrial changes were carried out very rapidly, with a high rate of de-industrialization that, unlike in all other countries in the control group, was even measured in terms of output over the whole investigated period. North Sea oil and gas have contributed significantly to the export balance of the UK.

Table 5.53 Overview on the macro-economic development of the United Kingdom

Year	Population	GDP p/c	Exports	Trade	Unemployment	Agriculture	Manufacturing (VA)		Fuel exp.	Services	KIBS
	mn	*k USD*	*% of GDP*	*% of GDP*	*% of active*	*% of empl.*	*% of empl.*	*bn USD*	*% of ME*	*% of empl.*	*% of empl.*
1973	56.2	18.3	23.1	-2.2	2.7	2.2	24.8	277.1	3.0	58.3	9.2
1988	56.9	24.5	22.9	-3.2	8.5	1.9	16.5	268.9	7.1	70.3	13.2
1993	57.7	25.8	25.6	-0.1	10.2	1.7	12.5	239.3	7.1	74.0	15.1
2008	61.8	38.4	29.4	-2.2	5.6	1.1	7.9	213.3	13.4	82.8	20.9
	CAGR (%)	*CAGR (%)*	*CAGR (%)*	*Δ 5 y*	*Δ 5 y*	*CAGR (%)*	*CAGR (%)*	*CAGR (%)*	*average*	*CAGR (%)*	*CAGR (%)*
73-88	0.1	2.0	0.0	-0.3	1.9	-1.0	-2.7	-0.2	11.6	1.3	2.4
88-93	0.3	1.0	2.2	3.0	1.7	-2.6	-5.4	-2.3	7.0	1.0	2.7
93-08	0.5	2.7	0.9	-0.7	-1.5	-2.4	-3.0	-0.8	7.9	0.8	2.2
73-08	0.3	2.1	0.7	0.0	0.4	-1.9	-3.2	-0.7	9.5	1.0	2.4

Sources Based on World Bank (2014a) data, constant 2010 prices

Volatility of change

The British results are shown in Table 5.54. They show that due to strong shifts in unemployment, the trade balance and also manufacturing and agricultural output, the total volatility of the United Kingdom is comparatively high. The transition from industrial to service society has not been free from stress.

Table 5.54 CAGR (%) volatility of de-industrialization indicators (UK)

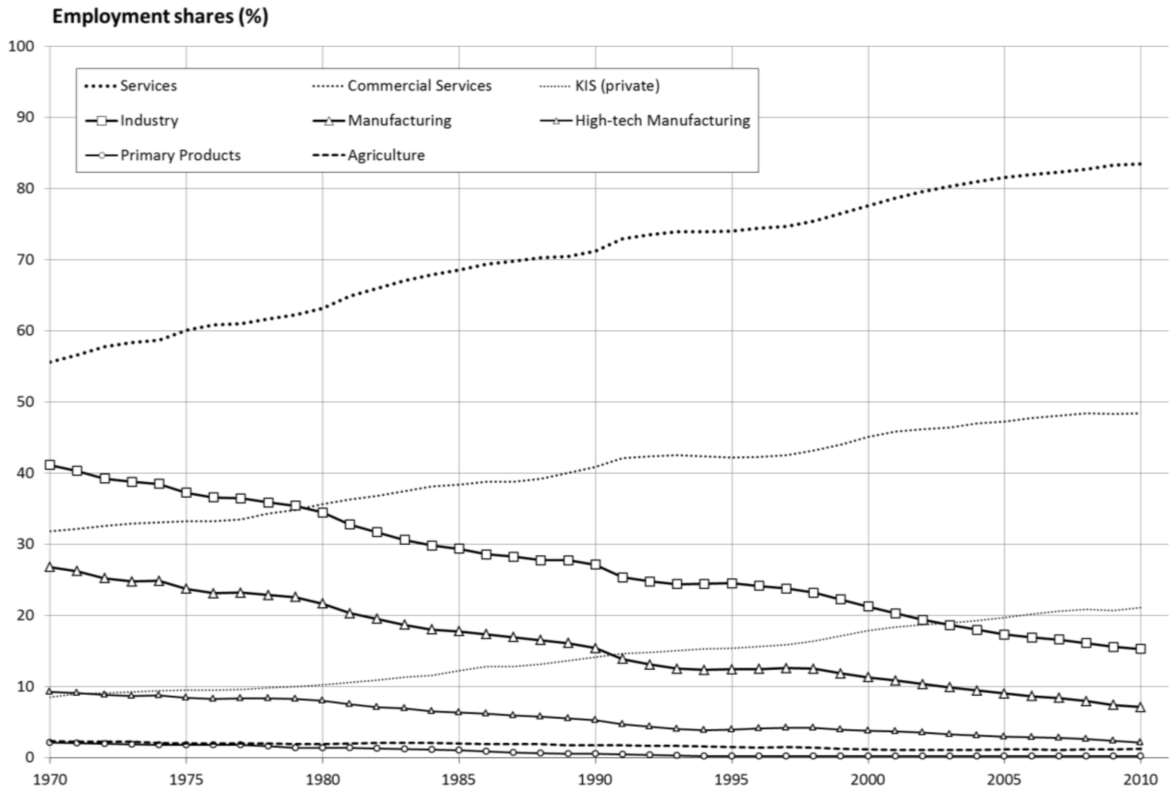
Years	υ_T	$\sigma_{1,T}$ manu. empl.	$\sigma_{2,T}$ unemployment	$\sigma_{3,T}$ trade balance	$\sigma_{4,T}$ GDP p/c	$\sigma_{5,T}$ manu. output	$\sigma_{6,T}$ primary prod. exp.	$\sigma_{7,T}$ agricult. empl.	$\sigma_{8,T}$ KIBS empl.
78-88	**13.62**	0.90	3.02	3.21	1.04	2.80	0.50	1.29	0.85
88-98	**11.44**	1.75	2.32	2.60	1.01	2.29	0.20	0.58	0.69
98-08	**10.31**	1.55	1.56	1.10	0.54	1.72	0.40	2.87	0.58
78-08	**13.88**	1.38	3.10	2.56	0.95	2.46	0.53	2.16	0.72

Source: Own calculation, evaluation based on (EU KLEMS, 2012) and World Bank (2014a) data

Sectoral changes

Employment

Structural shifts resulted in high rates of unemployment from the mid-1970s. This problem can in summary be attributed to adaptive difficulties in the course of globalization (see above). It was only solved by millennium by a combination of success factors in the service sector (cf. 5.3.10.4, p. 235) (Baddeley, 2008).



Source: Own graph, based on World Bank (2014a) and national employment data

Figure 5.62 Structural change of the United Kingdom

Britain, once the 'workshop of the world', had become a country with a chronically negative trade balance – mostly due to lacking competitiveness of its manufacturing sector (Kitson & Michie, 2014).

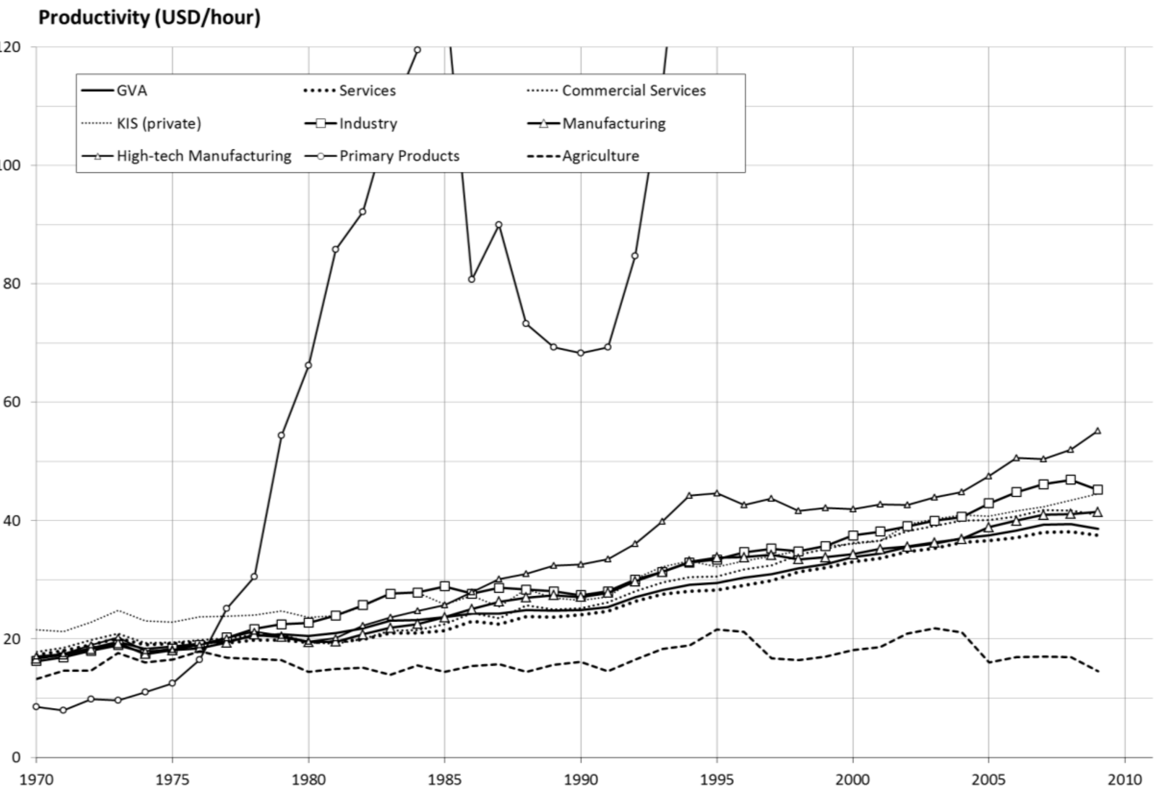
When looking into the details of the development of sectoral employment, it is quite striking that sectoral growth and decline have happened quite constantly over time (Figure 5.62). There are certain deflections, bumps in the process, but the general trends were stable over time.

While the primary industries played a certain role in terms of employment in the 1970s and 1980s, this is no longer the case today. Employment was mainly in the traditional mining industries which served the domestic market while exports were realized on the basis of oil and gas from North Sea fields.

Productivity

The shift of primary products from coal to gas is very visible in terms of productivity (Figure 5.63, Figure 5.64). Being lower than all other sectors in the early 1970s, it went almost straight up with the production of North Sea oil.

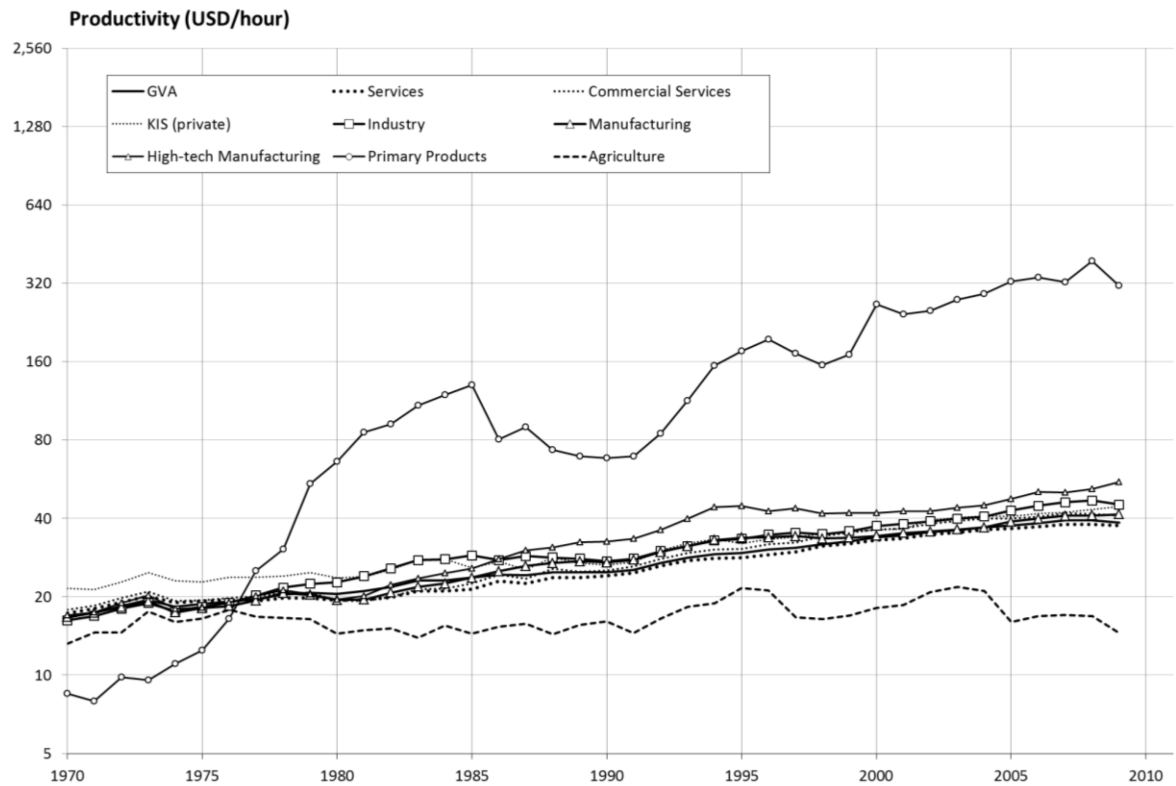
While agriculture stagnated, all other sectors went up more or less in parallel. The high-tech manufacturing sector showed the best performance, services in general the worst. This is a possible explanation for the observed sectoral shift from industry to services which absorbed the decruited industrial workforce.



Source: Own graph, based on EU KLEMS (2012) data

Figure 5.63 Sectoral productivity in the United Kingdom

The combination of high sectoral capital demand and volatility of oil and gas prices led to a productivity that cannot be displayed adequately on the scale utilized in Figure 5.63. Thus, in Figure 5.64 a log y-axis is introduced. It helps illustrating the extreme productivity of primary products. But in comparison to the Dutch oil and gas industry (Shell, cf. Figure 5.45, p. 197), even these values are rather low.



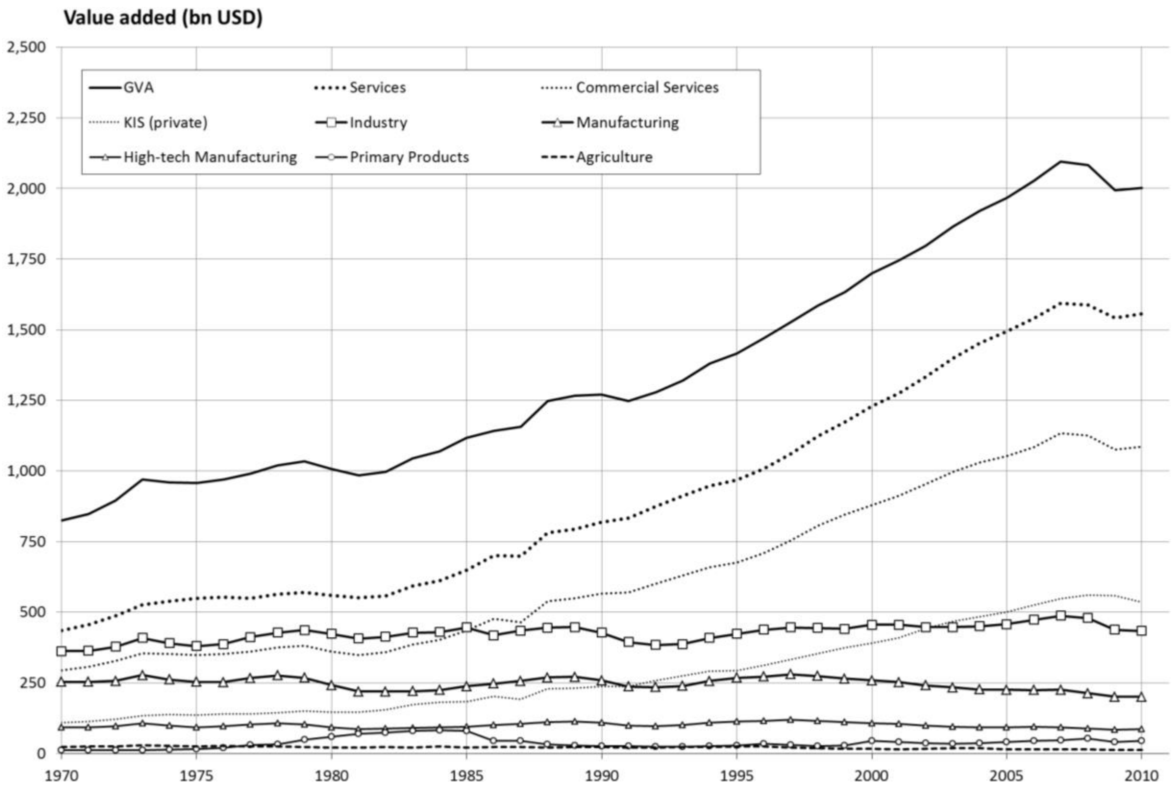
Source: Own graph, based on EU KLEMS (2012) data

Figure 5.64 Sectoral productivity in the United Kingdom (log y-axis)

Output

When turning to the total value added (Figure 5.65), it becomes clear that the British economy stagnated for around a decade after the oil crisis. Only from around 1982, it managed to return to a pattern of growth. This growth was entirely driven by services, especially commercial services, while all other sectors stagnated or even declined.

There is a small exception concerning the North Sea oil driven boom of the primary sector from the late 1970s. In parallel, a significant decline in the manufacturing was perceived, so there is the reasonable suspicion of a crowding-out effect.



Source: Own graph, based on EU KLEMS (2012) data

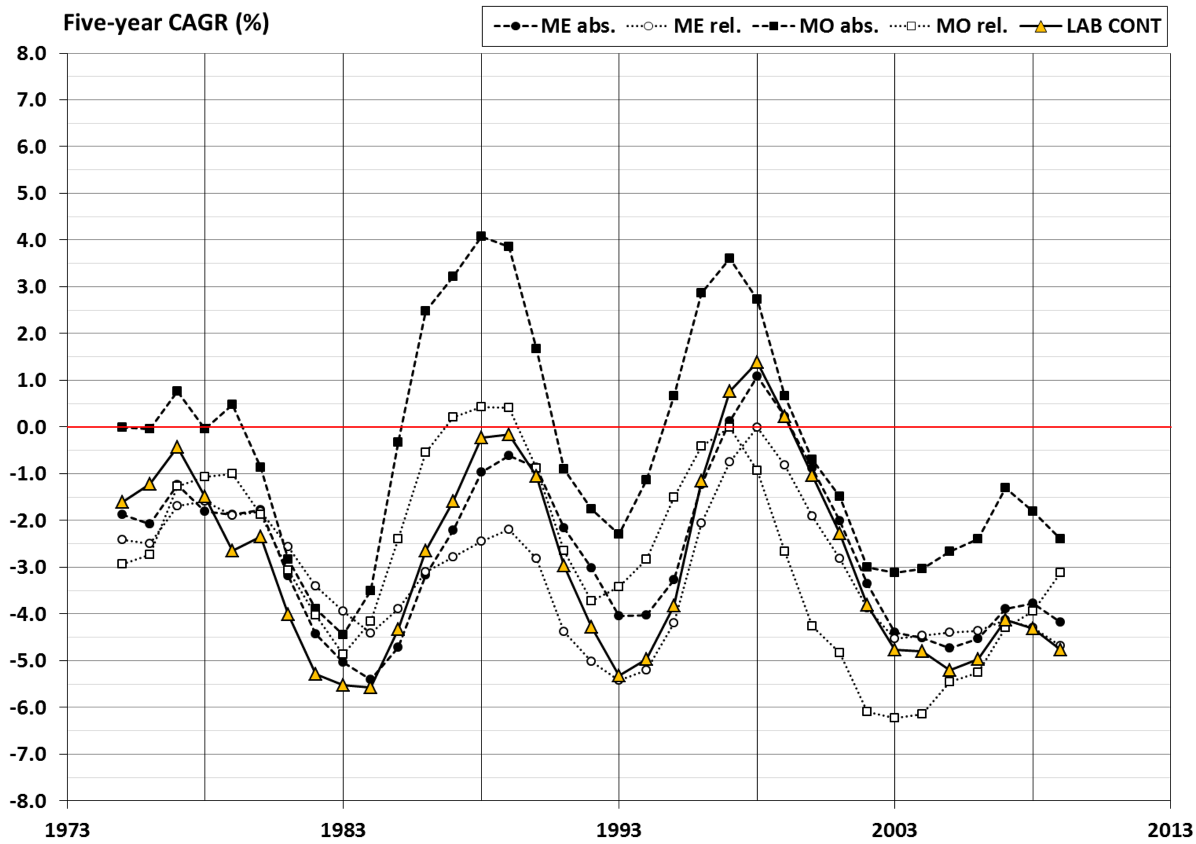
Figure 5.65 Sectoral gross value added in the United Kingdom

5.3.10.2 Economic scenarios

Key indicators

The key indicators for de-industrialization of the United Kingdom show a remarkably stable trend over the last decades (Figure 5.66). All indicators are pretty well correlated, so there is a remarkable stability in British industrial policies. There are significant tidal moves, yes, but the mean values have remained constant over the roughly three short economic cycles, i.e. up- and down-swings. While output sank by approximately a little less than 1 % p.a., the country de-industrialized a good 3 % p.a. in relative employment (c.f. Table 5.53, p. 227).

Since the output indicator was always higher than the one of labour content, Britain constantly gained in productivity.



Source: Own graph, based on own calculations drawing from EU KLEMS (2012) data

Figure 5.66 Indicators of de-industrialization (United Kingdom)

Table 5.55 Correlations of de-industrialization indicators (UK)

R^2 of 5y CAGR (%)	ME (abs.)	ME (rel.)	MO (abs.)	MO (rel.)	LAB CONT
ME (abs.)	100.0	74.2	60.5	43.7	93.7
ME (rel.)	74.2	100.0	40.8	34.3	78.8
MO (abs.)	60.5	40.8	100.0	79.7	70.3
MO (rel.)	43.7	34.3	79.7	100.0	48.8
LAB CONT	93.7	78.8	70.3	48.8	100.0

Source: Own calculation of coefficients of determination, based on EU KLEMS (2012) data

The following is concluded from the UK chart (Figure 5.66) and the correlation factors (Table 5.55):

- **LAB CONT:** The total number of working hours followed the economic cycle. Only in the 1997-99 boom years, they increased, so there were periods of industrialization.
- **ME (abs.)**: The absolute manufacturing employment indicator followed the labour content to a large extent, but not fully. The correlation factor amounts to 93.7 %. Yet, in boom times, the workload was a little bit increased, while in times of recession, employment did not fall as fast as the labour content, so some unemployment was

avoided by reductions in working hours. This effect was most prominent throughout the years from 2002.

- **ME (rel.)**: Even in boom years, relative employment remained in constant decline.
- **MO (abs.)**: Over many years, the British manufacturing industry could keep its position by neutralizing downswings by upswings. After a short start of recovery, in the course of the 2008-10 economic crisis, the sector failed to fully recover and instead fell back further.
- **MO (rel.)**: In comparison to the service sector, British manufacturing continuously lost in importance for the national economy apart from the three small boom years 1987-89.

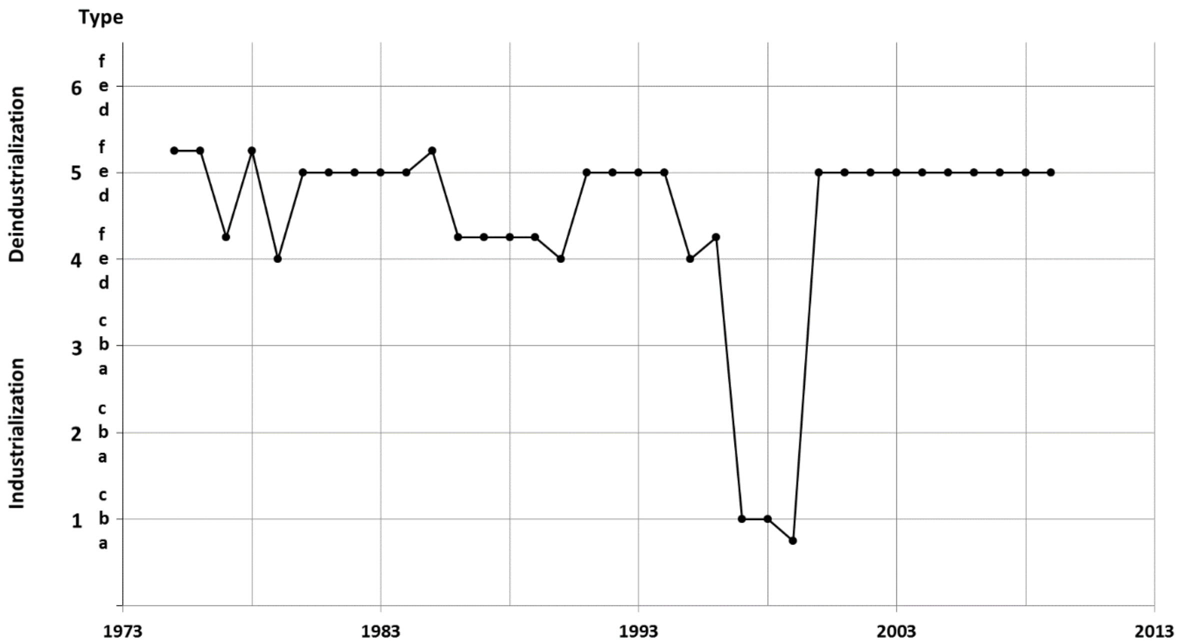
Summarizing these findings, this is concluded:

- The United Kingdom de-industrialized heavily in a sociological sense. Also its industry lost in output in recent years, this effect became clearly visible and non-cyclic. Britain, unlike e.g. Germany or Sweden, never returned to a positive trade balance and relied on exports only to a comparatively limited extent.
- The British manufacturing output declined while its population grew, so the output per person has significantly decreased (cf. Table 5.53, p. 227).
- The British manufacturing sector has not kept its international position despite of its significant productivity rises and latest technology.

Scenarios

A clear picture is rendered by the graphical analysis of scenarios rendered in Figure 5.67. The prevailing scenario is the 5e type, i.e. a scenario characterized by very ambitious productivity gains, but yet resulting in reduced output. The total labour content reductions are realised by parallel reductions of manufacturing workload and employment.

In the mid-1980s boom years, the British employers tended to rather increase the workload than to employ more personnel (4f type).



Source: Own graph, based on own calculations drawing from EU KLEMS (2012) data
Categories as illustrated in Figure 4.4, p. 101

Figure 5.67 Economic scenarios (United Kingdom)

5.3.10.3 Application of the eclectic model of de-industrialization

The results of modelling are presented in Table 5.56. It shows that most of the time, the UK has very much de-industrialized. Since finally, the UK arrived at serious increases in national income and an unaltered trade at certain increases in unemployment, the total balance the overall development is rated as ambivalent.

Yet, the difficulties of British manufacturing become clearly visible. There are certain signs of lacking technical maturity and also market failure. And even more striking is the fact that no shift to high-tech manufacturing has taken place.

The United Kingdom has focussed on KIBS and also invested seriously in producing oil and gas. The ‘city’, i.e. the big (London) capital holders, seem to have preferred these investment instead of going for the capital-intensive manufacturing of goods.

Table 5.56 De-industrialization of the United Kingdom

Year	De-industriali-zation	Type	Technical maturity	Failure	Shift to		
					Hi-tech	KIBS	Primary products
73-08	yes	ambivalent	yes	no	no	yes	jobless growth
73-88	yes	ambivalent	yes	no	yes	yes	jobless growth
73-78	yes	ambivalent	yes	no	no	yes	no
78-83	yes	negative	ambiguous	ambiguous	no	yes	jobless growth
83-88	yes	ambivalent	yes	no	yes	yes	no
88-93	yes	ambivalent	ambiguous	ambiguous	no	yes	no
93-08	yes	ambivalent	yes	no	no	yes	jobless growth
93-98	no						
98-03	yes	ambivalent	ambiguous	ambiguous	no	yes	jobless growth
03-08	yes	positive	ambiguous	ambiguous	no	yes	jobless growth

Source: Own compilation, evaluation based on EU KLEMS (2012) and World Bank (2014a) data

5.3.10.4 Economic and political explanations for structural changes

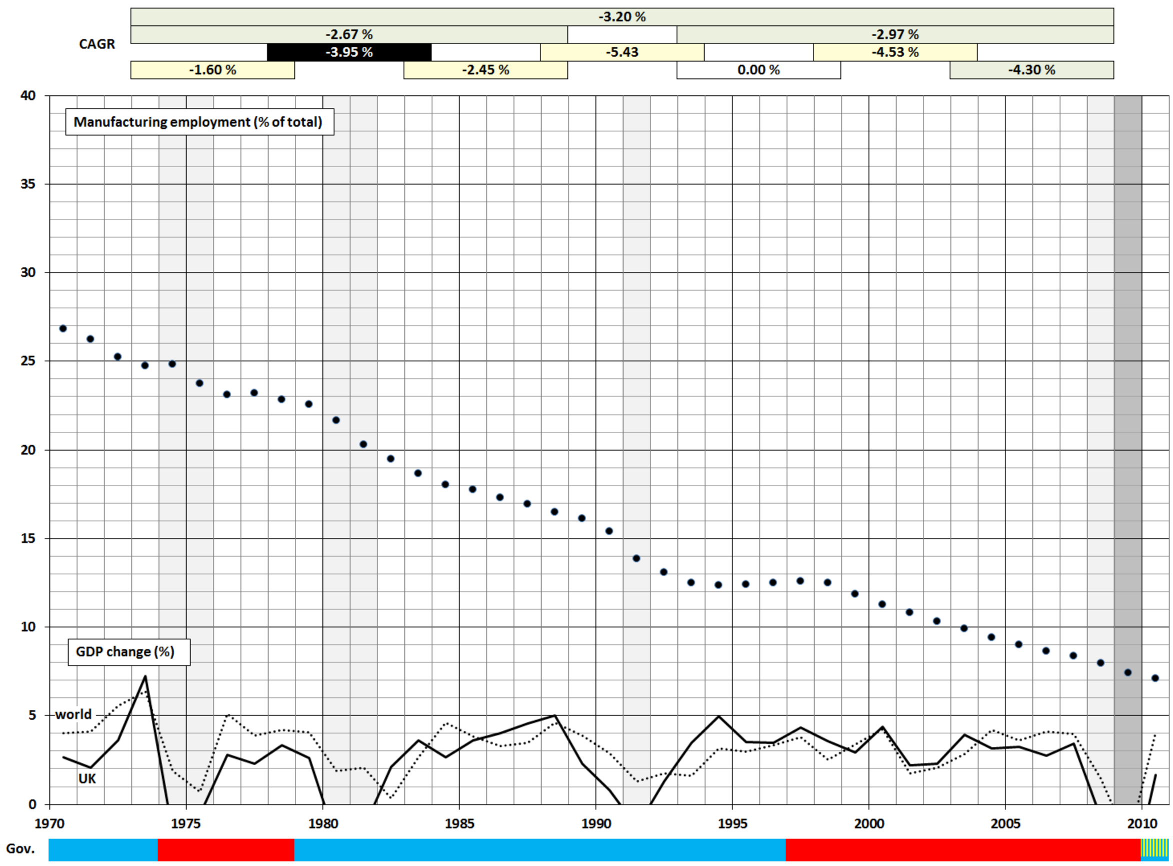
National trends and influences

After World War II, the UK pursued a strategy of creating industrial clusters by nationalization, the 'national champion' approach. It was aiming at cost reductions on the basis of mass production. In the West midlands auto cluster, almost the whole British car industry was centrally managed from the 1950s (Bailey, Kobayashi, & MacNeill, 2008).

Retrospectively, these British industrial policies continuously pursued by conservative and social democrat governments at their very end led to very unsatisfactory results. But between 1950 and the early 1970s, the nation experienced continuous economic growth, low unemployment rates and low and stable inflation. Manufacturing employment peaked in 1966. The total period was experienced and described as a 'Golden Age' (Kitson & Michie, 2014, p. 311). This (subjective) experience camouflaged the hidden economic facts that came to light after the oil-shock in 1973. Although the UK continuously raised its productivity and living standard, other Western European nations had grown faster and more efficiently. As a result, the UK had lost its competitive advantage over other Western European nations over the years. The country, in pursuing allegedly social policies, had adhered to many unproductive jobs, e.g. in the coal industry. The situation was worsened by the ruinous work of self-indulgent trade unions, often overacting in their attempt to cope with lacking influence guaranteed by institutions present in other Nordic states, e.g. Sweden and Germany (Worcester, 1991).

In a self-contained economic world of splendid isolation, nobody would have been too bothered about this, but times were changing rapidly. The Conservative government under Edward Heath was elected in 1970 to fight the beginning economic downturn and unemployment. Suffering from the oil-shock and miners strikes, it lost the 1974 elections, and Labour under Harold Wilson, in 1976 succeeded by James Callaghan returned to power (Clement, 2014; Draper, 2014).

In 1975, the UK joined the European Union as intended by Edward Heath, but only after Wilson had renegotiated the entrance conditions and approval by the population (Clement, 2014).



Sources: Based on World Bank (2014a) data, own calculations and political information (Kimber, 2013)

Figure 5.68 Economic and political development of the United Kingdom

Besides of entering the common market, some of the remedies prescribed by then-contemporary economists to the economic downturn especially in the manufacturing sector sound almost ridiculous from today's point of view. At a time when the British producers struggled hard to find customers for their products, Bacon and Eltis (1976) diagnosed "too few producers" from crowding-out effects imposed by the public sector. To fight these effects and to balance the high and rising numbers of unemployment and also inflation, the government tried to preserve industrial jobs and restrict the wages of public sector workers. To the latter, the trade unions reacted with strikes that forced the UK in the 'winter of discontent' in 1978 to 1979 and caused Callaghan to resign in March 1979 (Draper, 2014).

The general election in 1979 brought Margaret Thatcher into power. She changed the face of the UK's economic structure radically by following "a radical programme of privatisation and deregulation, reform of the trade unions, tax cuts and the introduction of market mechanisms into health and education" (Government Digital Service, 2014a). The same also happened in the manufacturing sector. While in the Keynesian era of the 1950s and 1960s, the market mechanisms were taken out of the industry by the 'national champion' approach, now fierce competition on the local markets hindered long-term strategic thinking and investments. Productivity increases in the manufacturing sector were no longer expected from increased output, but only from job cuts (Kitson & Michie, 2014). Strong losses in manufacturing employment (Evans, Ewing, & Nolan, 1992) and in production (Coutts & Godley, 1989) resulted.

Kitson and Michie (2014) present statistical evidence for very little British investments in the capital stock of the manufacturing industry already from the 1960s. These investments were lower than in all other Major Western countries in the same period. Between 1979 and 1989, the total assets did not grow at all. The authors blame chronical underfinancing for major parts of the industrial misery, but, as already pointed out, that is only one facet of the story.

The situation only changed around the mid-1990s when the UK under John Major left the Exchange Rate Mechanism and the economy started to pick up. Yet, Major could not make use of this economically favourable situation due to some affairs that damaged his and his party's public image (Boulton, 2014).

The charismatic 'New Labour' leader Tony Blair was expected to change the economic policies of the Conservatives, probably back to a course more in favour of the industry –

but these expectations were fully disenthralled (Kitson & Michie, 2014). As the employment figures show, de-industrialization under Blair and his successor Gordon Brown continued at almost the same pace as under the Thatcher regime. Yet, future-oriented public investments into education and innovation helped to continue the national productivity rises achieved under the conservative predecessors (Corry, Valero, & van Reenen, 2011).

Only in very recent years, the role of manufacturing has been seen differently by British politicians, and initiatives to establish privately-owned small or medium-sized enterprises, even a 'March of the Makers' have been promoted (Kitson & Michie, 2014).

Summarizing the findings, it might be concluded that British manufacturing continuously suffered from extreme policies:

- Until the 1970s, the state was very intervening, shielding the industry from foreign and domestic competition. Thus suffering from little innovativeness concerning products and processes, the British manufacturing sector's productivity fell behind those of its main competitors step by step.
- The Thatcher government brought about radical change. The state totally let loose, leaving an industry widely unprepared fully to market forces. Massive de-industrialization and very high unemployment rates were the predictable results over many years. But on the other hand, the British economy started to grow again.

The crucial question remains: Was there an alternative? Or were the structures of large parts of the manufacturing industry, including the education and mindset of the workers, too encrusted for a smooth cure? Probably, the groove of the old traditions of industrial culture was just too deep to get out of it without breaking its sidewalls. Only by creating the "polemical dichotomy of 'state versus market'" (Crouch, 2004, p. 100), the crusted structures could be broken. Now, more than 30 years later, to assure mindful industrial governance, the old dichotomy finally needs to be overcome.

Linkages to the world and regional economy

The British economy was equally well linked to the European, East Asian and also the USA cycles (44.5 %) in the first double-decade. In the second phase, a paradigm shift has taken place. Despite of the rise of Asia, the correlation has become marginalized. The EU influence has increased, but most striking for an EU member is the fact that the correlation with the US economy stood at 76.7 % – by far the highest value in international competition.

Table 5.57 GDP (CAGR, %) coefficients of determination with the United Kingdom

R^2 (%)	World	Europe & Central Asia	USA	East Asia & Pacific	Latin America & Caribbean
1970-1990	51.9	48.2	44.5	44.2	0.0
1990-2010	64.9	57.9	76.7	7.2	17.9
1970-2010	55.1	49.3	55.4	21.9	3.0

Source: Own calculations, based on EUKLEMS (2012) and World Bank (2014a) data

5.3.11 Japan

After first contacts to the West in the 16th century, a long period of national seclusion followed during the Edo Shogunate period. Only the Meiji restitution from 1868 returned the power to the imperial court. Within one generation, Japan was transformed into an industrial state. On the base of victorious battles against China and Russia, it became an imperialistic power (Japanese Ministry of Foreign Affairs (MOFA), 2014).

In the late 1920s, Japan was hit by the world economic downturn at a time when it was still suffering from the Great Kanto Earthquake of 1923 that devastated the Tokyo area. Economic depression helped to increase the power of the military which finally, after an intermediate democratic time, gained control of the government. Japan continued its aggressive policies, invading Manchuria in 1931 and joining the Axis powers in 1936. In the course of World War II, Japan, after a victorious start, finally had to surrender unconditionally (Pearson Education, 2014a).

After the war, Japan was under American occupation and governed by general McArthur until 1952. A democratic constitution was established, leaving the emperor in a merely symbolic role. Japan's post-war economic recovery was almost miraculous (Japanese Ministry of Foreign Affairs (MOFA), 2014). Based on ever new technologies and a clever trade policy, Japan obtained major shares in Western markets. Despite – or because of? – a close involvement of the Japanese government in the country's banking and industry, economic growth continued throughout the 1970s and 1980s. Japan became the world's second-largest national economy. From the 1990s, this growth process slowed down significantly, involving periods of standstill and even recession (Pearson Education, 2014a). Today, the Japanese economy is number three in the world (BBC, 2014).

5.3.11.1 Structural shifts

Some key facts

With a population density of 349.7/km² (2010), Japan is very densely populated. It has virtually no natural resources, so it heavily relies on imports of coal, oil and gas (CIA, 2014) and also on its nuclear energy (Pearson Education, 2014a).

The key facts of the Japanese economic development in the last four decades are listed in Table 5.58. Japan has doubled its national wealth. Only in the last two decades, it has become seriously exposed to global markets. While the manufacturing output rose significantly in the first long period investigated (1973-88), growth slowed down and eventually stagnated afterwards.

Table 5.58 Overview on the macro-economic development of Japan

Year	Population	GDP p/c	Exports	Trade	Unemployment	Agriculture	Manufacturing (VA)		Fuel exp.	Services	KIBS
	mn	*k USD*	*% of GDP*	*% of GDP*	*% of active*	*% of empl.*	*% of empl.*	*bn USD*	*% of ME*	*% of empl.*	*% of empl.*
1973	108.1	21.2	9.8	0.0	1.3	16.1	25.8	744.2	0.3	48.0	5.8
1988	122.6	33.4	9.8	2.1	2.5	9.7	22.7	1,064.1	0.2	57.5	9.3
1993	124.5	38.1	9.1	2.2	2.5	7.6	21.9	1,103.3	0.6	59.7	10.5
2008	127.7	43.5	17.7	0.2	4.0	5.0	16.9	1,105.4	2.4	69.2	14.8
	CAGR (%)	*CAGR (%)*	*CAGR (%)*	*Δ 5 y*	*Δ 5 y*	*CAGR (%)*	*CAGR (%)*	*CAGR (%)*	*average*	*CAGR (%)*	*CAGR (%)*
73-88	0.8	3.1	-0.1	0.7	0.4	-3.4	-0.8	2.4	0.3	1.2	3.2
88-93	0.3	2.7	-1.5	0.1	0.0	-4.8	-0.8	0.7	0.4	0.8	2.3
93-08	0.2	0.9	4.6	-0.7	0.5	-2.7	-1.7	0.0	0.7	1.0	2.3
73-08	0.5	2.1	1.7	0.0	0.4	-3.3	-1.2	1.1	0.5	1.1	2.7

Sources Based on World Bank (2014a) data, constant 2010 prices

Volatility of change

The Japanese results are listed in Table 5.61. All the sub-periods are remarkably stable. Due to the two economic 'shelves' including the instable mid-transition, characterized by a relatively high volatility of the manufacturing output, the total volatility was amidst the German and the French.

Table 5.59 CAGR (%) volatility of de-industrialization indicators (Japan)

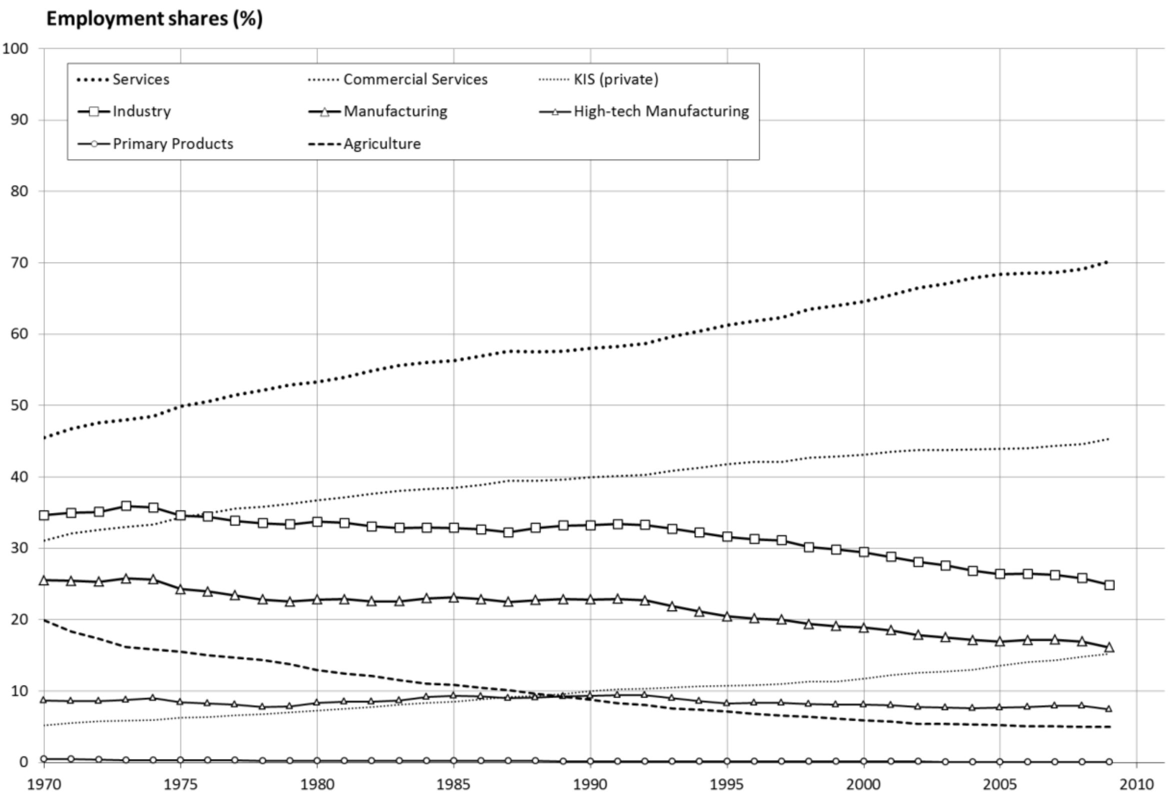
Years	υ_T	$\sigma_{1,T}$ manu. empl.	$\sigma_{2,T}$ unem-ployment	$\sigma_{3,T}$ trade balance	$\sigma_{4,T}$ GDP p/c	$\sigma_{5,T}$ manu. output	$\sigma_{6,T}$ primary prod. exp.	$\sigma_{7,T}$ agricult. empl.	$\sigma_{8,T}$ KIBS empl.
78-88	**6.12**	0.99	0.27	1.78	0.60	1.47	0.23	0.55	0.23
88-98	**8.35**	1.09	0.82	0.99	1.60	2.55	0.18	0.42	0.69
98-08	**6.36**	0.53	1.28	0.54	0.53	1.60	0.54	0.79	0.56
78-08	**9.09**	0.99	0.89	1.49	1.45	2.28	0.48	0.80	0.71

Source: Own calculation, evaluation based on (EU KLEMS, 2012) and World Bank (2014a) data

Sectoral changes

Employment

Being an industrial nation with a still comparably high share of agricultural employment in the 1970s, Japan has more and more become a service economy with a major share of private and high-tech activities (Figure 5.69). Transitions have been smooth and continuous. While the manufacturing sector in general had to face de-industrialization, the high-tech industries almost kept their level of workforce.

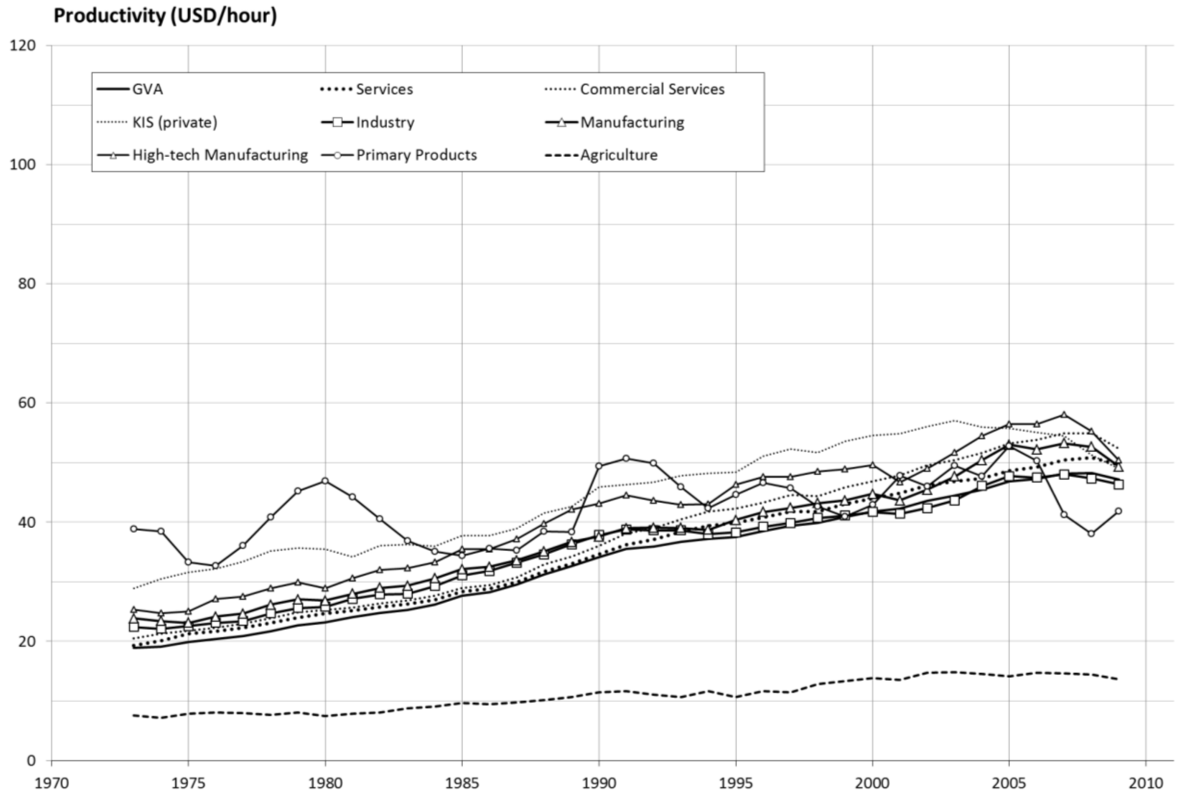


Source: Own graph, based on World Bank (2014a) and national employment data

Figure 5.69 Structural change of Japan

Productivity

The trends of sectoral productivity (Figure 5.70) are parallel and close to each other in all sectors apart from agriculture which is far less productive than the rest of the Japanese economy. The continuous improvement was only interrupted by the world economic crisis in 2008 which, probably due to reduced capital utilisation, led to a downturn.

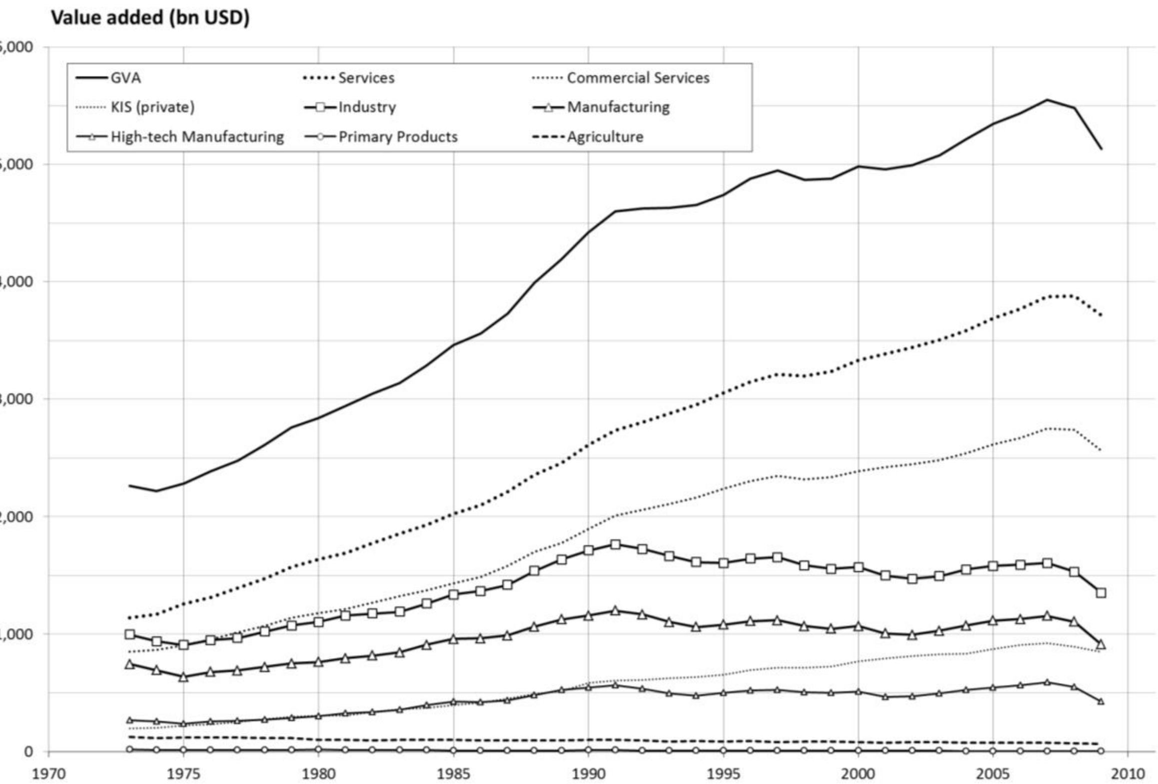


Source: Own graph, based on EU KLEMS (2012) data

Figure 5.70 Sectoral productivity in Japan

Output

The development of the total value added per sector gives a very clear picture (Figure 5.71). Until 1991, industry and services sectors grew constantly. Then, growth was no longer achieved by the industry but only in services. All in all, a very modest de-industrialization was experienced, but in some years also in terms of manufacturing output.



Source: Own graph, based on EU KLEMS (2012) data

Figure 5.71 Sectoral gross value added in Japan

5.3.11.2 Economic scenarios

Key indicators

When looking at the key indicators for the Japanese economy, there is the observation that there were two totally different conditions of the Japanese manufacturing sector. Until the 1990s, manufacturing was in an 'upper shelf', characterized by very stable conditions over almost 20 years. Concerning output and the total labour content, Japan was still industrializing.

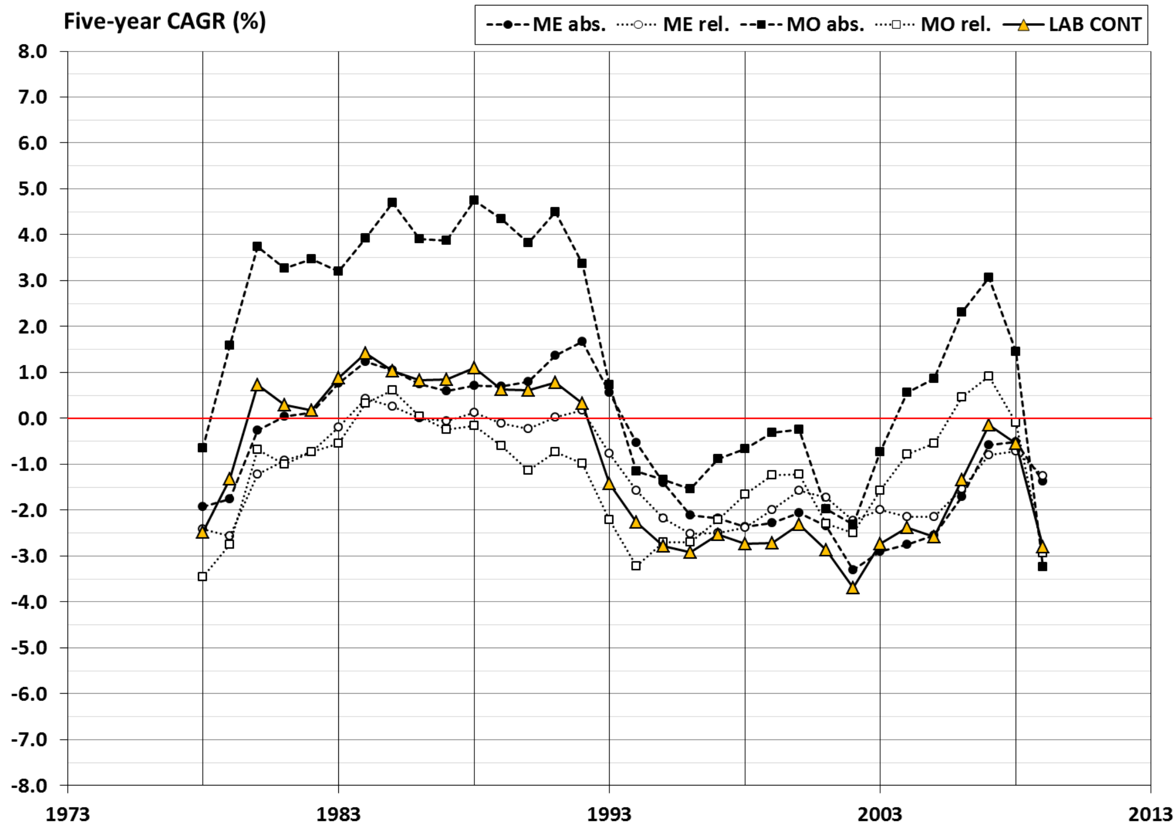
From 1993, the scenery hat completely changed. Japan stayed in a 'lower shelf'. Some timid signs of industrial recovery were blown away by the 2008/09 recession.

More specifically, the following can be stated from analysing Figure 5.72 and Table 5.60:

- **LAB CONT:** The total number of working hours increased constantly from 1980 until 1992 and fell constantly from 1993.
- **ME (abs.)**: In most years, manufacturing employment relatively strictly followed the labour content. Only for the period 1990-98, manufacturing employment decoupled

from it. In this period, the individual average workload was reduced, since labour content was reduced faster than the manufacturing employment. All in all, the correlation was modest 82.6 %.

- **ME (rel.)**: Due to a high growth of other sectors, relative manufacturing employment fell most of the time also when the economy was on the 'lower shelf'.
- **MO (abs.)**: During the 'upper shelf' period, the Japanese output grew very fast at a good 4 % average. Enormous productivity rises were achieved, since the output grew much faster than the labour content. In the 'lower shelf' phase, the output declined for ten years to then recover until the world economic crisis.
- **MO (rel.)**: In comparison to the service sector, Japanese manufacturing continuously lost in importance for the national economy even through most of its boom years except of 1986-88 and 2006-08.



Source: Own graph, based on own calculations drawing from EU KLEMS (2012) data

Figure 5.72 Indicators of de-industrialization (Japan)

Table 5.60 Correlations of de-industrialization indicators (Japan)

R^2 of 5y CAGR (%)	ME (abs.)	ME (rel.)	MO (abs.)	MO (rel.)	LAB CONT
ME (abs.)	100.0	86.1	66.1	23.7	82.6
ME (rel.)	86.1	100.0	65.3	43.5	80.5
MO (abs.)	66.1	65.3	100.0	60.7	91.3
MO (rel.)	23.7	43.5	60.7	100.0	49.8
LAB CONT	82.6	80.5	91.3	49.8	100.0

Source: Own calculation of coefficients of determination, based on EU KLEMS (2012) data

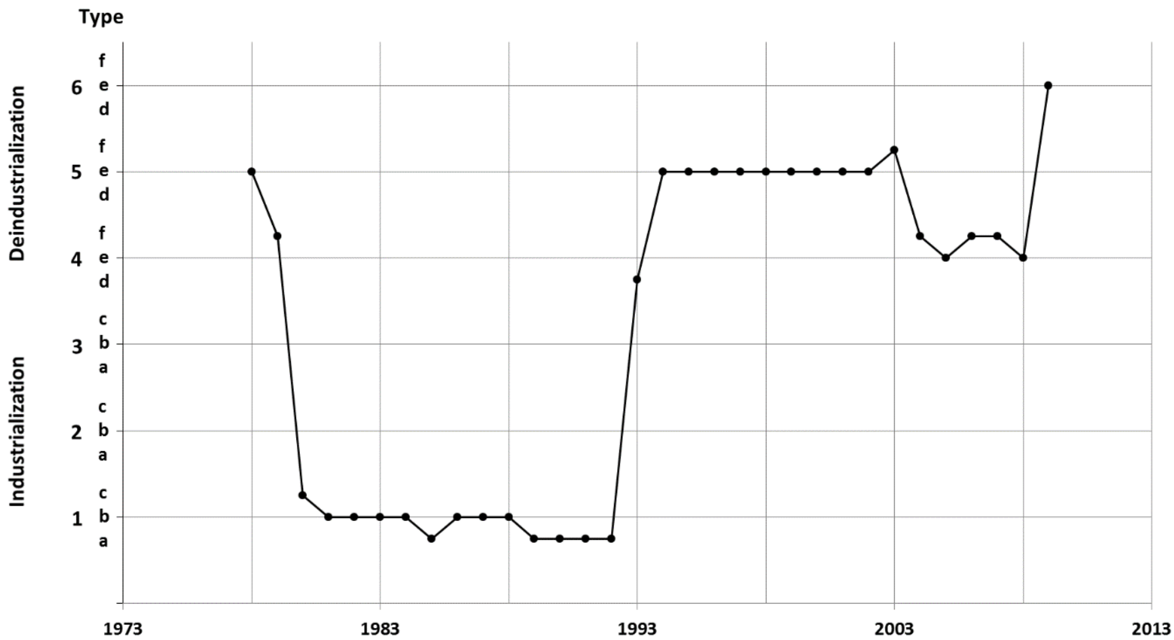
Summarizing these findings, this is concluded:

- Japan can be described by a two-shelf model. While in a first phase roughly until 1990, Japan only de-industrialized modestly if at all, afterwards de-industrialization in a sociological sense became clearly visible. In the first phase, Japanese manufacturing grew in output, in the second phase it roughly stagnated.
- Over all, the Japanese manufacturing output grew faster than the population, so the output per person has increased (cf. Table 5.58, p. 240). Both indicators have in total been close to zero after 1993.
- Japanese manufacturing for many years improved its international position on the basis of high technology and rapid productivity rises. In recent years, it tried to maintain its international position, though struggling with a continuous stagnation of the national economy.

Scenarios

The clear-cut 'two-shelf' description also shows in the scenario analysis (Figure 5.73). After some very early cuts in labour content, probably late effects of the oil crisis, the Japanese industry took off for a long phase of impressing success. While increasing productivity and output, more and more work was created. In 1b type scenarios, the workload even increased, while in 1a scenarios, it was reduced.

After 1992, the economy changed its course dramatically and shifted to permanent de-industrialization involving reductions of output until 2003. In the 5e mode prevailing over almost a decade, productivity increased while some of labour content reductions were covered by workload reduction. Japan returned to the 'healthy' type 4 scenario but rushed in a deep crisis in 2009, the evil 6e scenario.



Source: Own graph, based on own calculations drawing from EU KLEMS (2012) data
Categories as illustrated in Figure 4.4, p. 101

Figure 5.73 Economic scenarios (Japan)

5.3.11.3 Application of the eclectic model of de-industrialization

When applying the eclectic model of de-industrialization, all in all a quite positive picture of the Japanese transition to a service economy is rendered: Japan was technically mature, achieved a shift towards high-technology and also a shift to KIBS.

Table 5.61 De-industrialization of Japan

Year	De-industriali-zation	Type	Technical maturity	Failure	Shift to		
					Hi-tech	KIBS	Primary products
73-08	yes	ambivalent	yes	no	yes	yes	no
73-88	no						
73-78	yes	positive	yes	no	yes	yes	no
78-83	no						
83-88	no						
88-93	no						
93-08	yes	ambivalent	yes	no	yes	yes	no
93-98	yes	negative	yes	no	yes	yes	no
98-03	yes	ambivalent	yes	no	no	yes	no
03-08	no						

Source: Own compilation, evaluation based on EU KLEMS (2012) and World Bank (2014a) data

When looking a little bit more in detail, this picture gets some cracks. The five years from 1993 were a negative period due to the negative trend of the labour market while the national income per capita and the trade balance stagnated.

In five out of nine sub-periods, Japan did not de-industrialize at all, given the -1 % hurdle of CAGR in manufacturing employment. It is important to state that market failure was never a problem of the Japanese manufacturing sector.

5.3.11.4 Economic and political explanations for structural changes

National trends and influences

The (politically rather conservative) Liberal Democratic Party (LDP) was in power for most of the country's post-war history. It has been closely linked to Japan's rapid post-war expansion. In a consensus-oriented and still very “traditional society with strong social and employment hierarchies” (BBC, 2014), Japan developed unique ways of linking public and private economic spheres. Characteristic elements are:

- close and somewhat non-transparent links between politics and the private sector (especially banking) (Pearson Education, Japan, 2014a),
- special forms of cooperation between core banks and a dependent group of firms, organized in layers of suppliers for a large OEM (industrial *keiretsu*) (Miwa & Ramseyer, 2002),
- unique ways of inspiring creativity and ambition without open competition and a constant threat of the job (e.g. *Kaizen,* see below).

Japanese production systems as a success factor

A publication of the Massachusetts Institute of Technology (MIT) in 1990 initiated a fundamental change in the production systems of industrial enterprises throughout the world. Lean production, as the new Japanese system was named, was first put into practice in the automotive industry. Experts speak of a “second revolution” after the introduction of flow production by Henry Ford. In the study, the automotive industry in Japan, North America and Europe was compared. It proved the clear superiority of the production system utilized by the Japanese manufacturer Toyota in terms of productivity, flexibility and especially in product and process quality (Womack, Jones, & Roos, 1990).

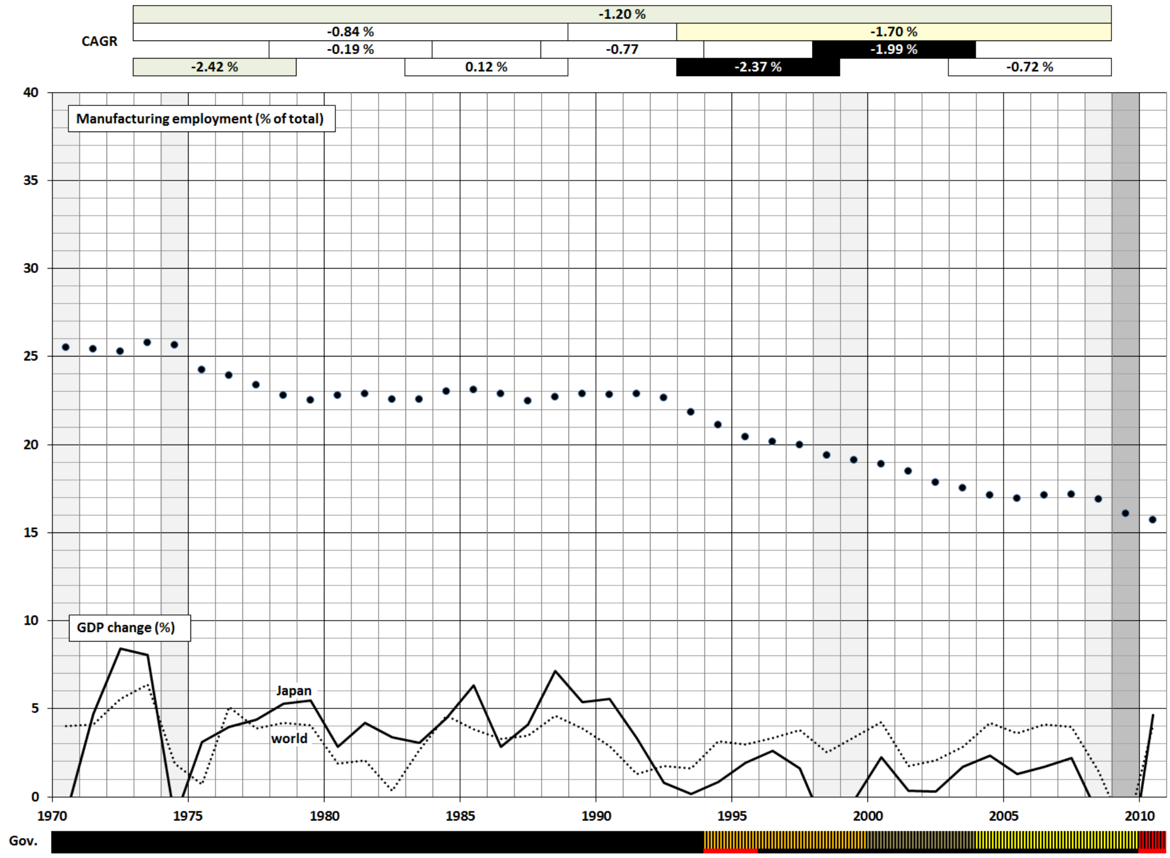
Toyota was (and still is) organized as a vertically integrated industrial keiretsu. This means that Toyota is sourcing from suppliers organized in several tiers (system, module, element suppliers) which closely cooperate (Miwa & Ramseyer, 2002). This is very different to Western principles of improvement on the basis of competition and survival of the fittest. Close cooperation with suppliers allowed the Japanese to bring their products to the market much faster than American and European carmakers.

Yet, how could they achieve improvements of their products without competitive pressure between firms? They utilized deeply rooted principles of honour and dedication in the Japanese society that made workers strive for the best in their immediate work environment. And these workers were given attention and responsibility, unlike in a tradition Western company organized following the principles of F. W. Taylor. So *Kaizen*, as they called the process of continuous improvement, also describes a Japanese life and working philosophy which focuses on the aspiration to on-going advancement (Brunner, 2008).

The key elements of lean production (Toyota, 2009) are:

- **Kaizen**, the most important process for avoiding wastage by "continuous improvement" of all industrial processes of a company (Gemba, 1997). Besides utilizing quality tools, the success of the Kaizen depends on the work attitude of the employees and the management. It has to be influenced in such a way that both are not only striving at short-term problem-shooting, but aiming at sustainable improvements.
- **Just-in-time production** (JIT). It means that a process is triggered by the demand of the following production step. This principle is called the pull principle of production control; ultimately, all production is triggered by customer demand, sending a wave through the whole workflow until reaching the first step of in-house production and finally the suppliers. The pre-requisite for continuous smooth manufacture thus is a continuous demand, ideally resulting in a *one-piece-flow* through all work stations (Brunner, 2008).
- **Jidoka**, meaning "intelligent automation". It stands for machines that stop autonomously if a non-conformity good has been produced. It involves displays that show the employees from a distance if a machine has been stopped (Brunner, 2008).

This for a long time highly successful system, e.g. in the car and consumer electronics industries, ran into serious problems by the 1990s. Japan has since suffered from "a mounting debt burden that successive government have failed to address" (BBC, 2014). The Liberal Democratic Party has since 1993 constantly failed to gain the absolute majority it used to gather until then (Figure 5.74). Yet, no Japanese government has solved the central issue of "how to meet the huge social security costs engendered by an ageing society", despite of reform efforts in the banking, public spending and private sector (BBC, 2014).



Sources: Based on World Bank (2014a) data, own calculations and political information (collected starting from Wikipedia, 2014c)

Figure 5.74 Economic and political development of Japan

Summarizing the findings, the cooperative and consensus-oriented structures of the Japanese society have been the boon and bane of Japan. They helped to build up industry and wealth very rapidly, but from the early 1990s, they locked the country at a certain stage of development. Figure 5.74 shows that an overall positive development has turned into neutral or even a negative direction from the 1990. This entailed several changes of government, e.g. after the Asian financial crisis (after 1997), but which did not have a sizeable effect on the economy.

Serious reductions of the Japanese manufacturing workforce were resulting in recent years. They were challenging and changing the traditional promise of a life-long occupation to a more short-termed employment for the younger generation while in parallel, the old could keep their privileges. This is just one tradition that has been prompted to change, but the process has additionally fuelled a young generation that is questioning the old ideals and is ready to more and more adapt Western culture and ideas (BBC, 2014).

Linkages to the world and regional economy

As shown by Table 5.62, Japan was the dominant economic power in the East Asia and Pacific region in the first investigated two decades. Almost the complete economic zone had followed the course of the Japanese economy.

Table 5.62 GDP (CAGR, %) coefficients of determination with Japan

R^2 (%)	World	Europe & Central Asia	USA	East Asia & Pacific	Latin America & Caribbean
1970-1990	32.5	10.3	24.9	94.7	0.0
1990-2010	48.2	37.1	12.6	72.8	19.1
1970-2010	43.8	30.5	22.4	79.1	8.2

Source: Own calculations, based on EUKLEMS (2012) and World Bank (2014a) data

In recent years, this influence was a little reduced while the very limited links to the European and Latin-American markets became significantly tightened. All in all, Japan became more embedded in the world economy, with a wider scope of trade connections.

5.3.12 United States

The USA is the world's largest national economy. From a tiny assembly of 13 colonies with barely two million inhabitants (J & echomikeromeo, 2012), they became the world's leading industrial power before World War I and a global power during the course of it (Przywara, 2006). By finally beating Japan and the Axis Powers in World War II, America cemented this position.

The cold war years brought about a military race against Russia and infamous atrocities in the Far East. At home, the fight for social rights dominated the 1960s. The USA proved its technological mastery by bringing the first men to the moon in 1969. Yet, the 1970 were of limited success both politically and economically. In the early 1970s, America had to withdraw from Vietnam, the Watergate scandal shocked the nation and the oil-shock severely hit the economy (J & echomikeromeo, 2012).

Later, the Democrat president Jimmy Carter could not quite succeed in leading the US economy back on a stable growth track. All that, together with changes in the campaign law from 1971 that tied the president more and more to large donations of companies and "in effect legalized the financial corruption of politics" (Harvey, 2005, p. 48), paved the way for a radical change in economic policies. Neoliberalism was the agenda of president Ronald Reagan who gained the electoral basis of his 'Reaganomics' programme of tax reliefs for the rich by combining it with traditional American values and religious positions delivered by the Christian right (Harvey, 2005).

After the decay of the Soviet Union, the 1990s brought about the procession of internet technologies in which the USA again took the lead. Thus, the Clinton era became one of great economic success. After millennium, George W. Bush was far less successful, leading the US into wars 'on terror' in the Middle East as a declared reaction on the destruction of the World Trade Center twin towers by Muslim terrorists in 2001 (J & echomikeromeo, 2012).

5.3.12.1 Structural shifts

Some key facts

With a population density of only 33.8/km² (2010), despite of an almost constant growth of their population over the last four decades, the USA at average are still sparsely populated. Starting from an already high level, they were able to further constantly increase their average income per capita.

The USA has consequently pursued their structural change towards a knowledge economy. Agriculture has become marginalized in terms of employment, and also manufacturing employment has been more than halved while services, especially KIBS, blossomed (Table 5.63).

Table 5.63 Overview on the macro-economic development of the USA

Year	Population	GDP p/c	Exports	Trade	Unemployment	Agriculture	Manufacturing (VA)		Fuel exp.	Services	KIBS
	mn	*k USD*	*% of GDP*	*% of GDP*	*% of active*	*% of empl.*	*% of empl.*	*bn USD*	*% of ME*	*% of empl.*	*% of empl.*
1977	220.9	27.3	7.6	1.3	7.1	2.9	20.5	1,217.0	3.5	69.7	11.4
1988	244.5	35.0	8.5	-2.1	5.5	2.1	16.1	1,399.0	2.7	74.8	15.7
1993	259.9	37.0	9.5	-0.9	6.9	1.9	14.4	1,421.3	2.2	77.4	16.5
2008	304.1	49.4	12.5	-4.8	5.8	1.5	9.5	1,660.9	6.5	82.5	19.5
	CAGR (%)	*CAGR (%)*	*CAGR (%)*	*Δ 5 y*	*Δ 5 y*	*CAGR (%)*	*CAGR (%)*	*CAGR (%)*	*average*	*CAGR (%)*	*CAGR (%)*
77-88	1.0	2.3	0.9	-1.5	-0.7	-2.7	-2.1	1.3	4.0	0.6	2.9
88-93	1.2	1.1	2.4	1.1	1.4	-1.7	-2.3	0.3	2.8	0.7	1.0
93-08	1.1	1.9	1.8	-1.3	-0.4	-1.6	-2.8	1.0	2.5	0.4	1.1
77-08	1.0	1.9	1.6	-1.0	-0.2	-2.0	-2.5	1.0	3.1	0.5	1.7

Sources Based on World Bank (2014a) data, constant 2010 prices

Volatility of change

The American results are listed in Table 5.64. The total volatility of de-industrialization is low, with no big deteriorations or abnormalities, despite of some critical periods.

Table 5.64 CAGR (%) volatility of de-industrialization indicators (USA)

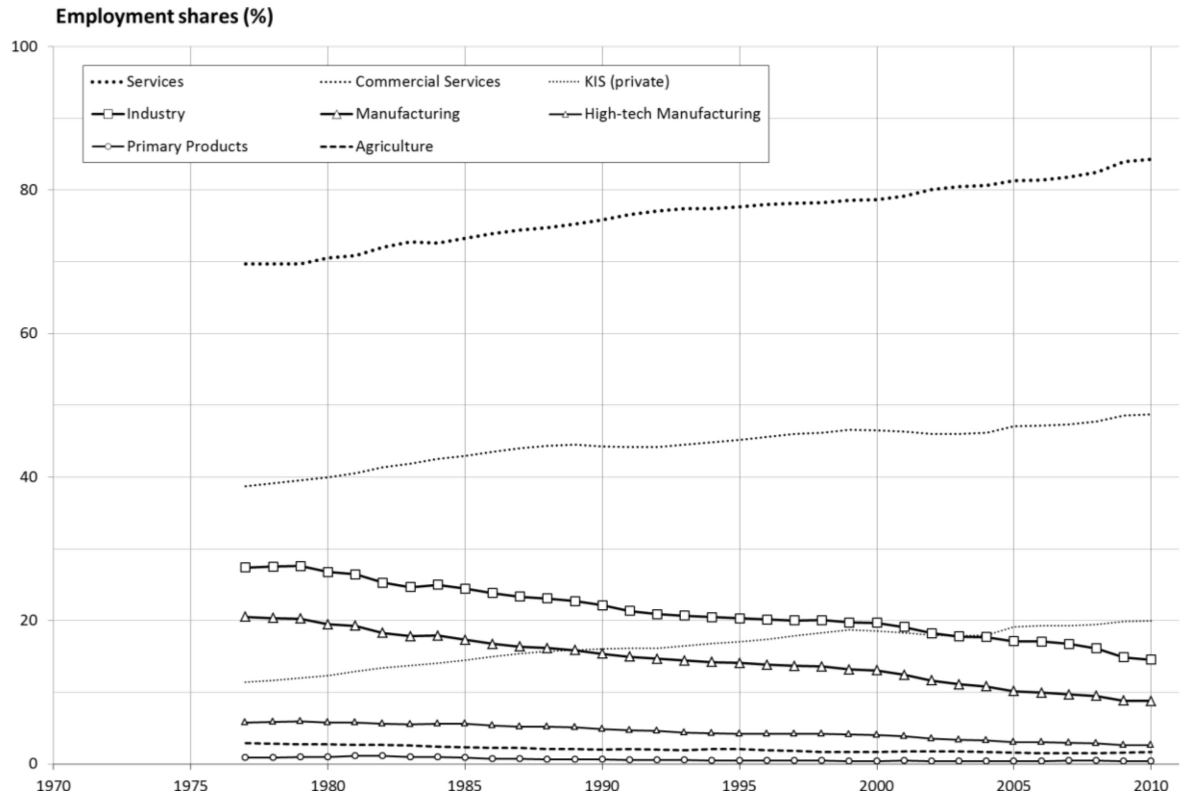
Years	υ_T	$\sigma_{1,T}$ manu. empl.	$\sigma_{2,T}$ unemployment	$\sigma_{3,T}$ trade balance	$\sigma_{4,T}$ GDP p/c	$\sigma_{5,T}$ manu. output	$\sigma_{6,T}$ primary prod. exp.	$\sigma_{7,T}$ agricult. empl.	$\sigma_{8,T}$ KIBS empl.
78-88	**7.70**	0.50	2.23	0.91	0.94	1.65	0.22	0.98	0.25
88-98	**7.10**	0.39	1.71	1.17	0.77	1.04	0.27	1.18	0.58
98-08	**8.11**	1.20	1.31	0.72	0.55	1.49	0.53	1.32	0.97
78-08	**9.01**	0.92	1.73	1.42	0.75	1.42	0.43	1.24	1.10

Source: Own calculation, evaluation based on (EU KLEMS, 2012) and World Bank (2014a) data

Sectoral changes

Employment

The structural changes have been carried through at a remarkably constant pace, as the growth rates and the smooth curves, almost straight lines, in Figure 5.75 reveal.



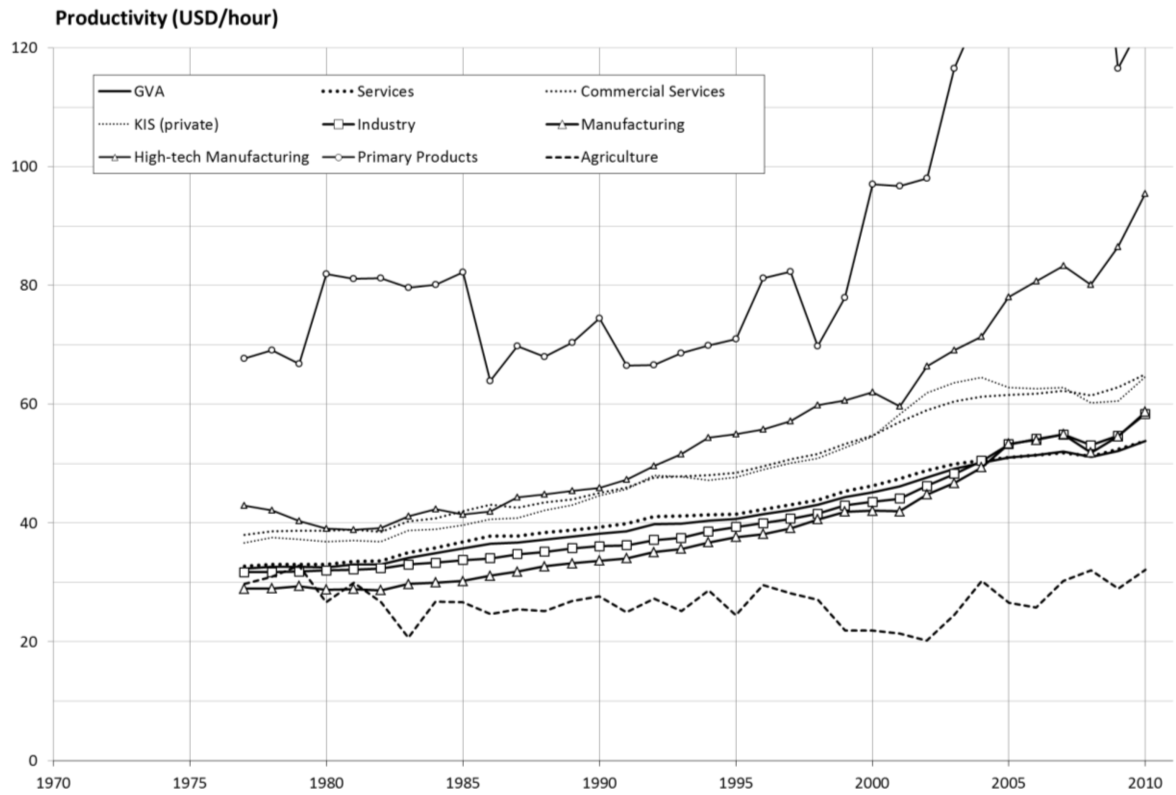
Source: Own graph, based on World Bank (2014a) and national employment data

Figure 5.75 Structural change of the USA

Productivity

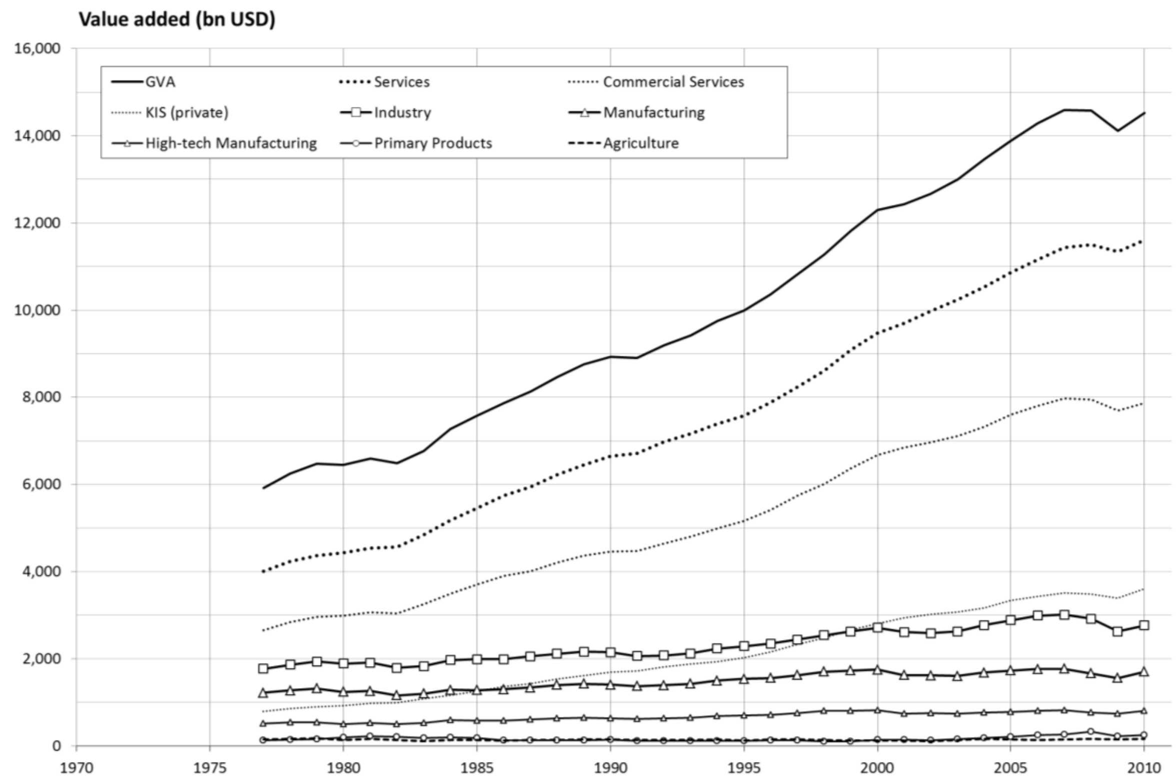
Unlike for example in Japan, the American development of productivity of economic sectors shows huge differences (Figure 5.76).

- In 1977, the productivity of agriculture was in the range of manufacturing. It stagnated of the following decades while industry and services could register sizeable increases.
- The high-tech sectors within manufacturing were able to even double their productivity from the late 1970s until 2010. This speaks for a high degree of automation in the American industry.



Source: Own graph, based on EU KLEMS (2012) data

Figure 5.76 Sectoral productivity in the USA



Source: Own graph, based on EU KLEMS (2012) data

Figure 5.77 Sectoral gross value added in the USA

Output

When turning to the total value added, it becomes clear that all sectors could increase their total output (Figure 5.77). Clearly, there was no de-industrialization in terms of output. The productivity rises over-compensated the job losses over the last three decades.

The constant pressure on the job market was hardly relieved during the economic crisis in 2008. While in European countries and Japan, state measures were taken to retain jobs throughout the crisis in combination with already existing labour protection schemes which took effect, this was not the case in the USA. In Europe and Japan, the crisis led to temporary losses in productivity which were not accepted by the capital holders and company managers in the USA.

5.3.12.2 Economic scenarios

Key indicators

American manufacturing can roughly be characterized by two phases, as Figure 5.78 shows. There are three significant tidal moves, the first two of which (until year 2000) hover around a higher mean value than the last one, which followed an economic down-swing after which the manufacturing sector settled at a lower level. While in the first phase, the output increased and employment remained roughly constant, the mean output remained constant in the last cycle while employment sank.

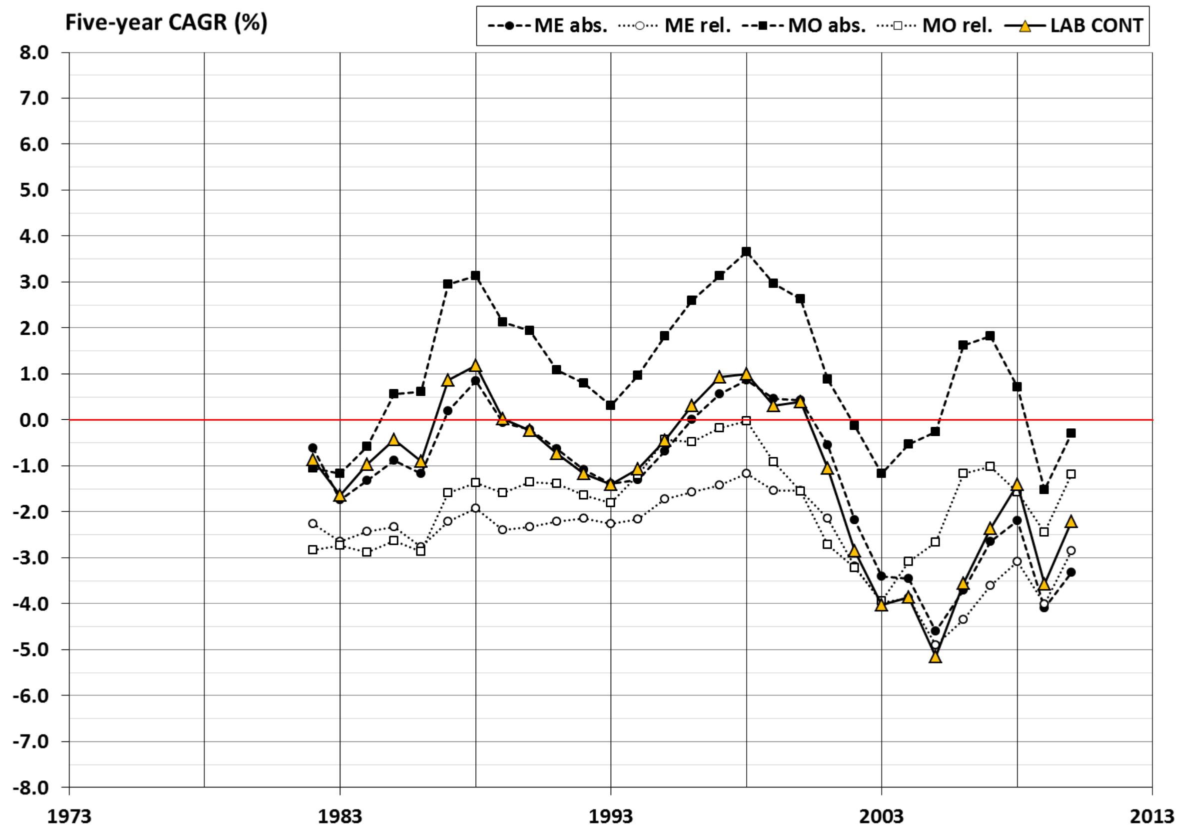
Since the output indicator was always higher than the one of labour content, American manufacturing constantly gained in productivity. The difference between both was never as big as for example in Japan during its boom years ('upper shelf' period).

The following is concluded from the USA chart (Figure 5.78) and respective correlation factors (Table 5.65).

- **LAB CONT:** The total number of working hours followed the economic cycle. In two boom phases (around 1988 and 1998), the total labour content grew.
- **ME (abs.)**: The absolute manufacturing employment indicator followed the labour content to a large extent, but not fully. The correlation factor amounts to 93.6 %. Pretty much like in the UK, in boom times, the workload was a little bit increased, while in times of recession, employment did not fall as fast as the labour content, so

some unemployment was avoided by reductions in working hours. Also in the USA, this effect was most prominent in the years from 2002.

- **ME (rel.)**: Due to a high growth rate in services, even in boom years relative manufacturing employment remained in constant decline.
- **MO (abs.)**: While until about 2000, American manufacturing grew in output, from then it struggled hard to at least keep its output constant.
- **MO (rel.)**: Due to high sectoral growth of services, US manufacturing continuously lost in importance for the national economy.



Source: Own graph, based on own calculations drawing from EU KLEMS (2012) data

Figure 5.78 Indicators of de-industrialization (USA)

Table 5.65 Correlations of de-industrialization indicators (USA)

R^2 of 5y CAGR (%)	ME (abs.)	ME (rel.)	MO (abs.)	MO (rel.)	LAB CONT
ME (abs.)	100.0	87.4	53.4	23.8	93.6
ME (rel.)	87.4	100.0	38.1	29.7	86.9
MO (abs.)	53.4	38.1	100.0	63.1	55.1
MO (rel.)	23.8	29.7	63.1	100.0	33.5
LAB CONT	93.6	86.9	55.1	33.5	100.0

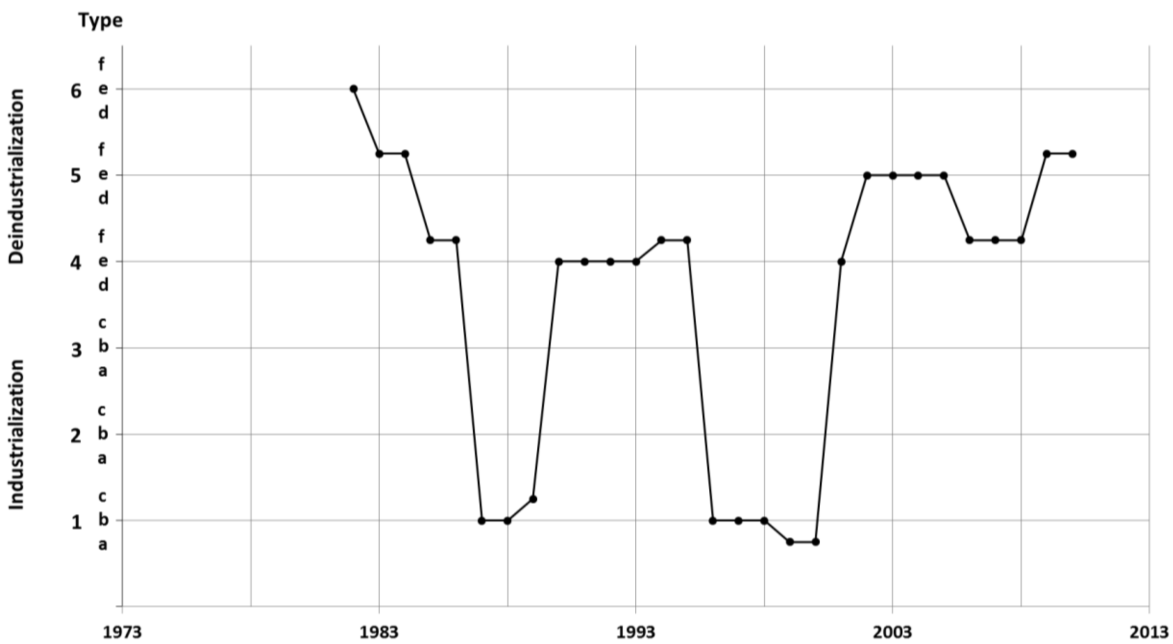
Source: Own calculation of coefficients of determination, based on EU KLEMS (2012) data

Summarizing these findings, this is concluded:

- The United States de-industrialized strongly in a sociological sense. Its industry was close to losing output in recent years and in some, it did. As an effect, the USA trade balance turned into negative over the years (c.f. Table 5.63, p. 252).
- The US output grew at exactly the same pace as the US population, so the output per person remained constant (c.f. Table 5.63, p. 252).
- The American manufacturing sector has not kept its international position despite of its productivity rises and – in some branches – latest technology.

Scenarios

America came from a phase of stagnation in the early 1980s when de-industrialization was even pushed towards the evil 6-type (unfortunately, the data before 1982 is incomplete).



Source: Own graph, based on own calculations drawing from EU KLEMS (2012) data
Categories as illustrated in Figure 4.4, p. 101

Figure 5.79 Economic scenarios (USA)

Later, American manufacturing returned to healthier tracks. The subsequent years were characterized by constant rises in productivity, resulting in reduced employment and alternating phases of workload release (e-type) or growth (f-type). In some years, the US even re-industrialized in terms of the total labour content.

5.3.12.3 Application of the eclectic model of de-industrialization

While the overall development of American manufacturing was ambivalent with all signs of a harmonious shift towards services except of a growing trade deficit, the short periods show a more detailed picture:

- There was one period of no and negative de-industrialization and three ambivalent semi- decades.
- Technical maturity and a shift to high-tech were not always given.
- There were serious and at the end successful efforts to produce more domestic oil and gas, recently very much of these on the basis of controversially disputed technologies like gas fracking and conveying offshore and Arctic oil (Mann, 2013). These efforts likably crowded out capital and some human resources from the manufacturing sector.

It might be concluded that the model of de-industrialization renders a good indicative basis for the structural development of the American manufacturing sector.

Table 5.66 De-industrialization of the USA

Year	De-industriali-zation	Type	Technical maturity	Failure	Shift to		
					Hi-tech	KIBS	Primary products
73-08	yes	ambivalent	yes	no	yes	yes	jobless growth
73-88	yes	positive	yes	no	yes	yes	no
73-78	no						
78-83	yes	negative	no	yes	no	yes	new jobs
83-88	yes	positive	yes	no	yes	yes	no
88-93	yes	positive	yes	no	yes	no	no
93-08	yes	ambivalent	yes	no	yes	yes	jobless growth
93-98	yes	positive	yes	no	yes	yes	no
98-03	yes	ambivalent	ambiguous	ambiguous	no	no	jobless growth
03-08	yes	positive	yes	no	no	yes	new jobs

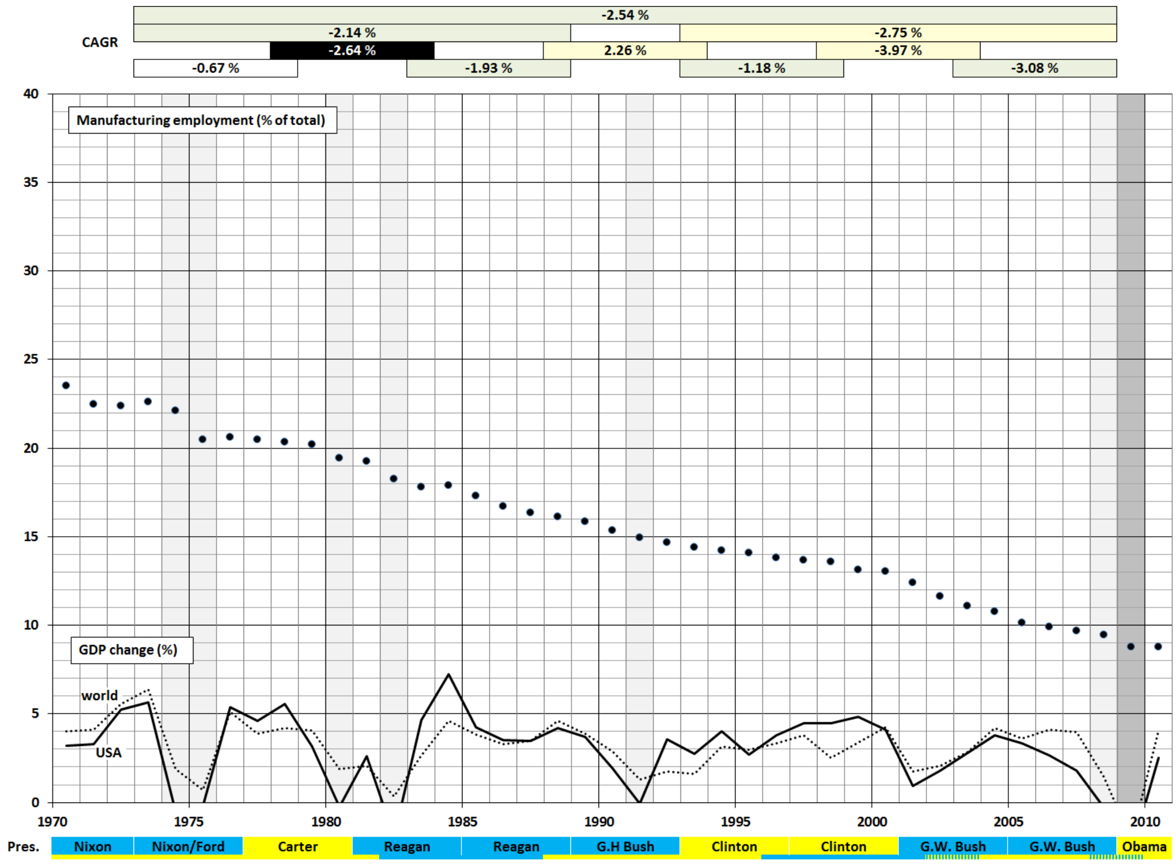
Source: Own compilation, evaluation based on EU KLEMS (2012) and World Bank (2014a) data

5.3.12.4 Economic and political explanations for structural changes

National trends and influences

When turning to the interrelations of political and economic spheres as illustrated by Figure 5.80, the self-reflective statement of Bill Clinton that “it’s the economy, stupid” (Galoozis, 2014) was proven at various instances:

- The shift from Gerald Ford to Jimmy Carter followed the oil crisis which hit the US economy comparatively hard. Presumably, also the repercussions of the Watergate affair had an additional influence by favouring a dedicated “good guy”.
- The shift from George Bush senior to Bill Clinton was preceded by a poor development of the US economy.
- The shift to Barack Obama was preceded by the 2008 world economic crisis.



Sources: Based on World Bank (2014a) data, own calculations and political information (Pearson Education, 2007; Pearson Education, 2012)

Figure 5.80 Economic and political development of the USA

When looking at the interrelation of the political affiliation of the president and de-industrialization, it seems that less jobs in manufacturing were discarded during Democrat rule than under Republican presidents. Although the Democrats under Clinton (and later Obama), in order not to lose the crucial flux of donations from powerful financial interest holders, did not entirely put down the blunt neo-liberal agenda that Ronald Reagan and both Bushes followed, these Democrat presidents tended to counter-balance it a little bit more, probably not to alienate their voters' base (Harvey, 2005).

Linkages to the world and regional economy

Despite of the high import rate from China, the American economy is practically not in line with the Asian. America contributes largely to the world economy and therefore determines its economic cycles. Anyhow, it does not do so much on the basis of mutual trade but on its mere size.

Table 5.67 GDP (CAGR, %) coefficients of determination with the USA

R^2 (%)	World	Europe & Central Asia	USA	East Asia & Pacific	Latin America & Caribbean
1970-1990	75.5	37.7	100.0	35.8	1.8
1990-2010	60.0	46.2	100.0	2.4	14.5
1970-2010	68.7	41.8	100.0	19.6	5.9

Source: Own calculations, based on EUKLEMS (2012) and World Bank (2014a) data

Despite of numerous efforts to gain political influence also in Latin America, its economic embedment is rather weak.

The links to the European Union have become stronger over the years. The cycles of both economies are pretty well in line.

6 Comparative evaluation of mature de-industrialization

After analysing de-industrialization processes in detail for each of the twelve mature countries under examination, the essence of these processes is distilled and compared in the following. These comparisons aim at identifying

- generalizable trends (induction following deduction) or alternatively
- national specifics (identification of behaviour not found elsewhere and not explicable by external influences).

In the first sub-section, the structural shifts of the sample group will be compared by re-utilizing the indicators known from the previous sections (productivity, absolute and relative output and employment, labour amount). The analysis will follow the timeline and will refer to the periods before (1973-88), during (1988-93) and after (1993-2008) the fall of the Iron Curtain.

In the second sub-section, the states of technological development in the investigated sample group will be compared. The relations between available technology and the trade policy (export or import country) and for success or failure in trade will be evaluated.

The third sub-section focuses on national specifics as influencing factors. Culture, geography, institutions and policies, e.g. the rigidity of labour laws and investment policies (liberal or regulated markets), will be investigated.

In the fourth sub-section (conclusion), the key findings of all three parts will be combined, so rationales for the observed structural phenomena will be brought to light.

6.1 Structural shifts

The analysis of structural shifts aims at clarifying the economic effects in the long-term perspective (1973-2008). Also the three sub-periods (1973-1988, 1988-1993, 1993-2008) will be addressed in more detail.

These means of analysis will be utilized:

- Compound annual growth rates of relative manufacturing employment and the indicators required for determining the scenarios according to the definitions in chapter 4.2 will be calculated. Additionally, the CAGR of output per capita as the difference between growth in absolute output and absolute employment will be utilized.
- Classifications according to the eclectic model of de-industrialization and the manufacturing industry scenario are made on the basis of the applied indicators.
- The total volatility of change will be compared (cf. 5.3.1.1, pp. 125).

By the following tables, a classification of the actual values of indicators is carried out. It will be applied on the tables compiled for each time period. By the shading, an optical marker for distinctive features is created.

Table 6.1 Total volatility (classification and shading)

	+	o	–	—	——
υ_T	< 6.0	6.0 … < 12.0	12.0 … < 18.0	18.0 … < 24.0	≥ 24.0

Source: Own compilation

Table 6.2 Key indicators (classification and shading)

CAGR (%) of	+	o	–
Empl. (rel.)	> – 1.0	– 1.0 … – 2.0	< – 2.0
Empl. (abs.)	> – 1.0	– 1.0 … – 2.0	< – 2.0
Output (abs.)	> 0.5	0.0 … 0.5	< 0.0
Output/cap.	> 2.0	1.0 … 2.0	< 1.0
Productivity	> 2.0	1.0 … 2.0	< 1.0
Workload	< 0.0	0.0 … 0.5	> 0.5
Labour	> – 1.0	– 1.0 … – 2.0	< – 2.0

Source: Own compilation

Table 6.3 Model and scenario descriptors (classification and shading)

CAGR (%) of	+	o	–	—	——
De-ind.?	no	yes			
Type	positive	ambivalent	ambivalent		negative
Mature?		yes	ambiguous		no
Failure?		no	ambiguous		yes
→ High-tech		yes			no
→ KIBS		yes			no
→ Primaries	new jobs / jobless	no			
Scenario	1a	1c, 4e	4d, 4f	5e, 5f	6f

Source: Own compilation

6.1.1 The long-term perspective: 1973-2008

The comparative analysis is carried out in some detail, primarily basing on the introduced models (section 6.1.1.1), and then wrapped up (section 6.1.1.2).

6.1.1.1 Model-based analysis

This part of the analysis will contain two main elements:

- First, the key indicators will be listed and then compared, also by means of graphic analysis.
- Then, the key results of both de-industrialization models (eclectic model and scenario model) will be analysed on a comparative basis.

Volatility of change

When comparing the volatility of change over the full 35 years (Table 6.4), it is noticeable that the founding members of the EU (BEL, FRA, GER, ITA, NLD since 1 January 1958) had a quite smooth development, also Austria (since 1 January 1995) due to its specific political conditions as described in section 5.3.1 and Japan and the USA due to their size and government (sections 5.3.11, 5.3.12).

Table 6.4 Total CAGR (%) volatility of de-industrialization indicators (1973/8-2003/8)

	AUT	BEL	FIN	FRA	GER	ITA	NLD	ESP	SWE	UK	JPN	USA
υ_T	7.05	9.45	17.11	8.12	9.60	10.89	10.93	16.95	13.16	13.88	9.09	9.01

Source: Own calculation, evaluation based on (EU KLEMS, 2012) and World Bank (2014a) data

The later EU accessors had a more irregular road to go. The reasons can be well explained by large swings in the political direction of these countries (also see the respective sections of chapter 5):

- Finland (EU member since 1 January 1995) re-adjusted its policies from rather socialist with certain influence from Moscow to Western liberal policies as soon as it was possible.
- Spain (EU member since 1 January 1986) had to cope with the transition from dictatorship to democracy and rather radical political changes due to its electoral system.

- Sweden (EU member since 1 January 1995) left its quite socialist way of social democracy in the 1980s and never returned to it, even when the social democrats returned to power.
- The United Kingdom (EU member since 1 January 1973) pursued a radical swing from rather socialist to consequent neo-liberal policies around 1980 under Margaret Thatcher (European Union, 2015).

Key indicators

In Table 6.5, the key figures are listed, supplemented by country rankings of relative employment. The mean value (not weighted) of all countries is also given.

Table 6.5 Overview on de-industrialization indicators (1973-2008)

Indicator		AUT	BEL	FIN*	FRA	GER	ITA	NLD	ESP	SWE	UK	JPN	USA**	mean
Empl. (%)	1973	25.1	31.1	24.0	24.1	32.8	27.3	21.8	22.0	26.8	24.8	25.8	20.5	25.4
	2008	15.3	13.2	16.8	11.8	18.2	19.3	10.2	12.2	15.4	7.9	16.9	9.5	13.9
	Rank 73→08	6→6	2→7	8→4	7→9	1→2	3→1	11→10	10→8	4→5	9→12	5→3	12→11	
CAGR (%)	Empl. (rel.)	-1.4	-2.4	-1.1	-2.0	-1.7	-1.0	-2.1	-1.7	-1.6	-3.2	-1.2	-2.5	-1.8
	Empl. (abs.)	-0.8	-1.9	-0.8	-1.4	-1.1	-0.3	-0.8	-0.2	-1.2	-2.7	-0.8	-1.0	-1.1
	Output	1.6	0.2	2.1	0.2	0.9	0.7	0.8	0.3	1.6	-0.7	1.1	1.0	0.8
	Output/cap.	2.4	2.1	2.9	1.6	2.0	1.0	1.6	0.5	2.8	2.0	1.9	2.0	1.9
	Productivity	2.8	2.5	3.3	2.2	2.7	1.2	2.1	0.9	2.5	2.2	2.3	1.9	2.2
	Workload	-0.4	-0.4	-0.3	-0.6	-0.7	-0.1	-0.5	-0.3	0.2	-0.2	-0.3	0.1	-0.3
	Labour	-1.3	-2.3	-1.1	-2.0	-1.8	-0.5	-1.3	-0.6	-1.0	-2.9	-1.1	-0.9	-1.4

Sources: Based on EU KLEMS (2012) data (in 2010 USD), own calculations, unweighted mean values
* 1975-2008; ** 1977-2008

Additionally, the correlation between the various indicators for de-industrialization was tested. The results are given in Table 6.6.

Table 6.6 Correlation between de-industrialization indicators (total sample)

R^2 of 5y CAGR (%)	ME (abs.)	ME (rel.)	MO (abs.)	MO (rel.)	LAB CONT
ME (abs.)	100.0	57.4	42.6	19.3	87.5
ME (rel.)	57.4	100.0	41.5	39.5	52.8
MO (abs.)	42.6	41.5	100.0	74.7	48.9
MO (rel.)	19.3	39.5	74.7	100.0	26.5
LAB CONT	87.5	52.8	48.9	26.5	100.0

Source: Own calculations, based on EU KLEMS (2012) data

Some conclusions may be drawn:

- The labour content is (as expected) normally largely determined by absolute numbers of employment in manufacturing. Workload changes play a minor role. Anyhow, in some cases, they may be significant (e.g. France).
- Absolute and relative manufacturing output correlate very well. This shows that the development of manufacturing productivity does not differ too much from the general development of productivity (average of all sectors).
- The correlation between changes of input indicators (= employment, labour) and those of output is far less than 50 % at average. The supply-side response is (naturally) not fully in time with demand-side changes (and the more vice versa).

As a clear and striking result, all countries have de-industrialized in a sociological sense in the last four decades. There are three speed groups of de-industrialization in terms of relative manufacturing employment:

- fast (CAGR < – 1.9 %): UK, USA, Belgium, Netherlands, France
- medium (CAGR – 1.9 to – 1.5): Germany, Spain, Sweden
- slow (CAGR > – 1.5 %): Austria, Finland, Italy, Japan

Moreover,

- there is no clear-cut relation between the initial degree of manufacturing employment and the velocity of industrial decline,
- there is no such relation between the initial percentage of manufacturing employment or its reduction and possible efficiency gains, expressed by Δ CAGR.

All countries followed individual paths, based on individual comparative advantages or disadvantages as described in the national sub-chapters before. In other words, there was no such thing as <u>the</u> standard pattern of industrial decline.

Industrialization only happened in terms of employment, not in terms of output. The only exception is the United Kingdom.

Fast de-industrializers

The UK did the change most radically, ending up at less than 8 % employment in manufacturing: It had the highest negative growth rate and was the only country that also observed a decline in manufacturing output.

Belgium also underwent a rather radical transition from industrial to service economy, with the highest percent-point reduction (17.9 %) of all countries and a CAGR of 2.4 %.

In 1973, the USA was the world leader concerning the structural shift from manufacturing towards services. It kept a high pace and ended up slightly behind the UK.

Belgium and the USA were also in the top group concerning productivity gains, indicated by the difference between output increase and employment decline, both expressed by CAGRs. Britain was not in this top group, which at the end of the day led to reductions in manufacturing output which would not have occurred with efficiency gains like in Belgium or the USA, the Δ CAGR of which exceeding the British job reduction rate.

Medium de-industrializers

This group contains two traditional countries renowned for their engineering: Germany and Sweden. The three other members, France and especially Spain and the Netherlands, come from a lower degree of manufacturing employment.

France and Spain did not perform well in terms of efficiency gains which may have contributed to relatively high job losses and low output rise (the argument goes this way round!).

Slow de-industrializers

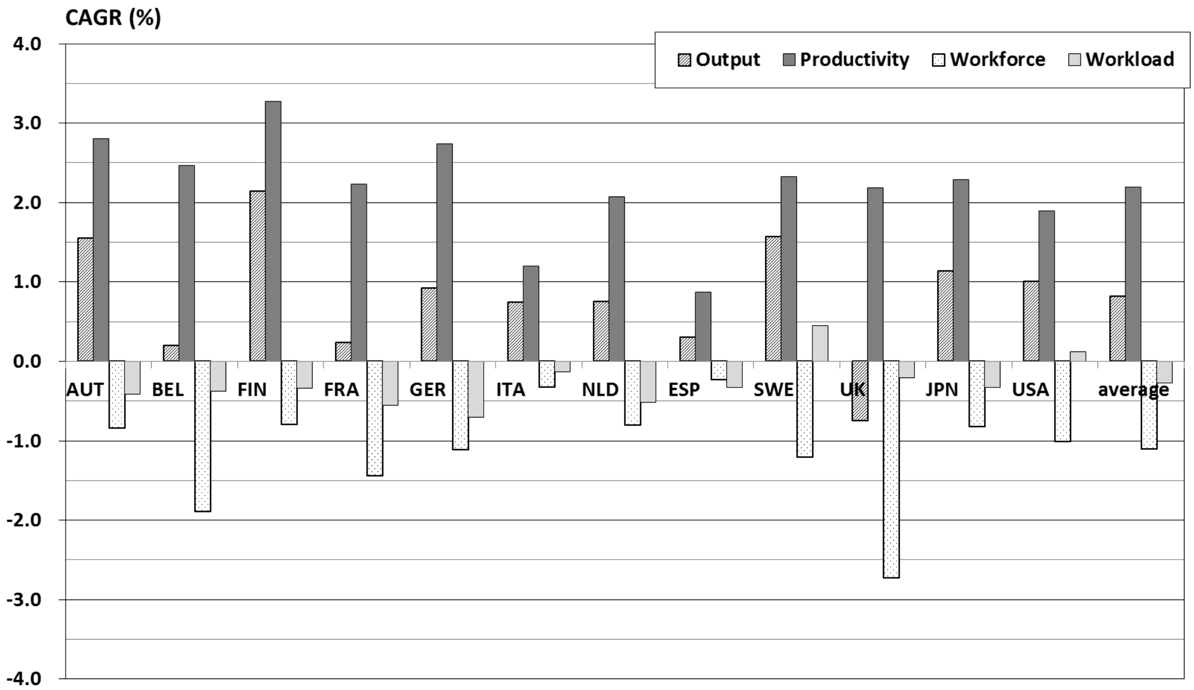
Austria and Finland are the stars in this group, because due to high efficiency gains, their outputs could be increased significantly.

Japan remained quite industrialized and is medium in its overall performance.

Italy relatively kept most people in the industry, but without achieving appropriate efficiency rises and, in this course, output rises. Italy’s industrial position seems to be very much endangered by international competition.

Labour content indicators

In Figure 6.1, the demand and supply sides of the labour content are displayed (cf. subsections 4.2.2, 4.2.3). The amplitudes in the one or the other direction deliver a very clear picture of (de-)industrialization processes in all countries.



Source: Own calculations, based on EU KLEMS (2012) data.
Growth rates are for absolute values of output and manufacturing employment.

Figure 6.1 Comparison of de-industrialization key data (1973-2008)

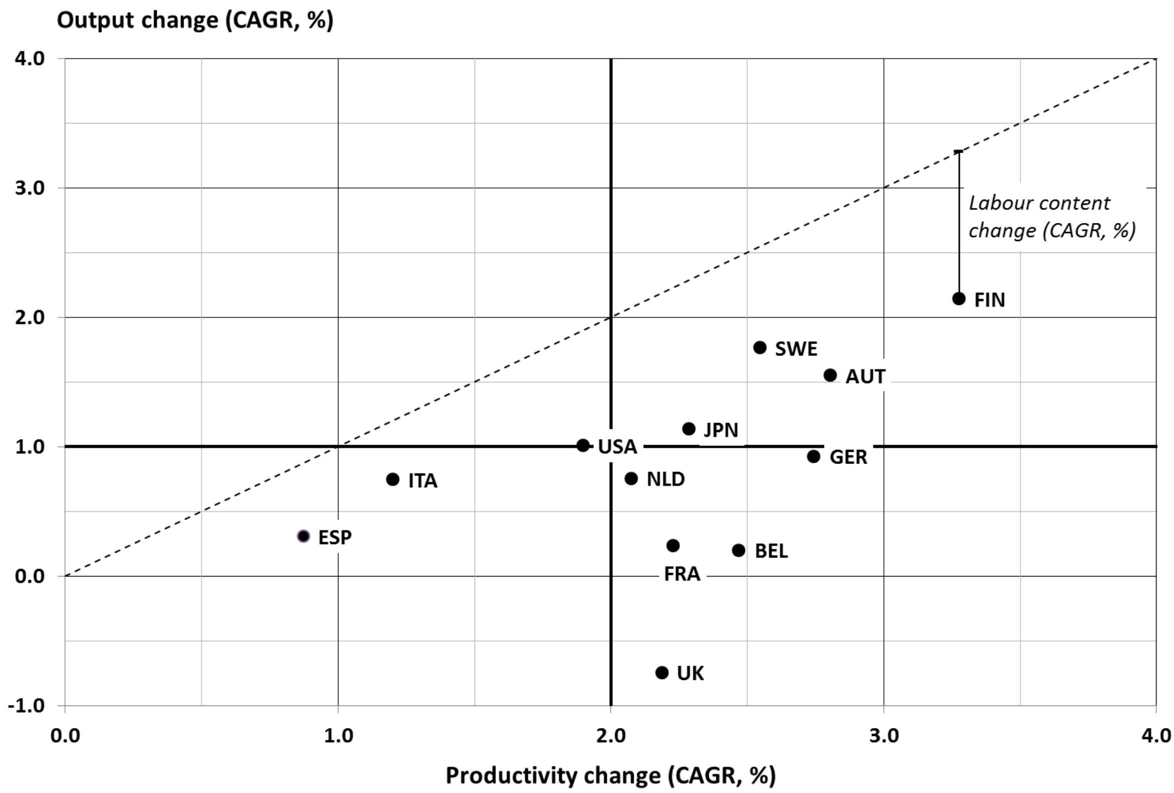
The output indicator shows an overall negative development only in the United Kingdom.

The reduction of total labour involved (workload) is determined by the difference between productivity and output change. Increasing productivity will increase international competitiveness. But most likely, the output will not follow at the same pace, so the gap between the two widens. In effect, this means pressure on the labour market. This pressure can be buffered to a certain, but limited extent by workload reductions. (As the French example has shown, these might influence productivity negatively.)

Here, there is one of the major pitfalls for industry policy makers. In an economy with high unemployment rates, politicians might abstain from putting too much pressure on the economy to avoid the immediate negative effects on the labour market – with the long-term consequence of more and more losing out in international competition. Italy and Spain are examples for this phenomenon.

These interrelations are graphically shown in Figure 6.2 were changes in output are displayed versus those in productivity. In addition, the bisecting line of both axes is shown. The difference in y-direction from a point to this line indicates the change in labour content.

By introducing four quadrants, a grouping of effort (= rising productivity, section line at CAGR = 2 %) and success (= rising output, section line at 1 %) is achieved. It can be associated with the BCG matrix (BCG, 2015) , with dogs at the bottom left, stars at the top right, question marks at the bottom right and (in economic boom times) cash cows at the top left.



Source: Own calculations, based on EU KLEMS (2012) data

Figure 6.2 Output vs. productivity change (1973-2008)

From 1973 to 2008, the hard Finnish, Austrian and Swedish efforts were rewarded by significant increases in output. Germany even pushed a little harder than Sweden, but with less success in output. There is a group of states that increased their productivity at around 2 %. Nonetheless, the resulting output rise was quite different, with Japan in the lead and the United Kingdom at the very bottom end of industrial success, even losing in output.

Italy and Spain followed a different path. Both achieved much less productivity rises but limited the influence on their labour market. As a consequence, their market success is also quite low. Yet, it was still higher than that of France, Belgium and the UK who struggled harder.

Scenarios and applied eclectic model of de-industrialization

An overview on the results for the eclectic model, accomplished by the identified scenarios, is rendered in Table 6.11. The exact scenarios are given in stacked graphs of the demand and supply side Figure 6.3. There is a certain standard pattern of de-industrialization that is followed by Austria, Belgium, Finland, Germany and Japan, characterized by

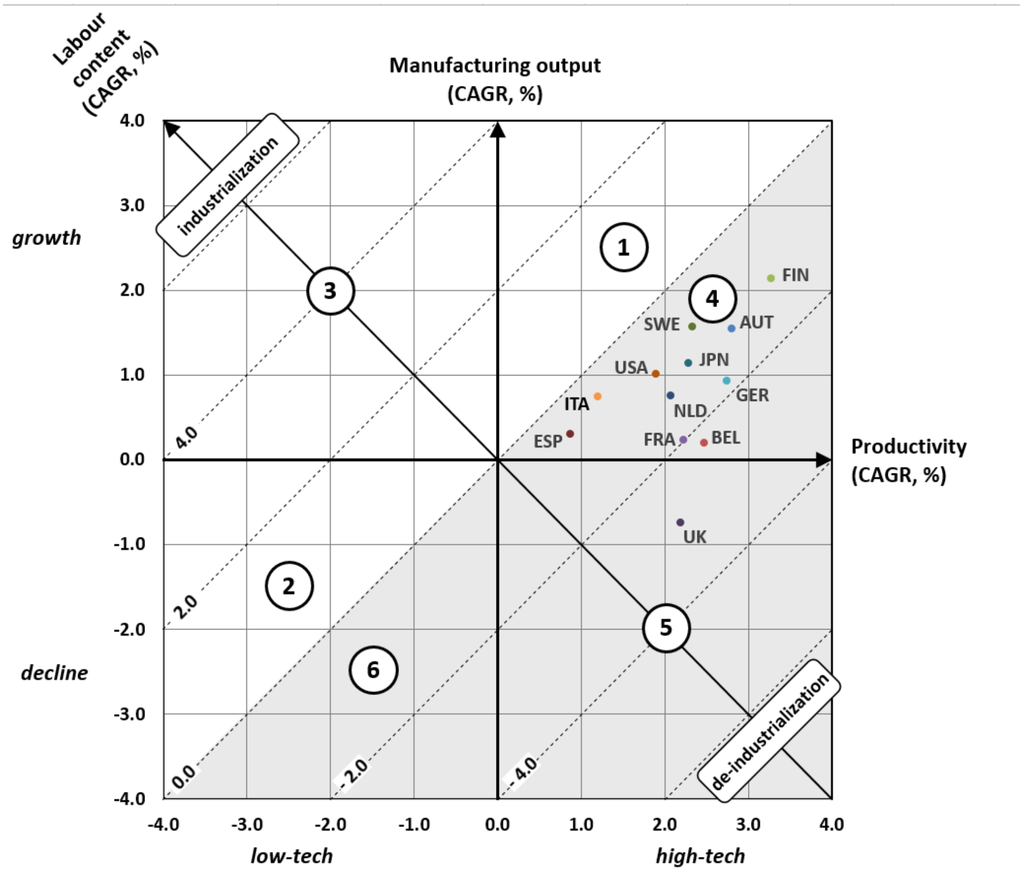
- significant reduction of relative employment (de-industrialization),
- growing national income per capita, but growing unemployment (ambivalent type); change of the trade balance[*] at minimum neutral,
- a positive development of both productivity and output (mature, no failure),
- a shift to high-tech manufacturing and KIBS,
- no primary products of importance,
- a scenario characterized by reductions of labour that are distributed on employment and workload (4e type scenario).

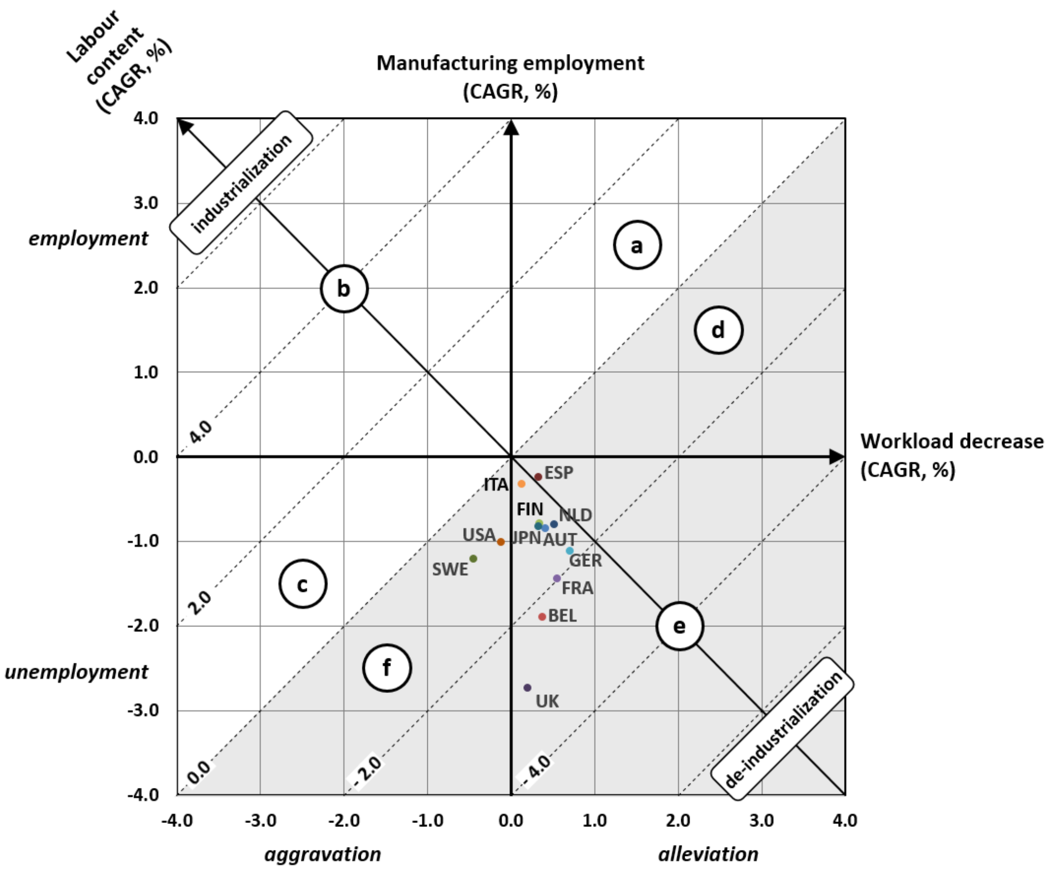
Table 6.7 Model results and scenarios of de-industrialization (1973-2008)

	AUT	BEL	FIN*	FRA	GER	ITA	NLD	ESP	SWE	UK	JPN	USA**
De-ind.?	yes	yes	yes	yes	yes	no	yes	yes	yes	yes	yes	yes
Type	ambival.	ambival.	ambival.	ambival.	ambival.		positive	ambival.	ambival.	ambival.	ambival.	ambival.
Mature?	yes	yes	yes	yes	yes		yes	ambigu.	yes	yes	yes	yes
Failure?	no	no	no	no	no		no	no	no	no	no	no
→ High-tech	yes	yes	yes	no	yes		yes	yes	yes	no	yes	yes
→ KIBS	yes	yes	yes	yes	yes		yes	yes	yes	yes	yes	yes
→ Primaries							jobless			jobless		jobless
Scenario	4e	4e	4e	4e	4e	4e	4e	4e	4f	5e	4e	4f

Source: Own calculations, based on World Bank (2014a) and EU KLEMS (2012) data
* 1975-2008; ** 1977-2008

[*] Export policies will be investigated more closely in section A6.2.1.





Source: Own graph, based on EU KLEMS (2012) data, 1973-2008

Figure 6.3 Scenarios for mature countries: demand/supply side (up/down)

All other countries differ from the mainstream in certain distinct features:

- France

  The French high-tech manufacturing output did not grow faster than total manufacturing, so no shift to high-tech manufacturing took place.

- Italy

  According to the classifications, Italy has not de-industrialized. The Italian value for the decline of relative manufacturing employment is – 0.98 %, so it is just a little higher than the hurdle of – 1.00 %. If Italy had crossed the hurdle, its results would be an exact parallel to the Netherlands.
  Note: In Table 6.5, the rounded value is rendered (– 1.0 %).

- Netherlands

  Since the Netherlands were facing only very modest increases in unemployment, their type of de-industrialization was classified as positive.
  Primary products have played a significant role in the Dutch national economy.

- Spain

  In Spain, apart from national income growth per capita (2.0 %), the general economic figures were not beneficial. Unemployment grew by 8.7 percentage points, the trade balance worsened by 5.1 percentage points. Moreover, some doubt was cast on technical maturity by relatively low productivity (0.9 %) and output (0.3 %) growth, leading to an 'ambiguous' result.

- Sweden

  Sweden differs in showing a 4f type instead of a 4e scenario. Manufacturing employment was reduced more than the total labour content, resulting in an increased workload per employee.

- United Kingdom

  Like France, the United Kingdom did not shift to high-tech manufacturing. Even worse, the British manufacturing output sank, so a 5e scenario resulted.
  Primary products (here: North Sea oil and gas) have played a significant role in the UK national economy.

- USA

  Unlike all other states of the sample group, the United States could reduce their unemployment rate. But at the same time, its trade balance worsened significantly. Thus, there also is the ambivalent type of de-industrialization.

  Like Sweden, the USA pursued the very ambitious 4f scenario and increased the individual workload.

  Primary products played a significant role in the US national economy.

6.1.1.2 Aggregate findings

When applying the definitions of de-industrialization summarized in Table 2.13, p. 66, it becomes clear that in the long run, all mature states have de-industrialized in almost all categories but absolute output (Table 6.8). The UK even had a declining output as the only country.

Table 6.8 Fulfilled de-industrialization definitions (mature states, 1973-2008)

	Labour content	Employment	Output
abso-lute	**LAB CONT** CAGR < 0.0 %: all	**ME (abs.)** CAGR < 0.0 %: all	**MO (abs.)** CAGR < 0.0 %: UK
rela-tive		**ME (rel.)**: CAGR < 0.0 %: all CAGR ≤ -1.0 %: all w/o ITA	**MO (rel.)**: CAGR < 0.0 %: all

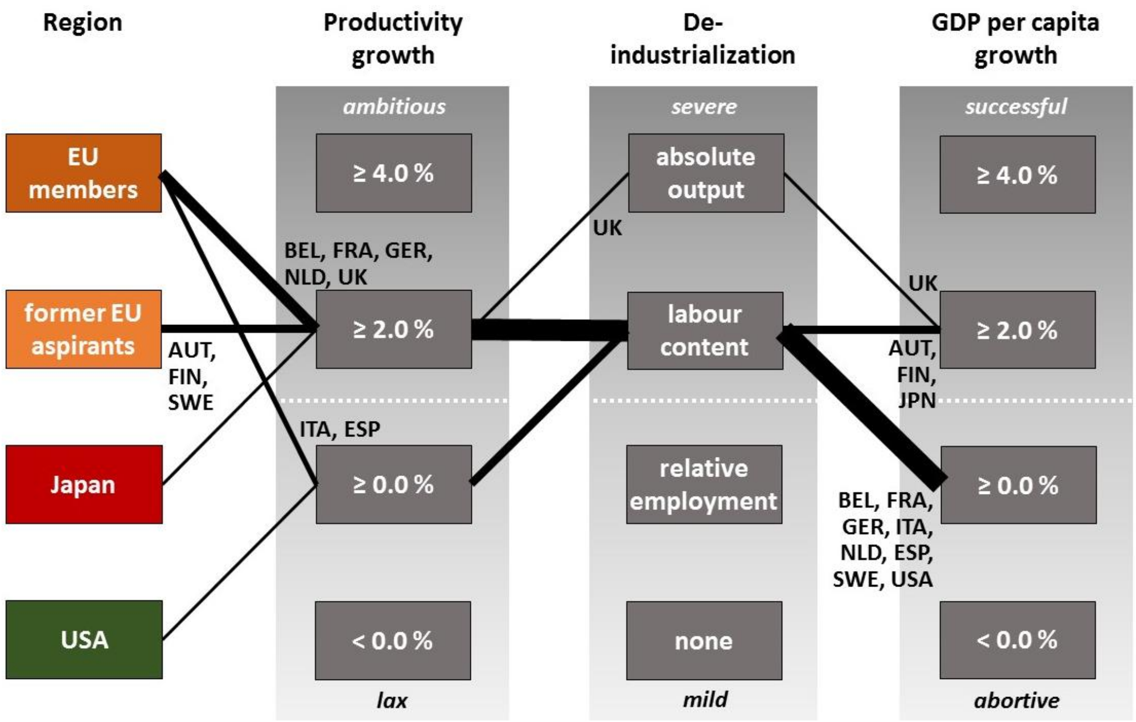
Source: Own compilation, based on World Bank (2014a) and EU KLEMS (2012) data.
Data for FIN: 1975-2008, USA 1977-2008

Under the circumstances of most Western economies, the total workforce has risen in recent decades because of a higher share of female employment. Thus, even in an economy with a constant absolute employment in manufacturing, the relative employment would sink. The 'normal' behaviour would also be sinking absolute numbers in manufacturing employment due to productivity rises exceeding those of labour participation. The total number of hours worked would normally decrease even a little faster than absolute employment because of a certain diminished average workload of the employees.

While absolute output would in the 'normal' case still be rising due to elevated manufacturing productivity, the sectoral contribution will be lowered due to the over-proportional growth of the service sector.

As a result of these considerations, there is a ranking of de-industrialization scenarios. When only taking into account the most critical and relevant indicators, the ranking from uncritical to most critical de-industrialization is: 1. none; 2. reduced relative manufacturing employment; 3. reduced labour content; 4. reduced manufacturing output.

In Figure 6.4, this ranking is utilized. The graph connects a key input factor (productivity growth) with the most severe country-specific manifestation of de-industrialization (highest position in the ranking) and a key indicator for the performance of a national economy (GDP per capita). In addition, for reasons of clarity, the categories are dyed and descripted; the upper two and the lower two values of each category are separated by a white dotted line.



Source: Own calculations based on World Bank (2014a) and EU KLEMS (2012) data

Figure 6.4 Key features of de-industrialization (mature economies, 1973-2008)

For the 35-year period from 1973 to 2008, there is a typical pattern that the Western states followed. Apart from Italy, Spain and the USA, they all arrived at medium-high income per capita productivity rises which resulted in reductions of the total hours worked (labour content) in the manufacturing industry. The UK even went further and was facing significant output losses.

With this course, the UK could achieve medium-high rises of the income per capita, a success that could only be met by Austria, Finland and Japan. All other states remained below the two percent hurdle. Among these were Italy and Spain, the two states that followed a less ambitious course in raising productivity.

In the very long run, the large tidal difference evened up. The UK apparently did not suffer from its fast de-industrialization but was able to compensate it.

Behind the long-term trends, there are certain developments that will only become clear when taking a closer look at the sub-periods, especially the 15-year periods before and after the fall of the Iron Curtain.

6.1.2 The prelude to globalization: 1973-1988

Generally, the course of analysis of this period will be similar to the analysis of the full investigated period.

6.1.2.1 Model-based analysis

Volatility of change

Overall change amplitudes were quite modest despite of oil-shock and the global economic crisis around 1980. The smoothest process happened in France where state regulations assured little economic change. On the upper end of the volatility scale are the Dutch and the British.

- The Netherlands were quite exposed to the oil-shock and world economic crisis due to a high share of primary products in there national economy (Royal Dutch Shell company) and high export orientation.
- The British problems in adapting to increased competition after entering the European Union in 1973 (European Union, 2015) after decades of centralist economic policies eliminating productive competition lead to a radical reaction, finally the drastic treatment prescribed by Margaret Thatcher.

Table 6.9 Total CAGR (%) volatility of de-industrialization indicators (1978-1988)

	AUT	BEL	FIN	FRA	GER	ITA	NLD	ESP	SWE	UK	JPN	USA
υ_T	6.26	10.28	9.18	5.16	7.71	9.94	12.46	10.29	7.81	13.62	6.12	7.70

Source: Own calculation, evaluation based on (EU KLEMS, 2012) and World Bank (2014a) data

Key indicators

The key indicators for 1973 to 1988 are rendered in Table 6.10. Again, in a sociological sense (relative employment), all countries de-industrialized, although Italy and Japan stayed above the set hurdle rate of the respective indicator (– 1.0 %). Also Spain's manufacturing employment declined a little slower (at the second decimal place) than the model hurdle rate of de-industrialization requires.

In the sociological sense, Belgium, the Netherlands, the United Kingdom and the USA experienced a very rapid decline.

Table 6.10 Overview on de-industrialization indicators (1973-1988)

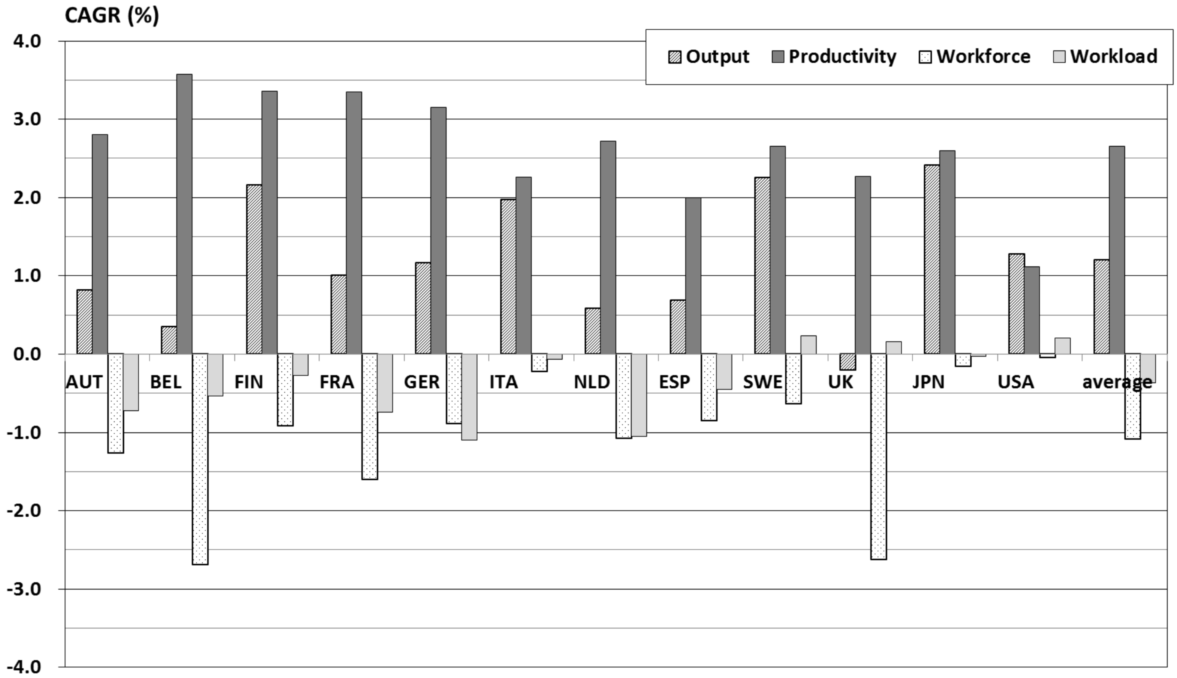
Indicator		AUT	BEL	FIN*	FRA	GER	ITA	NLD	ESP	SWE	UK	JPN	USA**	mean
Empl. (%)	1973	25.1	31.1	24.0	24.1	32.8	27.3	21.8	22.0	26.8	24.8	25.8	20.5	25.4
	1988	20.6	20.4	20.0	18.0	26.6	23.9	15.9	19.0	21.5	16.5	22.7	16.1	20.1
	Rank 73→08	6→5	2→6	8→7	7→9	1→1	3→2	11→12	10→8	4→4	9→10	5→3	12→11	
CAGR (%)	Empl. (rel.)	-1.3	-2.8	-1.4	-1.9	-1.4	-0.9	-2.1	-1.0	-1.4	-2.7	-0.8	-2.1	-1.6
	Empl. (abs.)	-1.3	-2.7	-0.9	-1.6	-0.9	-0.2	-1.1	-0.9	-0.6	-2.6	-0.2	-0.0	-1.1
	Output	0.8	0.3	2.2	1.0	1.2	2.0	0.6	0.7	2.3	-0.2	2.4	1.3	1.2
	Output/cap.	2.1	3.0	3.1	2.6	2.1	2.2	1.7	1.6	2.9	2.4	2.6	1.3	2.3
	Productivity	2.8	3.6	3.4	3.3	3.2	2.3	2.7	2.0	2.9	2.3	2.6	1.1	2.7
	Workload	-0.7	-0.5	-0.3	-0.7	-1.1	-0.1	-1.1	-0.5	-0.0	0.2	-0.0	0.2	-0.4
	Labour	-2.0	-3.2	-1.2	-2.3	-2.0	-0.3	-2.1	-1.3	-0.7	-2.5	-0.2	0.2	-1.5

Sources: Based on EU KLEMS (2012) data (in 2010 USD), own calculations, unweighted mean values
* 1975-1988; ** 1977-1988

In most countries, the manufacturing industry pushed productivity very hard (2.0 % and more). Since output only followed at a certain distance, a labour content gap opened. Most countries answered with some workload reduction. The only exceptions were Sweden, the UK and the USA:

- The UK and Sweden increased the workload despite of a severe reduction in the labour content.
- The USA followed a totally different path. Their productivity rose only modestly while they were able to increase their output, so their total labour content increased. The

USA realized this extra demand of work by increasing the workload while keeping absolute employment figures more or less constant (Figure 6.5).



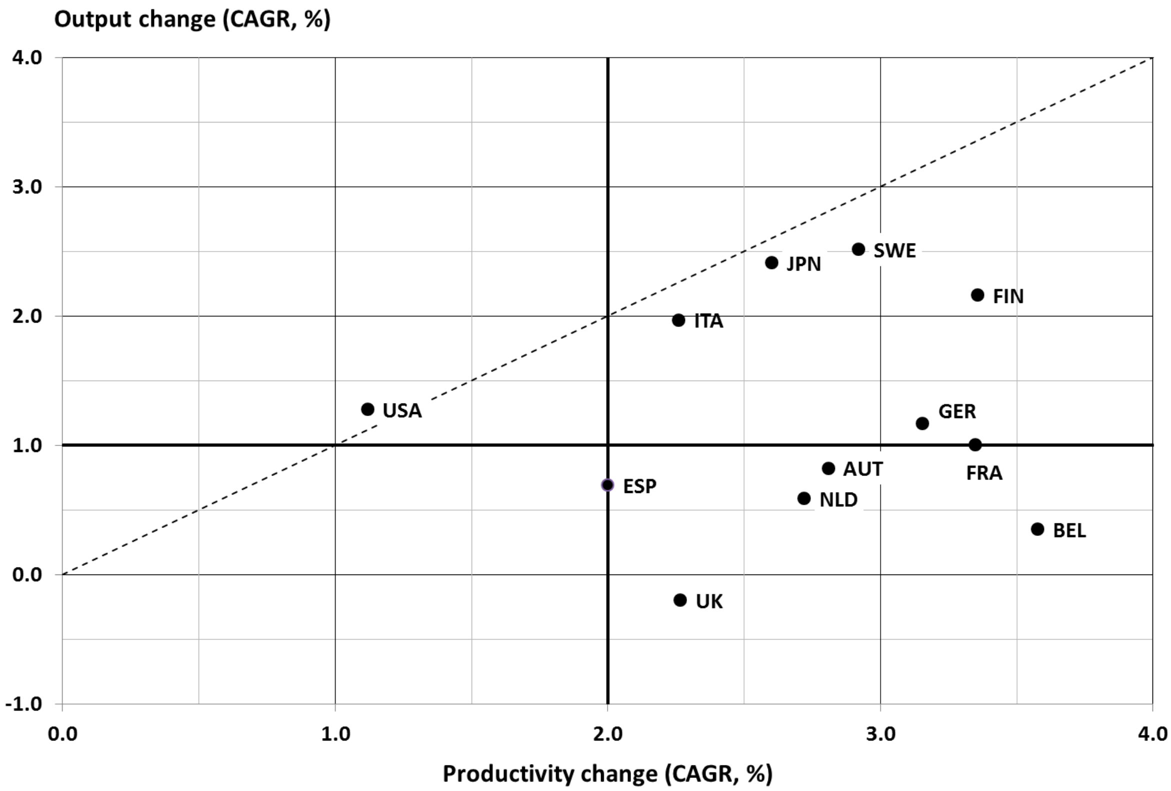
Source: Own calculations, based on EU KLEMS (2012) data

Figure 6.5 Comparison of key data for de-industrialization (1973-1988)

In Figure 6.6, the results are placed on the output versus productivity matrix. The ambitions of most countries become clearly visible, since apart from the USA, they are all on the right side of the chart, aiming at improvements in their competitive position.

Six countries are in the star group: Finland, France, Germany, Italy, Sweden and Japan. Another four states at least managed to increase their output, with Belgium accounting the highest losses in total labour content (difference in y-direction to the dotted line). The UK was underperforming, with reductions in output and also severe reductions in labour content.

The USA played a very special role, with only little increases in productivity, but yet an increased output. This output increase roughly refers to the population growth (cf. 5.3.12.1, p. 251). The American industry seems to have not done much to assure its future but rather rested on its laurels.



Source: Own calculations, based on EU KLEMS (2012) data

Figure 6.6 Output vs. productivity change (1973-1988)

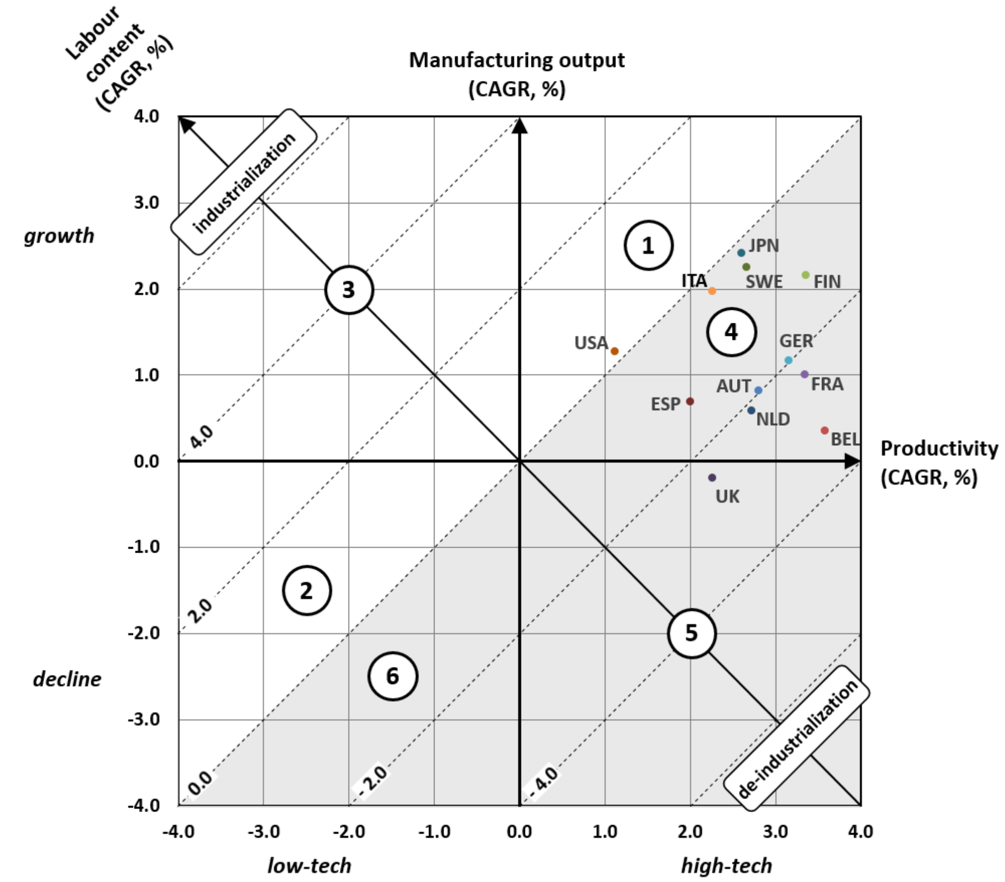
Scenarios and applied eclectic model of de-industrialization

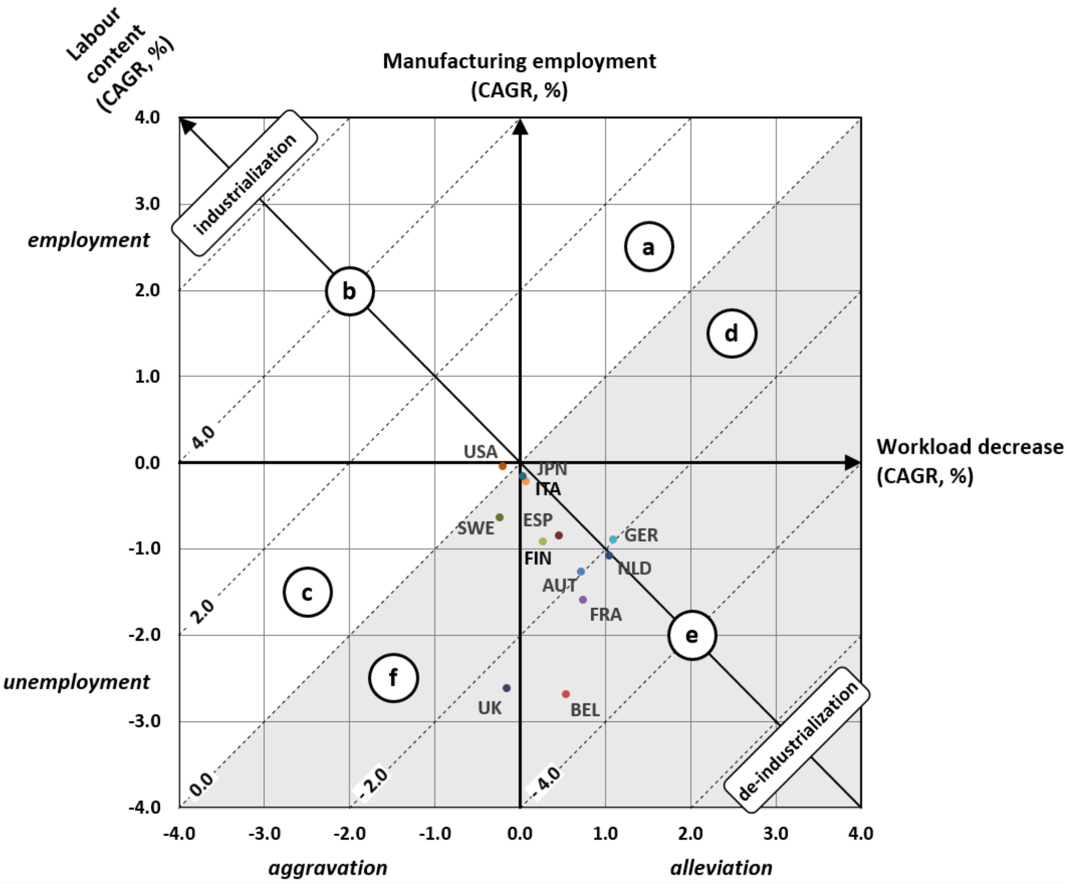
When turning to the eclectic model of de-industrialization (Table 6.11) and the scenarios (Figure 6.7), the standard pattern listed in the previous section (cf. p. 269) is taken as the reference point. It is met exactly by Austria, Finland and Germany. Belgium and France did not shift to high-tech, the Netherlands had some additional shift to primary products.

Table 6.11 Scenarios of de-industrialization (1973-1988)

	AUT	BEL	FIN*	FRA	GER	ITA	NLD	ESP	SWE	UK	JPN	USA**
De-ind.?	yes	yes	yes	yes	yes	no	yes	No	yes	yes	no	yes
Type	ambival.	ambival.	ambival.	ambival.	ambival.		ambival.		positive	ambival.		positive
Mature?	yes	yes	yes	yes	yes		yes		yes	yes		yes
Failure?	no	no	no	no	no		no		no	no		no
→ High-tech	yes	no	yes	no	yes		yes		yes	yes		yes
→ KIBS	yes	yes	yes	yes	yes		yes		yes	yes		yes
→ Primaries							jobless			jobless		
Scenario	4e	4e	4e	4e	4e	4e	4e	4e	4f	5f	4e	1c

Source: Own calculations, based on World Bank (2014a) and EU KLEMS (2012) data
* 1975-1988; ** 1977-1988





Source: Own graph, based on EU KLEMS (2012) data, 1973-1988

Figure 6.7 Scenarios for mature countries: demand/supply side (up/down)

While Italy, Spain and Japan did not de-industrialize quickly enough in terms of relative manufacturing employment to meet the hurdle rate, so the eclectic model shows no result, they are also diagnosed as a 4e type scenario.

Three countries follow very different paths of de-industrialization.

- Sweden

  Sweden follows the very ambitious 4f scenario, with workload increases despite of sinking labour content, so additional lay-offs result. Yet, this lead to a positive economic development, including a reduction of unemployment, so increasing the workload is very likely the result of increasing total labour demand in the national economy.

- United Kingdom

  The UK, unlike all other states, had losses in output. Like Sweden, it increased the workload, but unlike Sweden, it did despite of a severe growth of unemployment, resulting in a 5f type scenario and an ambivalent type of de-industrialization. Also a shift to primary products took place.

- USA

  The situation in the USA was characterized by reduced unemployment, an only very modest negative shift of the trade balance and an increase in national income per capita, so all in all, it is of the 'positive' type.
  Compared to the standard scenario, a type 1c case is noted, meaning that employment was (slightly) reduced while in fact, the labour content grew. The gap was closed by increasing the workload. This scenario leaves the impression of being one of de-industrialization, but in fact, it is not, since more labour needs to be done. That is why it is classified as 'pseudo de-industrialization'.

As a whole, the Western manufacturing industry was rather successful in the investigated period. Relatively high raises of productivity could be achieved, leading to labour content reductions that were, except of the USA, not fully compensated by increased output.

6.1.2.2 Aggregate findings

A test of de-industrialization standard indicators for the period 1973-1988 (Table 6.12) shows almost exactly the same picture as the long-term analysis 1973-2008 (Table 6.9, p. 275).

Table 6.12 Fulfilled de-industrialization definitions (mature states, 1973-1988)

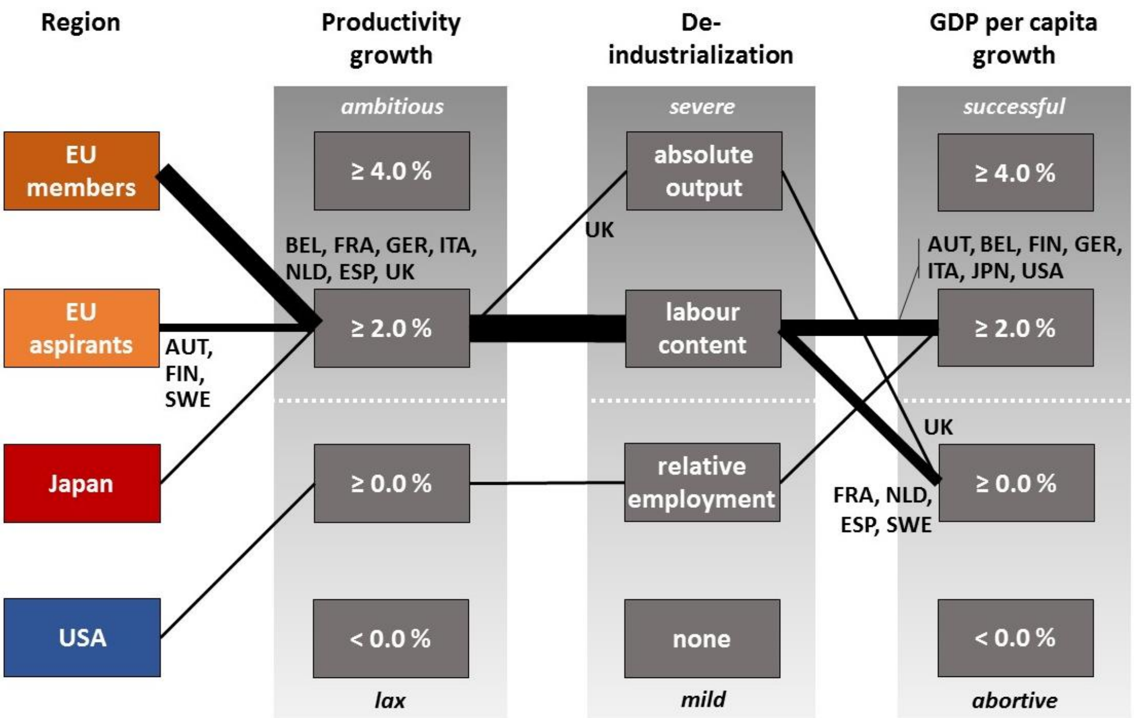
	Labour content	Employment	Output
abso-lute	**LAB CONT** CAGR < 0.0 %: all w/o USA	**ME (abs.)** CAGR < 0.0 %: all	**MO (abs.)** CAGR < 0.0 %: UK
rela-tive		**ME (rel.)**: CAGR < 0.0 %: all CAGR ≤ -1.0 %: all w/o ITA, JPN, ESP	**MO (rel.)**: CAGR < 0.0 %: all

Source: Own compilation, based on World Bank (2014a) and EU KLEMS (2012) data. Data for FIN: 1975-1988, USA 1977-1988

The differences lie in the fact that i) Japan de-industrialized a little slower in terms of relative manufacturing employment and ii) the USA did not de-industrialize in terms of labour content despite of decreasing absolute manufacturing employment. This means that the average workload per employee was increased, a rather unusual behaviour that is easily explicable by neoliberal policies picked up in the Reagan era.

The industrial policies resulted in a quite uniform medium high productivity growth with the USA as the only exception. The modest US change of productivity led to very modest de-industrialization that only showed in relative employment. All other states observed labour content reductions, the UK even had to face a reduction of its absolute manufacturing output.

The relative winners and losers by increases in income per capita were partly different to those of the full 35 years (Figure 6.8). The UK could finally change for the better, Belgium, Germany, Italy and the USA changed for the worse. All other states were in the identical category over the first 15 and full 35 years.



Source: Own calculations based on World Bank (2014a) and EU KLEMS (2012) data

Figure 6.8 Key features of de-industrialization (mature economies, 1973-1988)

6.1.3 The wind of change: 1988-1993

6.1.3.1 Model-based analysis

Volatility of change

The volatility of change in times of change is shown in Table 6.13. The indicator reached very high values in certain countries (Finland, Sweden, Spain) while being surprisingly low in all other countries, especially Germany which had to deal with a merger of two very unequal formerly separate German states under the West German roof.

Table 6.13 Total CAGR (%) volatility of de-industrialization indicators (1988-1998)

	AUT	BEL	FIN	FRA	GER	ITA	NLD	ESP	SWE	UK	JPN	USA
υ_T	4.69	6.91	20.80	5.91	8.75	7.96	7.62	15.22	16.47	11.44	8.35	7.10

Source: Own calculation, evaluation based on (EU KLEMS, 2012) and World Bank (2014a) data

Sweden and especially Finland had to restructure their international political positions and trade, then accessing the European Union in 1995 (European Union, 2015).

Spain had all of a sudden lost its unique value proposition as a (relative) low-cost country: the East European states offered similar technical competence at less distance and often lower prices. The socialist government did not prepare for economic hardships and necessary productivity rises, so severe crisis symptoms resulted.

Key indicators

A quick view on the five-year epoch-making change shows the dramatics of the development (Table 6.14, Figure 6.9). Almost all European countries apart from Austria and the Netherlands suffered from reduced output.

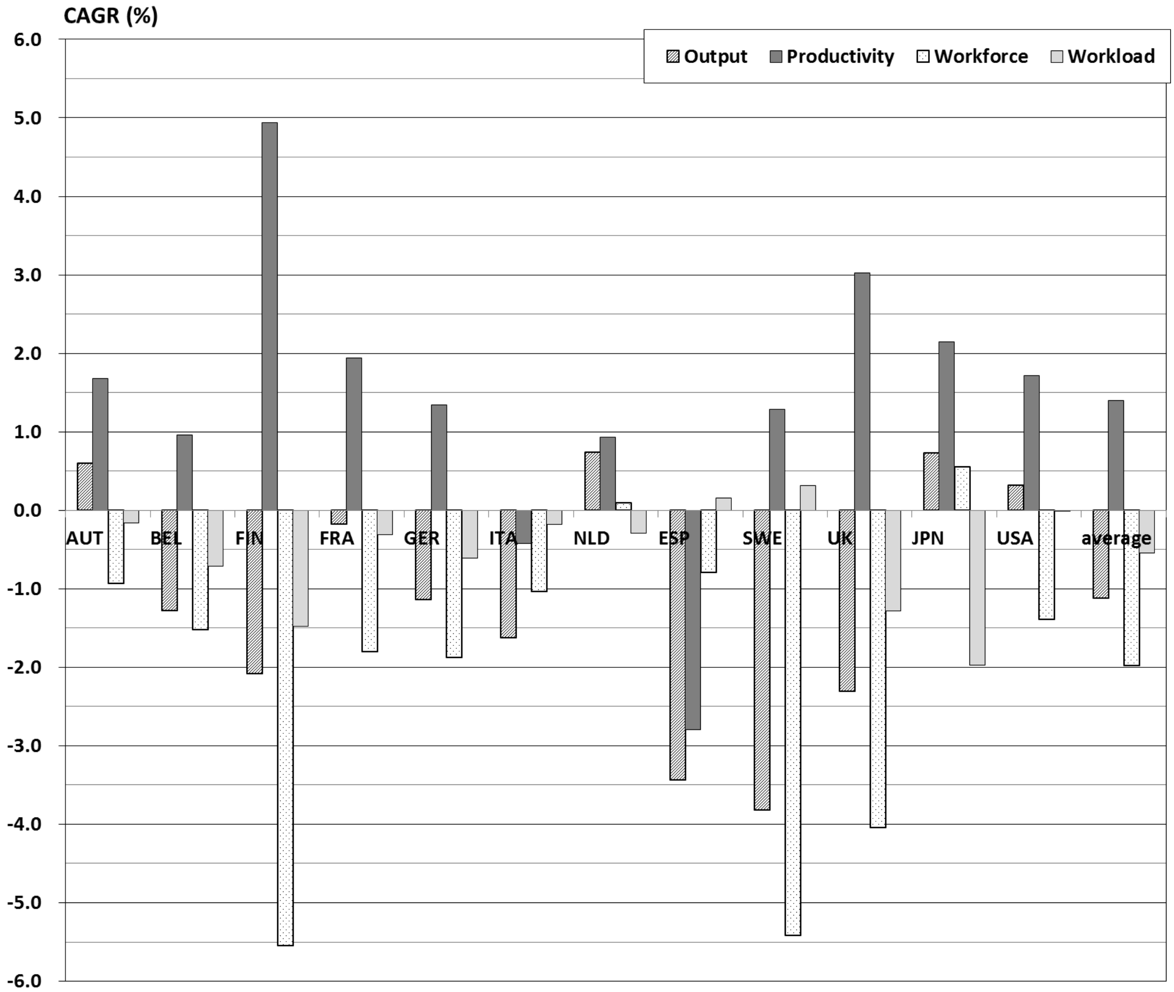
Finland and Sweden, traditional trade partners of the Soviet Union, were facing the deepest cuts. Despite of these negative trends, both countries raised their productivity, Finland even at record levels. In fact, this drastic treatment led to a record in labour content reduction, compensated by very high increases in unemployment and also significant workload reductions. The United Kingdom also pursued a very consequent strive for increased productivity.

Italy and Spain followed an opposite strategy. They compensated output losses by losses in productivity, i.e. they kept much of their workforce despite of less work to do (reduced labour content).

Table 6.14 Overview on de-industrialization indicators (1988-1993)

Indicator		AUT	BEL	FIN	FRA	GER	ITA	NLD	ESP	SWE	UK	JPN	USA	mean
Empl. (%)	1988	20.6	20.4	20.0	18.0	26.6	23.9	15.9	19.0	21.5	16.5	22.7	16.1	20.1
	1993	18.7	18.4	18.2	16.3	23.0	22.5	14.5	17.4	18.0	12.5	21.9	14.4	18.0
	Rank 88→93	5→4	6→5	7→6	9→9	1→1	2→2	12→10	8→8	4→7	10→12	3→3	11→11	
CAGR (%)	Empl. (rel.)	-2.0	-2.1	-1.9	-2.0	-2.9	-1.2	-1.8	-1.7	-3.5	-5.4	-0.8	-2.3	-2.3
	Empl. (abs.)	-0.9	-1.5	-5.5	-1.8	-1.9	-1.0	0.1	-0.8	-5.4	-4.0	0.6	-1.4	-2.0
	Output	0.6	-1.3	-2.1	-0.2	-1.1	-1.6	0.7	-3.4	-3.8	-2.3	0.7	0.3	-1.1
	Output/cap.	1.5	0.2	3.4	1.6	0.8	-0.6	0.6	-2.6	1.6	1.7	1.3	1.7	0.9
	Productivity	1.7	1.0	4.9	1.9	1.3	-0.4	0.9	-2.8	1.3	3.0	2.1	1.7	1.4
	Workload	-0.2	-0.7	-1.5	-0.3	-0.6	-0.2	-0.3	0.2	0.3	-1.3	-2.0	-0.0	-0.5
	Labour	-1.1	-2.2	-7.0	-2.1	-2.5	-1.2	-0.2	-0.6	-5.1	-5.3	-1.4	-1.4	-2.5

Sources: Based on EU KLEMS (2012) data (in 2010 USD), own calculations, unweighted mean values

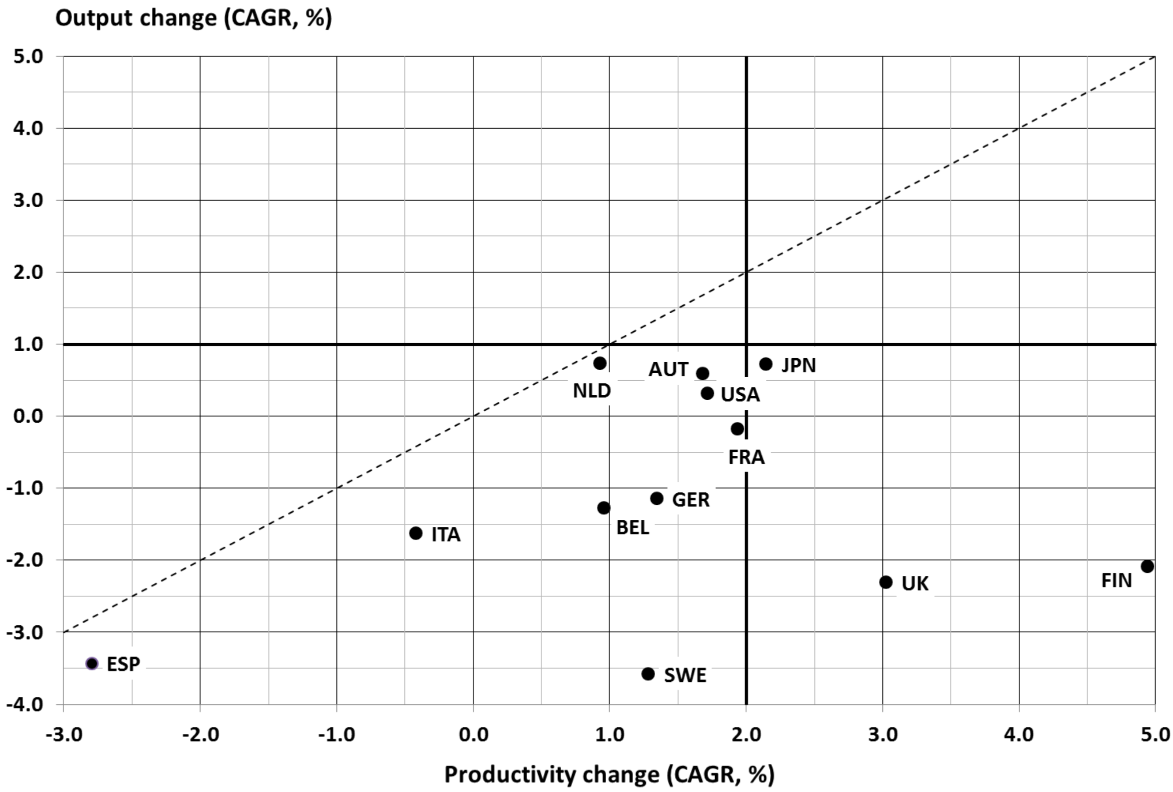


Source: Own calculations, based on EU KLEMS data (EU KLEMS, 2012)

Figure 6.9 Comparison of key data for de-industrialization (1988-1993)

The other countries pursued a somewhat balanced strategy, with limited efforts to increase the productivity, but at reduced job losses. If customer markets are not able to absorb more goods, any increase in productivity leads to additional burdens on the labour market.

Some relief might be found by reductions of the average workload – but only at the danger of certain productivity reductions. It is difficult for politicians to make adequate choices here.



Source: Own calculations, based on EU KLEMS (2012) data

Figure 6.10 Output vs. productivity change (1988-1993)

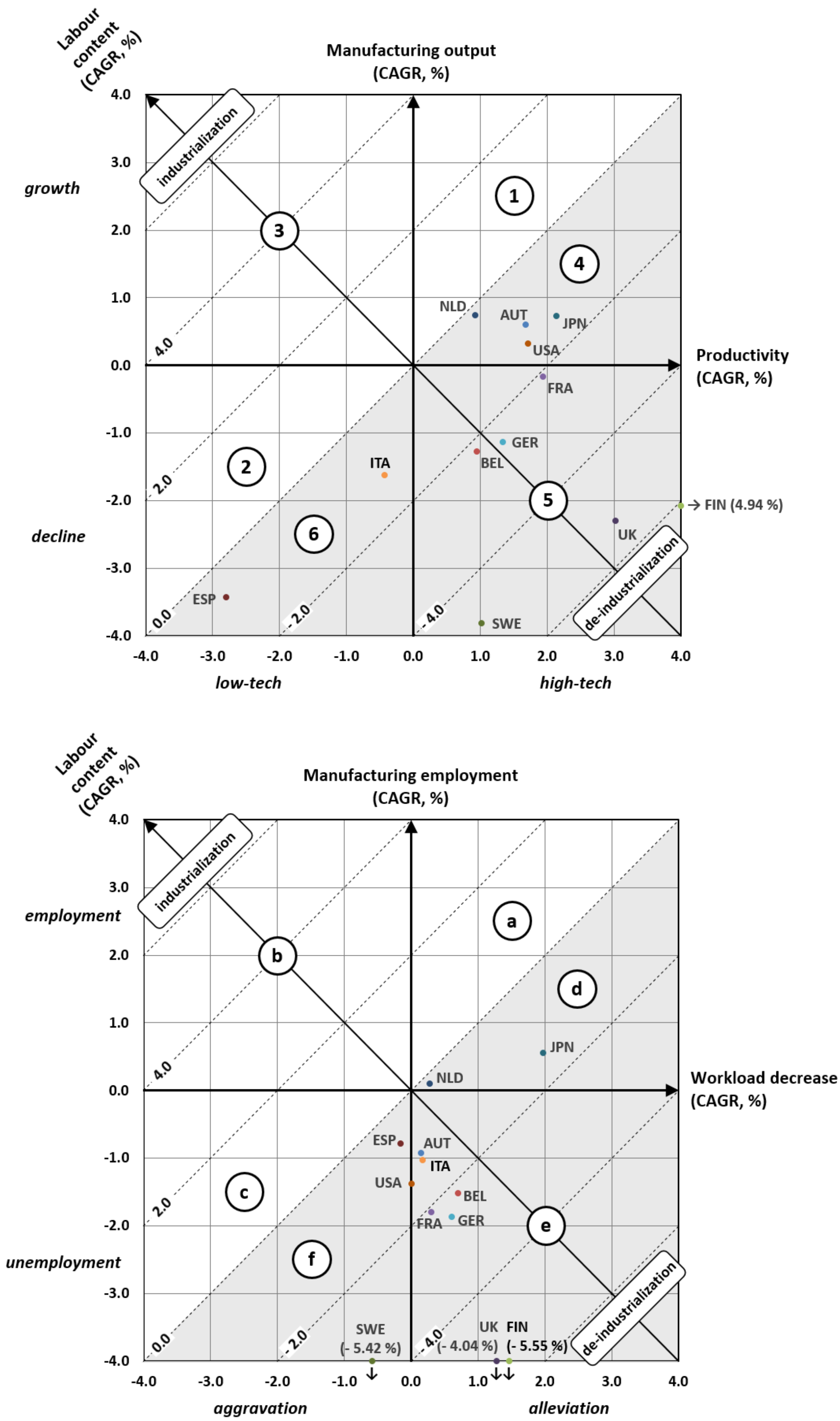
Scenarios and applied eclectic model of de-industrialization

The key results for the period of rapid political and economic change are given in Table 6.15 and Figure 6.11 (scenarios).

Table 6.15 Scenarios of de-industrialization (1988-1993)

	AUT	BEL	FIN	FRA	GER	ITA	NLD	ESP	SWE	UK	JPN	USA
De-ind.?	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	no	yes
Type	positive	positive	ambival.	ambival.	ambival.	positive	positive	ambival.	negative	ambival.		positive
Mature?	yes	no	ambigu.	yes	ambigu.	no	ambigu.	no	ambigu.	ambigu.		yes
Failure?	no	yes	ambigu.	no	ambigu.	yes	no	yes	ambigu.	ambigu.		no
→ High-tech	yes	no	no	no	no	no	no	no	no	no		yes
→ KIBS	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes		no
→ Primaries												
Scenario	4e	5e	5e	5e	5e	6e	4d	6f	5f	5e	4d	4e

Source: Own calculations, based on World Bank (2014a) and EU KLEMS (2012) data



Source: Own graph, based on EU KLEMS (2012) data, 1988-1993

Figure 6.11 Scenarios for mature countries: demand/supply side (up/down)

Apart from Japan, all countries de-industrialized by relative employment. Times were so turbulent that no country was able to follow the standard scenario (cf. p. 269). Only Austria and the USA follow a 4e type scenario, both even of the positive type. The USA was the only country where no shift to KIBS can be diagnosed.

Due to output losses, the standard scenario is 5e. Sweden, coming from very socialist post-war years, stuck to its increases in the workload and pursued a 5f scenario. The national economy was in a crisis, with losses in wealth and very high unemployment.

With Italy and Spain, the situation was even worse because all key factors (productivity, output and labour content) were in the negative range. While Italy fought the situation with workload reductions, Spain even increased the workload, probably to fight the losses in productivity at least to a certain extent.

It is astounding that in such a dramatic situation, the overall development was of the 'positive' type. Italy managed to increase national wealth and seriously acquired new markets, probably in the East, so the trade balance was improved.

Apart from Austria and the USA, no shifts to high-tech products can be found, so the situation was really unusual.

Anyhow, this period of transition was only five years long, so the impact of the sudden changes was very high.

As a result of this investigation, it must be noted that even five years are not really long enough for watching long-term structural shifts and evaluating them in an adequate manner. To put it differently, the findings do not suffice to be extrapolated.

6.1.3.2 Aggregate findings

The period-specific tests of de-industrialization indicators (Table 6.16) clearly show the economic turbulences that most European states were part of. Unlike in the long run, apart from four states, all were even facing losses in absolute output, i.e. the most severe form of de-industrialization. All countries had reduced numbers of total hours worked. Due to workload releases, these did not lead to reductions in absolute employment in Japan and the Netherlands. The national economies of both countries boomed.

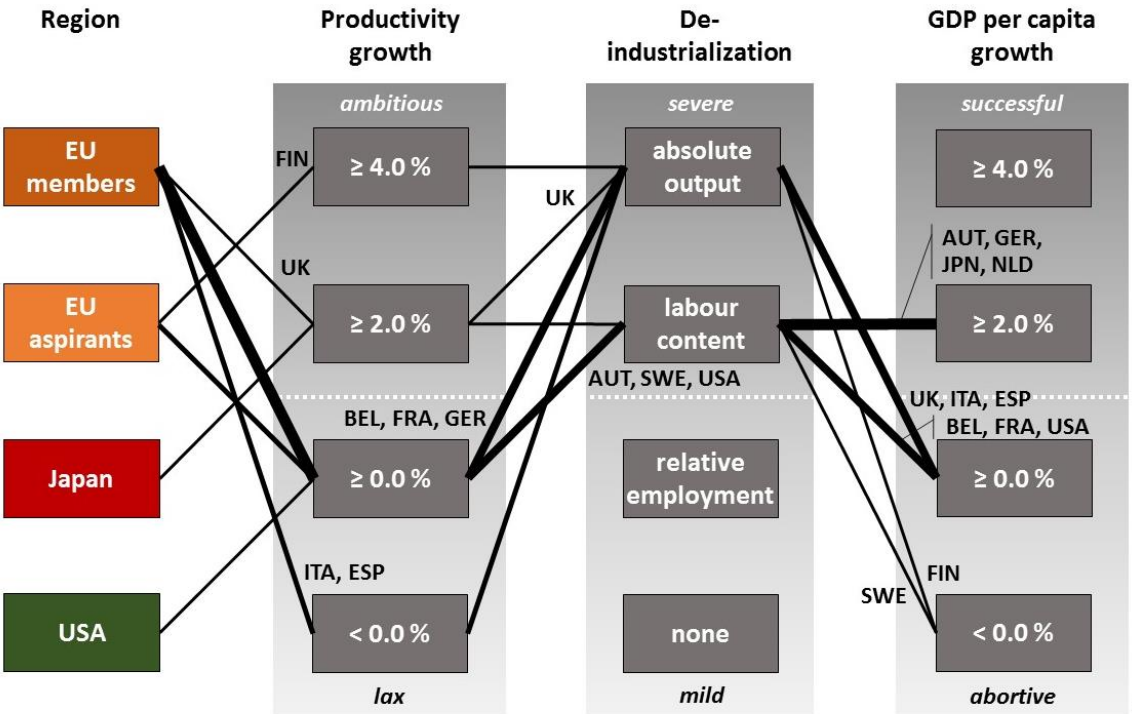
Table 6.16 Fulfilled de-industrialization definitions (mature states, 1988-1993)

	Labour content	Employment	Output
abso-lute	**LAB CONT** CAGR < 0.0 %: all	**ME (abs.)** CAGR < 0.0 %: all w/o JPN, NLD	**MO (abs.)** CAGR < 0.0 %: all w/o AUT, JPN, NLD, USA
rela-tive		**ME (rel.)**: CAGR < 0.0 %: all CAGR ≤ -1.0 %: all w/o JPN	**MO (rel.)**: CAGR < 0.0 %: all

Source: Own compilation, based on World Bank (2014a) and EU KLEMS (2012) data

The Eastern turbulences also inhibited Sweden and Finland, neighbouring countries which had relatively strong links to the former Soviet Union and were struggling to become free from these ties. For the five years under investigation here, both countries were even experiencing public welfare losses.

While all other states were going through the crisis without pushing their productivity too hard, Finland under its neo-liberal government did just the opposite – with catastrophic results to its national economy, expressed by high unemployment, fast de-industrialization and reduced income per capita.



Source: Own calculations based on World Bank (2014a) and EU KLEMS (2012) data

Figure 6.12 Key features of de-industrialization (mature economies, 1988-1993)

6.1.4 A world economically united: 1993-2008

6.1.4.1 Model-based analysis

In the final long period investigated, the phase of true globalization due to open Eastern markets, there were new frame conditions for the rich Western economies, especially for the manufacturing sector. Low-cost countries became more and more able to compete, at least on markets with low or medium levels of technology. Certain efforts were necessary to succeed in this environment, efforts that not all economies that were rather successful in previous decades were able to manage.

Volatility of change

The total volatility as calculated by formula (5.1), p. 125, is compared in Table 6.17. The findings match the long phase of prosperity that only ended with the economic crisis of 2008/9. The accumulated up and down of indicator growth rates is modest in all states and in the low range in Austria. This means that the transition in the globalized era happened quite smoothly. The findings match the long phase of prosperity that only ended with the economic crisis of 2008/9.

Table 6.17 Total CAGR (%) volatility of de-industrialization indicators (1998-2008)

	AUT	BEL	FIN	FRA	GER	ITA	NLD	ESP	SWE	UK	JPN	USA
υ_T	5.29	6.72	11.71	6.86	6.43	6.76	8.07	9.98	9.39	10.31	6.36	8.11

Source: Own calculation, evaluation based on (EU KLEMS, 2012) and World Bank (2014a) data

Key indicators

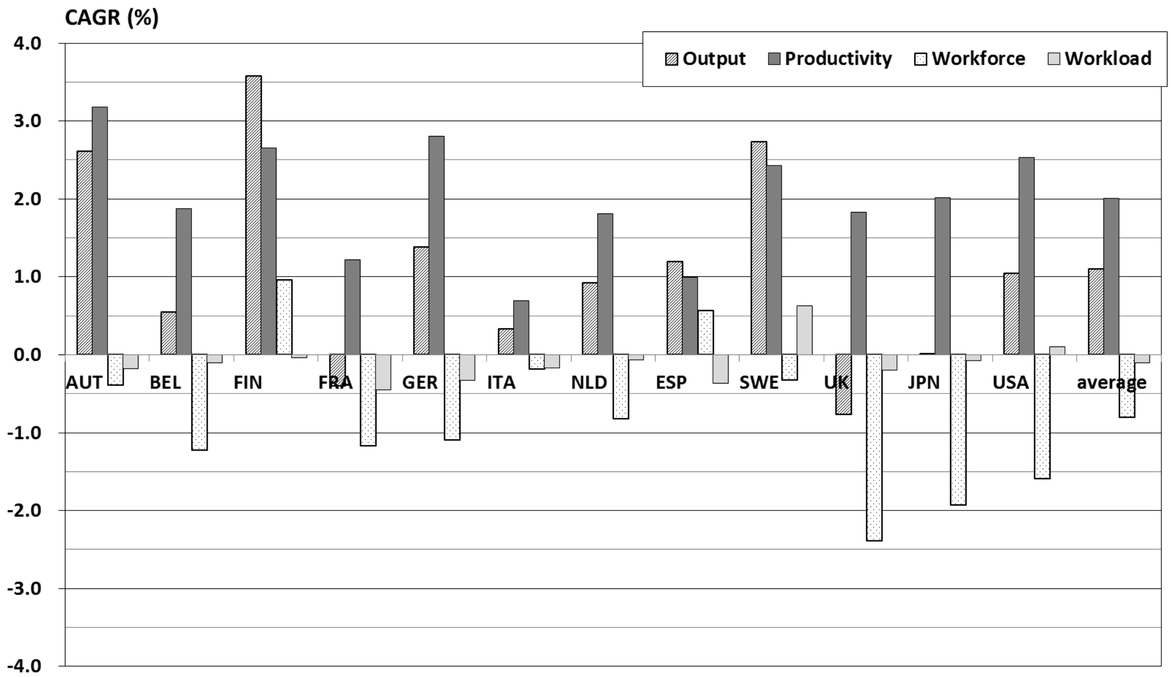
A comparative overview on the key indicators of de-industrialization is given by Table 6.18 and Figure 6.13.

All countries de-industrialized in a sociological sense, although Finland did not cross the hurdle of the eclectic model of de-industrialization. In half of the countries (Belgium, France, Netherlands, Spain, the United Kingdom, USA), relative employment decreased massively.

Table 6.18 Overview on de-industrialization indicators (1993-2008)

Indicator		AUT	BEL	FIN	FRA	GER	ITA	NLD	ESP	SWE	UK	JPN	USA	mean
Empl. (%)	1993	18.7	18.4	18.2	16.3	23.0	22.5	14.5	17.4	18.0	12.5	21.9	14.4	18.0
	2008	15.3	13.2	16.8	11.8	18.2	19.3	10.2	12.2	15.4	7.9	16.9	9.5	13.9
	Rank 93→08	4→7	5→7	6→4	9→9	1→2	2→1	10→10	8→8	7→5	12→12	3→3	11→11	
CAGR (%)	Empl. (rel.)	-1.3	-2.2	-0.5	-2.1	-1.5	-1.0	-2.3	-2.3	-1.0	-3.0	-1.7	-2.8	-1.8
	Empl. (abs.)	-0.4	-1.2	1.0	-1.2	-1.1	-0.2	-0.8	0.6	-0.3	-2.4	-1.9	-1.6	-0.8
	Output	2.6	0.6	3.6	-0.4	1.4	0.3	0.9	1.2	2.7	-0.8	0.0	1.0	1.1
	Output/cap.	3.0	1.8	2.6	0.8	2.5	0.5	1.7	0.6	3.0	1.6	1.9	2.6	1.9
	Productivity	3.2	1.9	2.7	1.2	2.8	0.7	1.8	1.0	2.6	1.8	2.0	2.5	2.0
	Workload	-0.2	-0.1	-0.0	-0.5	-0.3	-0.2	-0.1	-0.4	0.5	-0.2	-0.1	0.1	-0.1
	Labour	-0.6	-1.3	0.9	-1.6	-1.4	-0.4	-0.9	0.2	0.1	-2.6	-2.0	-1.5	-0.9

Sources: Based on EU KLEMS (2012) data (in 2010 USD), own calculations, unweighted mean values



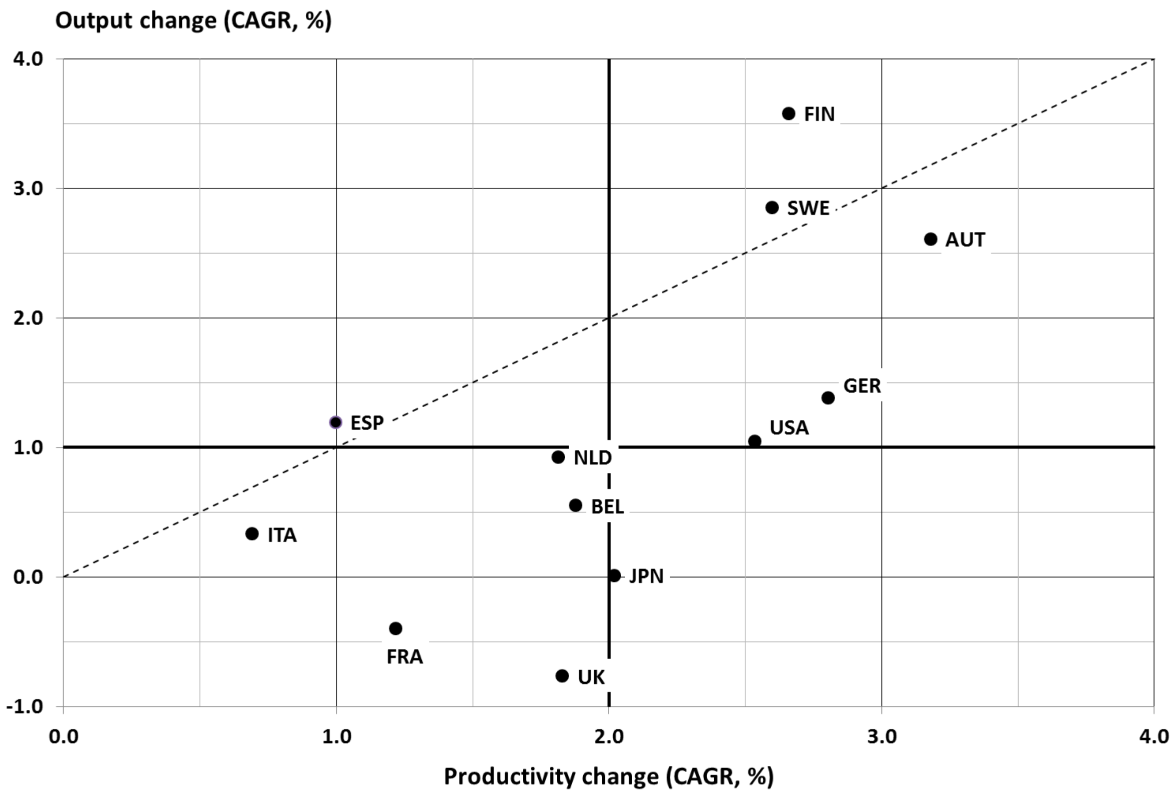
Source: Own calculations, based on EU KLEMS data (EU KLEMS, 2012)

Figure 6.13 Comparison of key data for de-industrialization (1993-2008)

On the other hand, all countries except of France and the UK managed to increase their output. The reductions in labour content were mostly the result of medium to strong increases in productivity.

- The four countries (Austria, Finland, Germany, Sweden) that were most determined in raising productivity were most successful in increasing their output (Figure 6.14). All are export countries and pursued a strategy striving for international competitiveness.

- Spain and Italy kept pursuing their traditional precautious strategies, aiming at little job losses. Spain performed comparatively well, given its limited industrial capabilities.
- France did not really meet with the competition but rather aimed at avoiding job losses by significantly reducing their workload. This resulted in limited productivity gains and a loss of its market position.
- Japan’s industry had the main new competition just next door. Despite of significant productivity rises, it could barely stabilize its output.
- The United Kingdom’s manufacturing industry kept losing out against its competitors, despite of some more productivity increases.
- Belgium and the Netherlands manoeuvred somewhere in the midfield, with a strategy somewhat stuck in the middle – not really increasing the competitive position, but not risking too many jobs as well.
- In comparison to the previous decades, the USA followed a pretty determined strategy towards a better competitive position also at an international stage.



Source: Own calculations, based on EU KLEMS (2012) data

Figure 6.14 Output vs. productivity change (1993-2008)

Scenarios and applied eclectic model of de-industrialization

The results of modelling de-industrialization are summarized in Table 6.19 and Figure 6.15 (scenarios).

The standard against which to compare is again the one identified for the 35-year period (cf. p. 269). In the actual period, it was exactly met by Belgium and Japan. Their development is considered being of the ambivalent type because of a negative development of their trade balances.

Table 6.19 Scenarios of de-industrialization (1993-2008)

	AUT	BEL	FIN	FRA	GER	ITA	NLD	ESP	SWE	UK	JPN	USA
De-ind.?	yes	yes	No	yes	yes	yes	yes	yes	yes	yes	yes	yes
Type	positive	ambival.		ambival.	positive	ambival.	positive	ambival.	positive	ambival.	ambival.	ambival.
Mature?	yes	yes		yes	yes	ambigu.	yes	ambigu.	yes	yes	yes	yes
Failure?	no	no		no	no	no	no	no	no	no	no	no
→ High-tech	yes	yes		no	yes	yes	yes	yes	yes	no	yes	yes
→ KIBS	yes	yes		yes	yes	yes	yes	yes	yes	yes	yes	yes
→ Primaries							jobless			jobless		jobless
Scenario	4e	4e	1a	5e	4e	4e	4e	1a	1c	5e	4e	4f

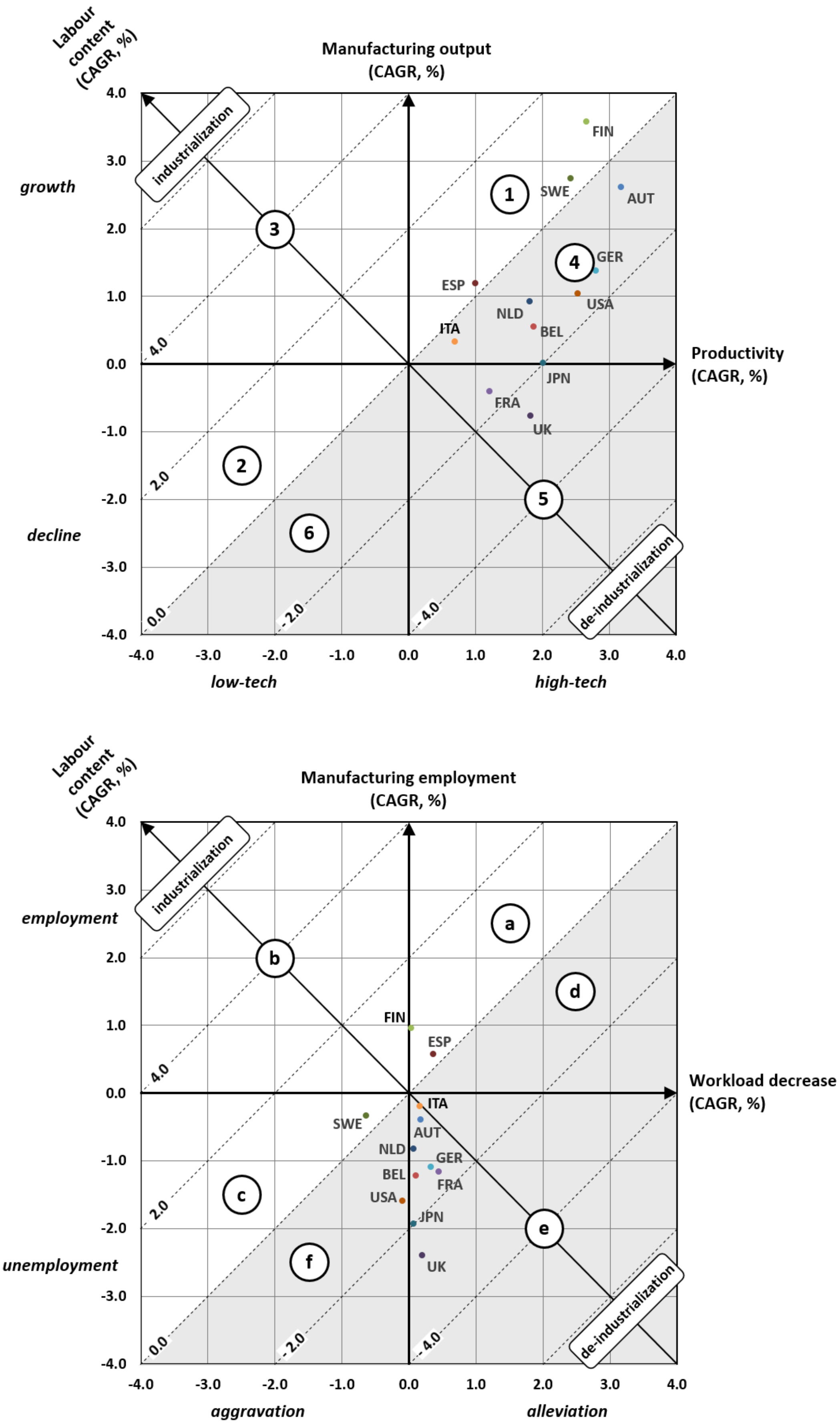
Source: Own calculations, based on World Bank (2014a) and EU KLEMS (2012) data

Austria and Germany followed the standard, but with a positive result. All their respective economic indicators are beneficial. The same goes for the Netherlands, but supplemented by some shift to the primary products sector.

The Italian situation is pretty close to the standard situation, but some doubt is cast on the maturity of the Italian manufacturing sector due to the low growth of productivity.

In the given period, the USA was facing some growth in unemployment, so their de-industrialization process is classified as ambivalent. This was partly due to workload rises which put the USA into a 4f scenario and build up extra pressure on the labour market.

Finland played a very extraordinary role. It managed to industrialize by raising productivity, output and labour content in parallel. Finland could also lower the average workload. Spain did the same, though at less impressive numbers – but nevertheless de-industrialized by relative employment. This is due to a significant growth in the total available workforce, leading to a relative decline of manufacturing employment despite of growth in absolute terms.



Source: Own graph, based on EU KLEMS (2012) data, 1993-2008

Figure 6.15 Scenarios for mature countries: demand/supply side (up/down)

Sweden also industrialized. Its output, productivity and also the labour content grew. Yet, Sweden increased the individual workload significantly, resulting in a decline of absolute manufacturing employment. The scenario is one of the 1c type, characterized as pseudo-de-industrialization.

Two countries ran into or remained in trouble: France and the United Kingdom. Both produced less output, and both were the only countries where high-tech manufacturing did not grow faster than the industrial average. Since due to globalization, there is more market pressure especially in standard goods, this is an unfavourable development.

6.1.4.2 Aggregate findings

In terms of success in manufacturing, the UK and France were the losers of the globalized period from 1993-2008. Both states had to face a decline in absolute output. While for the UK, this had become the usual scenario over decades, for France, this experience was new (Table 6.20).

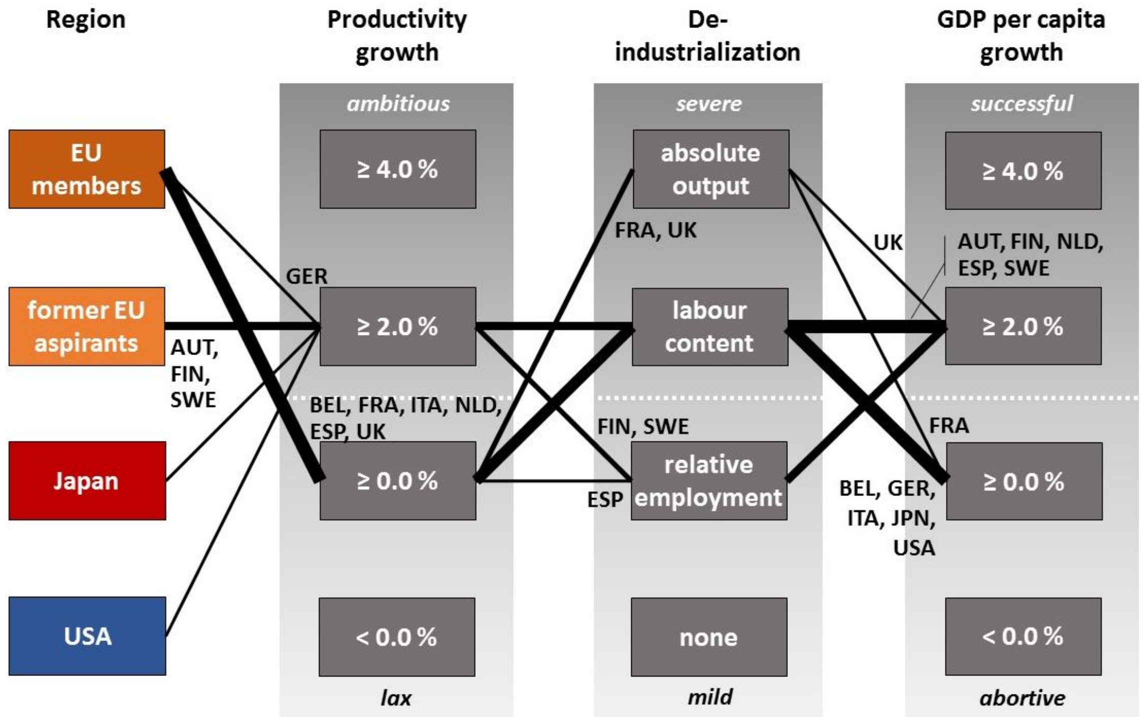
Finland and Sweden, in a different way also Spain, made the opposite experience and were very successful with their products, so their employment situation and total hours worked (labour content) remained about constant.

Table 6.20 Fulfilled de-industrialization definitions (mature states, 1993-2008)

	Labour content	Employment	Output
abso-lute	**LAB CONT** CAGR < 0.0 %: all w/o FIN, ESP, SWE	**ME (abs.)** CAGR < 0.0 %: all w/o FIN, ESP	**MO (abs.)** CAGR < 0.0 %: FRA, UK
rela-tive		**ME (rel.)**: CAGR < 0.0 %: all CAGR ≤ -1.0 %: all w/o FIN	**MO (rel.)**: CAGR < 0.0 %: all

Source: Own compilation, based on World Bank (2014a) and EU KLEMS (2012) data.

The essentials of industrial development are graphically displayed in Figure 6.4. It shows that high productivity rises were only achieved by half of the states.



Source: Own calculations based on World Bank (2014a) and EU KLEMS (2012) data

Figure 6.16 Key features of de-industrialization (mature economies, 1993-2008)

There is no simple interrelation with national income. Half of the more successful countries in GDP per capita had a medium-high productivity growth, half of them had a medium-low growth; the same holds for countries with a medium-low productivity growth. For mature economies, the manufacturing sector is not the only key driver of national wealth, as especially the British example demonstrates.

Yet, when limiting the comparison to the European countries, a much clearer picture evolves. There are four economies that have had a clear focus on technology, aiming at high productivity and international high-technology markets: Austria and Germany, Finland and Sweden. All of these had tremendous economic success; in Germany, the light picture was blurred by the burdens of its reunification. Its transfer payments to the former communist East amounted to an annual average of more than 100 billion Euro (Endres, 2010). Taking these payments into account, Germany was probably the economically most successful country between 1993 and 2008.

Ambitious industrial policies assured economic success at least in Europe. Only the Netherlands, Spain and the UK could achieve similar success, but on an individually different basis that was highlighted in the country-specific analyses (chapter 5.3). Briefly summarized, these national courses were:

- Netherlands: trade, oil and gas;
- UK: knowledge-intensive services, especially finance;
- Spain: construction sector which blossomed with support of the EU for building infrastructure, especially means of transport (motorways, high-speed trains).

Accordingly, the forms of de-industrialization were very diverse. While the UK could compensate its losses in manufacturing output by other sectors, in France, the losses went along with an economic crisis.

The course of de-industrialization is country-specific and is influenced by the respective country's position in the international division of labour. Some contingencies will be investigated in the following chapters.

6.2 Technology and trade as influencing factors

In the following sub-chapters, the development and influence of i) productivity and ii) the national exposition to world trade will be discussed. The national peculiarities will be listed and compared in order to identify common trends, but also path dependencies.

6.2.1 The state of technological development

Meaningful indicators for technological development are productivity and also the share of high technology. Both presumably have an influence on the international market success of manufacturing goods, indicated by exports rates and the trade balance. These relationships are analysed in this sub-chapter.

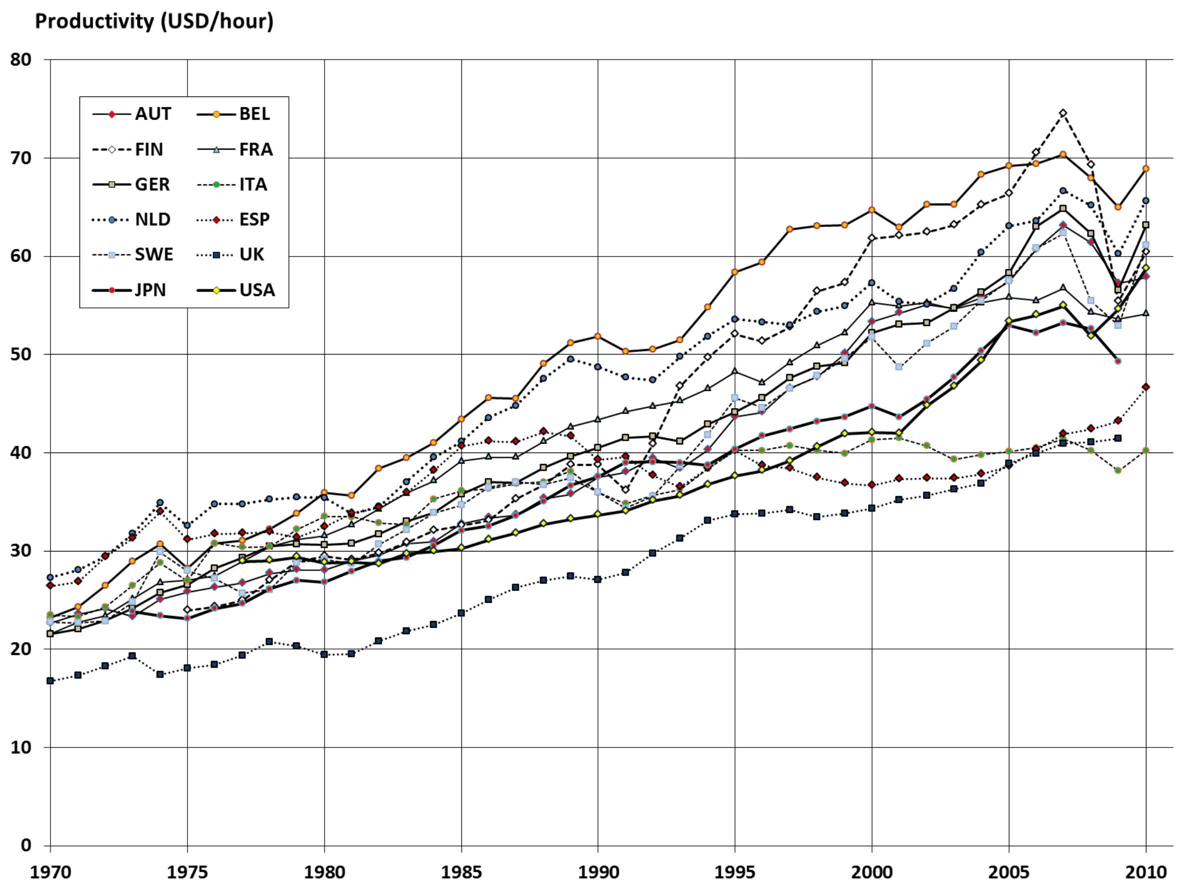
Following Porter (1980), a good may be sold on the basis of superior quality or even a stand-alone position or on a lowest-price basis resulting from low unit costs. While the basis for the first value-proposition is high technology, the basis for the latter for countries of comparatively high wages as those from the sample group is high productivity.

6.2.1.1 The development of productivity over time

In the previous chapters, de-industrialization phenomena were investigated mainly on the basis of growth rate comparisons. While this gives a generally good basis for comparing effort and progress made in a national economy, the absolute result of a percentage change depends largely on the point of departure. E.g. if a country has half the productivity of another one, it requires the double percentage change to only keep pace in absolute terms. In the following, absolute productivity will be in the focus of discussion.

In this work, productivity is generally utilized as labour productivity based on the sectoral gross value added. It is considered as the more accurate value compared to GDP-based calculations (Freeman, 2008). In return for good availability of data, certain inaccuracies caused by currency conversions have to be accepted (Sørensen & Schjerning, 2003)

In Figure 6.17, the development of manufacturing productivity over time is shown. The initial situation of the early 1970s is such that there are two states distinctly in the lead (Netherlands and Spain), nine other form a broad midfield while the United Kingdom is lagging far behind. The band between the most and least productive state amounts to roughly 10 USD/h (2010 prices), i.e. a little less than 40 % of the maximum 27 USD/h of the Netherlands.



Source: Based on EU KLEMS (2012) data

Figure 6.17 Comparison of manufacturing productivity

Until 1989, the year of epic change, the band width between most and least productive states had risen to 24 USD/h – almost 50 % of the maximum 51 USD/h. Belgium had replaced Spain in the top two group, even slightly outperforming the Netherlands. Spain, from around the early 1990s, had not pursued a productivity increase path anymore and stagnated (as already 1975-80) or even lost productivity. A midfield of nine other states from France (top) to the USA (bottom) is still identifiable, but the differences between states had become larger. The difference between France and the USA already amounted to a good 9 USD/h. The United Kingdom, despite of remarkable efforts, was still lagging far behind.

At the end of the investigated period, in 2007 (before the 2008/9 crisis), the scenario had changed very much. Finland had become the outperformer, followed by Belgium. After these two, another group of four high-performers can be distinguished: the Netherlands, Germany, Austria and Sweden. A group of three medium-well performers followed, consisting of USA, Japan and France. While for the first two, this result was realized by a catch-up process starting around millennium, with France it was just the opposite. France performed well until about 2000 when it started stagnating. (Japan followed in 2005.) At the bottom end of performance, the UK had finally caught up with Spain and Italy which had turned to a course of stagnation around 1995. The spread between top (Finland) and bottom (UK) had remained in the range close to 50 %, but had increased to 34 USD/h in absolute terms.

Summarizing the findings, the following developments could be observed until 2007:

- A group of six states constantly improved their performance and reached a high level (clearly over 60 USD/h): Austria, Belgium, Finland, Germany, Netherlands, Sweden.
- Three states arrived in a medium-high productivity position (around 55 USD/h), two of which after continuous improvements (USA, Japan), one of which after a decade of stagnation (France).
- Three states were in the low league (barely over 40 USD/h): Italy, Spain, and UK, the first two after long stagnation, the latter after a restless catch-up process.

One more key observation (or more poignant: a lesson to be learnt) is that productivity rises do not come by nature. Four states have turned to a productivity stagnation course: Spain (from 1990), Italy (from 1995), France (from 2000), and Japan (from 2005).

Productivity is an important basis for international competitiveness. But also the product base needs to be adequate to sell goods not only domestically, but internationally. Foreign trade is a key indicator for this.

6.2.1.2 The development of foreign trade over time

Foreign trade in the age of globalization has been fostered by ever-sinking costs of logistics, improved ICTs and the removal of trade hindrances (Abele, Kluge, & Näher, 2006). As a tendency, the smaller a country, the more it will be involved in trade since it will not be able to produce all goods domestically. Another natural factor of high importance is the geographical situation of a country. Countries in the heart of a continent like Belgium and the Netherlands will rather tend to be logistical hubs than an island like Britain or Japan or countries in peripheral regions like South Italy or Spain (cf. section 6.3.2).

Trade indicators

Key indicators for foreign trade are:

- Export and import rates
  The exposition of a country to global markets is indicated by the export and import rates, i.e. the ratio between goods and services exported respectively imported and the country's gross domestic product.
  Exports are largely determined by manufactured goods, so the export rate is a meaningful indicator for the competitiveness of the manufacturing sector. Manufacturing exports are the major part of merchandise exports which again are a major part of exports in general. Likewise, the GDP share of manufactured products can be calculated.
- Trade Balance
  The trade balance is the difference between exports and imports. It can also be expressed as a GDP ratio and formulated branch-specifically.

Export rate results cannot easily be interpreted, since high export values can mean three things or even two or all of them:

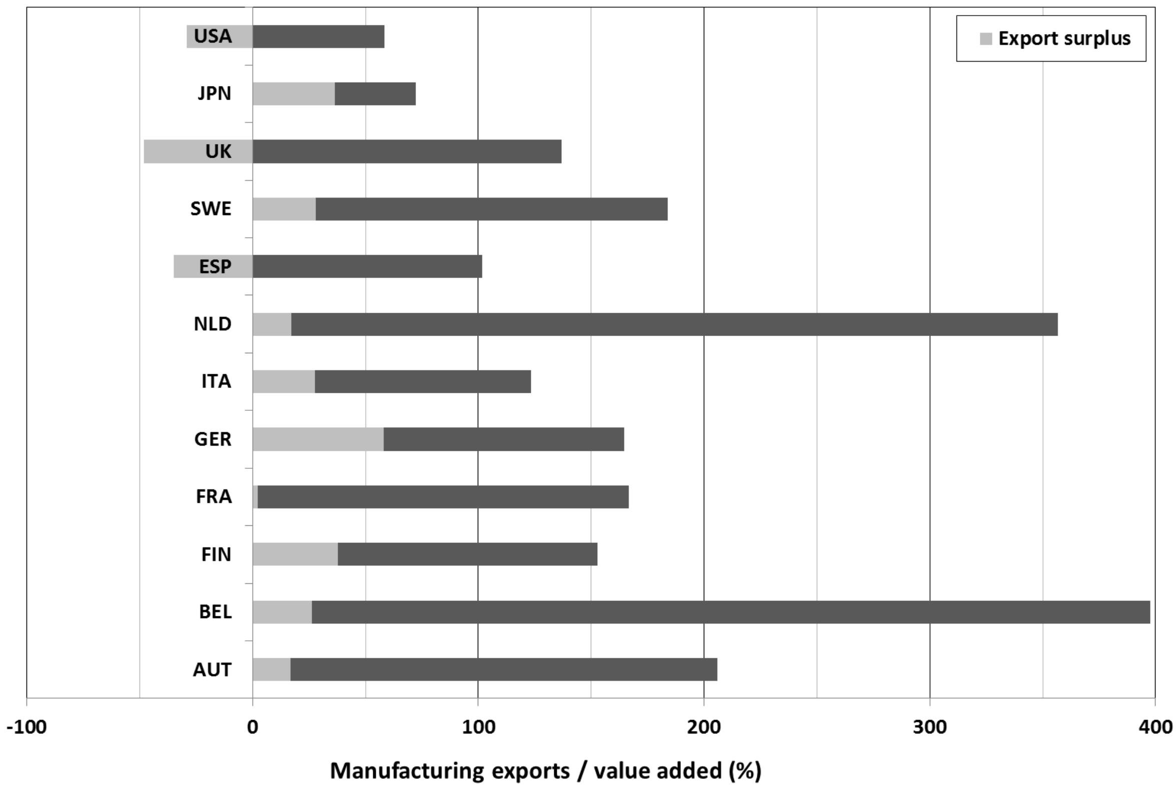
1) A country is very focussed on manufacturing technology.
2) A country is very much involved in international trade.

3) A country is very involved in international manufacturing value chains. Sometimes, certain pre-fabricates are exported, value is added by processing, then these products are re-imported and finally sold (=exported) as part of a finished product. Thus, their initial value is counted double for the export balance, and imports are also accounted.

When utilizing the trade balance, this problem does not occur, since the double count of export is compensated by the re-import. Yet, the trade balance does not render sufficient information on the magnitude of industrial production and exports. In any case, both data need to be considered jointly.

Trade size in comparison to domestic value creation

The degree of involvement in international trade is traceable by comparing the value added nationally with the export total in manufacturing. In Figure 6.18, the length of the bar starting from zero to the right represents the ratio between manufacturing exports and value added. The difference between exports and imports is indicated as export surplus.



Source: Own calculations, based on World Bank (2014a) and WTO (2014) data

Figure 6.18 Ratio of exports and value added in manufacturing

In cases of a positive manufacturing trade balance, the surplus forms graphical part of the export bar. In these cases, the dark area forms the size of the imports. In cases of a negative manufacturing trade balance (Spain, UK, USA), the deficit is carried off to the left, so the dark (positive) bar side indicates the exports, while the total bar length from negative to positive represents the imports.

Contrary to the USA and Japan, manufacturing exports exceed the value creation in all investigated European countries (ratios > 100 %, see Figure 6.18). Especially Belgium and the Netherlands, ideally situated for logistics and sea trade, have very high export ratios. Nevertheless, they are also importing almost the same amount of goods. Only a little less than half of the value creation, but about a quarter of the Belgian exports and imports can be attributed to MNEs (Dhyne & Duprez, 2013, p. 32). It may well be concluded that a major portion of exports and imports is intra-firm trade. The same goes for Holland which, due to very low taxation of profits, is a "secret tax paradise" (Savelberg, 2013).

The Dutch and Belgian ratios are about twice as high as the European average, with Austria and Sweden, France, Germany and Finland exporting a good 50 % more in value than they create. The UK, Italy and Spain are a little less involved in international manufacturing trade.

As a whole, the findings meet the expectations. Big countries with little geographic connection to others have rather little foreign trade (USA, Japan). Small countries with a central geographic situation have most trade (Belgium, Netherlands).

Some key data for 2008 is rendered in Table 6.21. It shows that the exports are mainly driven by manufacturing. Only British North Sea oil and Belgian trade in diamonds ((Salazar & McNutt, 2010) play a further significant role.

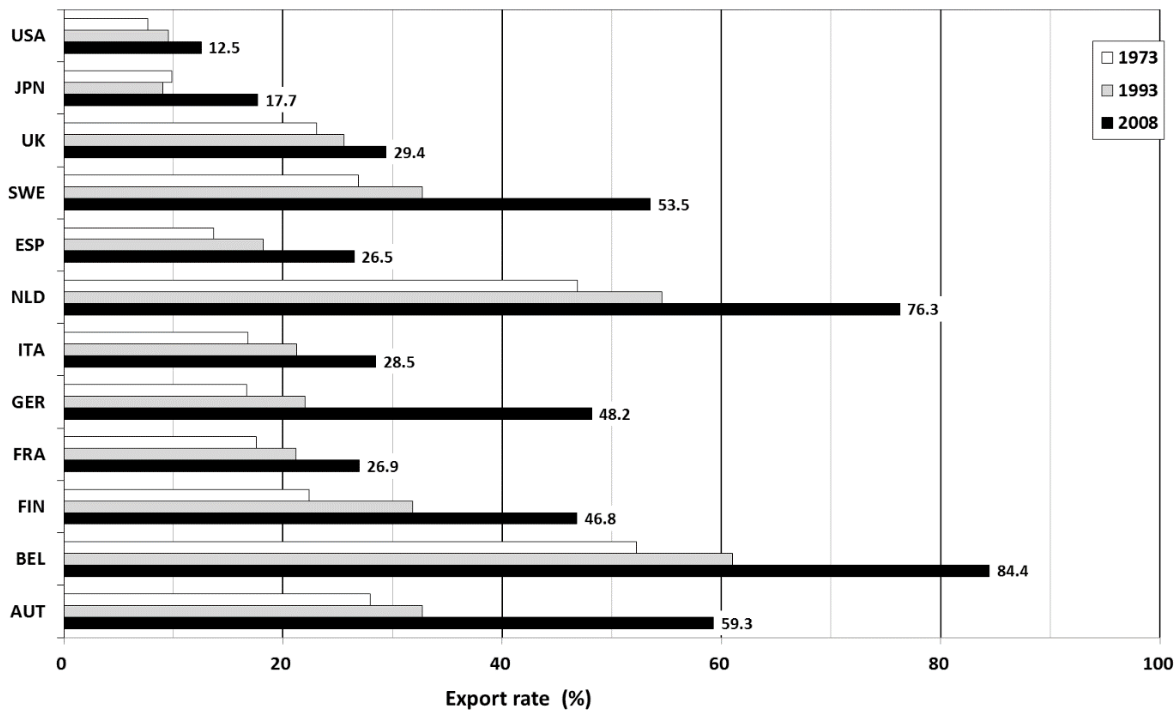
Table 6.21 Overview on exports (2008)

	AUT	BEL	FIN	FRA	GER	ITA	NLD	ESP	SWE	UK	JPN	USA
Total exports (% of GDP)	59.3	84.4	46.8	26.9	48.2	28.5	76.3	26.5	53.5	29.4	17.7	12.5
manufacturing (% of total export)	60.0	63.0	61.4	62.6	68.0	68.8	53.3	48.8	52.9	41.9	81.2	51.7
oil and gas (% of total exports)	2.5	7.7	5.3	4.1	2.1	3.8	2.5	4.2	5.1	8.0	2.2	4.5
ore and metals (% of total exports)	2.6	10.5	3.3	2.1	2.6	1.6	2.2	1.8	2.8	2.7	2.3	2.9
Manufacturing exports (% of GDP)	35.5	53.2	28.7	16.9	32.8	19.6	40.6	12.9	28.3	12.3	14.4	6.5
Merchandise exports to high-income countries (%)	84.0	88.9	85.3	81.1	83.2	79.2	90.1	80.5	86.4	83.9	64.9	65.3
Trade balance (%)	5.8	0.9	3.8	-2.1	6.3	-0.8	8.3	-5.8	6.8	-2.2	0.2	-4.8

Sources Based on World Bank (2014a) data and own calculations, constant 2010 prices

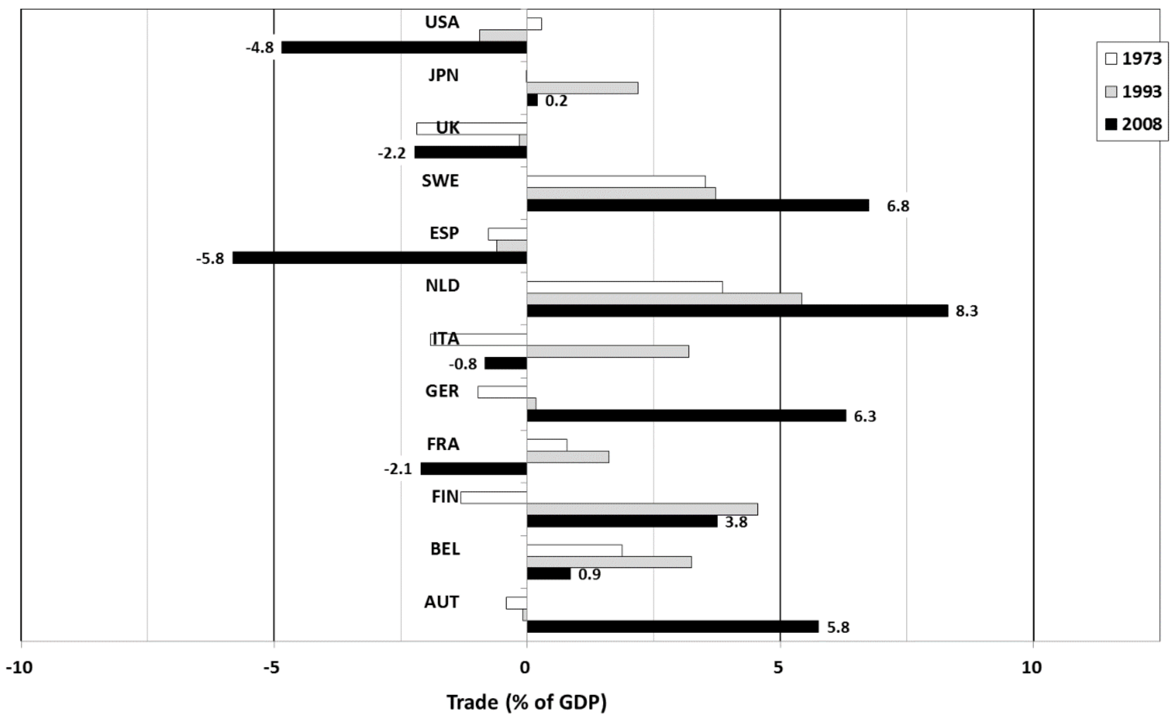
Further analyses are mainly carried out on the basis of charts which also involve data of previous decades (see Appendix 1).

In Figure 6.19 and Figure 6.20, the export figures and trade balances of the countries under investigation are charted for the initial state of this analysis (1973), immediately after the years of transition (1993) and the final state in 2008.



Source: Own calculations, based on World Bank (2014a) data

Figure 6.19 Export share of GDP



Source: Own calculations, based on World Bank (2014a) data

Figure 6.20 Trade balance

All states have significantly increased their international activities over time, especially after the fall of the Iron Curtain. But there are big differences between countries. A grouping by intervals of 20 % of exports leads to the following results:

- Countries of very high export orientation (export rate 60+ %): Belgium, Netherlands

  Based on their favourable location in the heart of Europe and equipped with high-capacity North Sea ports, their common region has been the traditional centre of European trade. Both have a positive trade balance. While the Dutch balance has been moving into positive, the Belgian has recently almost become neutral.

- Countries of high export orientation (export rate 40-60 %): Austria, Finland, Germany, Sweden

  All these are countries with a high affinity towards technology and of rich engineering traditions. Three countries of this group have managed to change from a negative to a positive balance over time; Sweden has always had one.

- Countries of medium export orientation (export rate 20-40 %): France, Italy, Spain, UK

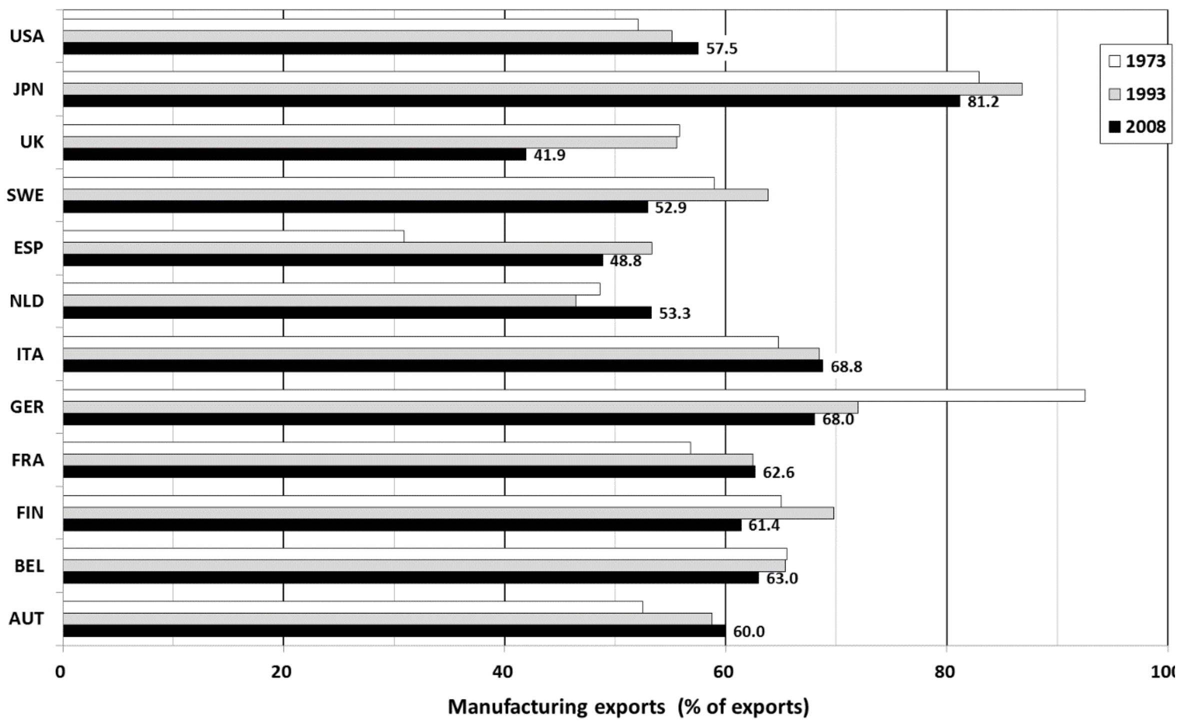
  These are countries with a certain industrial tradition, but no real deep-routed cultural affinity towards technology. All have a negative trade balance.

- Countries of low export orientation (export rate 0-20 %): Japan, USA

  Despite of their sizeable industries, both Japan and the USA are mainly producing for their large domestic markets, the by far largest in the investigated group of developed countries. The USA has turned from a positive to a very negative trade balance over the years, while Japan, starting around neutral, for a long time generated a trade surplus. In recent years, this surplus has almost vanished.

Trade in manufacturing

Very much of the total exports is realised on the basis of manufacturing, as Figure 6.21 shows.



Source: Own calculations, based on World Bank (2014a) data

Figure 6.21 Manufacturing share of total exports

When grouping countries by their share of manufacturing in total exports, there is the following result, indicating the dependency of exports on manufacturing:

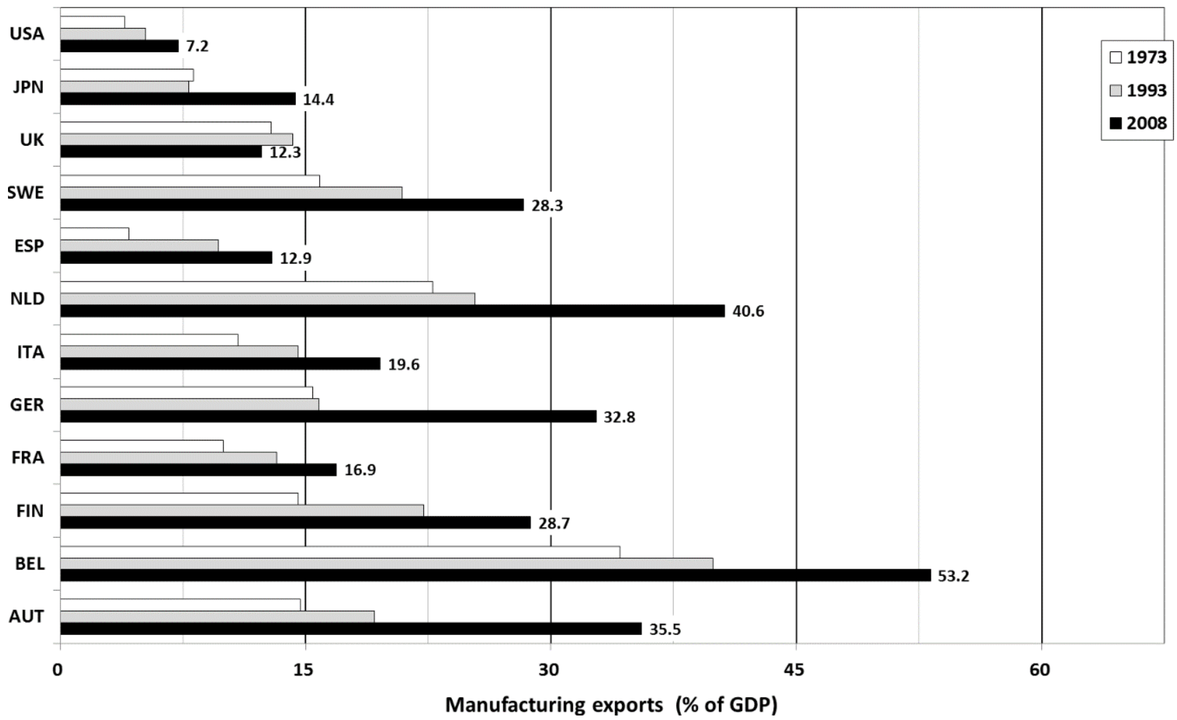
- Very high manufacturing share (70+ %): Japan

  Concerning exports, Japan almost totally relies on manufacturing. Germany also did before re-unification and the epic change along with the fall of the Iron Curtain.

- High manufacturing share (60-70 %): Belgium, Finland, France, Germany, Italy
- Medium-low manufacturing share (50-60 %): Austria, Netherlands, Sweden, USA
- Low manufacturing share (below 50 %): Spain, UK

This share contributes to the country-specific contribution of manufacturing to the national economy. It is calculated by multiplying the total exports (% of GDP) with the manufacturing share in total exports. The results are displayed in Figure 6.22. Also here, a grouping is made:

- Very high manufacturing export contribution to GDP (40+ %): Belgium, Netherlands
- High manufacturing share in exports (28-40 %): Austria, Finland, Germany, Sweden
- Medium-low manufacturing share in exports (16-28 %): France, Italy
- Low manufacturing share in exports (below 16 %): Spain, UK, Japan, USA

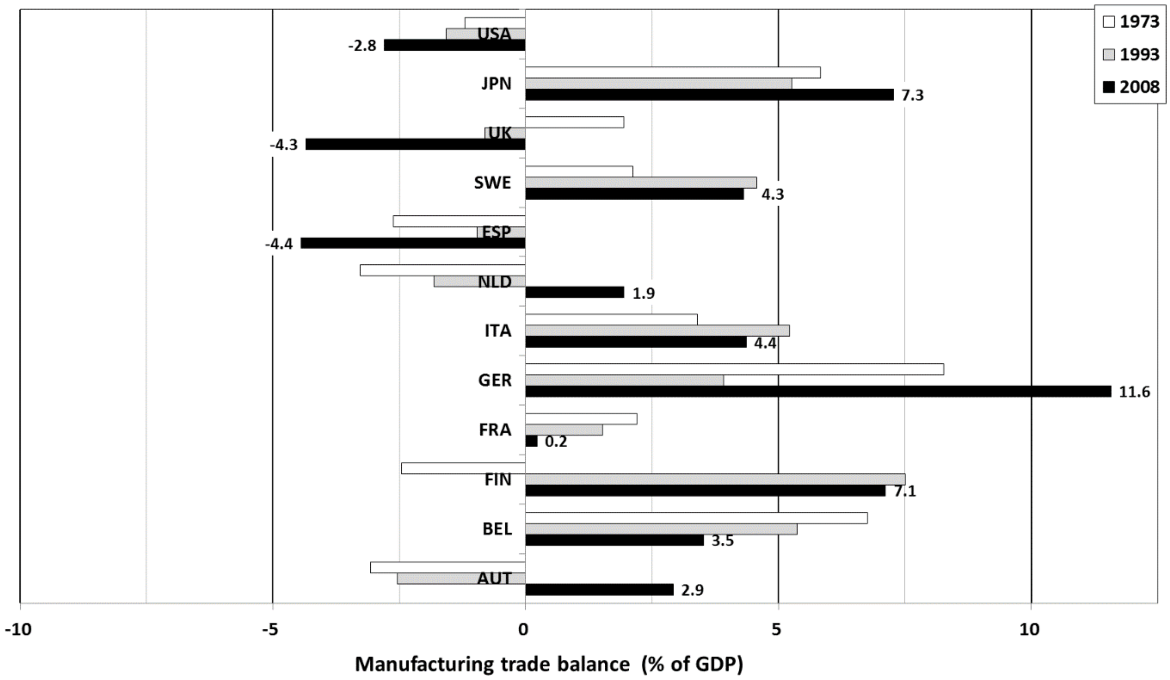


Source: Own calculations, based on World Bank (2014a) data

Figure 6.22 Manufacturing export contribution to the gross domestic product

International value chains and trade lead to sizeable in- and outbound flows of manufacturing goods, to a large extent semi-finished products. The official World Bank (2014a) data shows such processes for Belgium, probably unintended, since it occurs in no other country statistics. In their data set, Belgium's merchandise exports alone significantly exceed the total exports – something that is obviously impossible. This statistical effect is due to the fact that the Belgian national statistics as the primary source of World Bank (2014a) export rate values in all likelihood refer to the additional value created by an export, i.e. double counts were deducted, while in the WTO (2014) statistics as the basis for data on merchandise exports, this was not the case. Hence for Belgium the total export rate was taken as rendered by the World Bank (2014a); shares were calculated as a fraction of the WTO (2014) total of merchandise and service exports.

To avoid such irritations and to effectively judge the success of a country's manufacturing industry, the manufacturing trade balance is a meaningful indicator (Figure 6.23). In the balance, double flows are levelled out by inbound counter-flows, so the final value is accurate.



Source: Own calculations, based on World Bank (2014a) data

Figure 6.23 Trade balance of the manufacturing sector

Only three of the investigated states were net importers of manufacturing goods, while all nine others had manufacturing trade surpluses in 2008:

- Very positive balance of manufacturing trade (+ 10+ %): Germany

  The German manufacturing industry is extremely successful in the global economy. Simultaneously, it is of utmost importance for the Germany national economy.

- Quite positive balance of manufacturing trade (+ 5-10 %): Finland, Japan

  Japan has been traditionally successful in manufacturing exports. Finland has managed to turn its balance and become one of the most successful international players.

- Low, but positive balance of manufacturing trade (+ 0-5 %): France (close to zero), Austria, Belgium, Italy, Netherlands, Sweden

  Austria and the Netherlands turned from manufacturing importers to exporters over time. Belgium and France were exporters, but with diminishing success. Italy and Sweden were successful manufacturing exporters, but with recently a little bit lower results.

- Negative manufacturing contribution to the trade balance (< 0 %): Spain, UK, USA

  All these countries have developed into the negative manufacturing trade direction. Spain, like the USA, has remained a net importer of manufacturing goods. Spain's development was very negative in recent years. The UK turned from positive into very negative.

In the following, the reasons for success or lacking success in foreign trade will be investigated.

6.2.1.3 Assessment of the level of technology over time

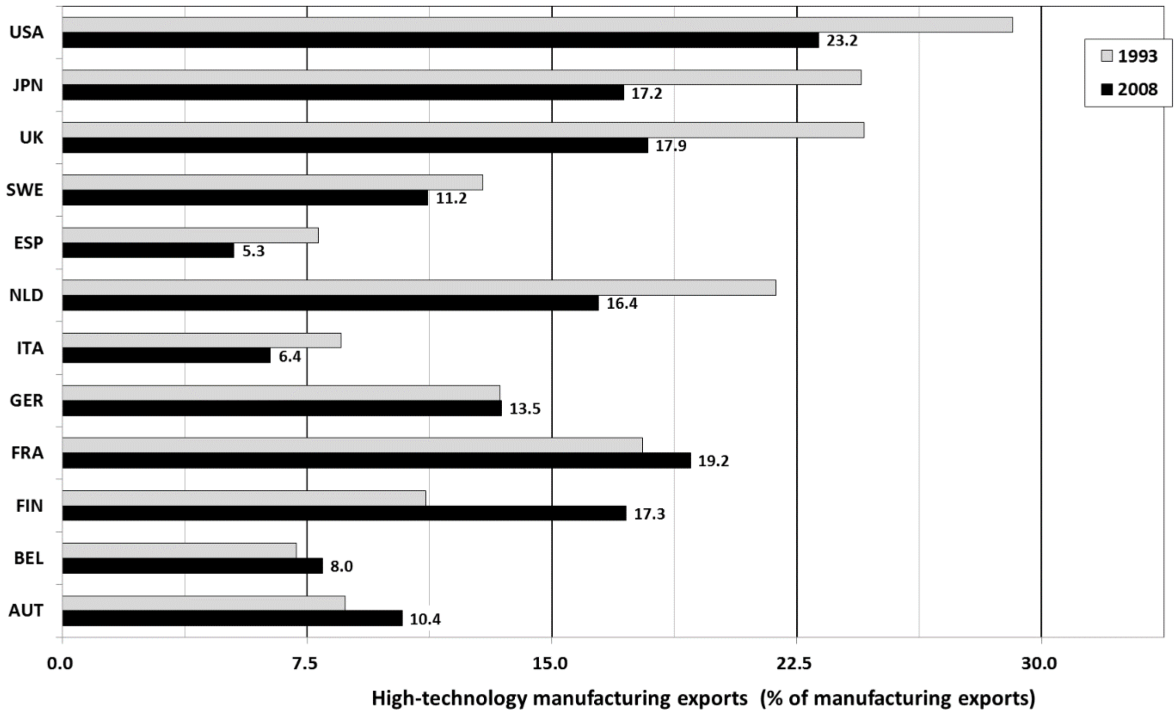
Apart from meeting the taste of the customers, two different value propositions are related to manufacturing:

- Success in mass production is related to a low price, so the success primarily depends on effective cost structures reflected by high productivity.
- Success in high-tech markets relies on technological development.

The definition of high-technology fields according to the ISIC classification is given in Appendix 4.

High-technology share in manufacturing

The share of high-technology products in manufacturing exports is a rough indicator for the ratio of both possible value propositions (price vs. high-tech). An overview is rendered in Figure 6.24.



Source: Own calculations, based on World Bank (2014a) and EU KLEMS (2012) data
Belgium: extrapolated from values for 1999, following the trend of EU countries

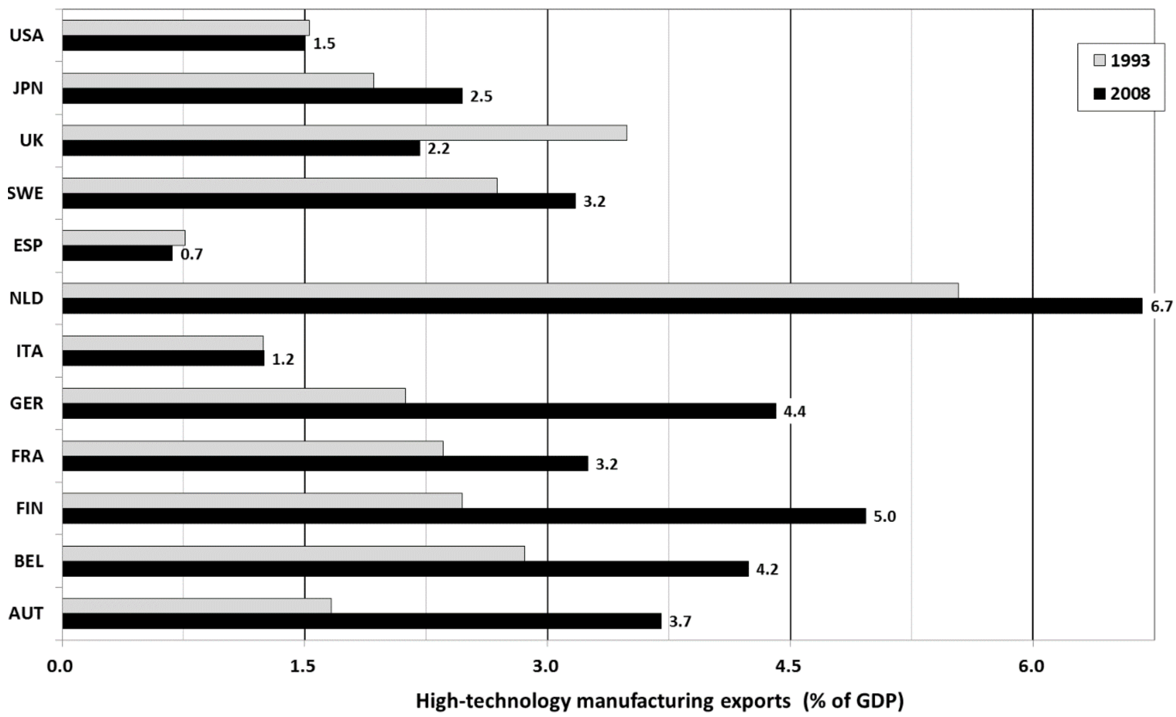
Figure 6.24 Share of high-technology in total manufacturing exports

Most countries could not keep their high-technology shares in exports. Only Austria, Finland, France and Germany strengthened their respective positions. While a high share of high technology could be considered as presumably beneficial, this is not necessarily the case. Such a share may be high for two reasons: i) absolute success of high-technology sectors in the world economy, ii) relative success of high-technology sectors compared to other sectors. In the latter case, a high share in high-technology products may just reflect a lacking bargaining position for non-high-tech goods. In this course, the international success may be limited if total manufacturing exports are low as e.g. for the USA.

Furthermore, some shares of exports may be double-counted due to re-imports along the international value chain (see above). This is especially the case in countries like Belgium and the Netherlands with their very fine logistical situation right in the middle of

Europe. These effects could by clarified by investigating the full trade balance of high-tech manufacturing. Unfortunately, the other side of the high-technology manufacturing trade balance, i.e. respective imports, is not available as World Bank (2014a) data, so the double-counts currently cannot be excluded from the findings.

For judging the success of high-technology manufacturing, the GDP share of respective exports was calculated. It shows the Netherlands clearly in the lead, followed by a group of Austria, Belgium, Finland, France, Germany and Sweden with a high-tech share in manufacturing of above 3 % of the GDP. The UK and Japan, followed by the USA and, with distinction, Spain, have less high-technology manufacturing involvement in their trade balances.



Source: Own calculations, based on World Bank (2014a) and EU KLEMS (2012) data
Belgium: extrapolated from values for 1999, following the trend of EU countries

Figure 6.25 GDP share of high-technology manufacturing exports

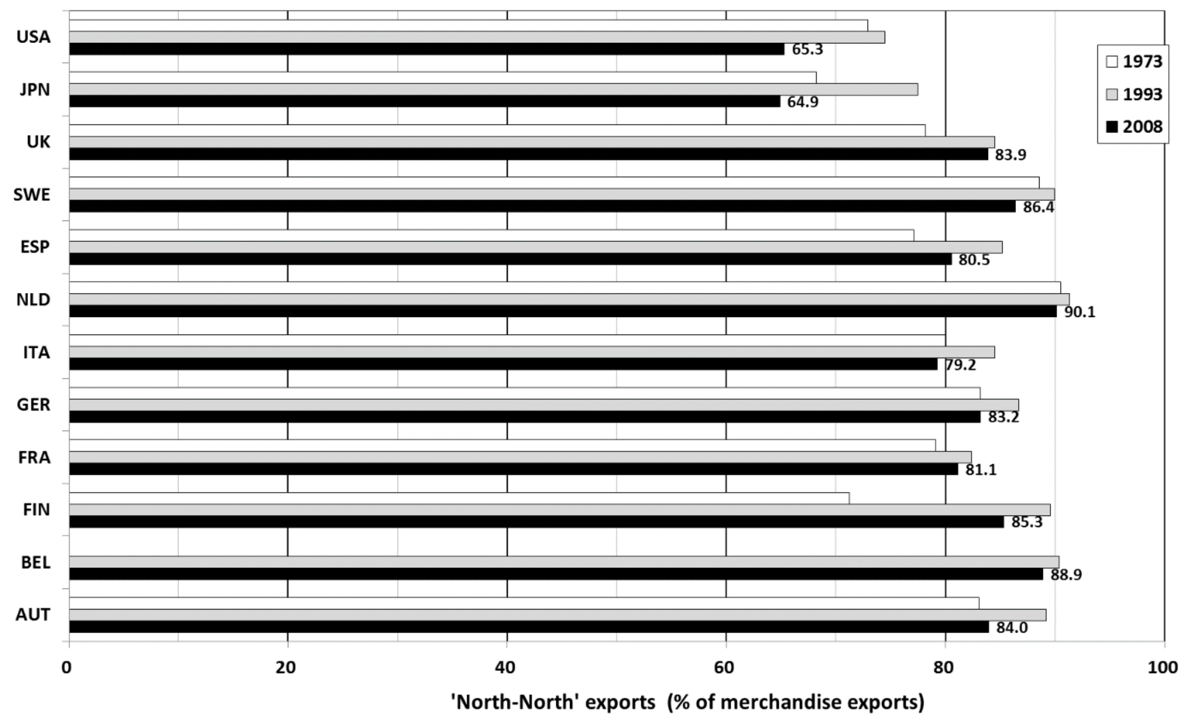
North-North trade

The share of merchandise exports from highly-developed to highly-developed countries, the so-called ‘North-North’ trade following Kollmeyer’s (2009) terminology (cf. section 2.3.2, pp. 54), is supposed to be a meaningful indicator for the technical level of products.

Often, only highly-developed countries can utilize and afford to buy very sophisticated technology.

To get an idea of the success of the manufacturing industry in high-technology markets, this merchandise trade with high-income economies (North-North trade) was investigated (Figure 6.26). No specific data on manufacturing was available.

While all European countries almost form a North-North export phalanx, with around a good 80 % of the manufacturing total, the USA and Japan show much lower values of around 65 %.



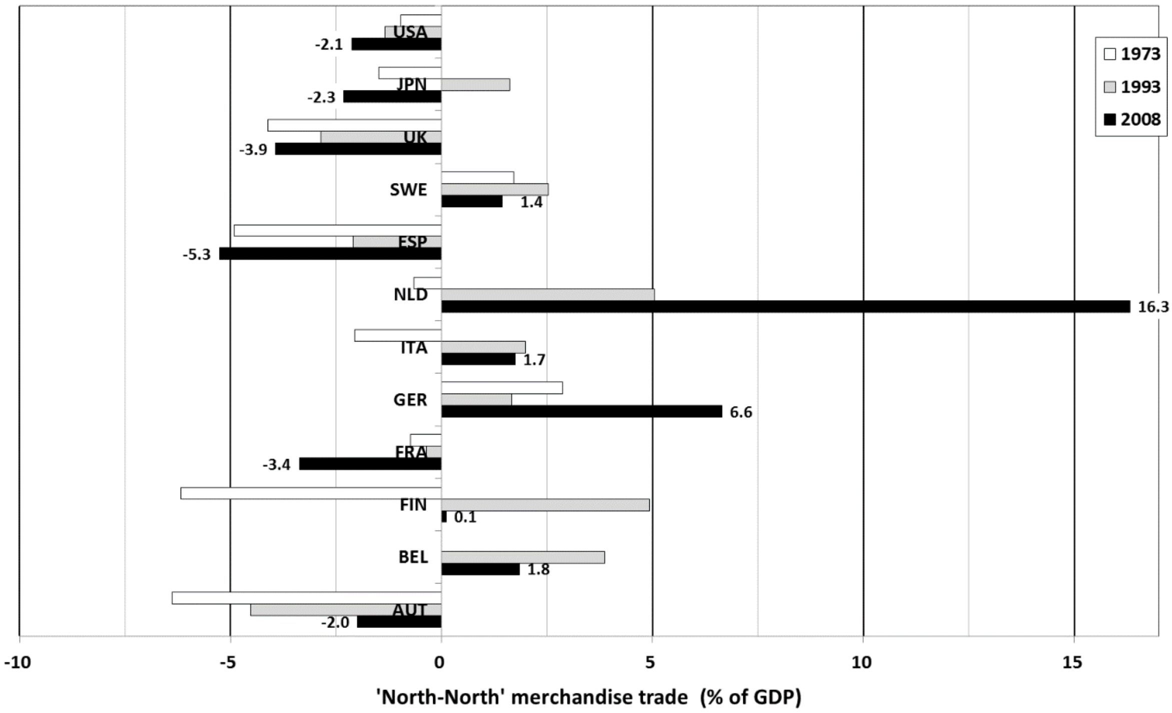
Source: Own calculations, based on World Bank (2014a) and EU KLEMS (2012) data
Belgium: extrapolated from values for 1999, following the trend of EU countries

Figure 6.26 GDP share of high-technology merchandise exports

Success in high-income markets may well be associated with superior technology, leading to innovative products, but also with high productivity based on continuous improvement of processes. Moreover, productivity advantages can partly be realized drawing from economies of scale due to better market integration. Trade, especially intra-firm trade, sometimes resulting from tax avoiding policies, may overlay the findings and distort the results significantly. Keeping this in mind, the North-North trade balance nonetheless is a good indicator for the state of technological development (Figure 6.27).

The overwhelming success of the Netherlands is most likely not due to its superior technology, but due to its very favourable geographical position and company-friendly taxation that has attracted MNEs to open subsidiaries or even relocate their headquarters (Savelberg, 2013). Since customer markets are not altered concomitantly, exports are resulting. A similar, but weaker development can be assumed for Belgium.

After dealing with these two states, there are only four countries left with a positive North-North trade balance: Sweden, Germany, Italy and Finland. All other countries are net importers of merchandise from other high-income countries, with France, the UK and especially Spain in the weakest position. Austria, coming from the last place, has managed to continuously improve its position.



Source: Own calculations, based on World Bank (2014a) and EU KLEMS (2012) data
Belgium: extrapolated from values for 1999, following the trend of EU countries

Figure 6.27 GDP share of North-North trade (trade balance)

Final assessment of the technological level

When combining the findings of both indicators, i.e. export rates of high-technology manufacturing and the balance of North-North trade, the findings are as follows.

- The Netherlands are clearly in the lead in both fields, so they must have a good technological basis. Nevertheless, a major portion of their excellent figures is to be attributed to favourable logistics and intra-trade of MNEs. The same holds, to a lesser extent, for Belgium which moreover had a worse position in 2008 than in 1993.

- Finland, Germany and Sweden combine a high-tech share in manufacturing of above 3 % of the GDP with a positive North-North balance and are thus identified as carriers of superior technology in certain engineering and manufacturing fields.
- Austria, France and Japan are very involved in high-technology manufacturing but do not sell more to high-income economies than they buy from them.
- Italy has a clear surplus in North-North trade, so it might be assumed that it is in possession of superior technology in certain areas. Anyhow, the Italian exposition to trade flows is limited in general, and so it is in high technology.
- Despite of their impressive high share of high-tech exports which besides some rather narrow technological strength mainly reflects a very limited exposition to trade, the USA is not very persuasive in their technological level. Much more, this holds for Spain which is ranking last in almost all indicators concerning technology.

6.2.1.4 The influence of productivity on foreign trade

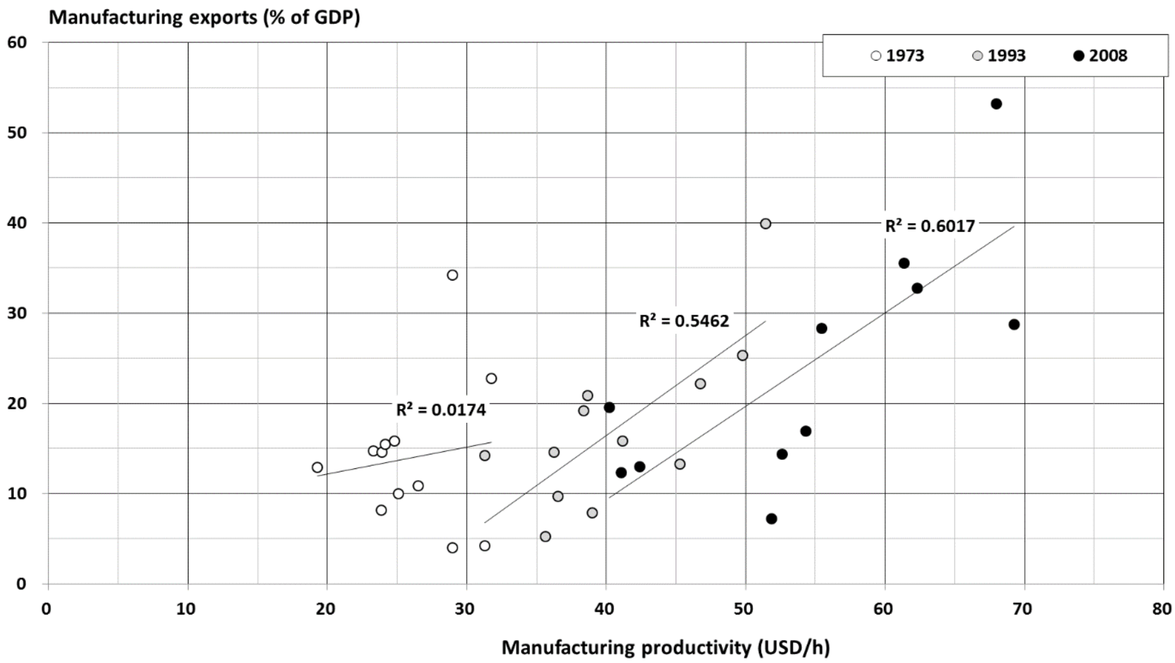
A favourable cost structure is the basis for offering superior (i.e. lower) prices to customers and/or achieving a high profitability. Thus, a high productivity should be highly influential on the market success of manufactured goods. In Figure 6.28, the interrelation of manufacturing exports and productivity is charted for three points in time. Also a linear trend is calculated, involving the correlation coefficient R^2.

The expectations in the course of globalization were these:

- Manufacturing exports, like productivity, would rise over time.
- Since markets have become ever-more connected, the dependency of manufacturing exports on productivity would rise.

Both expectations are fully met:

- Manufacturing exports rose.
- The dependency of manufacturing exports on productivity rose, as indicated by a steeper rise of the trend line and also a closer correlation of manufacturing productivity and manufacturing exports (higher R^2 coefficient).



Source: Own calculations, based on World Bank (2014a) and EU KLEMS (2012) data

Figure 6.28 Manufacturing exports vs. productivity

In addition, the influence of productivity on the trade balance was tested (Figure 6.29). Again, trend lines and correlation coefficients were added. Please note that for reasons of better optical plasticity of the trade balance, input (productivity) and output (trade) were displayed by interchanging the y-axis (here: input) and x-axis (here: output).

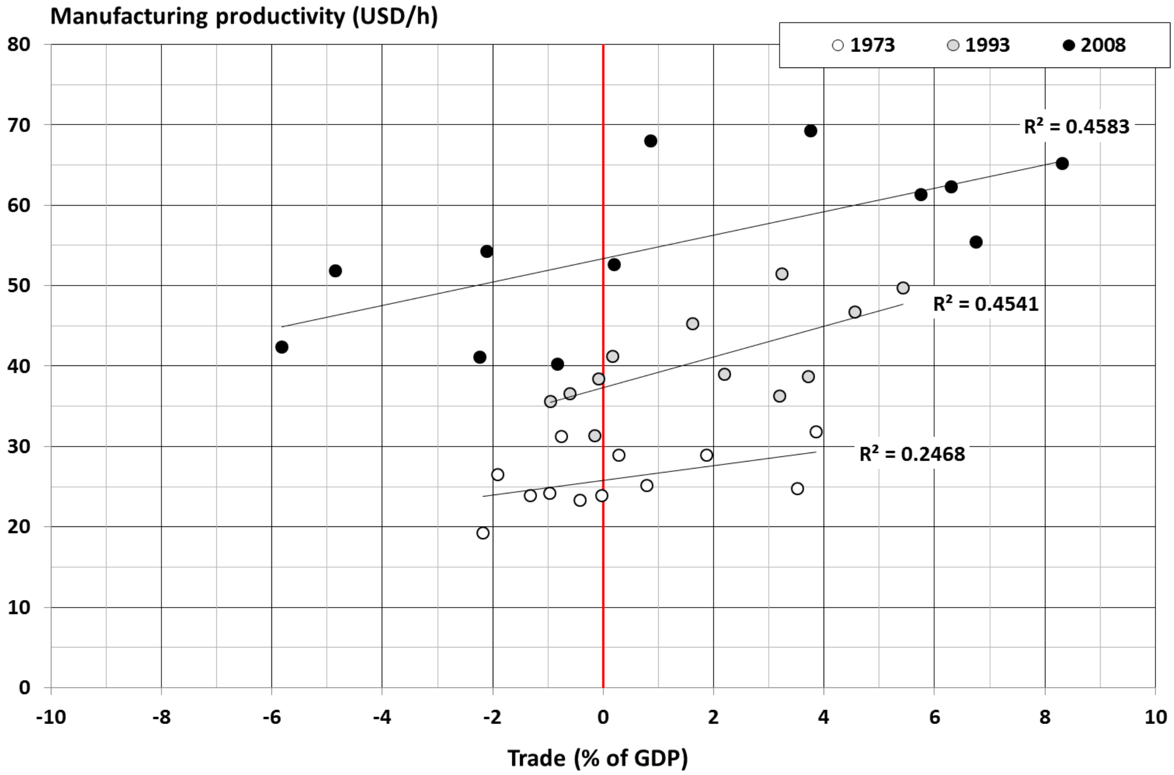
The expectations were that

- the higher the productivity at a certain point in time, the more positive the trade balance,
- the dependency of the trade balance on productivity would rise.

Both expectations are met:

- The trend lines are rising from left to right, so the higher the productivity at a certain point in time, the more positive is the trade balance.
- The dependency of the trade balance on productivity rose, as indicated by the rising R^2 values.

Additionally, the spread between countries with a positive and a negative trade balance has become much larger since 1993. Market pressure has risen, and countries tend to specialize in certain economic sectors.

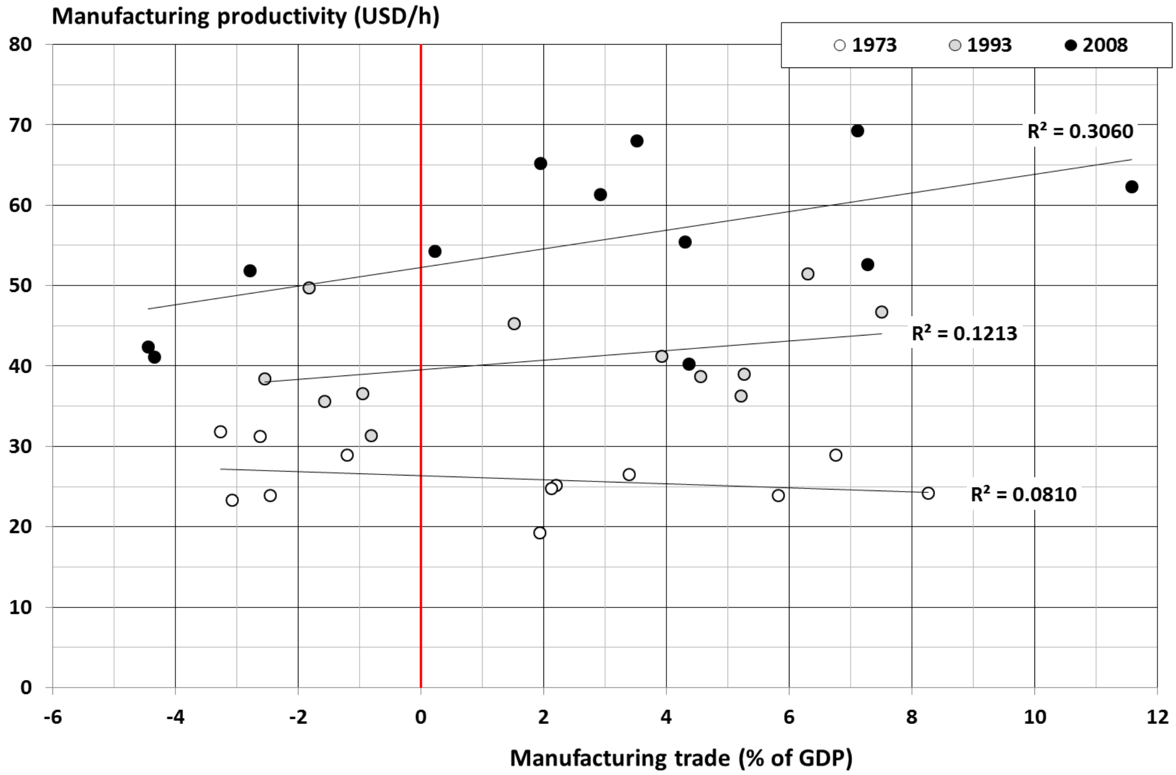


Source: Own calculations, based on World Bank (2014a) and EU KLEMS (2012) data

Figure 6.29 Manufacturing productivity vs. trade balance

Similar to the influence on the total trade balance, the influence on the balance of trade in manufacturing was tested (Figure 6.30).

In general, the outlined trends for trade are approved, but surprisingly, the correlations between manufacturing productivity and manufacturing trade are much worse than those of manufacturing productivity and total trade. There is no obvious explanation for this behaviour – but a sophisticated one. The manufacturing productivity in most cases more or less co-aligns with the average of other sectoral productivities. Since the basic population is larger when calculating the trade balance instead of the manufacturing trade balance, sector specific amplitudes and outliers do not count as much. Moreover, in some cases (e.g. Netherlands), despite of a very high productivity, the sector is suffering from crowding-out by other activities (services, primary products) and does not perform as it would free from national competition. When calculating an average of all sectors as with the total trade balance, this effect is omitted.



Source: Own calculations, based on World Bank (2014a) and EU KLEMS (2012) data

Figure 6.30 Productivity vs. manufacturing trade balance

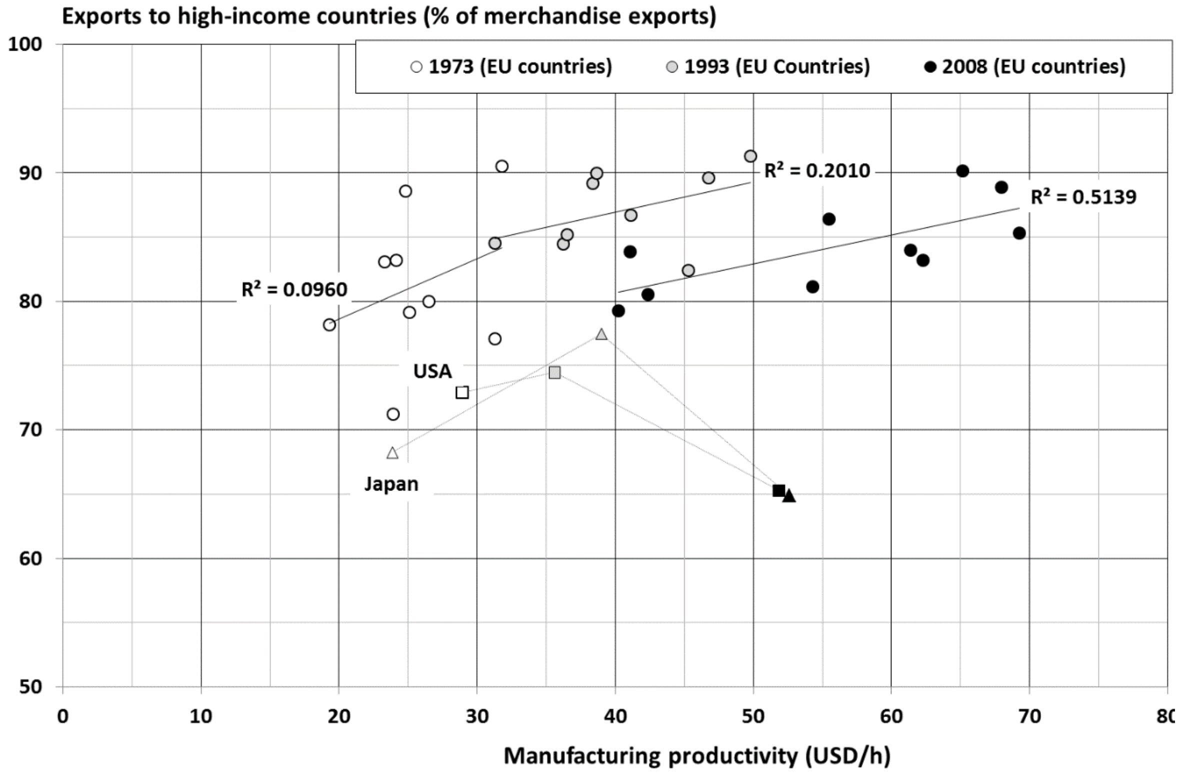
Finally, the influence of productivity on exports to high-income countries was analysed. The results are shown in Figure 6.31, also including linear trends and R^2 values. The values for the EU countries and Japan and the USA were separated because of the partially different regional markets both are involved in (see next sub-section).

For the EU countries, the following expectations were formulated:

- On the basis of the common EU market, exports to high-income countries (in the first place all EU countries) would first rise (probably from the 1970s until around millennium) to then fall in the course of globalization.
- No matter how high the maximum value, the dependency on productivity would become clearer over time.

Clearly, these expectations are fully met:

- For most countries, also for the USA and Japan, the North-North export shares rose from 1973 to 1993 to then fall until 2008.
- The correlation between productivity and North-North exports has become better since the R^2 values have risen over time.



Source: Own calculations, based on World Bank (2014a) and EU KLEMS (2012) data

Figure 6.31 Productivity vs. export share to high-income countries

Summarizing the findings, it may well be stated that manufacturing productivity is of key importance for the success in trade of the investigated group of countries. Countries losing out in this respect (e.g. Spain, United Kingdom) have little chances to be export countries, those which excel will be successful (e.g. Finland, Germany).

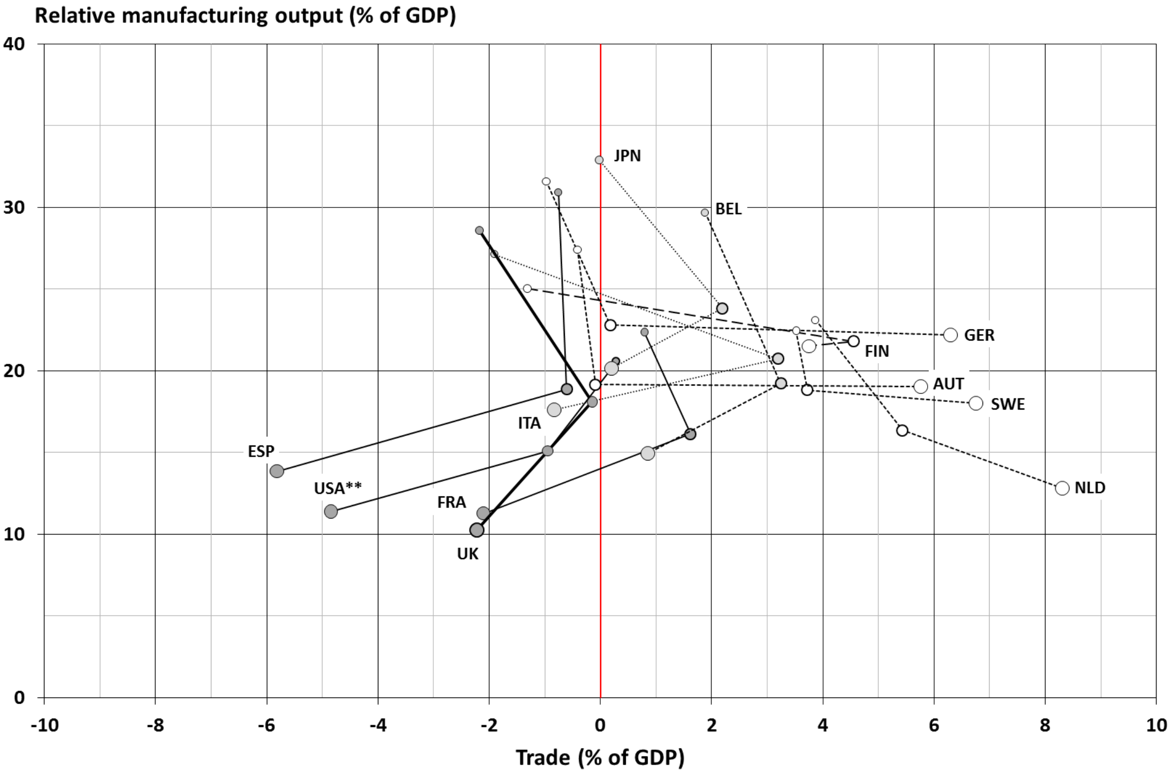
Besides of manufacturing productivity, also innovativeness can play a role for successful marketing. Moreover, logistics (geographical situation), tax policies (e.g. low profit taxation in the Netherlands) and crowding-out effects (e.g. by IT services or primary products) may influence the national trade balance and the contribution of the manufacturing sector.

6.2.2 Trade policies

After having analysed the influences of manufacturing technology (product and process innovation) on trade, the national positioning of the sample group of countries will be investigated.

6.2.2.1 Market position as manufacturing exporter or importer

Over time, the relative manufacturing output (share of value added to national gross value added) has declined in all investigated national economies. Still, manufacturing plays an essential role for foreign trade (cf. Figure 6.21, p. 303). While some countries became export countries, others became importers. As a general tendency, the importing countries reduced their share in manufacturing faster than the exporting countries (Figure 6.32).



(o 1973, O 1993, O 2008)

Source: Own calculations, based on World Bank (2014a) data

Figure 6.32 Relative manufacturing output vs. trade balance

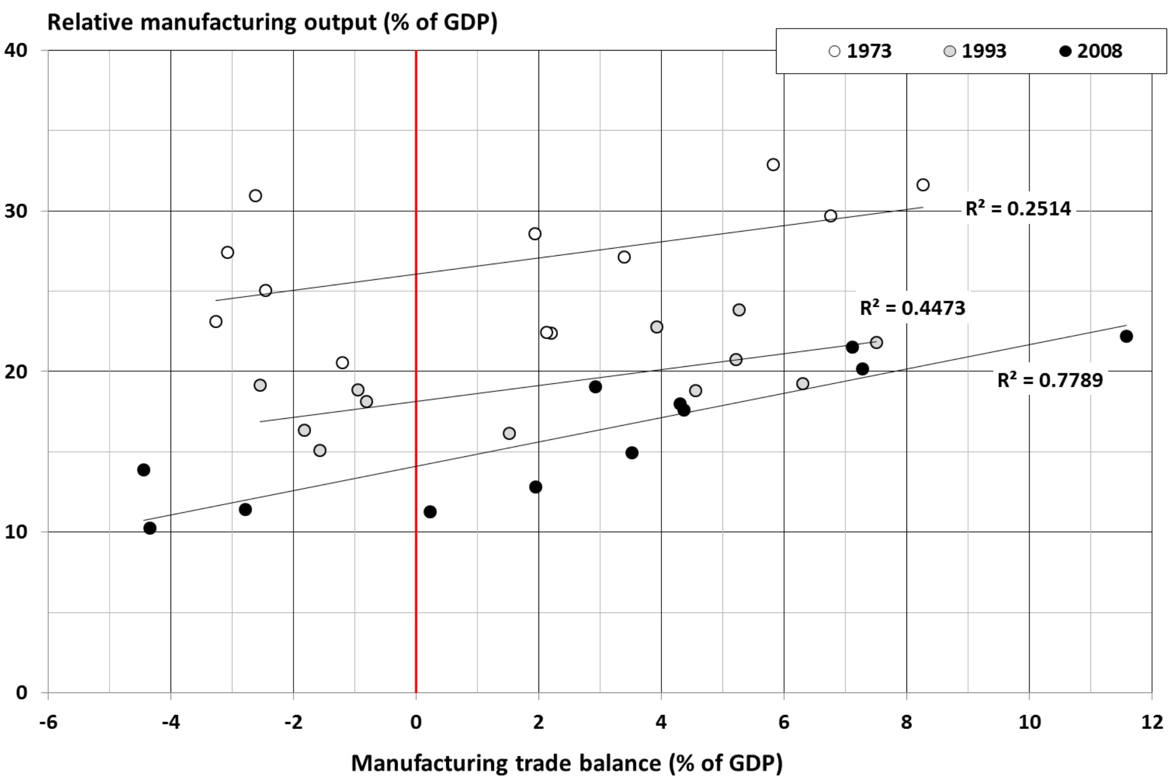
The Netherlands were an exception in this respect; their geographic situation is very favourable for trade, such as their tax system is very favourable for attracting MNEs which then generate intra-firm trade flows.

More in detail, the findings are:

- Germany, Austria and Finland (with a slight turn backwards until 2008) moved from importing to exporting.
- Sweden and the Netherlands built on their long export traditions.

- The USA was in a constant decline.
- All other countries improved their situation until 1993 but could not keep it. They significantly lost ground in foreign trade. Spain was the most severe case, but also the UK, France, Italy and (though still in the positive, but as a tendency) Belgium and Japan were running into problems.

International competitiveness became more and more crucial for maintaining sizeable manufacturing industry in a country. This is clearly demonstrated by Figure 6.33: The coefficient of correlation between the manufacturing trade balance and the relevance of manufacturing for the national economy, as demonstrated by its share in output, has constantly risen. In 2008, it stood at almost 80 %, so both variables are very closely linked.



Source: Own calculations, based on World Bank (2014a) data

Figure 6.33 Relative manufacturing output vs. manufacturing trade balance

As a result, it can be stated that only countries which manage to be constantly successful in manufacturing will be able to be successful in international trade. In terms of trade, manufacturing matters (cf. Hirst & Zeitlin, 1989; Kitson & Michie, 1997). Accordingly, the GDP manufacturing output share of states successful in terms of trade will be relatively high.

It is of utmost importance to note that the most favourable composition of the national economy in terms of the trade balance has changed over time and – following productivity rises – is shifted towards lower manufacturing output shares in the national economy.

6.2.2.2 Linkages to the world and regional economy

As the final piece of investigations on the interaction between trade and manufacturing, the international integration of national economies was analysed. This was carried out on the basis of correlations of national economic cycles with regional cycles. The underlying assumption is that the more economies are linked by mutual exchange, the better is the correlation between their economic cycles.

In Table 6.22, the correlation coefficients of national economies and regions are listed. While there are partially good correlations with Europe, the USA and East Asia & Pacific, this is not the case with Latin America and the Caribbean. For further analysis, only the first three areas were taken into account.

Table 6.22 Overview on correlation coefficients (1990-2010)

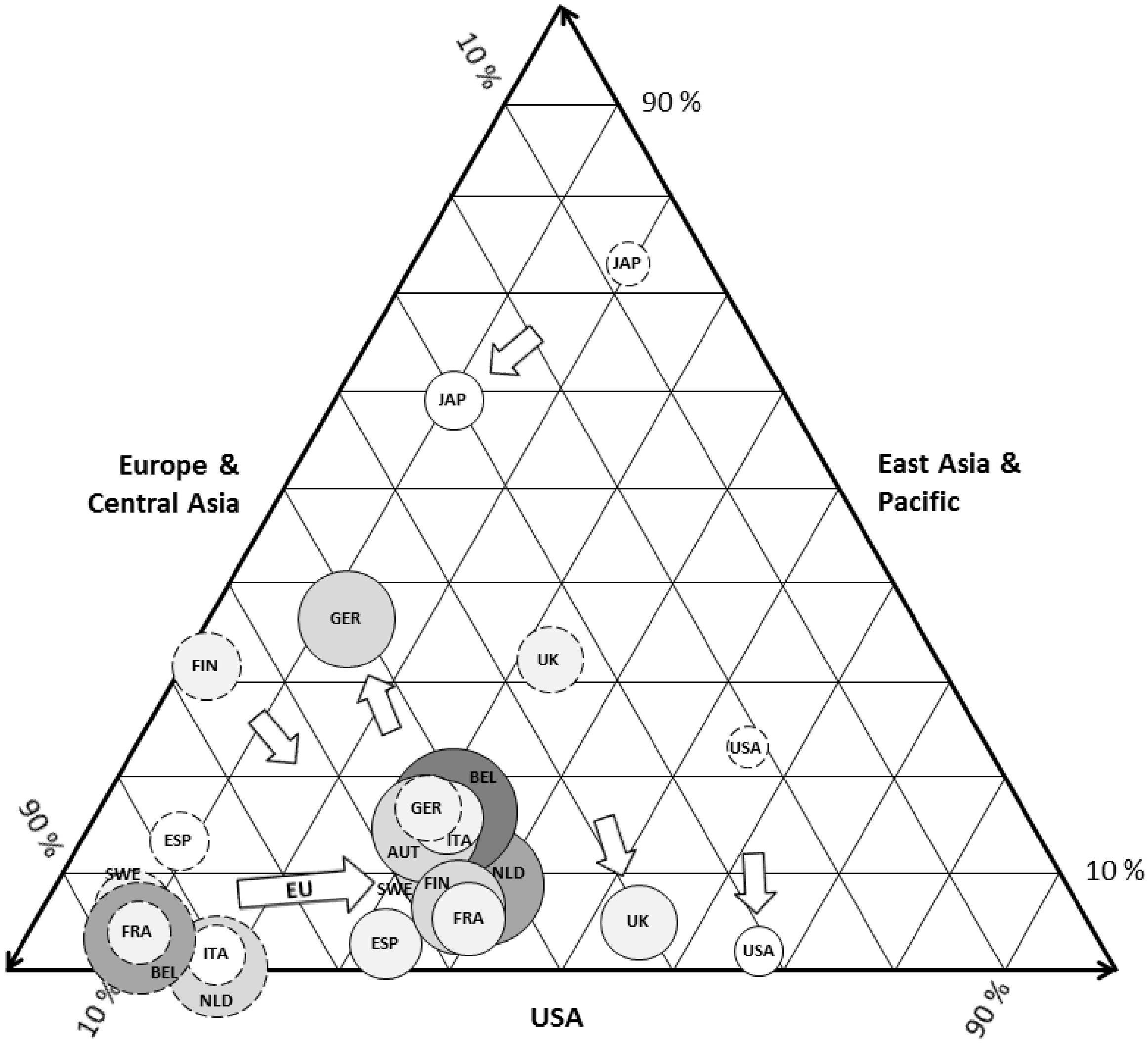
R^2 (%)	AUT	BEL	FIN	FRA	GER	ITA	NLD	ESP	SWE	UK	JPN	USA
World	59.2	72.9	74.2	68.7	39.7	70.2	57.1	51.8	75.6	64.9	48.2	60.0
Europe & Central Asia	67.7	74.3	79.8	80.7	44.3	76.7	64.4	76.5	75.9	57.9	37.1	46.2
USA	38.4	46.7	54.9	57.6	11.2	46.2	48.0	39.4	47.9	76.7	12.6	100.0
East Asia & Pacific	17.6	23.8	8.9	8.2	32.7	23.8	9.5	3.3	16.8	7.2	72.8	2.4
Latin America & Caribbean	16.4	21.6	19.3	10.7	18.8	16.4	16.2	3.5	17.7	17.9	19.1	14.5

Sources Based on World Bank (2014a) data and own calculations, correlation of GDP growth (CAGR), constant 2010 prices

To illustrate the relative dependency of a national economy on other regions, the correlation coefficient with one region was compared with the total of all three regions. Three relative correlation coefficients were calculated, always summing up to 100 %, by the following formula.

$$c_{R^2}(i) = \frac{R^2(i)}{\sum_{i=k}^{n} R^2(i)} \qquad (6.1)$$

In Figure 6.34, the results are presented for two 20-year phases, i.e. until 1990 (dotted outer line) and until 2010 (full outer line). Moreover, the export rate is visualized by shading and bubble size. Thus, small countries like Belgium and the Netherlands became optical giants and big countries like the USA and Japan became optical dwarfs.



Source: Own calculations, based on World Bank (2014a) data.
Notes: The size and the colour of the bubble area refer to the country's export rate:

[O 0.0…19.9 %; 20.0…39.9 %; 40.0…59.9 %; 60…79.9 %; 80 … %]

Dotted-line bubbles refer to 1970-90 values, continuous-line bubbles to 1990-2010 values

Figure 6.34 Relative correlations between national and regional economic cycles

The following groups were identified:

- European mainstream

  There is something like a European mainstream that most European countries followed (meanwhile also Finland which started differently), roughly characterized by the following relative coefficients for 1990-2010: Europe (55 %), USA (35 %), Asia (10%).

Clearly, Europe has moved from little connectedness (around 85 % dependence of most European countries on the European cycle for 1970-1990) towards higher dependency on other cycles, i.e. better correlation.

- USA and UK

  USA is the dominant factor (UK: 55 %; USA: 68 %, including the 100 % correlation of the US economy with itself), while Asia is almost insignificant (< 5 %). Europe plays a certain role (30-40 %).

  Despite of efforts to become more Pacific-oriented (Sharma & Gielen, 2013), the USA is not well connected with the Asian cycle – and with a falling tendency!

- Japan

  At the end of the investigated period, Japan had remarkably little connection with the US economy (10 %). It became more linked with Europe (30 %). As expected, its major influence is Asia (60 %).

- Germany

  Germany played a very special role in its international embedment. Already in the first period, it was in the position that the European mainstream followed 20 years later. In the second period, Germany followed a unique path with less dependency on the USA (10 %) and more on Asia (35%). The economic roles of the USA and Asia had interchanged!

  This scenario is a suitable explanation for the German success in exports. Germany managed early to enter the Asian growth markets. This resulted in a certain dependency, but also in the overwhelming market success of the German manufacturing industry (cf. Figure 6.23, p. 305).

6.3 National characteristics as influencing factors

National trends and influences will be analysed on the basis of the findings of chapter 5.3. The essence of these findings is listed in Table 6.23, p. 321.

Table 6.23 Synopsis of national trends and specific developments

<table>
<tr><th>Country</th><th>National policies</th><th>Specific trends and events</th><th>Scenario</th><th>Subtype of de-industrialization</th><th>Prod.</th><th colspan="2">Trade</th></tr>
<tr><td>Year</td><td></td><td></td><td>73-08
(73-88 | 93-08)</td><td>73-08
(73-88 | 93-08)</td><td>2008</td><td>Vol. 2008</td><td>Bal. 2008</td></tr>
<tr><td>Austria</td><td>social-democrat country, close cooperation between conservatives and social-democrats, conflict avoidance</td><td>great continuity, successful revitalization of East connections after 1989</td><td>4e
(4e | 4e)</td><td>o
(o | +)</td><td>+</td><td>+</td><td>+</td></tr>
<tr><td>Belgium</td><td>mostly conservative prime ministers, many small parties due to Flemish and Walloon division</td><td>location in the heart of Europe, much trade due to logistics and many MNEs, strong KIBS</td><td>4e
(4e | 4e)</td><td>o
(o | o)</td><td>++</td><td>++</td><td>o</td></tr>
<tr><td>Finland</td><td>socialist government and strong Soviet influence in 1970/80s, crisis around 1990 after short neo-liberal phase, social-democrat country</td><td>very successful in IT, dependency on NOKIA, therefore high economic volatility</td><td>4e
(4e | 1a)</td><td>o
(o | none)</td><td>++</td><td>+</td><td>+</td></tr>
<tr><td>France</td><td>successful state-administered catch-up industrialization after WW II, high social standards and regulations, still high state influence, 35 h workweek</td><td>productivity stagnation after 2000 along with output decline, high (youth) unemployment,</td><td>4e
(4e | 5e)</td><td>o
(o | o)</td><td>o</td><td>o</td><td>–</td></tr>
<tr><td>Germany</td><td>great continuity in politics because of coalition governments, mostly with participation of liberal party, rather social-democrat policies</td><td>re-unification in 1990, innovative, pioneer in Asian markets, high manufacturing export surplus</td><td>4e
(4e | 4e)</td><td>o
(o | +)</td><td>+</td><td>+</td><td>+</td></tr>
<tr><td>Italy</td><td>mostly conservative governments, little continuity, high interlocking of state and business spheres</td><td>economic North-South divide, mafia shade economy, productivity stagnation from 1995, FI</td><td>4e
(4e | 4e)</td><td>none
(none | o)</td><td>–</td><td>o</td><td>o</td></tr>
<tr><td>Nether-lands</td><td>great continuity in politics because of coalition governments, 'land of compromise', low-tax policies for enterprises</td><td>location in the heart of Europe, much trade due to logistics and many MNEs, strong KIBS</td><td>4e
(4e | 4e)</td><td>+ pp
(o pp | + pp)</td><td>++</td><td>++</td><td>+</td></tr>
<tr><td>Spain</td><td>no coalitions because of election system, strong policy changes from socialists to conservatives and vice versa, disheartened economic policies</td><td>productivity stagnation from 1985, high (youth) unemployment, volatility, large building sector</td><td>4e
(4e | 1a)</td><td>o tm
(none | o tm)</td><td>–</td><td>o</td><td>–</td></tr>
<tr><td>Sweden</td><td>long social-democrat tradition, high social standards, very independent economic policies until 1995, since then dedicated EU member</td><td>continuous tough increase of productivity, also by workload increases</td><td>4f
(4f | 1c)</td><td>o
(+ | +)</td><td>+</td><td>+</td><td>+</td></tr>
<tr><td>UK</td><td>long social-democrat tradition before 1970, adaptation difficulties in the course of internationalisation, neo-liberal policies from 1979</td><td>high backlog in productivity in 1970s, output decline, strong KIBS</td><td>5e
(5f | 5e)</td><td>o pp, nht
(o pp | o pp, ht)</td><td>–</td><td>o</td><td>–</td></tr>
<tr><td>Japan</td><td>close links of political, banking and industrial spheres, long-term rule of conservatives, very regulated economy</td><td>very successful industrial policies in 1970/80s, productivity stagnation after 2005</td><td>4e
(4e | 4e)</td><td>o
(none | o)</td><td>o</td><td>–</td><td>o</td></tr>
<tr><td>USA</td><td>after years of economic crisis around 1980, neo-liberal policies under Reagan were pursued</td><td>lowest export rate, increase of productivity at the expense of workload increase</td><td>4f
(1c | 4f)</td><td>o pp
(+ | o pp)</td><td>o</td><td>–</td><td>–</td></tr>
</table>

Manufacturing sector scenarios (for all: productivity ↑)

1a output ↑, labour ↑, employment ↑, workload ↓
1c output ↑, labour ↑, employment ↓, workload ↑
4e output ↑, labour ↓, employment ↓, workload ↓
4f output ↑, labour ↓, employment ↓, workload ↑
5e output ↓, labour ↓, employment ↓, workload ↓
5f output ↓, labour ↓, employment ↓, workload ↑

Subtype

+ positive
o ambivalent
– negative
nht no shift to high-tech
pp shift to primary products
tm ambiguous technical maturity

Productivity

++ > 65 USD/h
+ 55-65 USD/h
o 45-55 USD/h
– < 45 USD/h

Trade volume (of GDP)

++ > 60 %
+ 40-60 %
o 20-40 %
– 0-20 %

Trade balance (of GDP)

+ > 1.0 %
o -1.0-1.0 %
– < -1.0 %

Sources: Own compilation, as specified in sub-chapter 5.3

Specifically, the following possible influences on structural change are evaluated:

- Geography (location, i.e. land vs. sea borders, number of neighbouring states; size, i.e. number of inhabitants)
- Government (political orientation of government, frequency and amplitude of government change; electoral system; state-business relations, i.e. labour market regulation, company taxation; institutions)
- National culture
- Forms of capitalism

Before turning to these, a short analysis on if and how manufacturing employment corresponds with national economic success is rendered.

6.3.1 The interrelation between manufacturing employment and economic success

As an additional input for the considerations, the economic success of countries was taken into account. For this evaluation, a quantitative model of economic success was built. Basically, the relevant factors used are those for determining the type of de-industrialization. The success of a country's economic policies is mainly attributed to national income, unemployment and trade. To combine these influences, an economic success ratio s_{total} was calculated as defined by the following formulae:

$$s_{total} = (s_1 + s_2 + s_3)/3 \ (\%) \tag{6.2}$$

with

$$s_1 = (GDP/cap._i)/(GDP/cap._{max}) \ (\%) \tag{6.3}$$

$$s_2 = 115\,\% - 5 \cdot unemployment\ rate\ (\%) \tag{6.4}$$

$$[s_2 = 100\,\% \ \ if\ unemployment\ rate < 3\,\%]$$

$$s_3 = 76\,\% + 2 \cdot trade\ balance\ (\%) \tag{6.5}$$

Economic success was calculated for the 15+5+15 periods (cf. Appendix 6). There is no clear-cut relation between economic success and de-industrialization for the pre-globalization and transition periods and also not for the 35-year total. The R^2 values are close to zero.

For the period of globalization (1993-2008), there is a significant correlation between the decline in manufacturing employment and economic success (Figure 6.35). Spain, the UK and the Netherlands are distinctively above the trend line, while Italy and Japan are clearly below.

Source: Own calculations, based on World Bank (2014a) data

Figure 6.35 Economic success vs. relative manufacturing employment (1993-2008)

Hypotheses

These globalization period results leave room for various interpretations. The following hypotheses are plausible at first glance:

1) Keeping a strong manufacturing sector is good for the economy. The stronger the manufacturing sector, the better the economy. Outliers like Spain and Italy require additional clarification.
2) Causality is the other way round: If a manufacturing sector is successful, so is the economy. Market success creates higher workforce demand. A possible explanation for the outliers Japan and Italy would be that some unnecessary workforce is retained and productivity rises are comparatively low. The economic success in Spain is explained by reduced unemployment created by some other economic

sector(s), drawing from the manufacturing sector (crowding-out effect). In the case of Spain, this was the building industry. The same holds – to a lesser extent – for the UK and the Netherlands (crowding-out by oil and gas industry).

If i) was correct, this would be proof for the Kaldorian hypothesis. But does it hold in times of globalization?

Does Kaldor's 'First Law' work in times of globalization?

It would work under the assumption that relevant markets were seller's markets. This was the case in years of need, e.g. those immediately after World War II when all goods were snatched away from the producers and selling was still 'distribution', i.e. an effortless marketing and sales process. Already in the 1960s markets became increasingly saturated and firms needed to fight for market shares. While in insular national markets production could be planned on a long-term basis, the situation changed rapidly with ever-closer economic linking of nations and regions, fostered by improvements in logistics, IT and reduced trade barriers.

National efforts for building up a manufacturing industry proved to be successful in the past, as the 19th century examples of Germany, Japan, the post-war examples of France and Italy and the rise of Korea and China have shown. In all these cases, there was a big national demand for manufactured goods. Moreover, states like Germany and China started their rise on a low-cost of labour basis, rendering a market opportunity.

While long-term strategic thinking is still necessary – Michael Porter (1985) gave a timeless framework that has been constantly refined –, it is now common sense that a strategy cannot simply be enforced but sometimes rather is a flexible identification of opportunities (Mintzberg, 1994). And consequently, also the market success of manufacturing cannot simply be planned – it needs to be gained by a multitude of product and process innovations to succeed in terms of a unique selling proposition in terms of the kind, quality or price of a product (Daum, Greife, & Przywara, 2014). Thus, much doubt is cast on the possible role of the state as a central player in a successful national economy in times of globalization.

Conclusions on the influence of manufacturing on economic success

As a resume, explanation ii) is much more reasonable for explaining the findings of Figure 6.35: If a manufacturing sector is successful, so is the economy. Market success creates higher workforce demand.

Of course, this explanation only works in closely integrated, i.e. highly and mutually competitive markets. These were not given to the same extent in the first period (1973-88). Moreover, results were distorted by market adaptions in the transition periods when especially Finland and also Sweden had to struggle with the economic effects of radical political change, just like Germany that had to absorb a large economic unit of low productivity and little marketable products (the former German Democratic Republic, i.e. East Germany).

In short:

- The individual paths of development are too different for generalizing them over the full 35-year period – no relevant correlation between manufacturing employment and economic success can be identified.
- For the time after 1993, there are common streams below the national surface. The success is rather driven by the demand side than by the supply side, i.e. the offering has to be tailored more and more to international demand.

6.3.2 The influence of geography

Within the sample group, there are large differences between the natural frame conditions of development, contributing to very different living conditions, e.g. in terms of population density and national wealth. In this analysis, the influences of the number of inhabitants and the nature of country location were evaluated:

- The population values differ widely (the USA had 304 million inhabitants in 2008 while Finland only had a good 5 million). Thus, the log value was calculated for further considerations.
- As a second indicator, the degree to which the country is landlocked was calculated by dividing the length of its land borders by the total length of landline and coastline.

A correlation analysis between these factors and those of economic success was carried out, with the results given in Table 6.24. Since there is (by chance) quite a good negative correlation between both geographical input indicators (the big states Japan and USA are largely sea-locked, small states like Austria, Finland, Belgium and the Netherlands largely land-locked), the correlations of both with other factors are much alike.

Table 6.24 Correlation of population and coastline with economic indicators

R^2 (%) (linear trends)	Population (log)				Coastline share (%)			
	1973-1988	1988-1993	1993-2008	1973-2008	1973-1988	1988-1993	1993-2008	1973-2008
Political orientation [1)]	43.3	13.9	27.7	56.5	31.3	15.8	1.6	25.0
Total success ratio (%)	0.0	22.3	39.5	6.3	0.4	27.3	6.5	3.6
Unemployment change (%p)	0.0	19.5	10.5	3.8	0.0	0.1	0.4	1.0
GDP/cap. change (USD/h)	0.3	26.2	42.0	24.9	0.6	17.7	17.7	20.9
De-industrialization (%p)	4.6	0.7	40.3	0.3	12.8	0.2	3.9	2.5
Productivity change (USD/h)	28.7	6.0	20.3	33.6	35.0	4.5	44.7	50.6

Sources: Own calculations, based on CIA (2015) and World Bank (2014a) data
[1)] cf. section 6.3.3.1, pp. 327

Summarizing the findings, the more isolated and populated the sample group state,

- the more to the right is its political orientation and
- the lower are its economic prospects in terms of income and productivity rise.

The question remains whether this is mere coincidence or a logical consequence of globalization. It is assumed that there is some system behind the findings. The following interpretation appears to be reasonable:

- Large states have a larger domestic market, so their average market orientation is much more inbound. At average, they have a much lower export orientation and are less exposed to global markets. Thus, the market pressure is lower, yielding worse results in terms of productivity, export rates and, in consequence, national income.
- A domestic orientation also influences the world view of voters. People of small countries need to see the world and speak foreign languages, people of big coun-

tries are often self-contained within their world of its own. Thus, rather conservative and national standpoints will be preferred in comparison to liberal or even left-wing internationalism in small states.

Lacking export success and productivity increase is problematic especially for manufacturing. As a consequence, the larger the country, the faster it will, so the trend, de-industrialize.

6.3.3 The influence of government

While a government and the ministerial bureaucracy are, according to the findings of the previous section, less likely than ever to make smart micro-economic decisions, they have a wide spectrum of influencing the national economy. It ranges from still trying to govern the economy to a large extent (e.g. by nationalizing firms to avoid unemployment) over regulations like labour protection laws, organized sectoral support like R&D funds to neo-liberal withdrawal of the state, resulting in specific forms of capitalism (cf. section 2.2). Since these large-scale considerations require additional input, e.g. on national culture, they are covered in a specific sub-section (section 6.3.3.2).

The following sub-section focuses on a synthesis of central elements of the national political findings rendered in the sections of sub-chapter 5.3. First, the influence of the political orientation of governments, the continuity of their work and also a possible influence of the electoral system, largely influencing the frequency and amplitude of political change, will be analysed.

6.3.3.1 Political orientation, continuity and electoral system

Political orientation of government

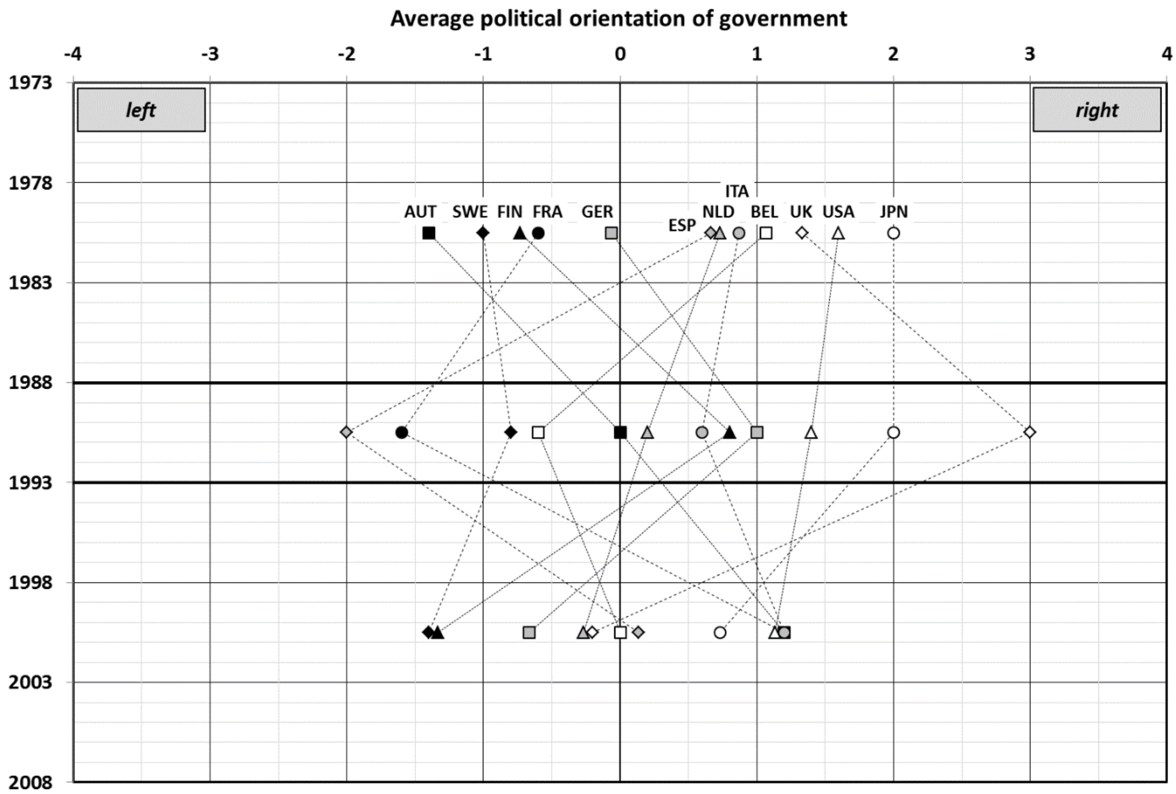
The political orientation of government was analysed by transferring the political spectrum into quantitative data according to the scheme shown in Table 6.25.

Table 6.25 Quantification of political orientation of governments

Attached value	Political orientation
-4	communist
-3	social-democrat and communist coalition
-2	social-democrats, greens
-1	social-liberal coalition, US democrats
0	great coalition, liberals (old style)
+1	conservative-liberal coalition
+2	conservatives
+3	neo-liberal conservatism
+4	nationalist

Source: Own compilation on the basis of data named in section 5.3

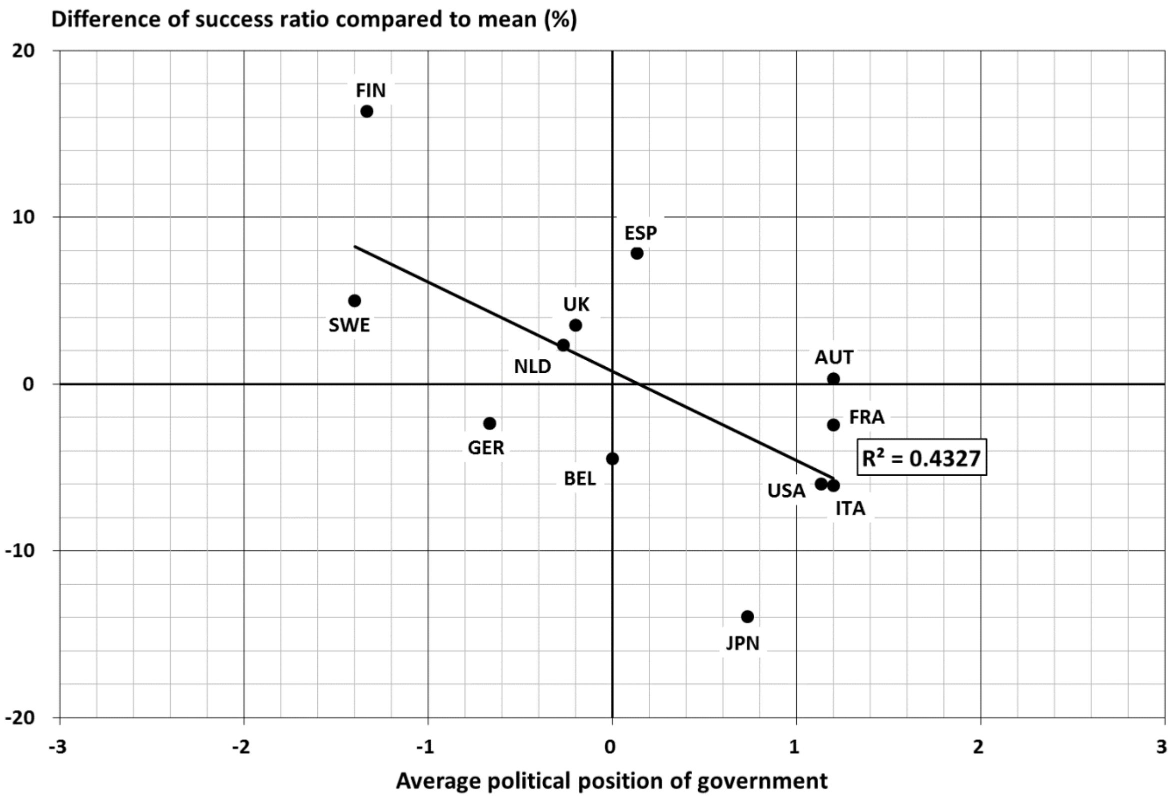
Government orientation was counted by years. In years of governmental change, the full year was attached to the government in power for the longer time span. Finally, the average orientation per period was calculated. The results for the 15+5+15 (pre-globalization, transition, globalization) year scheme are given in Figure 6.36.



Source: Own calculations

Figure 6.36 Average political orientation of government

This analysis served as the basis for a comparison between political and economic developments. While for the years from 1973 to 1993, the result was chastening not only for politicians, since no significant correlation between the political orientation of government and economic success could be found, the situation is very different for the period of globalization (1993-2008). Economic success correlates quite well with the political orientation of government. Generally speaking, the more to the left (social-democrat) the government was, the more successful was the result (Figure 6.37).



Source: Own calculations, based on World Bank (2014a) data

Figure 6.37 Economic success vs. political orientation of government (1993-2008)

Despite of the quite good correlation, the graph is not the outflow of an 'adamantine law', but only a very general trend. It is to be noted that none of the countries under investigation was politically extreme, at least not at average. All followed a certain mainstream. National results are probably very much influenced by other factors like frame conditions of geography (see section 6.3.2).

Notwithstanding these findings, there is no fully generalizable tendency of benevolent or malevolent influences of a certain political orientation. What works in one country must not necessarily work in another one and vice versa. Moreover, Finland and Japan have a very large influence on the findings. It has to be analysed if these influences can be assigned to political work or are of other nature, i.e. on the micro-economic level.

Political continuity (frequency and amplitude of change)

To evaluate the political continuity, each government change was counted and weighted by its amplitude (e.g. a change from communism (-4) to nationalist (+4) would count 8). The changes were summed up to finally calculate an annual average impact. The results are given in Table 6.26.

No generalizable trends could be found when comparing governmental change with economic success and also manufacturing employment by a correlation analysis.

The frequency of change in Italy sticks out from the rest. It will be considered as an eventual country-specific influence or indicator.

Table 6.26 Governmental change (frequency by impact, annual average)

Year	AUT	BEL	FIN	FRA	GER	ITA	NLD	ESP	SWE	UK	JPN	USA	mean
1973-1988	0.13	0.33	0.33	0.47	0.13	0.33	0.07	0.33	0.53	0.33	0.00	0.53	0.29
1988-1993	0.00	0.20	0.40	0.40	0.00	1.00	0.20	0.00	0.20	0.00	0.60	0.60	0.30
1993-2008	0.40	0.27	0.27	0.40	0.40	0.93	0.27	0.53	0.40	0.27	0.27	0.47	0.41
1973-2008	0.23	0.29	0.31	0.43	0.23	0.69	0.17	0.37	0.43	0.26	0.20	0.51	0.34

Sources: Own calculations

Electoral system

In Table 6.27, the electoral systems of the sample group states are listed. Countries mainly utilizing the majority-vote system are shaded in grey. When calculating the average governmental change of this group, the result is 0.35 which is almost exactly the total average from the previous section. Since no difference exists, no impact of the electoral system on success is expected.

Table 6.27 Electoral system

	AUT	BEL	FIN	FRA	GER	ITA	NLD	ESP	SWE	UK	JPN	USA
System	d'Hondt	d'Hondt	d'Hondt	run-off	Sainte-Laguë	Hare quota	d'Hondt	d'Hondt	Sainte-Laguë	FPTP	FTPT + d'Hondt	FPTP
Threshold	4 %	5 %			5 %	2 % (coalition)	0.67 %	3 %	4 %			
Remark					+ FPTP	closed lists		closed lists	modified		closed lists	electoral college

Sources: Own calculations, IDEA (2013)

6.3.3.2 Varieties of capitalism in mature states

In the following sub-sections, an analysis of the influence of varieties of capitalism on the development of the manufacturing sector is carried out on

- an aggregate level, i.e. by putting types of capitalism in relation to sectoral development, namely in terms of the key indicator of sectoral productivity,
- a fine-grained level, i.e. by putting quantitative indicators of institutional performance in relation to economic indicators.

Comparison of types of capitalism

For analysing mature states in terms of varieties of capitalism, the typology by Schmidt (2003) who complemented a third type of capitalism to the original VoC dichotomy of Hall and Soskice (2001a) was expected to be utile (cf. sections 2.2.2.1 and 2.2.2.2, pp. 32). As the key indicator of technological development in manufacturing, productivity was identified, being of crucial influence also on sectoral exports (cf. section 6.2.1, p. 295).

Among the key findings of the section on sectoral productivity was that four states stepped out of the line of constantly rising productivity in the period of globalization: Spain, Italy, France and Japan. This is exactly the group of the state-led variety of capitalism identified by Schmidt (2003) in contrast to managed economies, both classified as CMEs within the VoC dichotomy. Obviously, the state-led approach did not generate the necessary dynamism to meet the high pressure from global competition. Stagnation means to fall behind the leading nations in manufacturing, i.e. to rely on less innovative products and eventually lower positions in international value chains. Managed economies stayed on track, based on well-adapted institutions to promote the required continuous incremental change. Also both liberal economies (UK, USA) continuously increased their productivity.

In terms of sectoral decline by relative employment, the VoC approach predicts that DMEs are less apt for sectors of incremental change (e.g. mechanical and electric engineering) than CMEs, but have competitive advantages in high-technology sectors like KIBS (Hall & Soskice, 2001b). Faster employment shifts from traditional engineering to more radically innovative sectors are expected in the LMEs. Manufacturing is a sector of incremental change, so the employment in the UK and the USA should fall faster than in the CME economies. As the figures for all investigated periods show (Table 6.5, Table 6.10, Table 6.14, Table 6.18), this is really the case.

In sectoral decline of employment, the UK and USA are followed by Belgium and the Netherlands, both traditional countries of trade with a favourable location in the heart of

Europe and by the North Sea. It might well be assumed that business opportunities in trade have crowded out industry with growing internationalization especially in these countries.

From the findings, the following groups of nations are distinguished by their success and inclination towards manufacturing:

- Industry-oriented managed CME winners: Austria, Finland, Germany, Sweden
- Trade-oriented managed CME winners: Belgium, Netherlands
- State-led CME industrial losers: France, Italy, Spain, Japan
- Industry-adverse LMEs: UK, USA

Comparison of institutions

The following analysis focuses on national institutions of industrial relations and education/training. The first aspect is mainly covered by analysing aspects of state business relations. State business relations (SBRs) are "relations between the public and private sector" (te Velde, 2014, p. 9). They play an important role in developing and implementing industrial policies, i.e. "any type of selective intervention or government policy that attempt to alter the production toward sectors that are expected to offer better prospects for economic growth than would occur in the absence of such intervention" (te Velde, 2014, p. 9).

Effective state-business relations help to prevent economic losses from i) market failure (activities useful for the national economy remain undone because of lacking commercial attractiveness for individual players), ii) government failure (state actors are lacking insight in markets to be cured from failure). In this respect, business associations and government departments "complement price mechanisms in resource allocation" (te Velde, 2014), e.g. in basic research.

Unfortunately, no global index on the tightness of SBRs, i.e. state involvement in industrial policies, is available (te Velde, 2014). Instead, two indirect indicators were chosen that mark the degree of regulation and the degree of state involvement in the national economy's private business sector:

- OECD indicator of employment protection

  It measures the procedures and costs involved in dismissing individuals or groups of workers and the procedures involved in hiring workers on fixed-term or temporary work agency contracts (OECD, 2014b).

It is an indicator for labour market regulation, although it does not cover all influences involved, e.g. cultural aspects (hire-and-fire mentality vs. social responsibility). Here, the OECD indicator of employment protection serves as a proxy for market regulation in general.

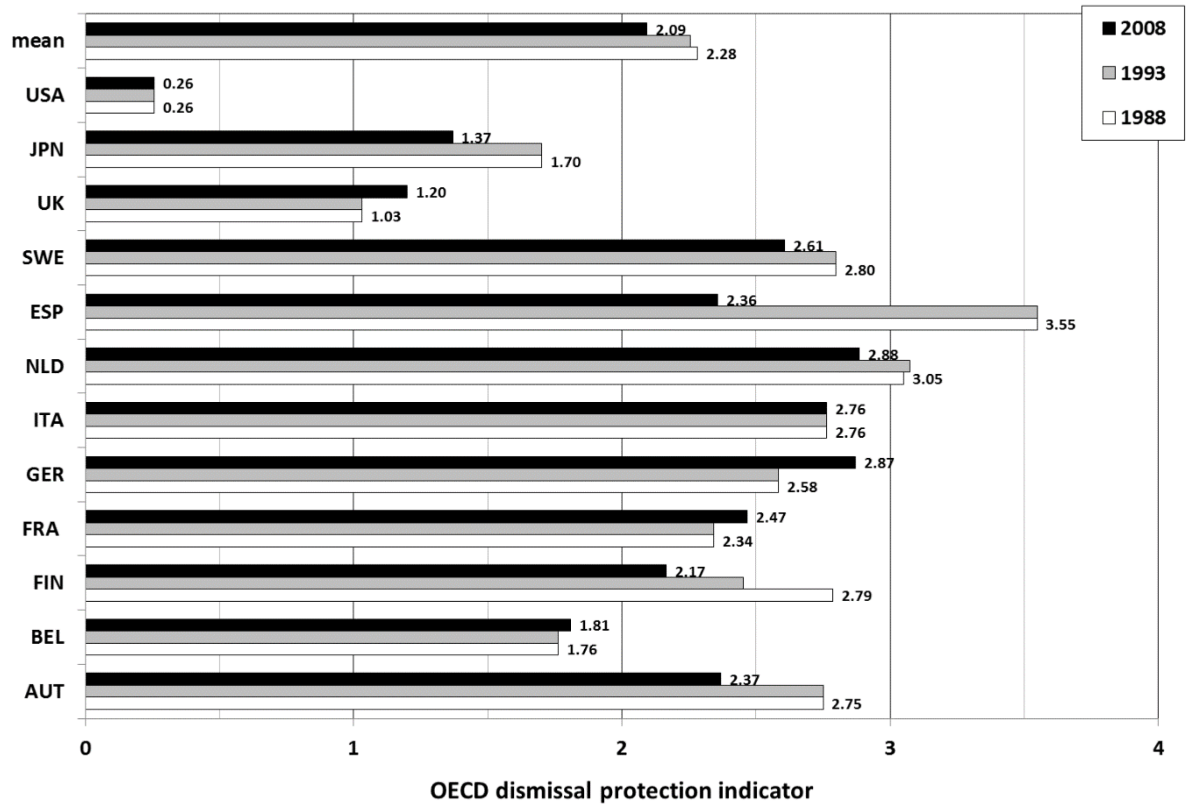
- Total tax rate (% of commercial profits)

  It measures the amount of taxes and mandatory contributions payable by businesses after accounting for allowable deductions and exemptions as a share of commercial profits (World Bank, 2014a).

  Here, it serves as an indicator for state influence on business.

Employment protection

The OECD indicator of employment protection for individual dismissal is given in Figure 6.38 for the sample group and the arithmetic mean value.



Sources: OECD (2014b), individual dismissals (regular contracts), Venn (2009)

Figure 6.38 Strictness of employment protection

In the USA, the workforce is traditionally almost unprotected, while in most Western European states, dismissal is involved with high costs. Spain was most restrictive in this sense until in 1994, a quite radical reform was enforced.

In the 1990s, in the course of market liberalisation policies, many states reduced their labour protection and gave their labour market more flexibility. While some of these were among the economic winners of the investigated globalization period (Austria, Finland, Netherlands, Spain, Sweden), Japan lost out in that period.

Eventual effects of employment protection are tested by means of a correlation analysis. The core results are rendered in Table 6.28.

Table 6.28 Correlation of labour protection and profit tax with economic indicators

R^2 (%) (linear trends)	Dismissal protection*				Profit tax**
	1973-1988	1988-1993	1993-2008	1973-2008	1993-2008
Political orientation	32.0	41.5	7.8	39.9	19.5
Total success ratio (%)	10.4	0.7	8.7	0.0	9.0
Unemployment change (%p)	20.2	1.3	2.8	18.0	0.1
GDP/cap. change (USD/h)	3.6	0.4	0.1	2.6	34.4
De-industrialization (%p)	10.0	2.1	10.7	2.6	0.2
Productivity change (USD/h)	22.6	15.8	0.0	2.8	20.0

Sources: Own calculations, based on OECD (2014b) and World Bank (2014a) data
* OECD indicator for strictness of employment protection concerning individual dismissals (regular contracts)
** World Bank data for total tax rate on commercial profits (%)

There is only one correlation that is really significant: the one of around 40 % between political orientation and labour laws in the 1970s and 1980s, influencing the total 35-year period. Labour protection has been of high symbolic relevance for politicians, so if rather left politicians were in power, they tended to establish protective labour laws. Not every law was withdrawn by later politicians, so the overall influence of the early 20 years remained decisive for the full period.

The factual results of the policies are rather sobering for political ideologists of all shades. Hardly any influence on the economic indicators can be traced. There are two seeming (light) correlations that are of little relevance:

- The apparent correlation with unemployment is positive, i.e. with rising protection, unemployment and productivity figures were rising stronger. But this impression from the pre-globalization period can largely be attributed to the strong influence of only a single country that was largely losing out in that period: Spain.

- The same holds for productivity. The USA was almost stagnating in that period. Due to their extreme policies in (lacking) employment protection, it imposes a high influence on the trend line.

Spain was extremely labour protective in that period, so its labour regulations could be easily identified as a major obstacle towards economic success. Reforms in 1994 were followed by an economic boom period that seemingly could, at least partly, be attributed to the reforms. So the labour market reforms were identified as a key to success. But most likely, this is a false conclusion, since the positive economic development was mainly driven by other causes (EU support, building boom bubble). This Spanish case is a very fine example for the difference between correlation and causality.

The (positive) correlation with de-industrialization is too weak for being really significant. The success of Finland plays a certain role for the results which are not really indicative.

Labour protection is a topic that has been discussed very emotionally over the years. In the 1990s, however, it was treated quite realistically by politicians who cut back some overshoots that probably hampered the economy to a certain extent. Yet, the most successful country Netherlands has had a quite rigid labour protection which did not hinder the country from fast de-industrialization and structural change. On the other end of the scale, the Anglo-Saxon tradition of little state support for dismissed persons did not result in positive nor negative effects, either. In times of globalization, practical politics did not follow the ideological divide of the 1970-80s any more, as the suddenly lacking correlation between political orientation and labour laws demonstrates. Employment protection now more than ever is a field for symbolic politics than for practical economic improvement.*

Company taxation

The second indicator for state-business relations, total tax rate on commercial profits, is only available from 2008. Thus, meaningful analyses can only be made for the globalization

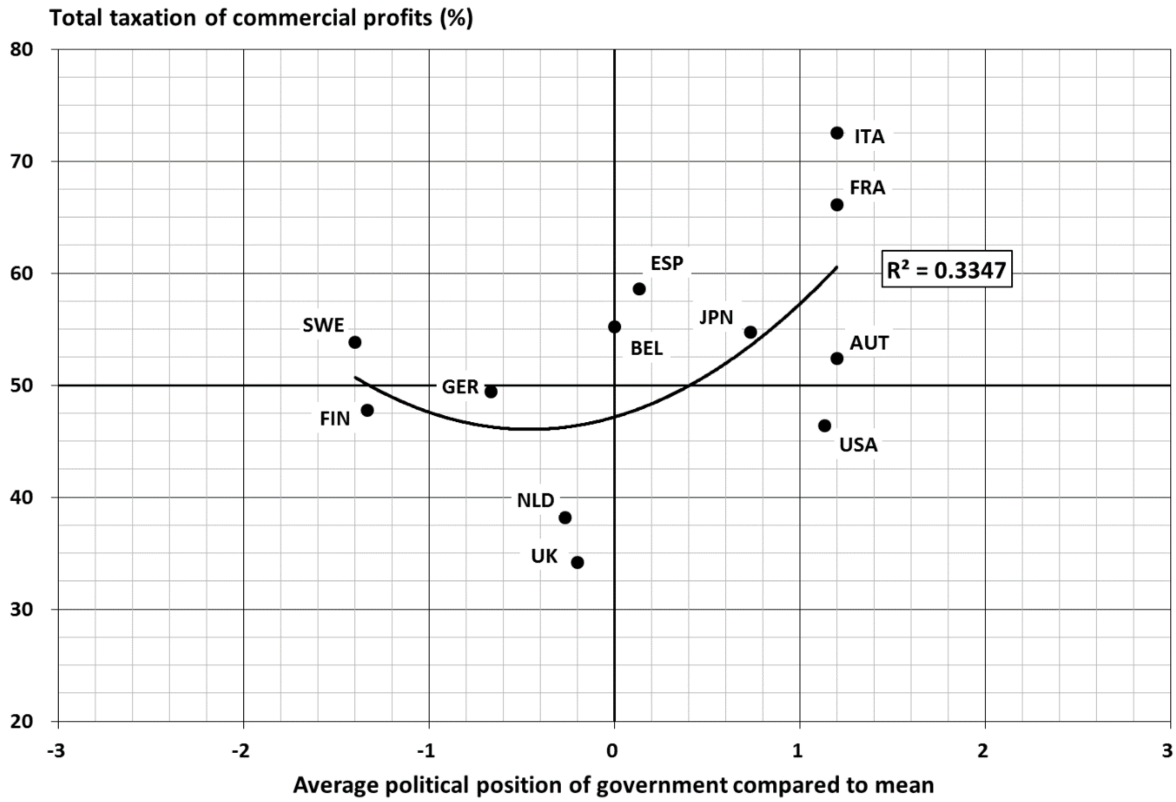
* Nevertheless, it may be influential in a sociological sense, reducing the feeling of helpless exposure to ‘the top brass’. Being cynical, instead of labour protection, also free access to guns might be prescribed as a respective remedy in line with the Second Amendment.

period, not before. The figures are given in Table 6.29 and graphically displayed in Figure 6.39. There is a broad midfield of countries which have a tax rate around the mean value of a good 50 %. Two states have much lower company profit taxation: UK and the Netherlands. On the other end of the scale, France and even more so Italy impose high state burdens on companies.

Table 6.29 Total tax rate on commercial profits (%)

Year	AUT	BEL	FIN	FRA	GER	ITA	NLD	ESP	SWE	UK	JPN	USA	mean
2008	52.4	55.2	47.8	66.1	49.4	72.5	38.2	58.6	53.8	34.2	54.7	46.4	52.4

Source: (World Bank, 2014a)



Source: Own calculations, based on World Bank (2014a) data. Polynomial trend (2nd degree)

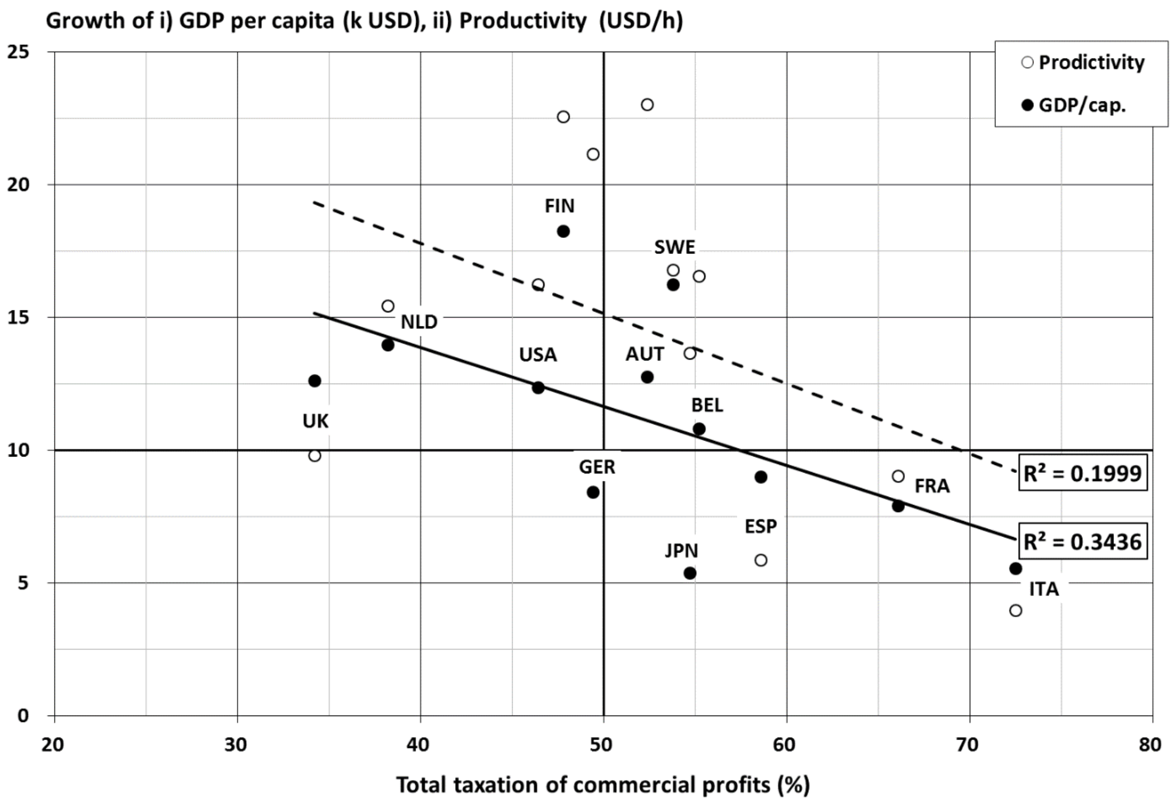
Figure 6.39 Political position vs. total profit taxation (1993-2008)

Company taxation politically and economically is a very different thing to labour protection. While labour protection is highly symbolic and emotional, but of comparably little economic impact as long as the hurdles for dismissal do not distort the labour market massively, company taxation can really make a difference for many firms, but also for the state. If profits are systematically drawn out of a company, that firm will not make necessary investments and, especially if it is an MNE daughter company, rethink the company location in general. Low taxation will attract MNEs and eventually foster R&D investments for product and process innovation.

On the other hand, too low taxation might drain necessary state resources.

Company taxation values do not correlate well with labour protection laws for the period from 1993 to 2008. For some countries like Spain and Sweden, both values were high, for the UK, both were low. Such match is not the case for the USA and the Netherlands. While the USA has about no labour protection, their company taxation is close to the mean value. The Netherlands have the highest labour protection but a very low profit taxation.

The economic outcome of profit taxation was again evaluated by means of a correlation analysis (linear trend), with the results given in Table 6.28, p. 334, and Figure 6.40.



Source: Own calculations, based on World Bank (2014a) data

Figure 6.40 Productivity and GDP p/c vs. profit taxation (1993-2008)

Two correlations are worth mentioning.

- The growth of national income is clearly negatively correlated with total taxation of profits. The lower the load on companies, the better the result for the respective national economy. This is of course just a strong tendency that still does not fully fit or explain any single case.

- To a lesser degree, there is also a negative correlation between taxation and productivity. High profit taxation hampers productivity rises, a major obstacle in times of globalization, when productivity plays a central role for the international competitiveness of firms.

A detailed analysis of institutions would go far beyond the scope of this thesis. Still, some important influences on sectoral development were touched in the country analyses and will be briefly summarized here, namely those of trade unions, workers associations and educational institutions.

Trade unions and workers representation

By tradition and legislation, trade unions may play the role of advocates of the workers in a rather short-sighted militant way usually characterized by a high readiness to strike or in a rather responsible way characterized by co-thinking of firm matters. The differences between both sides are large, as the strike statistics in Table 6.30 show.

Table 6.30 Average number of strike days (2000-2005)

Year	AUT	BEL	FIN	FRA	GER	ITA	NLD	ESP	SWE	UK	JPN	USA	mean
2008	1	89	82	104	3	97	10	166	26	25	72	23	58

Source: WKÖ (2012), own calculation

In Germany, the Co-determination Act of 1976 finally set the course in the second direction. It granted workers a role in corporate governance by placing representatives in the advisory board. Thus, it created responsibility in corporate matters instead of isolated thinking and fighting for short-term improvements of working conditions that would eventually even ruin a company.

At the same time, Britain was paralyzed by strikes of miners and unions denying the economic reality. In the United Kingdom, the power of the trade unions was broken by Margaret Thatcher, but nothing more constructive replaced them.

When people feel suppressed, they will not live up to their whole potential, but remain in paralyzed victimhood. Such circumstances become more problematic in an ever-more intensive global competition. Consequently, the average number of strike days is negatively correlated with productivity (R^2=39.5 %).

Business associations

As te Velde (2014) notes, business associations may contribute to shape state institutions in such a way that they help to address market failure issues appropriately and more targeted. No further research was carried out because of lacking indicators.

Education

The educational sector is of utmost importance for economic development, and it is susceptible to market failure (te Velde, 2014). In recent years, most states have recognized the value that is generated by state investments in higher, but also in vocational education as a means to assure economic growth and to avoid unemployment.

This awareness had to grow from sometimes bitter experience, e.g. in the United Kingdom and Spain where traditional thinking in societal hierarchies prevented adequate education at shop-floor level. Here, the hands-on approach of the German dual vocational education system meanwhile serves as a role model in many countries (Carroll, 2013). It did not at least over the first two decades of this analysis, a fact that has very likely contributed largely to the decline of manufacturing in the aforementioned countries.

6.3.4 The influence of national culture

National culture was compared on the basis of Hofstede's well-established model of cultural dimensions (cf. section 2.2.1). The scores of the national cultural dimensions according to Hofstede for the investigated sample of mature countries are given in Table 6.31.

Table 6.31 Data of Hofstede's cultural dimensions (mature countries)

Mature states	AUT	BEL	FIN	FRA	GER	ITA	NLD	ESP	SWE	UK	JPN	USA	mean
PDI	11	65	33	68	35	50	38	57	31	35	54	40	**43**
IDV	55	75	63	71	67	76	80	51	71	89	46	91	**70**
MAS	79	54	26	43	66	70	14	42	5	66	95	62	**52**
UAI	70	94	59	86	65	75	53	86	29	35	92	46	**66**
LTO	60	82	38	63	83	61	67	48	53	51	88	26	**60**
IND	63	57	57	48	40	30	68	44	78	69	42	68	**55**

Source: Hofstede, Hofstede, & Minkov (2010)

There are large differences between countries in all cultural dimensions.

- The PDI is rather low in the northerly countries and medium-high in the Romanic countries and Japan.
- Apart from Spain (IDV = 51) and Japan (IDV = 46), all countries have a clear tendency towards individualism.
- The largest discrepancy is in the MAS index where Sweden (MAS = 5) is identified as a very feminine society while Japan is very masculine (MAS = 95).
- In UAI, Belgium scores at extremely high 94 while Sweden maintains a very relaxed attitude (UAI = 29).
- In LTO, large differences exist. Japan is very traditional (LTO = 88) while the USA is exactly the opposite (LTO = 26).
- Large differences also exist in indulgence which ranges from Italy (IND = 30) to Sweden (IND = 78).

Since all countries were economically successful and could establish a manufacturing sector of high productivity, no obvious interrelation between aspects of culture and de-industrialization could be found. To identify hidden trends, a correlation analysis was conducted, involving data of the latest investigated period (1993-2008). The results are rendered in Table 6.32. The better the correlation, the higher is the coefficient of determination R^2 (%) and the more red are the highlighted grid elements.

Table 6.32 Correlation of economic and cultural indicators (mature countries)

R^2 (%)	PDI	IDV	MAS	UAI	LTO	IND
De-industrialization CAGR (93-08)						
ME rel.	9.8	21.1	2.2	0.2	0.6	5.7
ME abs.	2.3	16.6	23.2	0.9	10.8	2.5
MO abs.	37.8	9.3	18.3	7.9	11.6	9.0
MO/cap.	21.4	23.5	0.7	0.1	2.3	1.3
productivity	54.7	0.5	0.2	14.6	0.5	24.0
workload	12.7	3.9	19.6	37.7	6.7	40.3
LAB CONT	5.7	11.1	33.1	0.6	14.5	0.0
Indicators (2008)						
ME rel. (%)	1.0	29.9	4.4	10.0	15.4	35.1
productivity (USD/h)	4.3	1.2	9.7	0.5	5.9	7.4

Source: Own calculations on the basis of World Bank (2014a), ILO (2014) and Hofstede, Hofstede, & Minkov (2010) data

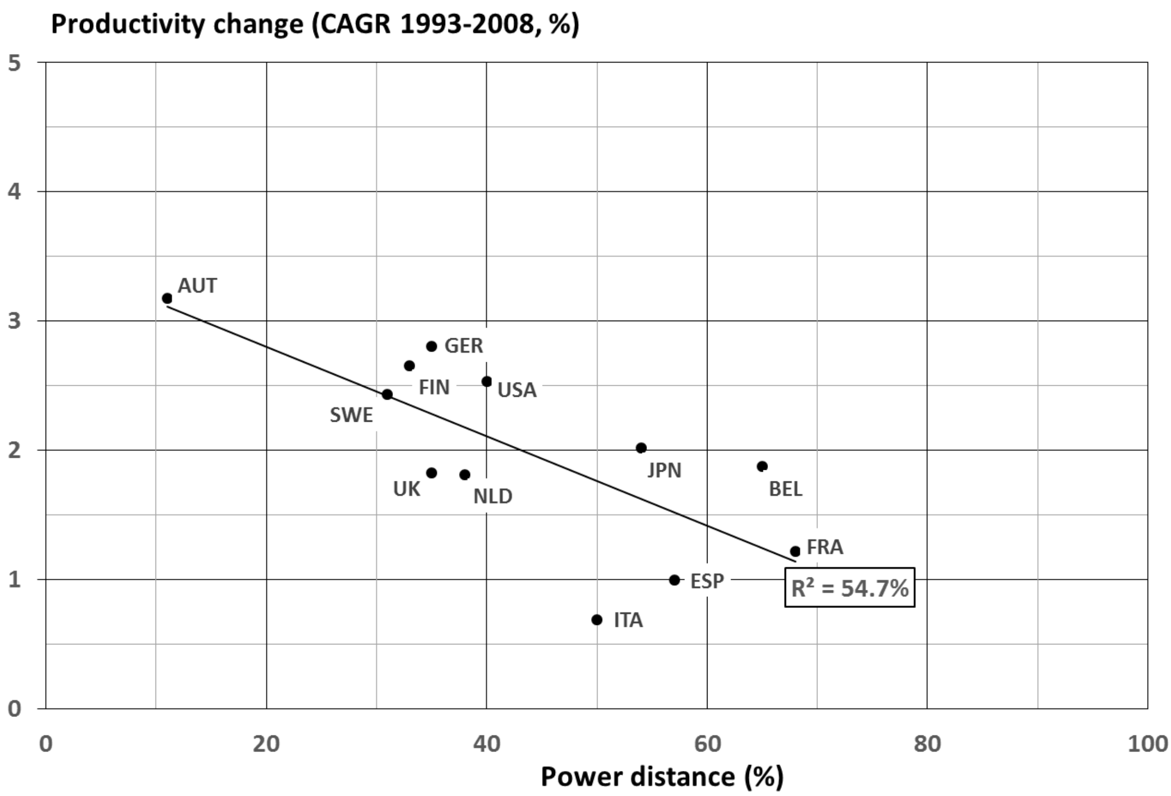
Two results are most significant:

- The productivity change in the globalization period can be explained by more than half by the Power Distance Index (PDI). The higher the power distance, i.e. the more hierarchical the society, the lower is the productivity growth rate.
- Indulgence (IND) seems to play a major role. It is negatively correlated with relative manufacturing employment and positively correlated with the change of the manufacturing workload. The higher the indulgence, i.e. the higher the relative freedom to strive for a fulfilment of wishes, the less industrial in terms of manufacturing is the economy, but the longer the individuals had to work in it.

Both findings will be analysed more thoroughly in the following.

Productivity change vs. PDI

The productivity change as a function of the Power Distance Index is shown in Figure 6.41. The result is striking: All states that lost out against their competition in terms of productivity (Spain, Italy, France, Japan, cf. section 6.2.1.1), are countries of high power distance!



Source: Own calculations based on World Bank (2014a), ILO (2014) and Hofstede, Hofstede, & Minkov (2010) data

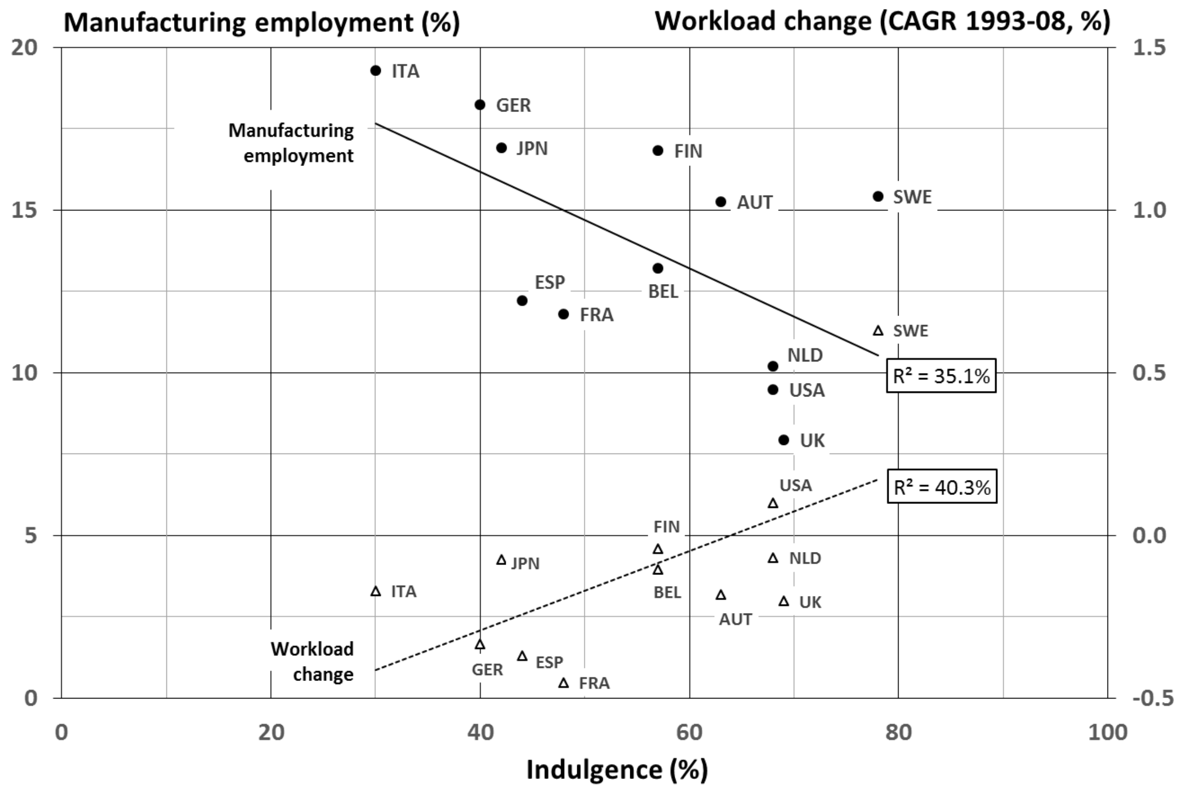
Figure 6.41 Productivity change vs. power distance (PDI) (mature countries)

Belgium plays a special role, presumably due to its location in the heart of Europe which supports its participation in international value chains where it acts like a 'flow heater' of imports and exports, with value creation preferably at the first tiers of the chain.

A likely explanation for the findings is that a hierarchical society (high PDI) allows less employee participation and thus keeps companies from making use of bottom-up innovations. Taylorism presumably still plays a bigger role in countries with a higher power distance, so more hierarchical levels exist. Decision-making processes take longer and employees do not take on responsibility.

Manufacturing employment and workload change vs. indulgence (IND)

The correlation of indulgence with these two economic parameters is shown in Figure 6.42. Indulgence seems to be a major influence on the affinity of a society to manufacturing. The higher the indulgence, the lower the share of manufacturing employment, but the less the reduction of the individual workload (in some cases, it even rose).



Source: Own calculations on the basis of World Bank (2014a), ILO (2014) and Hofstede, Hofstede, & Minkov (2010) data

Figure 6.42 Correlation of economic indicators with indulgence (mature countries)

An explanation for both effects is not easy to find. Before doing so, it has to be stressed that both effects are complementary: Workload increases could grave reductions of manufacturing employment.

Industrial (blue collar) work may appear as an individual hardship which will not be suffered if alternatives are available. Thus, the (indulgent) tendency towards leaving the manufacturing sector or only staying in it when high payments are the reward both support de-industrialization. Ironically, firms will try to compensate this by raising or at least maintaining the workload of their remaining workers.

Along with that, indulgence presumably supports erosion of solidarity and thus changes the negotiation base of the labour side for the worse.

6.4 Conclusions for industrial policies of mature economies

In this section, the key findings from the previous sub-chapters are summarized and conclusions are drawn.

From the investigation of structural shifts it became clear that economic success can be assured by different economic means, i.e. an emphasis on differing industrial or service sectors. Manufacturing, especially high-technology manufacturing, is one of these options that several states have pursued. Focusing on manufacturing requires a sound know-how base which can be considered as a core competency. Furthermore, a continuous ambition to innovate products and processes is necessary to assure state-of-the art products and a high productivity.

Especially the globalized period (1993-2008) is characterized by merciless competition through open-market policies and neo-liberal politics. In this period, Austria and Germany, Finland and Sweden were the most successful states in manufacturing, while the long-known economic success stories of Italy, France and Japan became jeopardized and their habitual policies scrutinized.

It appears that national culture is of major influence on the success of the national manufacturing sector. Countries with a lower power distance, i.e. less hierarchical thinking and management, were better able to increase their productivity, the most important indicator for sectoral ambition and predicator for success.

International competitiveness shows in trade success and is fostered by productivity and technological development (share of high-technology products). Productivity is positively correlated with the trade balance. Accordingly, the more successful exporters of manufactured goods tend to have a higher share of manufacturing within the national economy. Despite of other available economic options apart from manufacturing for acquiring wealth, the share of manufacturing is positively correlated with economic success.

Part of the identified specific German success in manufacturing can be attributed to the fact that the German industry, unlike all of its western competitors, had a strong focus on the Asian markets. Already in the 1980s, strong and lasting connections to China were built up, e.g. by the country of Lower Saxony under its conservative prime minister Ernst Albrecht and Volkswagen in which Lower Saxony holds a 20 % share. Other state premiers followed Albrecht's example and contributed to the industry's success by their political backup (Werwath, 2014). In recent decades, these early investments paid off. Volkswagen sold more cars in China than in Germany, and also BMW and Mercedes were successful (Eisert, 2015).[*]

Apart from available technology, there are certain frame conditions which influence the probability of economic success on the basis of manufacturing while others do not play a major role:

- Very high company taxation hampers the national economic development by hindering firms to innovate.
- In tendency, the larger the country, the more self-content it is and the less ambitious is its manufacturing sector.
- Workers representations and business associations not only feeling responsible for their clientele but for the whole economy, also responsible politicians not working for only one part of the balance, help to grow the economy.
- Good education at all levels of the firm including the shop-floor is the basis for innovation and responsibility. State institutions have to be shaped accordingly to provide this know-how base.

[*] Personal remark: Such a feel for the right trend is a viable factor that can hardly be implemented in a rigorous economic agenda or an MBA curriculum. It cannot be measured, but it is very helpful in micro- and macro-economic management. Management only starts when things cannot be measured.

The Varieties of Capitalism approach (Hall & Soskice, 2001a), enriched by the findings of Schmidt (2003), renders insights into the interplay of institutions, their specific innovative capacity and the path dependency of the distinguished types of market economy. When applied, it was found to be of high forecast and explicatory power. The following groups of nations can be distinguished by their success and inclination towards manufacturing:

1) Industry-oriented managed CMEs: Austria, Finland, Germany, Sweden
2) Trade-oriented managed CMEs: Belgium, Netherlands
3) State-led CME losers: France, Italy, Spain, Japan
4) Industry-adverse LMEs: UK, USA

The policies of clusters 1), 2) and 4) are in line with their national institutional conditions. Choices have to be made whether to pursue a narrow specialisation strategy or to prefer a more balanced national economy. While the first promises high profit in the short term, it makes the national economy very vulnerable because of its dependency on export market success and imports. To circumnavigate these risks, cluster 1) needs to create more flexibility in order to succeed in markets driven by radical innovative while clusters 2) and 4) need to strengthen their manufacturing sector. In cluster 2), appropriate institutions should be available, but investment incentives could smoothly redirect investments. In cluster 3), the state has to better withstand the seductions to guide the economy or to support encrusted structures propagated by lobbying activities of large enterprises.

7 De-industrialization of emerging economies

Economists of the 20th century described sectoral changes over time – from agricultural towards industrial towards service economy – as a quasi-natural development that all national economies would undergo sooner or later (cf. chapter 2). Such expectations for future developments were formulated in detail, even as (so-called) ‘laws’, e.g. the Kaldorian ‘laws’ described in section 2.3.3.1. While in the investigated mature economies, the degree of industrialization was rather high, with a maximum of well beyond 20 % of the employees working in manufacturing in all sample cases, the question remains whether this really is a quasi-natural peak value or whether other courses of development are possible.

In addition, it has to be clarified which paths of development are beneficial for a country with a certain profile of input variables like size, geography, natural resources, population, education and accumulated wealth and knowledge. Is a well-developed manufacturing industry at a certain point in time really a necessary prerequisite for national blossoming, i.e. is there “something special about manufacturing” (Kitson & Michie, 2014, p. 322) that distinguishes this sector from others, e.g. services?

In this course, a special focus will be on the presumably threatening effects of de-industrialization described in sections 2.3.3.2-2.3.3.5. Are these effects in play? And do they really have the suspected negative consequences on a ‘premature’ economy?

For these evaluations, a quite large sample of emerging countries from different regions, of different size and population and with quite different cultural and economic background was comparatively investigated. In the subsequent chapters, the sample and data selection will be explained (section 7.1), trends of national income and manufacturing employment will be analysed (section 7.2), followed by in-depth analyses of de-industrialization in all countries of the sample (section 7.3), basing on scenario analysis and the eclectic model of de-industrialization introduced in chapter 4. The regional analyses will then be compared (section 7.4), involving an additional analysis of the eventual impact of national culture on economic development.

7.1 Country sample selection and data processing

The initial suspicion of de-industrialization in emerging economies is examined for a sample of countries from three regions, following the World Bank (2014b) grouping: i) Latin America, ii) East Europe and Central Asia, iii) East Asia. A list of these countries is rendered by Table 7.1.

Table 7.1 Analysed emerging economies including key features (2010 data)

	Indicator	**Population**	**Pop. density**	**GDP**	**GDP p/c**
Country	**Code**	(million)	(per km²)	(bn USD)	(k USD)
Latin America					
Argentina	***ARG***	40.4	14.8	368.7	9.1
Brazil	***BRA***	195.0	23.1	2,143.0	11.0
Chile	***CHL***	12.5	23.1	217.6	12.7
Colombia	***COL***	46.4	41.9	287.0	6.2
Ecuador	***ECU***	15.0	60.4	67.5	4.5
Mexico	***MEX***	117.9	60.6	1,047.4	8.9
Venezuela	***VEN***	29.0	32.9	393.8	13.6
East Europe & Central Asia					
Bulgaria	***BUL***	7.4	68.1	47.7	6.5
Croatia	*HRV* ***(CRO)***	5.4	78.9	58.9	10.9
Czech Republic	***CZE***	10.5	135.6	198.5	18.9
Kazakhstan	***KAZ***	16.3	6.0	148.1	9.1
Poland	***POL***	38.2	125.5	469.7	12.3
Romania	***ROM***	20.2	88.0	164.8	8.1
Russia	***RUS***	142.4	8.7	1,524.9	10.7
Serbia	***SRB***	7.3	83.4	37.0	5.1
Slovak Republic	***SVK***	5.4	112.1	87.1	16.2
Turkey	***TUR***	72.1	93.7	731.1	10.1
Ukraine	***UKR***	45.9	79.2	136.4	3.0
East Asia					
China	***CHN***	1,337.7	143.4	5,930.5	4.4
India	***IND***	1,205.6	405.5	1,708.5	1.4
Indonesia	***IDN***	240.7	132.9	709.2	2.9
Korea	***KOR***	49.4	508.9	1,014.9	20.5
Malaysia	***MYS***	28.3	86.1	247.5	8.8
Thailand	***THA***	66.4	130.0	318.9	4.8
Vietnam	***VNM***	86.9	280.4	115.9	1.3

Source: Based on World Bank (2014a) data and codes (in brackets: codes utilized in this thesis)

The investigations follow the outlined eclectic model of de-industrialization. Limited to emerging countries, it reads as presented in Table 4.7, p. 92.

For emerging countries, the available data is not as reliable and complete as the data for mature countries compiled in the EU KLEMS database. Therefore, the analysis was limited to sectoral basic economic data and data on sectoral employment. Basis economic data was retrieved from the World Bank (2014a) database. Data on employment was gathered from ILO (2014).

Specifically, the evaluation basic data did not include detailed productivity considerations, so the scenario model (cf. section 4.2) could not easily be applied. The required productivity value was derived from several statistical sources by utilizing the following formula:

$$VA'_{manu} = \frac{GVA_{manu}}{number\ of\ workers_{manu} \times average\ working\ hours\ per\ year_{manu}} \tag{7.1}$$

GVA and the number of workers are available from World Bank (2014a) and ILO (2014) statistics. In many cases, data gaps were filled by inter- and extrapolation. The average number of working hours was derived by multiplying weekly working hours from ILO (2014) statistics with the number of working weeks calculated by subtracting the average weeks off due to holidays (five holidays equal one working week) from the annual total.

To evaluate de-industrialization in terms of the model, the bold type variables listed below (Table 7.2) were to be tested. All data (including the data not in bold) was available. The analysis was carried out at three levels of aggregation:

- per country,
- per region (triadic comparison),
- worldwide.

Thus, global or regional trends could be differentiated from national or regional peculiarities.

Initially, data was retrieved for the full 1970-2010 period. Soon it was realized that before 1990, the availability and quality of data was very limited for most of the countries under investigation. Moreover, many countries only gained independence around 1990, especially the CIS countries which were former members of the Soviet Union. The compiled data is available in Appendix 2 (Economic data of emerging countries).

Table 7.2 Emerging state data for the eclectic model of de-industrialization

Data	**ISIC 3 code**
Basic economic data	
- **GDP per capita** - **Unemployment rate** - **Trade Balance**	
Sectoral employment: i) **relative** (% of total), ii) absolute (persons)	
- **Agriculture**	**A**

- Industry
    - **Manufacturing**
    - **Primary products**
	B-F
	C
	B

- **Services** - **Knowledge-intensive business services (KIBS)**	**G-Q** **J-K**
Output: i) relative (% of total GVA), ii) **absolute** (GVA)	
- **Manufacturing**	**C**
Exports: i) **relative** (of total merchandise exports), ii) absolute	
- **Primary products**	**B**

Source: Own compilation

Thus, structural developments were analysed over the following periods:

1) Long-term trend (15 years)

   The analysed period starts a little after the irritations immediately after fall of the Iron Curtain in 1989/9. 15 years of post-transformative globalization (1993-2008) were investigated.

2) Semi-decades (3 x 5 years)

   As the shortest long-term indicator, three five-year periods were investigated (1993-1998, 1998-2003, 2003-2008).

All other processing was carried out analogously to the procedures outlined for mature economies (cf. section 5.1.2, pp. 106).

7.2 Macro-economic trends and related de-industrialization

This section is based on the theoretical grounds of de-industrialization processes as explained in chapter 2, namely sub-section 2.3.1, pp.53. Rowthorn's (1994) theory on the course of economic maturing processes was tested for all economies of the sample. The share of employment in manufacturing was calculated as a variable depending on the GDP per capita (log of USD).

7.2.1 Theory-based expectations

As outlined in sections 2.3.3.2-2.3.3.5, there are a number of possibilities for economic developments and sectoral shifts in emerging countries. The following types of national industrial and income development are possible for 'premature' economies:

- Maturing (continuous industrialization): growth of manufacturing employment share and national income per capita
- Positive de-industrialization: decreasing share of manufacturing employment at increasing national income per capita
- Negative de-industrialization: decreasing share of manufacturing employment and a decreasing national income per capita

While positive developments of national income may be the result of industrial development and/or the utilisation of abundant natural resources, negative developments would most likely contain elements of reverse developments like shifts towards agriculture or simple services (cf. Table 4.7, p. 92).

Although the basic expectancy is that emerging economies were – just like mature economies – able to increase the national wealth indicated by the GDP per capita (in constant prices), this would not generally be the case especially immediately around 1990 when the Soviet economy collapsed and drew the former Eastern Bloc economies into its maelstrom.

7.2.2 Manufacturing employment and GDP per capita over time

Analogously to the analysis of mature countries (cf. section 5.2.2, pp. 111), the interrelation of manufacturing employment and national wealth as income per capita was analysed. The plots for manufacturing employment over GPD per capita (log) given in the following sections differ in the range of the GDP displayed, corresponding to national wealth. While for mature countries, a log range between 9.4 (~ 12.1 k USD) and 11.0 (~ 59.9 k USD) was adequate, meaning that all of the countries were permanently located in the World Bank high income group, emerging countries were (and most of them still are) much poorer. The adequate range for Latin-American and East European countries was between 7.4 (~ 1.6 k USD) and 10.0 (~ 22.0 k USD) while some East Asian states required to extend the range to the left down to 5.6 (~ 0.3 k USD), meaning that people lived on less than one USD per day at average.

In the following, a short overview on the development of each state is given. Common and specific tendencies are highlighted.

7.2.2.1 Latin America

The results for Latin America are shown in Figure 7.1. At first glance, no clear tendency and also no reverse U-shape curves including tipping points expected by the classical economists can be traced.

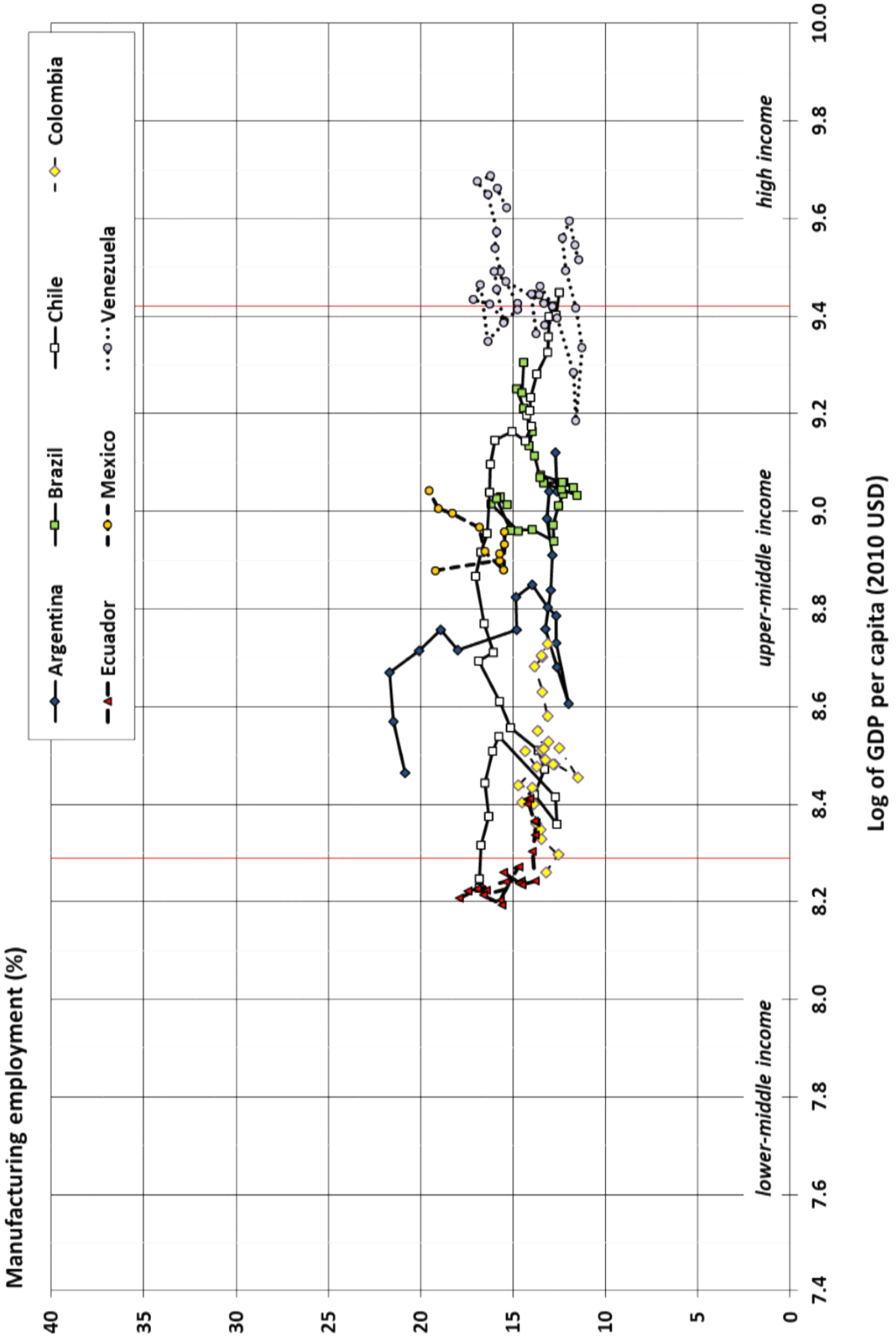
In all states, the share of manufacturing employment was most of the time in a very small range between 10 % and 20 % of total employment. In 2010, the investigated economies only had a tiny bandwidth from 11.5 % (Venezuela) to 16.5 % (Mexico) of manufacturing employment. Still, certain national characteristics can be identified (see below). They will be further investigated and explained in the sub-sections of chapter 7.3.

Argentina

The Argentinian economy between 1990 and 2010 is characterized by two phases: (1) inverted C curve (waxing moon shape) until 2003, i.e. after reaching a peak in 1992, a heavy loss of jobs in manufacturing followed, also finally involving losses in income per capita; (2) recovery from 2003, i.e. largely improved income per capita at a constant share of manufacturing employment (13 %).

Brazil

Brazil's economy is characterized by a notched curve, resulting from reductions in manufacturing employment that were later compensated. Overall, some growth of national income per capita could be achieved, especially in the most recent years under investigation.



Sources: Own graph, ILO (2014) and World Bank (2014a) data until 2010, starting 1975 (CHL, VEN), 1985 (BRA), 1990-2010 (ARG, COL, ECU, MEX)

Figure 7.1 ME (%) vs. GDP p/c (log), Latin America

Chile

Concerning national income per capita, Chile has written an almost continuous success story over the last 35 years (even reaching the group of high-income states in 2010), with exception of the early 1980s recession and a small downturn in 1998/9. The latter crisis brought about some serious reductions in manufacturing employment which had peaked at 17.0 % in 1992 and constantly declined to 12.5 % in 2010.

Colombia

Colombia developed on a quite constant base of manufacturing employment, slowly, but persistently growing in income per capita.

Ecuador

Being the weakest investigated economy in terms of income per capita, Ecuador has constantly improved the income situation while also, at lowering speed, reducing the manufacturing share of workforce.

Mexico

Mexico's situation has not changed too much over the years. There were some up- and downswings of the economy, but the manufacturing sector kept being about constant and improvements in income per capita were very modest.

Venezuela

Venezuela is the only Latin-American economy that has not managed to gain ground over the last 35 years. It more or less stagnated at the same national income, with some serious losses in between, and ended with some 4 % less employment in manufacturing. In a very abstract sense, the curve could be interpreted as a C (waning moon), when prescinding from the side-shows.

On the other hand, Venezuela was and still is the richest national economy within the group. It is even a member of the group of high-income economies according to the World Bank classification. Thus, Venezuela does not exactly fall under the rubrum 'premature', but since it is very close, it will be included in the analysis reported in the section on Latin America (7.3, pp. 363).

7.2.2.2 East Europe and Central Asia

The results for East Europe and Central Asia are shown in Figure 7.2, p. 355. Compared to the Latin-American results, the bandwidth is much larger, also concerning the shapes of the curves. C-shape curves are not rare.

Again, no classical inverted U-shape curves can be traced, only some left or right 'legs' of the U letter.

Bulgaria

Socialist Bulgaria was a very industrialized state which peaked at 34.8 % of manufacturing employment in 1987. Its then national income per capita of around 4.5 k USD was not reached again until 2003, illustrating the vigorousness of the economic decay of former Eastern Bloc Europe. Since 1997, the Bulgarian economy slowly recovered, with a manufacturing workforce of constantly around 22 %.

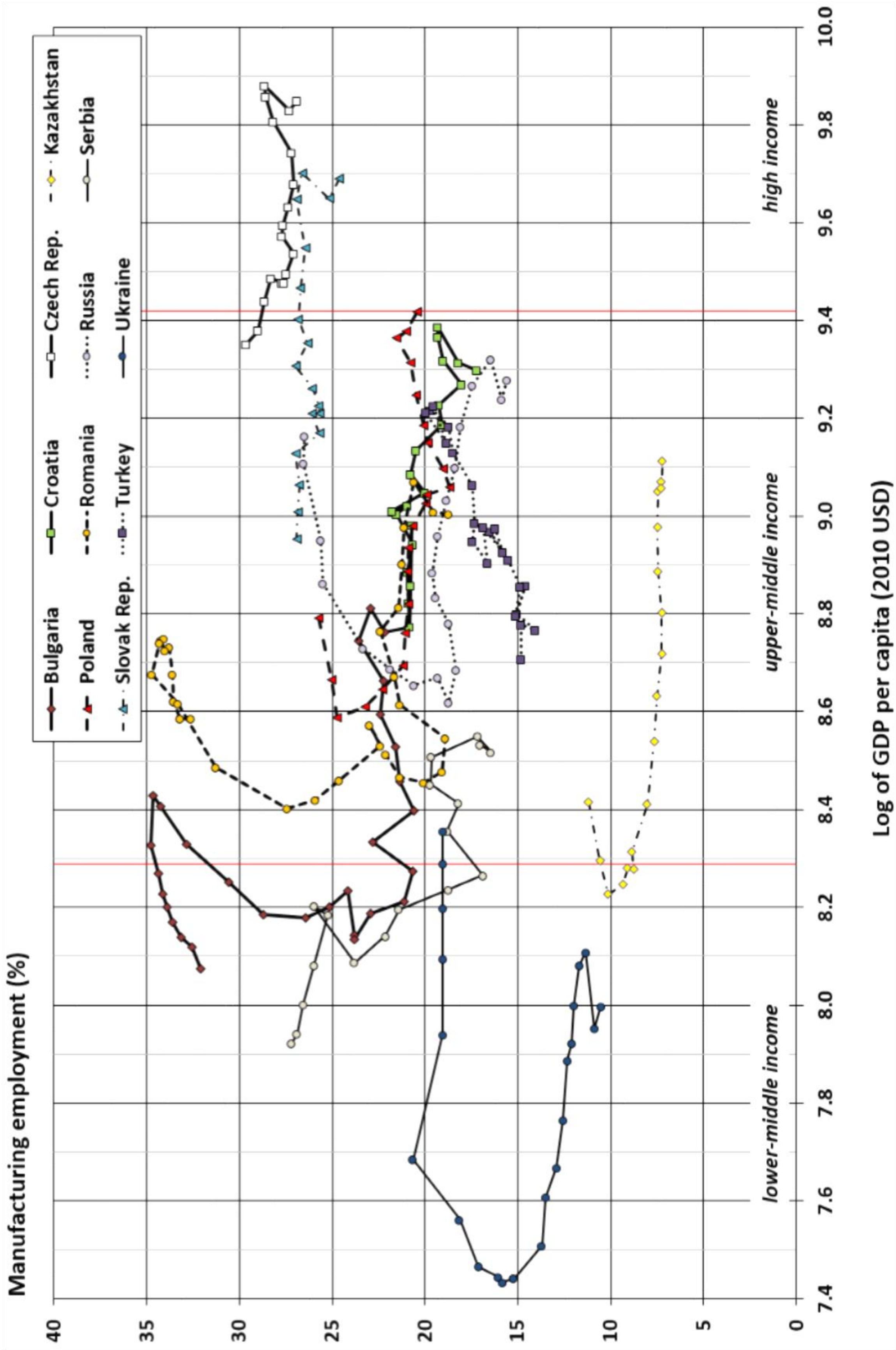
When taking the years before and after 1988, Bulgaria can be considered as a case of reverse industrialization, although the pace of post-communist industrial descent was much higher than the ascent before.

Croatia

From its national independence until 2008, Croatia managed to constantly raise its national income per capita while keeping the manufacturing labour base at around 20 % with a slow rate of decline. The crisis brought about some job and wealth reductions in 2009/10 which kept the country from making it into the group of high-income countries.

Czech Republic

The Czech Republic is a very industrialized country which in 2010 still occupied more than one quarter of its working population in manufacturing. The economic proceedings were quite remarkable: The Czech have managed to establish in the group of high-income countries, reaching a national income per capita of around 19 k USD.



Sources: Own graph, ILO (2014) and World Bank (2014a) data until 2008; starting 1970 (SRB); 1980 (BUL, ROM); 1989 (POL, UKR, TUR), 1990 (RUS), 1991 (CRO), 1993 (CZE, KAZ, SVK)

Figure 7.2 ME (%) vs. GDP p/c (log), East Europe and Central Asia

Kazakhstan

Kazakhstan has very little employment in manufacturing, even less than the analysed mature states. Nonetheless, after the post-socialist drawback resulting in a C-shape curve, Kazakhstan managed to constantly increase its national income per capita and head for the high-income group of states.

Poland

Poland is also one of the post-socialist countries that started with a C-curve and managed to recover impressively. After a shake-out of the manufacturing workforce during the 1990s, Poland kept a share of around 21 % of the workforce in manufacturing. In 2010, Poland entered the group of high-income countries for the first time in history.

Romania

Romania developed in parallel to Bulgaria, but at a higher level of national income. Like in Bulgaria, some form of reverse industrialization can be testified around 1988. The highly industrialized socialist economy peaked at a 34.7 % share of manufacturing employment in 1989. The economy was then already on a downswing, coming from a 6.3 k USD average income per capita which was only reached again in 2004. For a long time hovering around 20 % of manufacturing employment, after the 2008 crisis, a new phase of de-industrialization seems to have started.

Russia

Russia's economic decline after 1990 was dramatic. From 1989 until 1998, its income per capita almost halved. Moreover, its industrial base became eroded, especially in manufacturing. During the 1990s, the share of workforce in manufacturing fell fast. It kept descending after 2000, but at a slower pace.

After millennium, Russia managed to recover economically. The income per capita of 1989 was exceeded for the first time in 2007. The findings result in a C-shape curve of manufacturing over GDP per capita – the typical post-socialist scenario.

Serbia

In 1980, the last year under Tito (Rich, 1993), the Serbian income per capita as a part of Yugoslavia was around 6.9 k USD – more than the Romanian, more than the Turkish, more than twice the Bulgarian wealth at the same time. Only a few years of disaster (Yugoslav wars) sufficed to bring Serbia down to pitiful mere 2.8 k USD in 1993. This was the starting point of Serbia as an independent state.

Over the years, Serbia has become more and more de-industrialized. Starting from 27 % of employees in manufacturing in 1993, it ended up at only 17 % in 2010. Nonetheless, it managed to recover slightly in terms of income per capita, but with around 5.1 k USD in 2010, the level before the Yugoslav wars was still not reached again. Even Bulgaria has clearly overtaken Serbia in recent years.

Slovak Republic

The Slovak Republic, like the Czech Republic, can proudly look back on some fine economic development over the last two decades. Starting from a much lower average income than the Czech, Slovakia also managed to enter the group of high-income countries by its 16.2 k USD income per capita in 2010.

Turkey

Turkey is the only country in the group that followed the classical trend of industrialization foreseen by the economists of the mid-20th century. Turkey's manufacturing share peaked at exactly 20 % in 2008, the corresponding income per capita being 10.0 k USD.

The peak values are not very far away from the average tipping points featured in Figure 5.5, p. 118. Yet, neither the degree of industrialization of the industrial catch-up economy Turkey nor the corresponding income per capita reached the wuthering heights crested by the industrial pioneers.

Ukraine

Ukraine is another example for post-socialist trauma and (some) recovery, leading to a C-shape curve. Like Serbia, the Ukraine is an example for industrial erosion, with an almost halved workforce share in manufacturing.

Being comparatively poor already in socialist times, even until 2010, the Ukraine did not reach the 1989 figures of income per capita. Immediately after the starting point of this analysis, it had fallen out of the group of upper-middle income states and since then stayed in the lower-middle income group. With an average income per capita of around 3.0 k USD, the Ukraine is by far the poorest country of the investigated East European sample.

7.2.2.3 East Asia

The results for East Asia are shown in Figure 7.3, p. 359. In all of these states apart from China, industrial development follows, at least partly, the course predicted by 20th century economists (inverted U). In the cases of South Korea and Malaysia, even almost classical inverted U-shape curves can be seen.

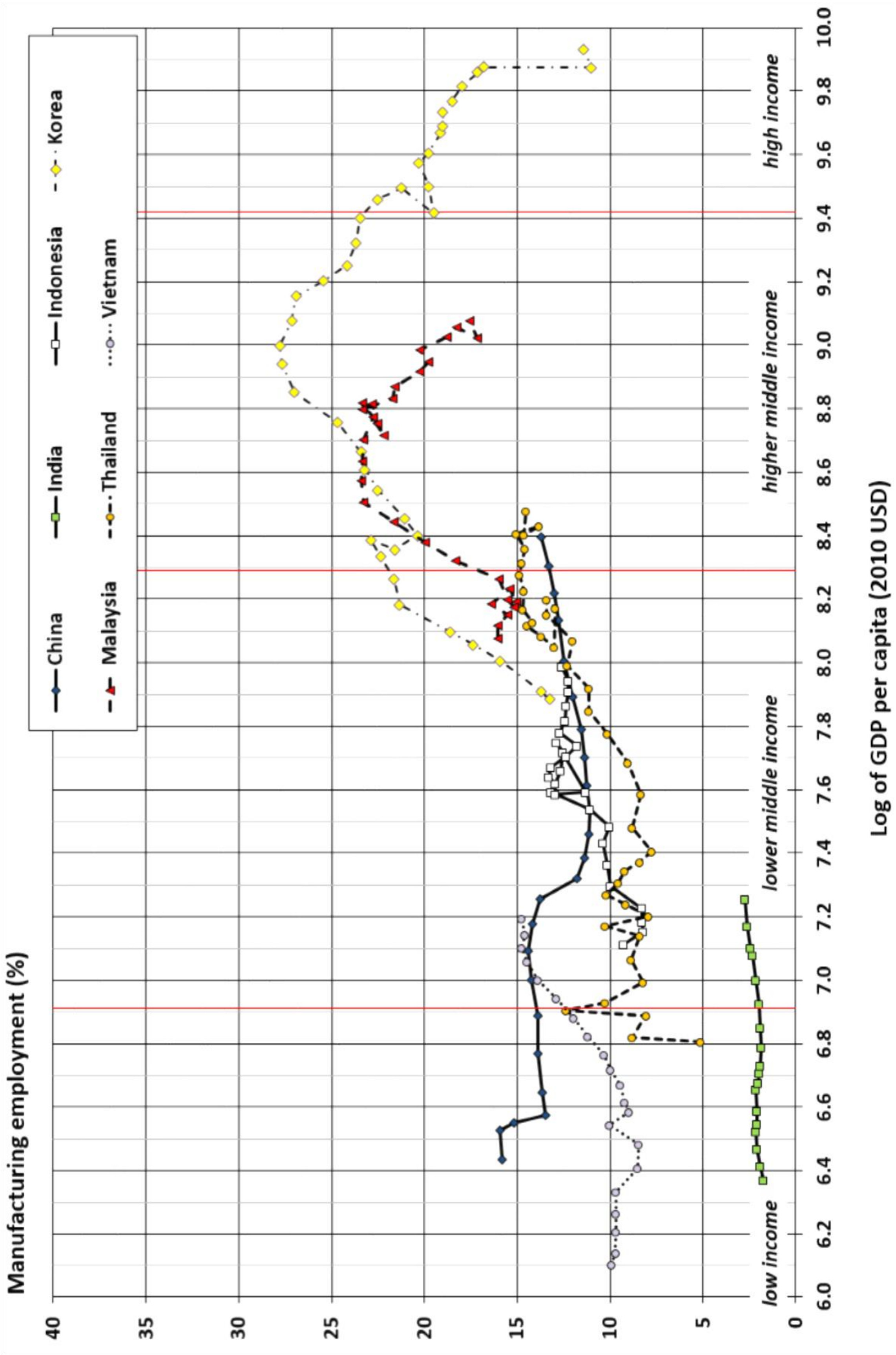
China

China has impressively increased its wealth over the last decades. From being a very poor nation even in the early 1990s when it belonged to the World Bank low-income group, China has constantly improved and reached the upper-middle income status in 2010. Over time, manufacturing employment has not changed much in absolute and relative terms. This means that China has managed to continuously improve its workforce productivity.

India

When looking at the Indian graph, the shares in manufacturing employment, depicted following data of the official statistics, are very low. This is due to the fact that most of the manufacturing employment is informal, i.e. not officially registered. A very recent figure of 2009/10 for the informal share in manufacturing is 87.1 % (ILO - Department of Statistics, 2012, p. 19), while Dasgupta and Singh identified 83 % in 2000/1 (Dasgupta & Singh, 2006, p. 15). Unlike the low figures of the official statistic, the total share of manufacturing employment was probably 23.4 % in 2009/10 (ILO - Department of Statistics, 2012, p. 19).

It must be noted that productivity in the informal sector is several times lower (3…20, depending on the region and industry) than in the officially registered jobs, following Dasgupta and Singh (2006, pp. 16-17). The inequality within the Indian society is very high. At average, India made some progress from low income to lower-middle income, with a moderately, but constantly rising share of workforce in manufacturing (inverted U-shape).



Sources: Own graph, ILO (2014) and World Bank (2014a) data until 2010, starting 1970 (KOR), 1971 (THA), 1980 (MYS), 1985 (IDN), 1987 (CHI), 1990 (VNM), 1993 (IND)

Figure 7.3 ME (%) vs. GDP p/c (log), East Asia

Indonesia

Indonesia was able to constantly increase its income per capita, apart from a short recession period after 1997. Manufacturing employment went up until 1994, then more or less stagnated over a good decade, but went up again after 2008. With a little bit of goodwill, the development can be interpreted as an inverted U-shape.

Korea

Korea underwent the classical development from industrial to post-industrial society, clearly tipping in 1989. Moreover, the country's wealth increased continuously from lower-middle income to a sound high income per capita of a good 20 k USD.

Malaysia

Also Malaysia has trodden the classical path of industrial development, with a maximum in manufacturing employment reached in 1997. Malaysia could increase its income per capita from the lower to the upper-middle segment of the World Bank classification.

Thailand

Thailand made very much progress in the investigated period. It developed from low income to upper-middle income since 1971. In recent years, the permanent increase in manufacturing slowed down, even came to a standstill, so it might be assumed that the country is close to the tip of its industrial development.

Vietnam

Vietnam, starting as a very poor country, has also industrialized in the last decades. Over the years, Vietnam turned from a low income country into a lower-middle income country, with good prospects for the future if the development will continue in the pursued way.

7.2.3 Comparative assessment of regional industrial development

The described phenomena are compiled in Table 7.3, p. 361. The following graph shapes were identified, describing the course of development of manufacturing employment over national income per capita.

Table 7.3 Industrial development processes in emerging countries

Country	Start	Income group		Curve shape			Tipping point		
	Year	Start	2010	Previous phases	Transition	Most actual phase	Year	Manufact. empl. (%)	GDP p/c (k USD)
Latin America									
Argentina	1990	HMI	HMI	inverted C	2002	→			
Brazil	1985	HMI	HMI	C	1999	inverted U	n/a		
Chile	1975	LMI	HI	inverted C	1983	inverted U	1992	17.1	7.1
Colombia	1985	HMI	HMI	n/a	n/a	→			
Ecuador	1990	LMI	HMI	↓	2003	→			
Mexico	1990	HMI	HMI	U	2000	C	2000	19.5	8.5
Venezuela	1975	HI	HI	n/a	n/a	C			
East Europe & Central Asia									
Bulgaria	1980	LMI	HMI	inverted U C	1989 2002	→	1987	34.8	4.1
Croatia	1991	HMI	HMI	n/a	n/a	→			
Czech Republic	1993	HMI	HI	n/a	n/a	→			
Kazakhstan	1993	HMI	HMI	C	2000	→			
Poland	1990	HMI	HI	C	2000	→			
Romania	1980	HMI	HMI	inverted U C	1986 2004	→	1989	34.7	5.9
Russia	1990	HMI	HMI	C	2006	→			
Serbia	1970	HMI	HMI	inverted U	1987	C	1988	34.9	6.9
Slovak Republic	1993	HMI	HI	n/a	n/a	→			
Turkey	1990	HMI	HMI	n/a	n/a	inverted U	2008	20.0	10.0
Ukraine	1993	HMI	LMI	n/a	n/a	C			
East Asia									
China	1987	LI	HMI	n/a	n/a	→			
India	1993	LI	LMI	n/a	n/a	inverted U	n/a		
Indonesia	1985	LMI	LMI	n/a	n/a	inverted U	n/a		
Korean Republic	1970	HMI	HI	n/a	n/a	inverted U	1989	27.8	8.1
Malaysia	1980	LMI	HMI	n/a	n/a	inverted U	1997	23.4	6.8
Thailand	1971	LI	HMI	n/a	n/a	inverted U			
Vietnam	1990	LI	LMI	n/a	n/a	inverted U			

Sources Own analysis, based on World Bank (2014a) data, constant 2010 prices. Groups: LI = low income; LMI = low middle income; HMI = high middle income; HI = high income

Forms related to growing national income per capita (positive de-industrialization):

- Inverted U-shape: industrialization and subsequent de-industrialization
- U-shape: (mild) de-industrialization and subsequent recovery
- →: constant share of manufacturing employment, rising productivity

Forms related to stagnation or (temporal) loss of national income per capita (negative de-industrialization):

- C-shape: reverse de-industrialization (income losses), turning into subsequent de-industrialization with income recovery)
  Note: The C-shape cycle ends when the initial income per capita (in constant prices) is reached again.
- Inverted C-shape: continuous de-industrialization, starting with gains in income per capita, then waning, finally turning into income losses

In the following, the results will be analysed conclusively. A more detailed analysis of the economic developments in the investigated countries and applications of the eclectic model of de-industrialization will follow in the subsequent chapters.

Latin America

The values for Latin America are divided into two major phases. In the first phase until around the year 2000, negative de-industrialization prevailed. More recently, there has been industrial development (inverted U-shape, →) or at least ongoing recovery (C-shape).

East Europe and Central Asia

The investigated former communist states all went through a crisis (C-shape) but have all managed to recover and keep the remains of their industrial base constant (→), apart from Serbia with its fast-eroding manufacturing base and the Ukraine somewhat lagging behind (both still C-shape).

Turkey, the only former non-communist country, is an exception within the investigated group, pursuing a constant industrial development (inverted U-shape).

Although being much less productive than Western states, very highly industrialized states in East Europe reached peaks in manufacturing employment shortly before 1990, as the examples of Bulgaria, Romania and Serbia illustrate.

East Asia

All East Asian countries apart from China (→) have followed the classical path of industrialization (inverted U-shape). By this form of catch-up modernization, they made significant economic progress. China has become the ‘workshop of the world’ without altering the size of its workforce in manufacturing, but on the basis of its giant population and immense progress in productivity.

7.3 Regional analyses

For the following analysis of (de-)industrialization, the 15-year period 1993-2008 is mainly taken into account, partly because of data availability, partly because this analysis aims at identifying phenomena of de-industrialization which require a significant degree of industrialization reached before. Only when digging deeper in the political and socio-economic reasons for certain phenomena, previous periods will also be consulted.

Among the influencing factors on economic development, the location presumably plays a major role. To assure a manageable number of countries for comparison, the following analysis was split by the three regions of origin that were already utilized in previous sections: Latin America, East Europe & Central Asia, East Asia. All sections will be analysed following the same course of investigation. Some methodological aspects utilized for all regions will be introduced in the ensuing section on Latin America.

7.3.1 Latin America

This regional analysis is divided into four sub-sections:

- Macro-economic comparison
- Economic scenarios
- Application of the eclectic model of industrialization
- Summative assessment.

7.3.1.1 Macro-economic comparison

The macro-economic comparison is carried out by utilizing similar indicators as those for mature economies (cf. section 5). The macro-economic overview contains one additional column on manufacturing productivity per hour.

To estimate the smoothness of transition processes, the volatility of various change indicators was taken into account in a similar way as utilized for mature countries (see sub-section 'Volatility of change', pp. 125, in the analysis of the Austrian economy).

Macro-economic overview

In Table 7.4, a comparative overview on the development of the investigated group of Latin-American states is given. The key topics will be comparatively analysed, following the matrix columns from left to right. Comparisons will be made utilizing categories introduced in chapter 6 for mature countries.

Table 7.4 Overview on economic developments (Latin America)

1993	Pop.	GDP p/c	Exports	Trade	Unempl.	Agricult.	Manufacturing (VA)		VA/h	Fuel exp.	Services	KIBS
2008	*mn*	*k USD*	*% of GDP*	*% of GDP*	*% of active*	*% of empl.*	*% of empl.*	*bn USD*	*USD*	*% of ME*	*% of empl.*	*% of empl.*
ARG	34.0	6.1	6.9	-2.4	10.1	11.0	20.1	40.3	7.2	10.6	62.6	7.6
	39.7	8.4	19.9	3.1	7.8	8.9	13.1	66.8	14.3	12.7	69.1	9.1
BRA	157.0	7.9	10.5	1.4	6.0	27.4	12.8	308.6	17.8	12.2	51.9	6.0
	192.0	10.4	13.7	0.2	7.1	17.5	14.9	332.1	11.8	21.6	59.9	7.4
CHL	14.0	7.5	26.6	-2.0	4.5	16.6	16.7	19.3	10.0	43.3	56.2	5.8
	16.8	12.3	41.5	2.0	7.8	11.7	12.8	25.4	14.4	58.9	64.8	9.3
COL	35.3	4.6	16.4	-2.3	8.5	22,8	14,7	33,4	9.1	26,9	53.9	4,7
	45.2	6.0	17.8	-2.5	11.1	17.9	13,7	41,4	7.3	49,3	62.0	7,9
ECU	10.8	3.7	20.0	-3.1	8.3	28.3	14.5	8.4	6.0	42.4	50.9	3.4
	14.5	4.5	34.2	0.3	7.3	28.7	11.8	8.2	4.9	62.4	52.5	4.6
MEX	91.7	7.6	12.1	-1.7	3.2	26.9	15.5	124.1	11.4	16.6	51.1	3.3
	115.0	9.1	27.9	-2.3	3.5	13.2	16.5	177.6	10.4	20.1	61.1	5.9
VEN	21.2	13.0	27.0	-0.2	6.7	11.3	15.4	40.4	17.0	83.7	62.4	6.3
	28.1	14.7	30.8	9.8	6.9	8.5	11.9	61.7	21.3	95.5	68.4	5.2
93-08	*CAGR (%)*	*CAGR (%)*	*CAGR (%)*	*5 y change*	*5 y change*	*CAGR (%)*	*CAGR (%)*	*CAGR (%)*	*CAGR (%)*	*average*	*CAGR (%)*	*CAGR (%)*
ARG	1.0	2.2	7.3	1.8	-0.8	-1.4	-2.8	3.4	4.7	16.1	0.7	1.2
BRA	1.4	1.9	1.8	-0.4	0.4	-3.0	1.0	0.5	-2.7	13.5	1.0	1.3
CHL	1.3	3.4	3.0	1.3	1.1	-2.3	-1.8	1.9	2.5	50.1	1.0	3.2
COL	1.7	1.8	0.5	0.0	0.9	-1,6	-0,5	1,5	-1.4	36,8	0,9	3,5
ECU	2.0	1.3	3.6	1.1	-0.3	0.1	-1.4	-0.2	-1,4	43.9	0.2	2.1
MEX	1.5	1.2	5.7	-0.2	0.1	-4.6	0.4	2.4	-0.6	13.5	1.2	4.0
VEN	1.9	0.8	0.9	3.3	0.1	-1.9	-1.7	2.9	1.5	86.7	0.6	-1.3

Sources Based on World Bank (2014a) and ILO (2014) data, constant 2010 prices. Own calculation of manufacturing value added per hour on this basis, also involving data on total hours annually worked (OECD, 2015) and total holidays (Wikipedia, 2015).

Population

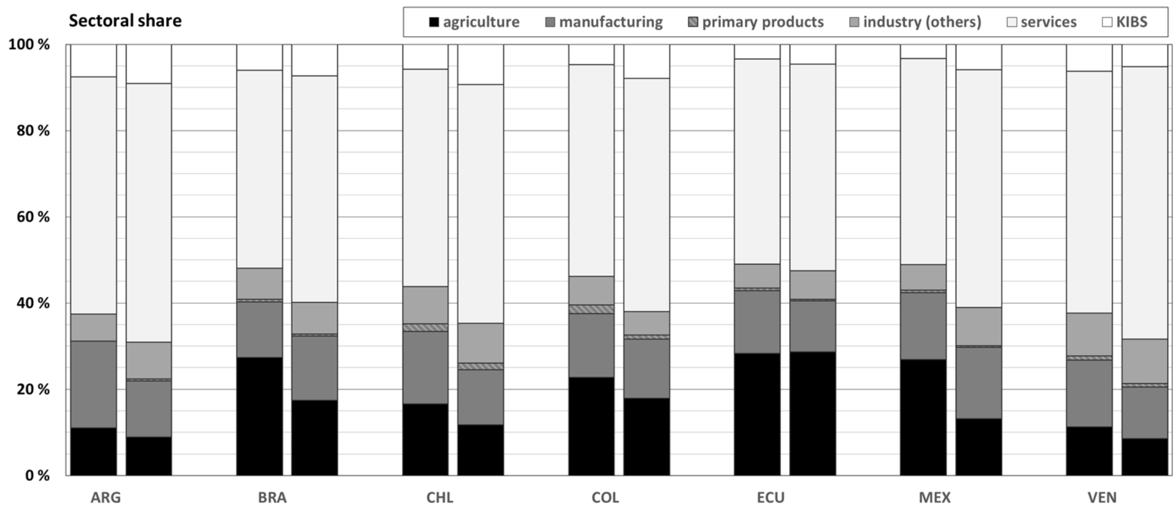
Portuguese-speaking Brazil is by far the most populated country in the group, with more people than the rest of South America. Mexico also has more than 100 million inhabitants while the other countries are comparatively little populated.

In relation to Europe, the fertility is much higher, resulting in a fast-growing population. A respective part of the total economic growth of these countries can simply be attributed to population growth. At average, the Latin-American population grew by 25 % over the investigated period. At the same time, the population of mature states almost stagnated. This difference must be kept in mind when discussing industrialization scenarios. Of course, more people do not automatically lead to more manufacturing jobs, but they enlarge the consumer and labour markets and thus the likelihood of growth in manufacturing.

Structural shifts

Sectoral shifts over the 15-year period 1993-2008 are graphically displayed in Figure 7.4. The investigated Latin-American nations had very different levels of economic development in 1993. Argentina and Venezuela were rather progressive, with little agriculture and a well-developed industrial sector, while Brazil, Colombia, Ecuador and Mexico were lagging behind; Chile was somewhat in the middle.

Over the fifteen years of change, the situation developed more or less in the expected direction. The share of work in agriculture diminished in all countries apart from Ecuador which remained largely rural. The transition of work from agriculture to industry and services happened most rapidly in Brazil and Mexico. These countries industrialized, while in all other countries, the industry in general and the manufacturing sector lost ground in terms of the relative number of jobs.



Source Own graph, based on World Bank (2014a) and ILO (2014) data

Figure 7.4 Sectoral shifts (Latin America), years 1993 and 2008

In all countries, a shift to knowledge-intensive business service could be traced, with the remarkable exception of Venezuela where the service sector grew but knowledge-intensive services shrank.

Unemployment

The situation on the labour market is remarkably alike in the investigated countries. All countries had developed unemployment rates around 7 % in 2008. Exceptions were Mexico which almost had full employment and Colombia which was facing a two-digit rate of unemployment and had related serious economic problems.

Argentina managed to reduce its rate significantly since 1993 while Chile's unemployment rate grew. It is quite surprising that these rather different countries are the ones that excelled in raising the productivity of their manufacturing sectors. Also in Venezuela, this was the case, while in all other countries, the manufacturing productivity fell.

In Brazil, it fell quite significantly. Most likely, this was not a real effect, but due to different accounting in the course of the privatization of the manufacturing sector from 1991 to 1995 (Cardoso, Marcuzzo, & Romero Sotelo, 2014). In its course, the value added more or less per hour dropped down in an instant to the value where it has stagnated since.

Manufacturing productivity

In 2008, the productivity expressed as value added per hour was between 4 USD/h (Ecuador) and roughly 20 USD/h (Venezuela). Compared to mature states, that is only about 10-50 % of the productivity of even the weakest of these countries (UK, Italy, Spain, cf. Figure 6.17, p. 296). Although progress has been made in some Latin-American countries, others have even lost out compared to their state 15 years before.

The findings speak for a quite big technological backlog between all Latin-American states and the investigated mature economies. Two general political strategies how to deal with this fact became visible:

- Some governments, namely those of Argentina and Chile, seem to be ambitious to close the productivity gap, allowing inefficient jobs to be cut.
- Other governments, namely those of Ecuador and Brazil, seem to put their attention rather on trying to preserve jobs in the sector, resulting in at average ever less efficient labour in the manufacturing sector.

Trade

A view on the trade structures of Latin-American countries (Table 7.5) reveals large differences compared to those of the investigated mature countries (section 6.2.1.2, pp. 298).

Table 7.5 Overview on exports (2008), Latin America

	ARG	BRA	CHL	COL	ECU	MEX	VEN	Mature
Total exports (% of GDP)	19.9	13.7	41.5	17.8	34.2	27.9	30.8	42.5
manufacturing (% of total export)	33.6	39.3	13.8	28.1	7.8	69.9	4.2	60.0
oil and gas (% of total exports)	10.2	8.3	2.0	41.0	55.0	16.5	91.7	4.3
ore and metals (% of total exports)	3.5	10.6	49.0	1.8	0.6	2.5	1.7	3.1
Manufacturing exports (% of GDP)	6.7	5.4	5.7	5.0	2.7	19.5	1.3	25.2
Merchandise exports to high-income countries (%)	43.4	56.8	58.6	62.9	69.1	90.7	66.0	81.1
Trade balance (%)	3.1	0.2	2.0	-2.5	0.3	-2.3	9.8	1.3

Sources Based on World Bank (2014a) and WTO (2014) data, own calculations
Mature: Unweighted mean value of results of sample group of mature countries

The relative size of foreign trade is below the average of mature countries which mostly have a high or very high export orientation. Most of these mature exports are contested on the basis of manufacturing. For emerging countries, only Mexico clearly shows such a manufacturing-oriented export structure, Argentina and Brazil to a far lesser extent, while all other countries only have a clear minority of their total exports as manufactures. Primary products – oil and gas for Colombia, Ecuador and especially Venezuela, ore and metals for Chile – play a crucial role in these economies. In the following, a short description is rendered, following the same export classifications as utilized for mature countries.

- Country of high export orientation (export rate 40-60 %): Chile

  With only limited manufacturing exports, Chile mainly relies on metals and ores for achieving its positive export balance. The main commodity that is exported is copper which alone provides almost 20 % of government revenues (CIA, 2015).

- Countries of medium export orientation (export rate 20-40 %): Ecuador, Mexico, Venezuela

  While Ecuador and Venezuela rely on their abundance of raw materials (mainly oil), Mexico relies on manufacturing exports. Most of the Mexican exports go to the northern neighbour USA, so they remain within the NAFTA free trade zone. Ecuador and Venezuela were running socialist policies that were not in favour of trade relations with the USA (CIA, 2015).

  Despite of its high share of manufacturing exports, Mexico is the only country with a negative trade balance. Quite obviously, the market conditions are not in favour of the Mexican workers. The bargaining power of the big neighbour in the North reduces the Mexican development potential by limiting trade margins.

- Countries of low export orientation (export rate 0-20 %): Argentina, Brazil, Colombia

  Brazil has some sizeable industry but is mainly producing for its large domestic market. Although the Argentinian industry is quite diversified and can compete internationally (CIA, 2015), export rates and manufacturing shares in exports are far below those of European countries – probably mainly because of the rather secluded geographical situation that makes long shipments unavoidable.

The share of manufacturing exports to high-income countries is more or less reciprocally proportional to the distance from the closest truly rich nation around – the USA.

Volatility of change

The Latin-American results are listed in Table 7.6. Remember that the total volatility of all investigated mature economies was well below 10 % over the same period. In comparison to these smooth transitions, the change in Latin America was far more dynamic, with Venezuela and Argentina at the upper end.

Table 7.6 CAGR (%) volatility of de-industrialization indicators (Latin America)

	υ_T	$\sigma_{1,T}$ manu. empl.	$\sigma_{2,T}$ unem-ployment	$\sigma_{3,T}$ trade balance	$\sigma_{4,T}$ GDP p/c	$\sigma_{5,T}$ manu. output	$\sigma_{6,T}$ primary prod. exp.	$\sigma_{7,T}$ agricult. empl.	$\sigma_{8,T}$ KIBS empl.
ARG	**24.79**	3.25	4.70	6.53	3.68	4.77	0.35	0.09	1.42
BRA	**16.12**	1.88	1.98	3.19	1.08	6.00	0.33	0.67	0.99
CHL	**13.16**	0.63	2.23	4.52	1.10	2.69	0.23	0.61	1.15
COL	**17.54**	2.31	5.66	3.00	1.73	2.78	0.28	1.78	2.81
ECU	**16.90**	1.87	3.39	5.58	1.68	1.64	0.41	1.32	1.01
MEX	**14.10**	2.68	1.66	2.01	0.87	2.99	0.40	0.86	2.63
VEN	**29.63**	1.62	5.37	9.30	3.68	5.22	0.08	2.46	1.91

Source: Own calculation, based on ILO (2014) and World Bank (2014a) data, 1998-2008 figures.

A certain portion of the measured unrest can be attributed to the high volatility of raw material prices which have a high influence on the trade balance. Venezuela surely is a striking example for this. Nevertheless, its extreme volatility is also due to the dramatic political and economic swing from largely failed neo-liberal to socialist policies (facilitated by high oil prices) in the investigated period (Kaplan, 2013).

For Argentina and Colombia, the turbulences were also caused by political and related economic circumstances:

- In Argentina, the growing balance of payments crisis 1994-2002 finally paralyzed the economy: “One-quarter of the labour force unemployed, half of the population poor or indigent, the political system repudiated, businesses bankrupt, and economic exiles were just some costs of neo-liberal policies” (Cardoso, Marcuzzo, & Romero Sotelo, 2014, p. 252).
- In Colombia, the nearly five-decade-long conflict between government forces and revolutionary forces, also involving funding by drug traders, took its toll (CIA, 2015).

7.3.1.2 Economic scenarios

When turning to the economic scenarios, it is important to remember that the population of all Latin-American states has been growing relatively fast. At the same time, the participation rate in the labour market grew, so the total active workforce grew even faster than the population. Hence, a large difference between absolute and relative growth of employment in manufacturing may occur.

While for the eclectic model of de-industrialization, the relative decline of the sector is the key factor (i.e. the involved sociological change), the scenario model rather looks at absolute sectoral change (i.e. is a tool for strictly economic considerations). In the following sub-sections, the latter will be in the main focus. Sectoral shifts will be analysed in section 7.3.1.3, utilizing the eclectic model.

Key indicators

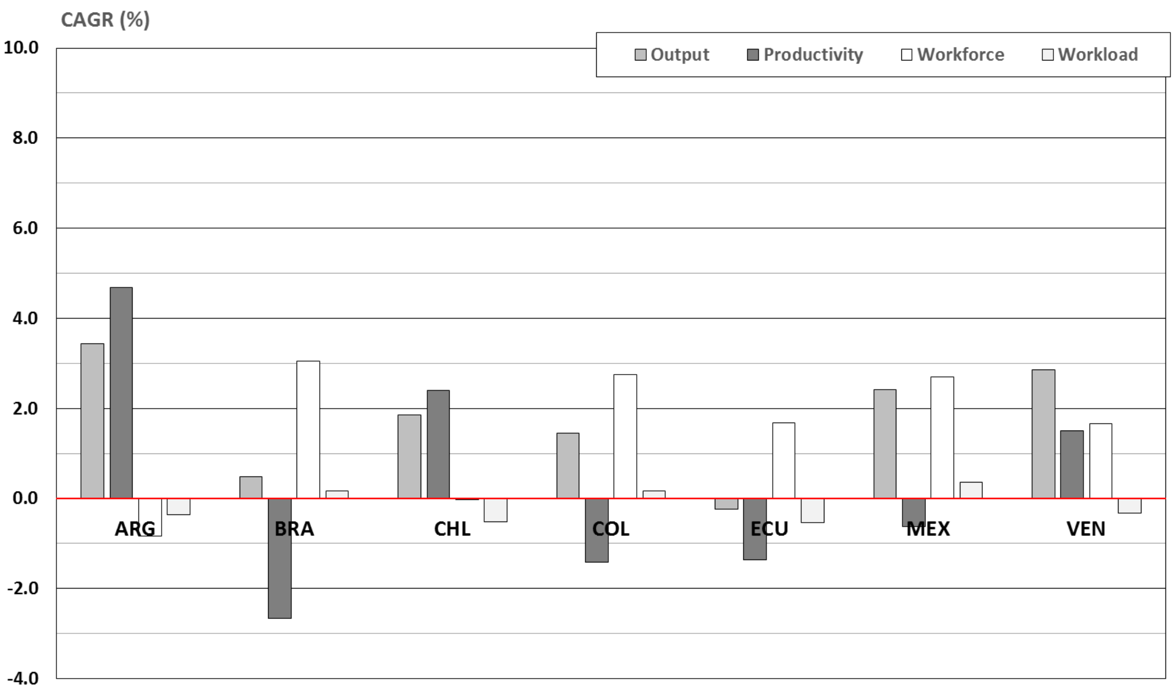
When comparing the indicators of de-industrialization for Latin-American states with the average of mature states (Table 7.7), the relative employment figures are in the same order of magnitude around 15 %. Only in Brazil and Mexico, the sectoral share of workforce has grown while all other countries de-industrialized in the sociological sense. On the other hand, absolute employment and output grew in all but one state, so there was no predominant de-industrialization in the purely economic sense.

Table 7.7 Overview on de-industrialization indicators (Latin America)

	Indicator	ARG	BRA	CHL	COL	ECU	MEX	VEN	Mature
Empl. (%)	1993	20.1	12.8	16.7	14,7	14.5	15.5	15.4	18.0
	2008	13.1	14.9	12.8	13,7	11.8	16.5	11.9	13.9
	Rank 93→08	1→5	7→2	3→6	6→4	2→3	4→1	5→7	
1993-2008 CAGR (%)	Empl. (rel.)	-2.8	1.0	-1.8	-0.5	-1.4	0.4	-1.7	-1.8
	Empl. (abs.)	-0.8	3.1	0.0	2.7	1.7	2.7	1.7	-0.8
	Output	3.4	0.5	1.9	1.5	-0.2	2.4	2.9	1.1
	Output/cap.	4.3	-2.5	1.9	-1.3	-1.9	-0.3	1.2	1.7
	Productivity	4.7	-2.7	2.5	-1.4	-1.4	-0.6	1.5	2.0
	Workload	-0.4	0.2	-0.6	0.2	-0.5	0.4	-0.3	-0.1
	Labour content	-1.3	3.1	-0.6	2.9	1.1	3.1	1.4	-0.9

Sources: Own calculation, evaluation based on ILO (2014) and World Bank (2014a) data. Mean value of mature states based on EU KLEMS (2012) data and own calculations, constant 2010 prices, mean value not weighted.

While in Argentina, Chile and Venezuela, the productivity grew (in Argentina, it rose fast), it fell in all other investigated states. Partly, this may be attributed to lacking technological ability, not allowing to produce high-technology products. Some socialist labour market protection is assumed to also play an important role (Brazil, Colombia, Ecuador). In addition, there may be a problematic bargaining position when heavily exporting to mature Western economies (e.g. Mexico to USA).



Source: Own calculations, based on ILO (2014) and World Bank (2014a) data, CAGR 1993-2008,

Figure 7.5: Indicators of de-industrialization (Latin America)

In manufacturing, Argentina and Chile consequently followed a path of raising international competitiveness. Argentina, undergoing a shock therapy in the course of its quasi-bankruptcy in 2001, was even more successful in terms of productivity. Yet, unlike in Chile, a negative impact on the national labour market could be avoided.

The decisive factor for differentiating between industrialization and de-industrialization in the scenario model is the total labour content in manufacturing (see bottom row of Table 7.7). Its growth rate is described by the change of workforce minus the change of individual workload (labour market supply side) which is equivalent to the difference between output change and productivity change (labour market demand side), all of which with respect to the manufacturing sector. The relevant indicators of change are displayed in Figure 7.5.

Scenarios

The resulting scenarios are listed in Table 7.8 and graphically displayed in Figure 7.6. Only Argentina and Chile are countries of de-industrialization. Both followed a 'healthy' 4e path also pursued by most mature countries. It is characterized by higher productivity on the one hand and reductions in individual workload on the other hand (Table 7.8).

Venezuela also followed a 'healthy' standard path. It was industrializing, raising its output on the basis of higher productivity, more workforce and a little less workload.

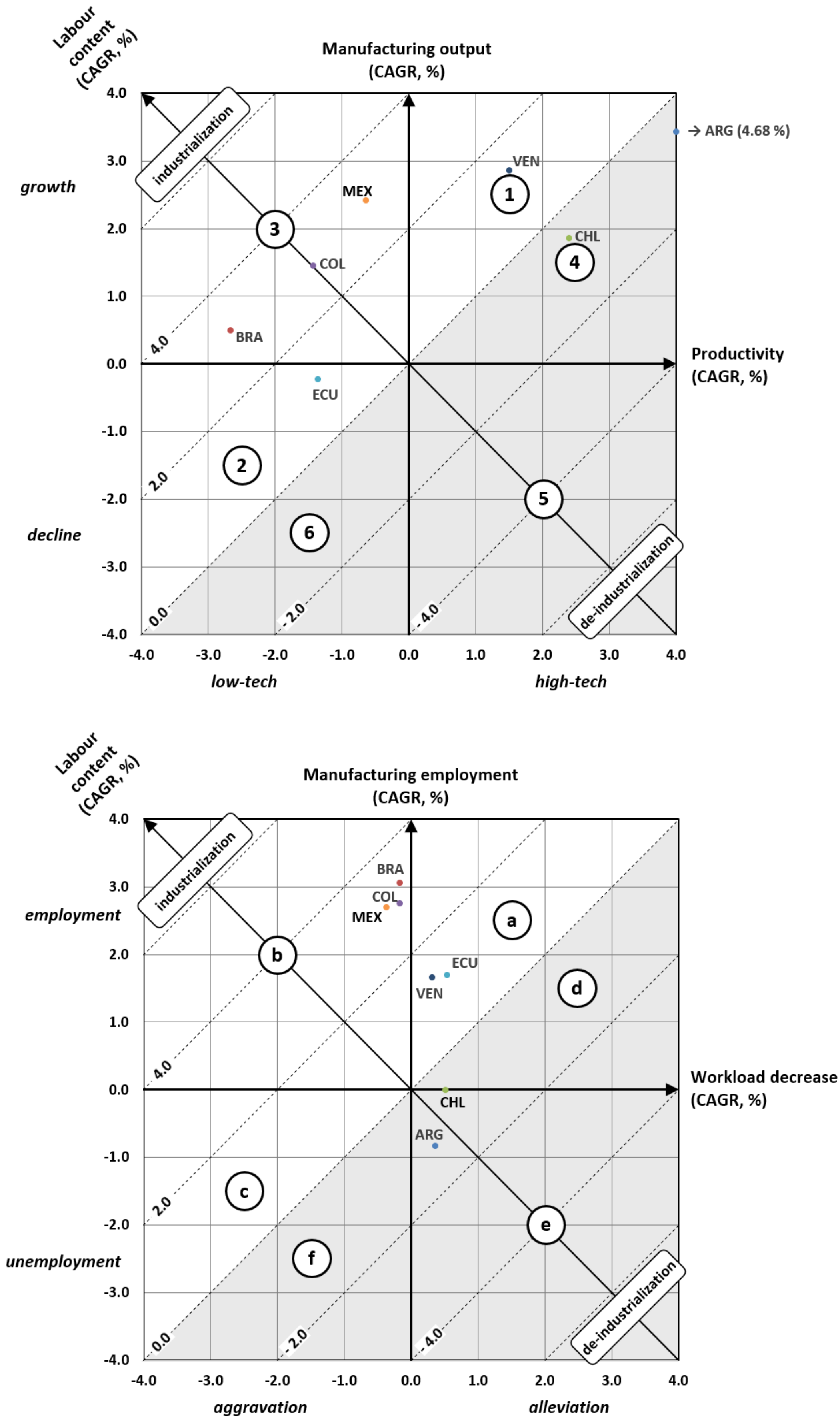
Brazil, Colombia and Mexico also industrialized but did neither manage to elevate productivity nor reduce individual workload. Their common 2b scenario is normally not an advantageous one.

The most problematic scenario is the 3a scenario of Ecuador. Ecuador is the only country that was producing less in 2008 than in 1993. Nevertheless, far more people were employed in the manufacturing industry, but they were far less effective and working less at average. A clear shift to lower technology is diagnosed.

Table 7.8 15-year scenarios of de-industrialization (Latin America)

Country	ARG	BRA	CHL	COL	ECU	MEX	VEN
Scenario	4e	2b	4e	2b	3a	2b	1a

Source: Own calculations, based on ILO (2014) and World Bank (2014a) data, 1993-2008



Source: Own graph, based on Word Bank (2014a) and ILO (2014) data, 1993-2008

Figure 7.6 Scenarios for Latin America: demand/supply side (up/down)

7.3.1.3 Applied eclectic model of de-industrialization

The eclectic model of de-industrialization aims at describing sociological shifts, taking sectoral distribution of workforce, i.e. relative figures, as the basis of analysis. The 15-year results and those of the three five-year sub-periods are given in Table 7.9.

Three Latin-American countries did not de-industrialize in relative terms over the full 15-year period: Brazil, Colombia and Mexico. Yet, there were signs of de-industrialization in certain five-year periods.

Table 7.9 De-industrialization of Latin-American states (eclectic model)

Coun-try	Year	De-indus-trialization	Type	Shift to KIBS	Shift to primary products	Shift to agriculture	Shift to simple services	Reverse type
ARG	**93-08**	**yes**	**positive**	**yes**	**possible**	**no**	**no**	**no**
	93-98	yes	ambivalent	yes	no	no	no	no
	98-03	yes	ambivalent	no	possible	no	no	possible
	03-08	no						
BRA	**93-08**	**no**						
	93-98	yes	ambivalent	yes	no	no	no	no
	98-03	no						
	03-08	no						
CHL	**93-08**	**yes**	**ambivalent**	**yes**	**likely**	**no**	**no**	**no**
	93-98	yes	ambivalent	yes	possible	no	no	no
	98-03	yes	ambivalent	yes	possible	no	no	no
	03-08	yes	positive	yes	likely	no	no	no
COL	**93-08**	**no**						
	93-98	yes	ambivalent	yes	possible	no	no	no
	98-03	no						
	03-08	no						
ECU	**93-08**	**yes**	**positive**	**yes**	**possible**	**no**	**no**	**no**
	93-98	yes	ambivalent	yes	possible	no	no	no
	98-03	no						
	03-08	no						
MEX	**93-08**	**no**						
	93-98	no						
	98-03	yes	ambivalent	yes	possible	no	no	no
	03-08	no						
VEN	**93-08**	**yes**	**ambivalent**	**no**	**likely**	**no**	**no**	**no**
	93-98	yes	ambivalent	no	likely	no	no	no
	98-03	yes	ambivalent	no	likely	no	yes	likely
	03-08	no						

Source: Own compilation, evaluation based on ILO (2014) and World Bank (2014a) data

With Ecuador and Venezuela, two countries de-industrialized with respect to the relative role that manufacturing plays in these societies despite of an absolute growth of their manufacturing workforce. The peculiarities of the Ecuadorian path of de-industrialization were depicted in the previous sub-section on scenarios. Those of Venezuela become clear from the eclectic model:

- Venezuela is the only country in the investigated group that did not manage a transition towards knowledge-intensive business services.
- It is likely that crowding out by oil production played a major role in the (relative) de-industrialization process. This fits well with the rising productivity of the sector despite of basically socialist policies. If money is spent on manufacturing, it needs to beat the returns expected from oil production. Obviously, this was often not the case. And the same holds for KIBS which most likely were also crowded out by the Venezuelan oil production.

Since Argentina and Chile even followed de-industrialization scenarios (reduced total labour content) despite of their growing population, it is clear that the relative sociological role of manufacturing in the national economies also diminished. In both cases, some workforce was probably transferred to KIBS. In Chile, to a far lesser extent also in Argentina, the manufacturing sector also had to compete with the primary product segment. Some crowding out is very likely in Chile.

The average national income rose in both countries and the trade balance turned to the positive side. Only in Argentina, unemployment figures fell, while in Chile they rose significantly. Thus, the change from 1993 to 2008 can be summarized as being positive in Argentina while leaving an ambivalent impression in Chile.

7.3.1.4 Summative assessment of structural change in Latin America

Concerning their average income per capita, the Latin-American states performed quite well. For a large part of the population, this does not mean much since compared to most parts of the world, the income is distributed very unevenly, with a factor of around 30 between the top and the lowest income decile (World Bank, 2014a).

The high volatility indicates that the structural change processes did not proceed smoothly, but with grave political swings and economic problems, as especially Argentina and Venezuela show.

Generally, there are two industrial policies followed by the governments in Latin-American states (Table 7.10):

- Ambitious modernizers aiming at productivity increases (Argentina, Chile) who have quite successfully pursued their economic paths, Chile with a neo-liberal agenda, Argentina with a moderate left position under president Kirchner (Mendel, 2011), presiding over the failed Washington Consensus agenda of his predecessors.
- Anxious governments who (in the short term) tried to avoid job releases and/or picked up more simple production (Brazil, Colombia, Ecuador, Mexico) and in the long run lost in competitiveness. Ecuador was most extreme in this respect.

Venezuela, with its abundance of oil, played a very special role. Crowding out by its primary product sector on the one hand prevented the manufacturing industry from growing but on the other hand assured that only productive investments were made, so the remaining manufacturing industry was relatively effective.

Table 7.10 Wealth (2008) and de-industrialization (Latin America)

Indicator / Country	ARG	BRA	CHL	COL	ECU	MEX	VEN
Income per capita	higher middle	higher middle	high	higher middle	higher middle	higher middle	high
CAGR (%) volatility (total)	very high	medium high	medium high	medium high	medium high	medium high	very high
Scenarios	4e	2b	4e	2b	3a	2b	1a
De-industrialization	yes	no	yes	no	yes	no	yes
Type	positive		positive		positive		ambiva-lent
Shift to KIBS	yes		yes		yes		no
Shift to primary products	possible		likely		possible		likely
Shift to agriculture	no		no		no		no
Shift to simple services	no		no		no		no
Reverse type	no		no		no		no

Source: Own calculation, based on ILO (2014) and World Bank (2014a) data, years 1993-2008
Scenario categories as illustrated in Figure 4.4, p. 101

Table 7.11 Fulfilled definitions of de-industrialization (Latin America)

	Labour content	Employment	Output
abso-lute	**LAB CONT** CAGR < 0.0 %: ARG, CHL	**ME (abs.)** CAGR < 0.0 %: ARG, CHL	**MO (abs.)** CAGR < 0.0 %: ECU
rela-tive		**ME (rel.)**: CAGR < 0.0 %: all w/o BRA, MEX CAGR ≤ -1.0 %: ARG, CHL, ECU, VEN	**MO (rel.)**: CAGR < 0.0 %: all w/o ARG, VEN

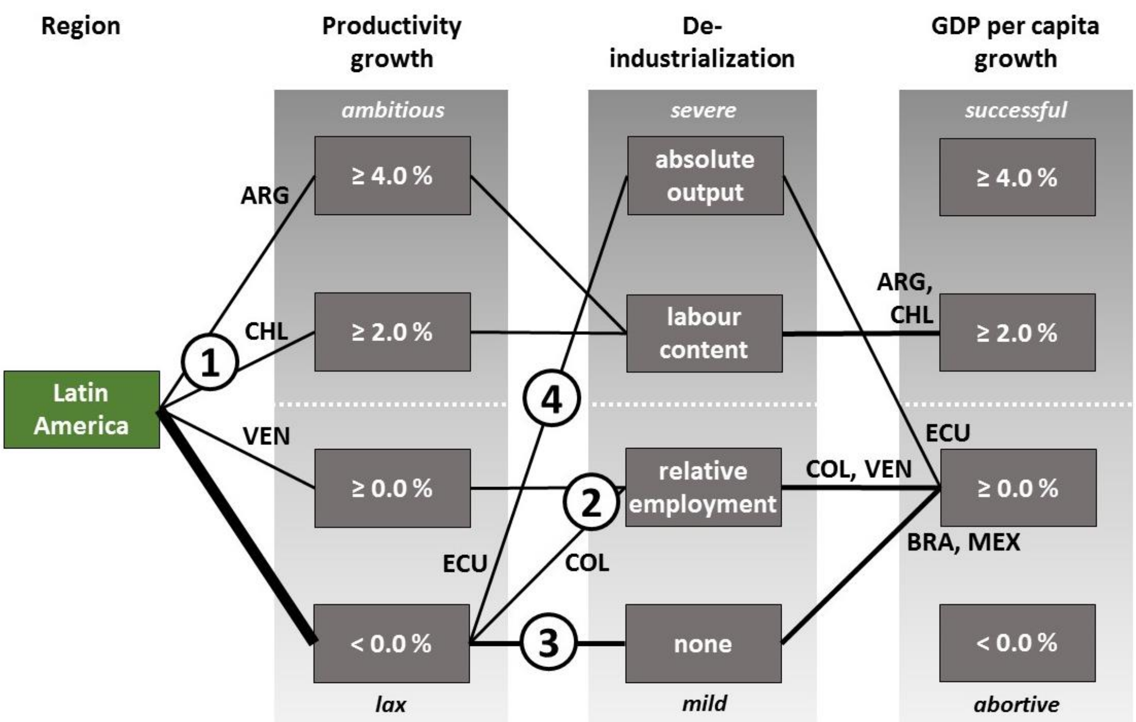
Source: Own compilation, 1993-2008 period

The results of the economic policies are summarized in Table 7.11.

- The two countries following very ambitious policies in manufacturing (Argentina and Chile) are the ones that were facing absolute losses in manufacturing employment and total hours worked.
- On the other hand, the productivity increases in Argentina were so high that the Argentinian manufacturing industry could even increase its share in the nation's GDP. The same holds for Venezuela.
- Ecuador was just the opposite. The Ecuadorian manufacturing sector worked more but had to face output losses.

Over the whole period, Brazil and Mexico did not de-industrialize in terms of relative manufacturing employment. Yet, their development is quite different. While Brazil slowly, but constantly built up jobs in manufacturing, Mexico's manufacturing sector, after high increases in the 1990s, tipped in 2000 and then started shrinking again.

In Figure 7.7, the key findings are summarized graphically. As shown, the most ambitious states in terms of manufacturing, Argentina and Chile, also achieved the best results concerning economic growth per capita.



Source: Own calculations based on World Bank (2014a) and ILO (2014) data

Figure 7.7 Key features of de-industrialization (Latin America, 1993-2008)

In total, all other Latin-American states were not very successful in increasing their national welfare. Their timid industrial policies, focusing on short-term avoidance of unemployment, did not pay off in the medium or long term.

For Latin America, the relations between industrial policies and economic success seem to be quite clear and linear. The ambitious countries fared far better than the rather socialist.

This notwithstanding, it has to be remarked that this result does not involve any consideration of the distribution of national wealth between the rich and the poor and how it changed over time. According to World Bank (2014a) data, the ratio between the first and last decile of income is about a good five times higher in Latin America than in East Europe.*

7.3.2 East Europe and Central Asia

This analysis follows the same course as applied in the section on Latin America.

7.3.2.1 Macro-economic comparison

The macro-economic comparison is carried out analogously to that of Latin America. A macro-economic overview is rendered, complemented by an analysis of the volatility of change expressed by the standard deviation of change indicators.

Macro-economic overview

In Table 7.12, a comparative overview on the development of the investigated group of East European and Central Asian states is given. The key topics will be comparatively analysed, following the matrix columns from left to right. Comparisons will be made utilizing categories introduced in chapter 6.

Population

Unlike the Latin-American states, the investigated East European states have a more or less stagnating (CRO, CZE, POL, SVK) or even shrinking (BUL, KAZ, ROM, RUS, SRB, UKR) population. Turkey, with a growth rate of 1.4 %, is the only exception to the rather pessimistic scenery.

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* In other words (not utilising economic terminology), the income distance is almost obscene.

Table 7.12 Overview on economic developments (East Europe & Central Asia)

1993	Pop.	GDP p/c	Exports	Trade	Unempl.	Agricult.	Manufacturing (VA)		VA/h	Fuel exp.	Services	KIBS
2008	*mn*	*k USD*	*% of GDP*	*% of GDP*	*% of active*	*% of empl.*	*% of empl.*	*bn USD*	*USD*	*% of ME*	*% of empl.*	*% of empl.*
BUL	8.5	3.6	38.2	-7.6	21.4	22.1	26.5	5.1	4.0	13.4	41.3	8.1
	7.5	6.7	58.2	-20.5	5.6	7.5	22.9	7.7	6.1	32.8	56.1	8.5
CRO	5.3	6.5	52.4	-1.2	14.8	23.1	20.8	10.6	14.4	11.2	47.4	5.2
	5.4	11.9	42.1	-7.8	8.4	13.6	19.3	10.1	15.6	17.0	55.9	7.2
CZE	10.3	11.5	47.8	1.4	4.3	7.7	29.6	27.1	9.8	9.2	49.4	5.9
	10.4	19.5	64.4	2.4	4.4	3.3	28.7	49.3	17.8	4.9	56.3	9.7
KAZ	16.3	4.5	37.9	-8.8	7.0	31.2	11.2	10.6	6.7	37.4	43.6	1.2
	15.7	8.7	57.2	20.1	6.6	30.2	7.3	17.3	15.6	80.9	50.9	6.0
POL	38.5	5.7	21.0	0.9	14.0	24.6	22.3	53.4	8.2	17.8	42.0	7.6
	38.1	11.7	39.9	-4.0	7.1	14.0	21.5	82.8	12.5	8.1	54.1	8.7
ROM	22.8	4.5	23.0	-5.0	7.2	36.0	25.9	26.2	5.8	13.1	28.2	2.4
	20.5	8.7	30.4	-13.0	5.8	28.7	20.6	43.9	12.3	13.9	39.8	4.4
RUS	148.5	7.1	38.2	7.7	5.9	15.5	25.5	194.9	5.8	42.9	46.5	4.7
	142.0	11.2	31.3	9.2	6.2	8.6	16.4	277.3	11.8	71.2	62.4	8.1
SRB	7.7	2.8	8.4	-3.7	23.1	28.9	30.6	4.3	2.8	15.9	38.6	3.9
	7.4	5.2	31.1	-26.6	13.6	25.1	17.2	6.3	6.3	2.5	48.7	5.3
SVK	5.3	7.7	56.2	-4.6	12.2	10.5	26.9	12.3	11.4	8.5	49.8	5.1
	5.4	16.3	83.5	-2.4	9.6	4.0	26.6	20.3	18.9	7.4	56.5	8.8
TUR	56.7	7.0	13.7	-8.9	9.0	42.2	14.6	86.5	14.9	3.7	35.2	2.3
	70.4	10.0	23.9	-2.9	11.0	23.7	20.0	127.8	11.9	9.2	49.5	5.5
UKR	52.2	2.8	25.9	-0.3	5.9	20.7	19.0	43.7	5.7	8.9	43.1	3.8
	46.3	3.3	46.9	-8.0	6.4	15.8	11.3	30.7	7.4	12.1	60.7	7.4
93-08	*CAGR (%)*	*CAGR (%)*	*CAGR (%)*	*5 y change*	*5 y change*	*CAGR (%)*	*CAGR (%)*	*CAGR (%)*	*CAGR (%)*	*average*	*CAGR (%)*	*CAGR (%)*
BUL	-0.8	4.3	2.8	-4.3	-5.3	-7.0	-1.0	2.8	2.9	20.6	2.1	0.4
CRO	0.1	4.2	-1.5	-2.2	-2.1	-3.5	-0.5	-0.3	0.5	13.2	1.1	2.2
CZE	0.0	3.6	2.0	0.3	0.0	-5.7	-0.2	4.1	4.0	-1.4	0.9	3.4
KAZ	-0.3	4.5	2.8	9.7	-0.1	-0.2	-2.8	3.3	5.8	67.3	1.0	11.4
POL	-0.1	4.9	4.4	-1.6	-2.3	-3.7	-0.2	3.0	2.8	11.0	1.7	0.9
ROM	-0.7	4.4	1.9	-2.7	-0.5	-1.5	-1.5	3.5	5.1	12.2	2.3	4.2
RUS	-0.3	3.1	-1.3	0.5	0.1	-3.8	-2.9	2.4	4.9	58.7	2.0	3.8
SRB	-0.3	4.3	9.1	-7.6	-3.2	-0.9	-3.8	2.5	5.5	14.3	1.6	1.9
SVK	0.1	5.1	2.7	0.7	-0.9	-6.2	-0.1	3.4	3.4	8.6	0.8	3.7
TUR	1.4	2.4	3.8	2.0	0.7	-3.8	2.1	2.6	-1.5	4.9	2.3	5.9
UKR	-0.8	1.1	4.0	-2.6	0.2	-1.8	-3.4	-2.3	1.7	13.7	2.3	4.5

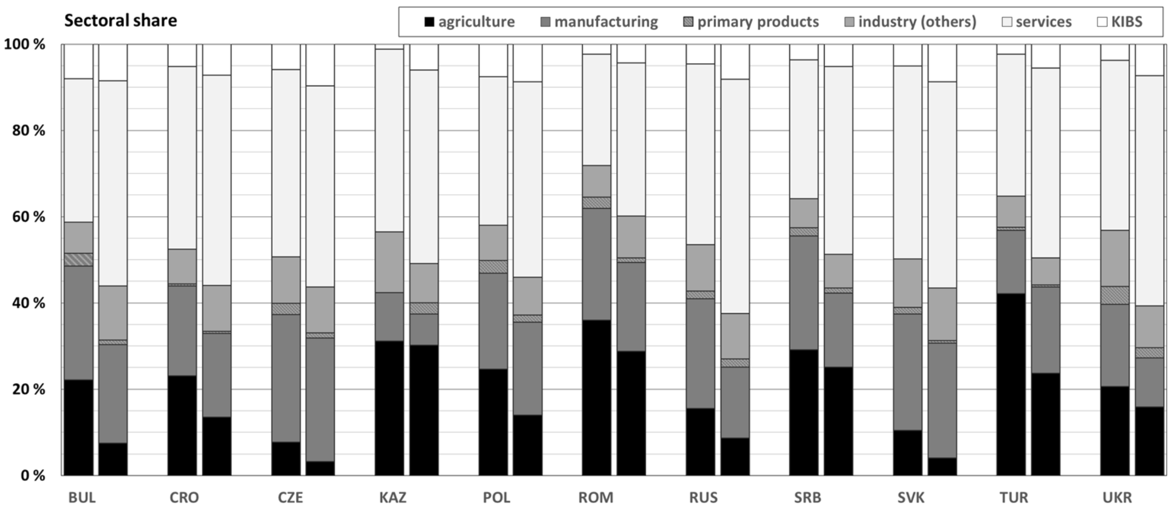
Sources Based on World Bank (2014a) and ILO (2014) data, constant 2010 prices. Values for Serbia additionally based on Statistical Yearbooks of Yugoslavia (FR of Yugoslavia, 1994; 2001; 2003).

Own calculation of manufacturing value added per hour on this basis, also involving data on total hours annually worked (OECD, 2015) and total holidays (Wikipedia, 2015).

The exact value for the CAGR of manufacturing employment of Bulgaria is -0.96 %. Thus, it is slightly higher than the hurdle rate that is required for diagnosing de-industrialization by the eclectic model.

Structural shifts

In general terms, all economies have followed the standard path of development, with shrinking relative employment in agriculture but a growing service sector (Figure 7.8). In all countries, knowledge-intensive services have clearly gained in importance.



Source Own graph, based on World Bank (2014a) and ILO (2014) data

Figure 7.8 Sectoral shifts (East Europe & Central Asia), years 1993 and 2008

There are remarkable differences in the speed of the reduction of relative agricultural employment and the final state reached in 2008:

- The Czech and the Slovak Republic have a modern structure with less than 5 % of employment in the first sector, speaking for their high productivity in this sector.
- Kazakhstan, Romania, Serbia and (despite of some remarkable progress) also Turkey still have around one quarter of their working population in agricultural jobs.
- Bulgaria, Croatia, Poland, Russia and the Ukraine are in a transient state, with Bulgaria and Russia already at less than 10 % agricultural employment.

Unemployment

The situation on the labour market has significantly improved in most states which suffered from lost Eastern markets in the early 1990s. Only Serbia still had a two-digit account in unemployment, despite of almost halving its rate from 1993 to 2008. Serbia still suffered from the backlogs of the Yugoslav wars (Grozdanic, 2011). Turkey raised the number of jobs, but not at the same speed as its population grew, so its unemployment rate rose above 10 %.

Manufacturing productivity

The situation in Croatia and Turkey is the most critical since their productivity gains were just above or even below zero (see below), so a number of the jobs are presumably either of very simple content or even obsolete. In combination with the number of unemployment, the situation is rather critical.

In the other investigated countries, the productivity rose fast after the end of socialist times, with some restrictions for the Ukrainian manufacturing sector.

Trade

The trade structure is displayed in Table 7.13. All investigated states have a sizeable export orientation. There are large differences in the nature and balance of trade.

Table 7.13 Overview on exports (2008), East Europe & Central Asia

	BUL	CRO	CZE	KAZ	POL	ROM	RUS	SRB	SVK	TUR	UKR	Mature
Total exports (% of GDP)	58.2	42.1	64.4	57.2	39.9	30.4	31.3	31.1	83.5	23.9	46.9	42.5
Manufacturing (% of total export)	38.0	33.6	88.3	13.5	64.3	61.0	15.2	49.5	74.7	61.2	55.9	60.0
oil and gas (% of total exports)	11.9	6.1	3.0	64.5	3.4	7.3	59.6	1.8	4.3	4.4	4.7	4.3
ore and metals (% of total exports)	12.4	2.1	1.9	10.8	3.2	3.8	5.0	7.4	2.1	2.6	4.9	3.1
Manufacturing exports (% of GDP)	22.1	14.1	56.9	7.8	25.6	18.6	4.8	15.4	62.3	14.6	26.2	25.2
Merchandise exports to high-income countries (%)	63.0	66.7	89.4	72.1	85.1	70.2	65.0	56.8	84.1	66.8	56.8	81.1
Trade balance (%)	-20.5	-7.8	2.4	20.1	-4.0	-13.0	9.2	-26.6	-2.4	-2.9	-8.0	1.3

Sources Based on World Bank (2014a) and WTO (2014) data, own calculations
Mature: Unweighted mean value of results of sample group of mature countries

A grouping by intervals of 20 % of exports rendered the following results:

- Countries of very high export orientation (export rate 60+ %): Czech Republic, Slovak Republic

  Based on their favourable location in the heart of middle Europe and their technical tradition lasting back to the Habsburg empire, both EU member states benefitted from their proximity to Western Europe, especially Germany. Almost 90 % of their exports went in Western direction which is no matter of course still so shortly after the fall of the Iron Curtain.

  The Czech Republic had a positive trade balance and little unemployment while the Slovak situation was somewhat less favourable. Both countries' exports mainly relied on manufacturing, not on primary products.

- Countries of high export orientation (export rate 40-60 %): Bulgaria, Croatia, Kazakhstan, Ukraine

While Bulgaria, Croatia and the Ukraine mainly relied on manufacturing where merchandise exports are concerned (with Bulgaria also having a comparably sizeable raw materials industry), Kazakhstan has based its prosperity mainly on the extraction of primary product. It possesses substantial fossil fuel reserves and minerals and metals like uranium, copper, and zinc (CIA, 2015).

Croatia exported more services than merchandise. Ideally situated by the Mediterranean Sea with its very long coastline, it has become a country of mass tourism.

- Countries of medium export orientation (export rate 20-40 %): Poland, Romania, Russia, Serbia, Turkey

  Apart from Serbia, these less export-oriented countries have large territories, allowing a certain degree of autarchy. All countries apart from Russia have little natural resources to draw from and rely on manufacturing. Russia could increase its wealth on the basis of its sizeable oil and gas production. As a result, it is the only country with a positive trade balance in this group.

  Serbia was facing a special situation after the decay of Yugoslavia and the Yugoslav wars. Its industry was largely destroyed or abandoned. Consequently, the Serbian trade balance is the most negative in the sample group.

- Countries of low export orientation (< 20 %): n/a

When comparing the trade situation of EU member states, it is quite striking that the larger the distance to Western Europe (especially Germany), the more negative is the trade balance. The order is CZE, SVK, POL, CRO, ROM, BUL. Proximity to markets leads to better export chances because it helps to adapt to market needs and to integrate within complex value chains, involving just-in-time production.

Volatility of change

The results for East Europe and Central Asia are listed in Table 7.14. Only the Czech Republic has managed to realize a relatively smooth transition from socialist to Western society. One main reason is that the Czech industrial sector almost did not shrink in terms of employment and grew in terms of output.

All other post-socialist countries had to face serious unrest in their development over the investigated 15-year period. Notably, these tendencies may result from upward or downward movements or ups and downs and need to be analysed in detail.

The Turkish development is one of continuous industrial growth, so the economical ups and downs were rather small compared to the former Eastern Bloc countries.

Table 7.14 CAGR (%) volatility of de-industrialization indicators (East Europe & Central Asia)

	υ_T	$\sigma_{1,T}$ manu. empl.	$\sigma_{2,T}$ unem-ployment	$\sigma_{3,T}$ trade balance	$\sigma_{4,T}$ GDP p/c	$\sigma_{5,T}$ manu. output	$\sigma_{6,T}$ primary prod. exp.	$\sigma_{7,T}$ agricult. empl.	$\sigma_{8,T}$ KIBS empl.
BUL	**28.26**	2.04	5.91	5.81	2.74	4.33	0.43	3.06	3.95
CRO	**18.10**	1.04	5.38	3.66	0.78	2.20	0.33	3.00	1.70
CZE	**10.54**	0.71	2.66	2.11	1.25	1.47	0.33	0.97	1.03
KAZ	**28.59**	1.77	3.85	4.84	4.01	5.31	0.35	4.08	4.38
POL	**20.25**	1.45	6.99	4.44	1.03	2.59	0.36	1.90	1.49
ROM	**26.97**	2.41	1.45	2.99	3.47	6.21	0.20	3.16	7.08
RUS	**23.75**	2.10	3.84	7.17	3.91	4.39	0.22	2.12	4.22
SRB	**20.76**	2.10	5.54	4.80	1.83	1.98	0.14	2.73	1.64
SVK	**18.56**	0.66	5.52	5.34	1.58	2.22	0.18	0.78	2.30
TUR	**17.28**	0.62	2.07	4.50	2.01	3.07	0.44	2.12	2.46
UKR	**30.53**	1.32	3.77	6.67	5.98	8.20	0.33	2.24	2.02

Source: Own calculation, based on ILO (2014) and World Bank (2014a) data, 1998-2008 figures.

7.3.2.2 Economic scenarios

The modelled economic scenarios were derived from key indicators (see section 4.2, p. 95). Accordingly, the key indicators and specific developments in certain countries will be highlighted before turning to the scenario analysis.

Key indicators

All countries apart from Turkey de-industrialized in terms of relative employment; the Czech and Slovak Republic almost remained constant. In absolute numbers of employment, Poland and Slovakia even grew slightly. Since their population roughly stagnated, this can mainly be attributed to the fact that the employment basis was broadened, i.e. the labour participation rate grew (more female labour).

Table 7.15 Overview on de-industrialization indicators (East Europe & Central Asia)

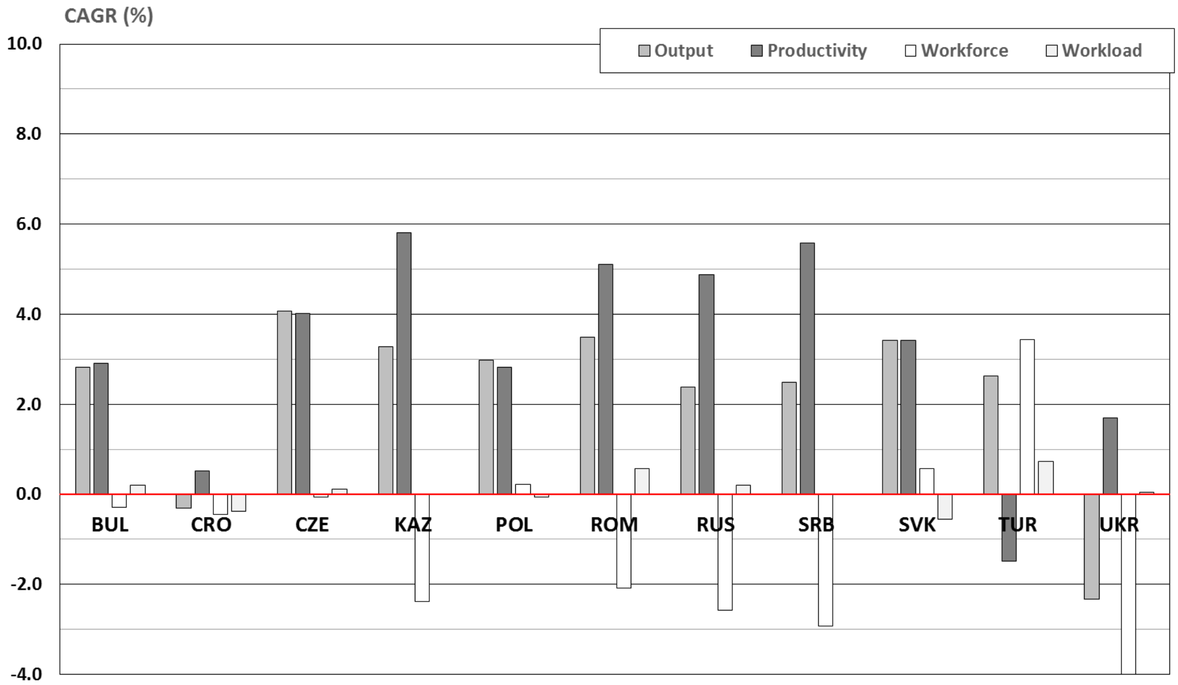
	Indicator	BUL	CRO	CZE	KAZ	POL	ROM	RUS	SRB	SVK	TUR	UKR	Mature
Empl. (%)	1993	26.5	20.8	29.6	11.2	22.3	25.9	25.5	30.6	26.9	14.6	19.0	18.0
	2008	22.9	19.3	28.7	7.3	21.5	20.6	16.4	17.2	26.6	20.0	11.3	13.9
	Rank 93→08	4→3	8→7	1→1	11→11	7→4	5→5	5→9	2→8	3→2	10→6	9→10	
1993-2008 CAGR (%)	Empl. (rel.)	-1.0	-0.5	-0.2	-2.8	-0.2	-1.5	-2.9	-3.8	-0.1	2.1	-3.4	-1.8
	Empl. (abs.)	-0.3	-0.4	-0.1	-2.4	0.2	-2.1	-2.6	-2.9	0.6	3.4	-4.0	-0.8
	Output	2.8	-0.3	4.1	3.3	3.0	3.5	2.4	2.5	3.4	2.6	-2.3	1.1
	Output/cap.	3.1	0.1	4.1	5.8	2.7	5.7	5.1	5.6	2.8	-0.8	1.7	1.7
	Productivity	2.9	0.5	4.0	5.8	2.8	5.1	4.9	5.6	3.4	-1.5	1.7	2.0
	Workload	0.2	-0.4	0.1	0.0	-0.1	0.6	0.2	0.0	-0.6	0.7	0.0	-0.1
	Labour	-0.1	-0.8	0.1	-2.5	0.2	-1.6	-2.5	-3.1	0.0	4.1	-4.0	-0.9

Sources: Own calculation, evaluation based on ILO (2014) and World Bank (2014a) data. Mean value of mature states based on EU KLEMS (2012) data and own calculations, constant 2010 prices, mean value not weighted.

In terms of absolute output, all countries grew apart from Croatia and the Ukraine. The latter suffered from several political swings and a role between East and West, with no clear direction. In a way, it became the economic backyard of both Europe and Russia.

Most countries could elevate their (former socialist) productivity at significant growth rates (see Figure 7.9). Only Croatia and Turkey, to a far lesser extent also the Ukraine, could not keep that pace.

- Concerning productivity, the situation is very critical in Turkey. Despite of its industrial growth, the Turkish productivity lowered over the years. Labour attracted was of rather limited qualification. Presumably, productivity raises were not consequently followed because of the abundance of cheap labour and to avoid higher unemployment rates. In this respect, it is quite strange that the workload grew significantly. Again, this speaks for a value proposition of low hourly rates.
- Croatia’s industrial policies were neither consequent nor successful. Low productivity rises and relatively high labour costs resulted in a weakened position of the Croatian manufacturing sector which is somewhat ‘stuck in the middle’, being not really cheap and not being at the forefront of technology.



Source: Own calculations, based on based on ILO (2014) and World Bank (2014a) data, CAGR 1993-2008,

Figure 7.9 Indicators of de-industrialization (East Europe & Central Asia)

Scenarios

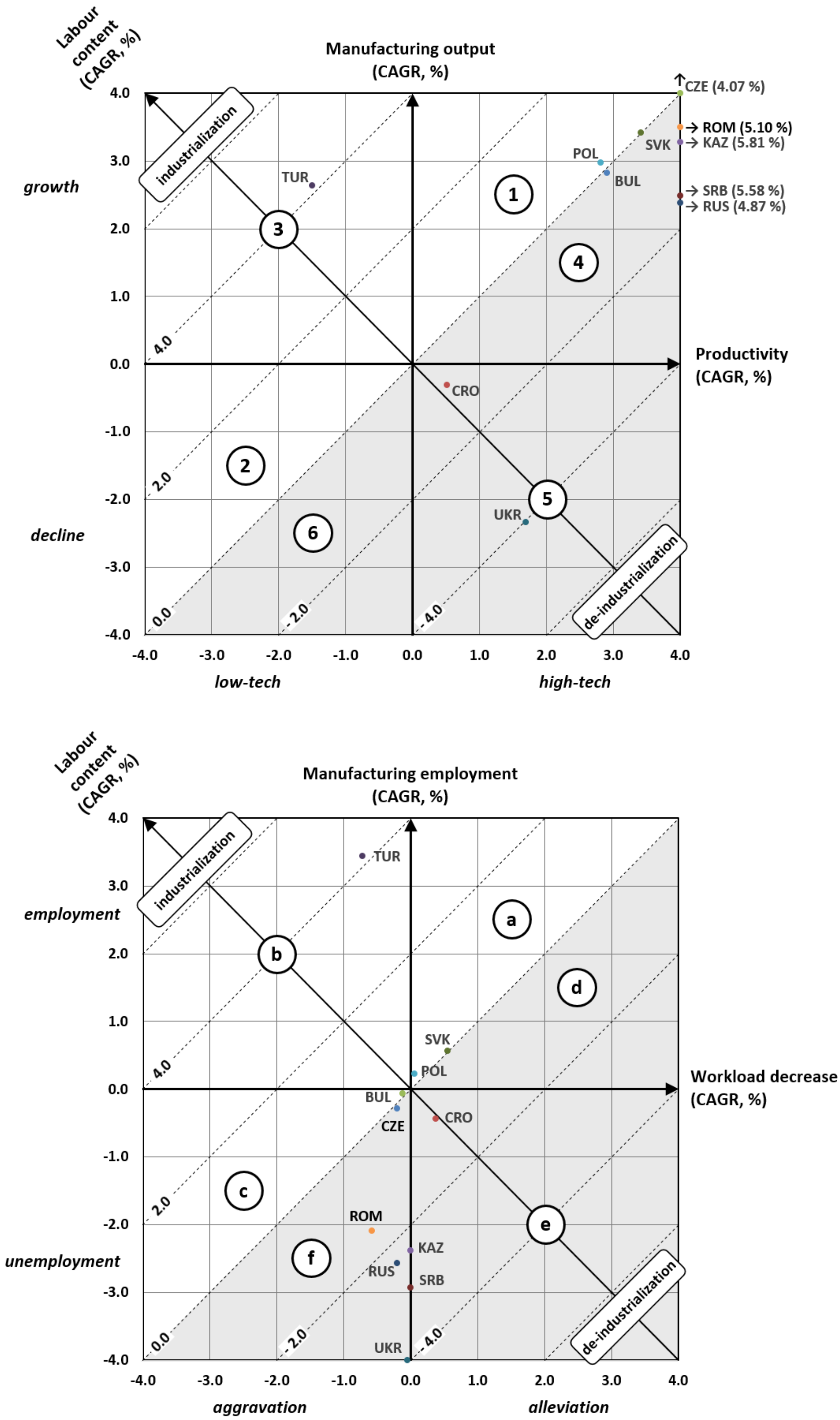
The resulting scenarios are listed in Table 7.16 and displayed in Figure 7.10. The most prominent scenario (Bulgaria, Kazakhstan, Romania, Russia, Serbia) is a very ambitious 4f scenario, constituted by a mix of de-industrialization in terms of employment, fuelled by productivity rises and a (slightly) elevated workload. Considering previous socialist times, a workload elevation is maybe not as alarming as in Western economies.

Three countries industrialized in terms of total labour content: the Czech Republic, Poland and Slovakia. In the Czech Republic, this development involved a slightly diminished total employment which was caused by an elevated workload – a phenomenon denominated as 'pseudo-deindustrialization' (cf. Figure 4.3, p. 99).

Table 7.16 15-year scenarios of de-industrialization (East Europe & Central Asia)

Country	BUL	CRO	CZE	KAZ	POL	ROM	RUS	SRB	SVK	TUR	UKR
Scenario	4f	5e	1c	4f	1a	4f	4f	4f	1a	2b	5f

Source: Own calculations, based on ILO (2014) and World Bank (2014a) data, 1993-2008



Source: Own graph, based on Word Bank (2014a) and ILO (2014) data, 1993-2008

Figure 7.10 Scenarios for East Europe & Central Asia: demand/supply side (up/down)

Croatia and the Ukraine were the countries that lost out to their competition. Both raised their productivity but still had to face output losses. Croatia (unsuccessfully) tried to compensate this by a reduced workload (5e scenario), while the Ukraine, like its Russian neighbour, lifted the average workload (5f scenario).

Again, Turkey pursued a special economic path, one that was also followed by some Latin-American countries (cf. section 7.3.1.2, p. 369). In fact, it is a backward-oriented scenario of reduced productivity, boasting output on the basis of individually more and cheaper manual work.

7.3.2.3 Applied eclectic model of de-industrialization

The applied model of de-industrialization (Table 7.17) contains a clear hurdle rate (-1.0 % CAGR) for diagnosing de-industrialization in terms of relative employment. For the full 15-year period, this rate is only met by Kazakhstan, Romania, Russia, Serbia and the Ukraine.

Only Turkey and the Slovak Republic were totally free from de-industrialization, i.e. it did not take place over any five-year period. On the other hand, only Serbia and the Ukraine de-industrialized in all five-year periods.

In Kazakhstan and Russia, de-industrialization was of the positive type, i.e. did not increase unemployment and worsen the trade balance while the GDP per capita rose. In both countries, crowding out by primary products was likely, a diagnosis which corresponds well with the findings concerning merchandise trade which mainly relies on oil and gas in both countries.

Also the other three de-industrializing countries have a little more than 12 % of merchandise exports on the basis of primary product production, so the possibility of crowding out effects is diagnosed. Anyhow, this effect is not of major economic relevance in these countries.

The expected shift to knowledge-intensive business services happened in all five de-industrializing countries. Also in the countries largely depending on natural resource production, the shift was not crowded out like it was found for Venezuela.

Table 7.17 De-industrialization of East Europe and Central Asia (eclectic model)

Country	Year	De-industrialization	Type	Shift to KIBS	Shift to primary products	Shift to agriculture	Shift to simple services	Reverse type
BUL	**93-08**	**no**						
	93-98	yes	ambivalent	yes	possible	no	no	no
	98-03	yes	ambivalent	no	possible	no	no	no
	03-08	no						
CRO	**93-08**	**no**						
	93-98	no						
	98-03	yes	ambivalent	no	no	no	no	no
	03-08	no						
CZE	**93-08**	**no**						
	93-98	yes	ambivalent	yes	no	no	no	no
	98-03	no						
	03-08	no						
KAZ	**93-08**	**yes**	**positive**	**yes**	**likely**	**no**	**no**	**no**
	93-98	yes	ambivalent	yes	likely	no	no	likely
	98-03	yes	positive	yes	likely	yes	no	no
	03-08	no						
POL	**93-08**	**no**						
	93-98	yes	ambivalent	yes	no	no	no	no
	98-03	yes	ambivalent	no	no	no	yes	no
	03-08	no						
ROM	**93-08**	**yes**	**ambivalent**	**yes**	**possible**	**no**	**no**	**no**
	93-98	yes	ambivalent	no	no	no	yes	no
	98-03	no						
	03-08	yes	ambivalent	yes	possible	no	no	no
RUS	**93-08**	**yes**	**positive**	**yes**	**likely**	**no**	**no**	**no**
	93-98	yes	ambivalent	no	likely	no	no	likely
	98-03	no						
	03-08	yes	ambivalent	yes	likely	no	no	no
SRB	93-08	**yes**	**ambivalent**	**yes**	**possible**	**no**	**no**	**no**
	93-98	yes	ambivalent	no	possible	no	no	no
	98-03	yes	ambivalent	yes	possible	no	no	no
	03-08	yes	ambivalent	yes	possible	no	no	no
SVK	**93-08**	**no**						
	93-98	no						
	98-03	no						
	03-08	no						
TUR	**93-08**	**no**						
	93-98	no						
	98-03	no						
	03-08	no						
UKR	**93-08**	**yes**	**ambivalent**	**yes**	**possible**	**no**	**no**	**no**
	93-98	yes	ambivalent	yes	possible	no	no	likely
	98-03	yes	positive	yes	possible	no	no	no
	03-08	yes	ambivalent	yes	possible	no	no	no

Source: Own compilation, evaluation based on ILO (2014) and World Bank (2014a) data

The model shows some reverse de-industrialization for the first post-socialist five-year period 1993-98 for all three Soviet Union successor states Kazakhstan, Russia and Ukraine.

This corresponds well with the C-type curve of log GDP, the upper part of which was traversed in the respective period (cf. Table 7.3, p. 361).

7.3.2.4 Summative assessment of structural change in East Europe and Central Asia

EU membership was expected to be a key influence on economic development by rendering free market access to the EU market. Therefore, this summative assessment was made for the two sub-groups of East European EU members and non-members. The latter group consists of three USSR successor states and three states striving for EU membership.

The status concerning EU membership is as follows (European Union, 2015):

- Bulgaria: EU member since 1 January 2007
- Croatia: EU member since 1 July 2013
- Czech Republic: EU member since 1 May 2004
- Kazakhstan: none
- Poland: EU member since 1 May 2004
- Romania: EU member since 1 January 2007
- Russia: none
- Serbia: EU candidate since March 2012
- Slovak Republic: EU member since 1 May 2004
- Turkey: EU candidate since 1997
- Ukraine: none

EU members

A summary of the findings for the group of EU members by 2008 is given in Table 7.18. It shows that the economic development of all former Eastern Bloc states was quite homogeneous. After the drawbacks in the course of the collapse of the Soviet Union, all states managed to recover and increase their wealth per capita significantly. An important basis of this recovery was the excellent technology base that allowed to relocate major parts of the value chain of Western firms to these East European countries. Thus, the value of manufactured goods increased significantly and rapidly. In all states, also the productivity was rising fast.

Table 7.18 Wealth (2008) and de-industrialization (East European EU members)

Indicator / Country	BUL	CZE	POL	ROM	SVK
Income per capita	upper-middle	high	high	upper-middle	high
CAGR (%) volatility (total)	very high	medium low	high	very high	high
Scenario	4f	1c	1a	4f	1a
De-industrialization	no	no	no	yes	no
Type				ambivalent	
Shift to KIBS				yes	
Shift to primary products				possible	
Shift to agriculture				no	
Shift to simple services				no	
Reverse type				no	

Source: Own calculation, based on ILO (2014) and World Bank (2014a) data, years 1993-2008
Scenario categories as illustrated in Figure 4.4, p. 101

Concerning technology transfer from West to East Europe, Romania was not as successful as the other countries of that group. Its de-industrialization process stayed over the -1.0 % hurdle set in model 1 while the other countries of the group de-industrialized much slower. Also Romania's trade balance worsened significantly, so despite a relatively relaxed labour market and a positive development of the GDP per capita, Romania's de-industrialization is of the ambivalent type.

When testing the countries' compliance with standard definitions of de-industrialization, the picture rendered by Table 7.19 is obtained.

Table 7.19 Fulfilled de-industrialization definitions (East European EU members)

	Labour content	Employment	Output
abso-lute	**LAB CONT** CAGR < 0.0 %: BUL, ROM	**ME (abs.)** CAGR < 0.0 %: BUL, CZE, ROM	**MO (abs.)** CAGR < 0.0 %: none
rela-tive		**ME (rel.)**: CAGR < 0.0 %: all CAGR ≤ -1.0 %: ROM	**MO (rel.)**: CAGR < 0.0 %: all w/o CZE

Source: Own compilation, 1993-2008 period

This means that:

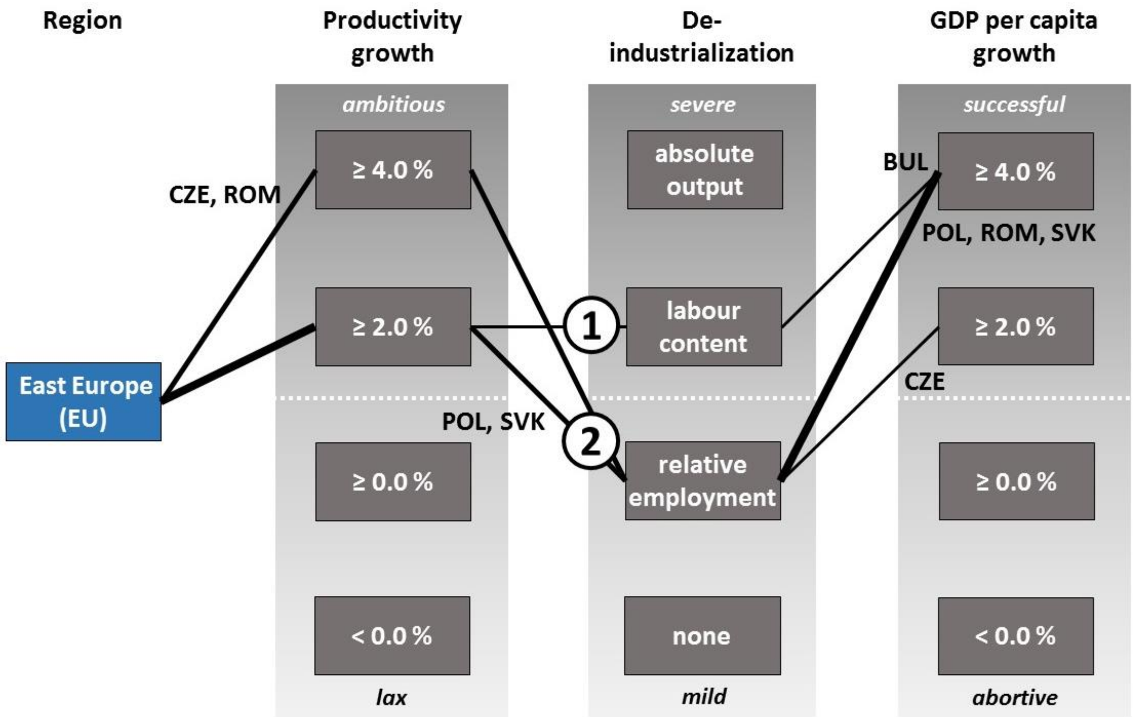
- Due to productivity rises, the labour content (total hours worked in manufacturing) sank in Bulgaria and Romania.

- Additionally fuelled by a shrinking total population, the absolute number of persons employed in manufacturing sank in Bulgaria, the Czech Republic and Romania.
- All countries de-industrialized in terms of relative employment, though at a low pace.
- All countries could increase their output.
- The national economic contribution of manufacturing became smaller in all countries apart from the Czech Republic where it grew.

After the turmoil of the immediate post-communist phase, striving for and finally achieving EU membership put all countries of the group under economic pressure. Especially the Czech Republic, but also Poland and Slovakia seem to have benefitted from their proximity to Germany and Austria. The road to prosperity was harder for Bulgaria and Romania which – apart from homemade political problems – suffered from their larger distance and often mountainous roads to Western markets.

In Figure 7.11, the key features of the de-industrialization process are summarized. After the downturn in the course of the Soviet Union collapse, all East European states underwent an ambitious change process with high or very high productivity rises. Thus, all states (path 2) could rise their output and even their total hours worked, with the sole exception of Bulgaria (path 1). On this basis, the national welfare was enhanced at very high growth rates. Only the Czech Republic had a somewhat little lower CAGR of its GDP p/c, but this is due to the fact that the starting base was already much higher than in the other investigated countries of the group. In absolute terms, the growth was even higher.

The industrial development of East Europe’s EU member states can be characterized as a success story in which the manufacturing sector played an important role. Employment was only reduced to a very little extent while productivity rose fast, so the output could be increased. This was the supply-side foundation to respond to the preferably Western European demand side. The East European EU member states became more and more involved in international value chains, e.g. those of the automotive sector, and took on more and more responsibility also in the high-technology parts of these chains.



Source: Own calculations based on World Bank (2014a) and ILO (2014) data, 1993-2008 period

Figure 7.11 Key features of de-industrialization (East European EU members)

CIS states and EU candidate states

An overview on the industrial development of non-EU states during the investigated period is given in Table 7.20.

Table 7.20 Wealth (2008) and de-industrialization (CIS and EU aspirants)

Indicator / Country	KAZ	RUS	UKR	CRO	SRB	TUR
Income per capita	higher middle	higher middle	lower middle	higher middle	higher middle	higher middle
CAGR (%) volatility (total)	very high	high	very high	high	high	medium high
Scenario	4f	4f	5f	5e	4f	2b
De-industrialization	yes	yes	yes	no	yes	no
Type	positive	positive	ambivalent		ambivalent	
Shift to KIBS	yes	yes	yes		yes	
Shift to primary products	likely	likely	possible		possible	
Shift to agriculture	no	no	no		no	
Shift to simple services	no	no	no		no	
Reverse type	no	no	no		no	

Source: Own calculation, based on ILO (2014) and World Bank (2014a) data, years 1993-2008
Scenario categories as illustrated in Figure 4.4, p. 101

Kazakhstan and Russia de-industrialized but in parallel managed to increase their wealth on the basis of oil and gas exports, positively influencing the trade balance and avoiding unemployment. Thus, a positive de-industrialization process resulted. Ukraine, the third CIS state, did not fare that well, being dependent on Russian oil and gas instead of being able to export. Ukraine remained the by far poorest country in the group.

Croatia and Serbia, two of the successor states of socialist Yugoslavia, pursued different paths to recover economically. While Serbia pushed its productivity and accepted a higher level of de-industrialization, Croatia pursued a more modest course, probably to avoid unemployment. Moreover, it failed to innovate (Švarc, 2006). In this respect, its industrial policies were very much like those of Spain and Italy (cf. Figure 6.2). The national ethics and values in all three countries are very much influenced by the Catholic Church, so that may be the underlying similarity in a Weberian sense (cf. Weber, 1920), a thought that may be extended on a number of Latin-American states (see previous section).

Turkey followed a very unique path of industrial policies. It even reduced its productivity and thus built up new jobs in manufacturing. Thus, it did not industrialize according to any category listed in Table 7.21 apart from relative manufacturing output. The growth in other sectors exceeded the one in manufacturing, so the relative impact of it declined.

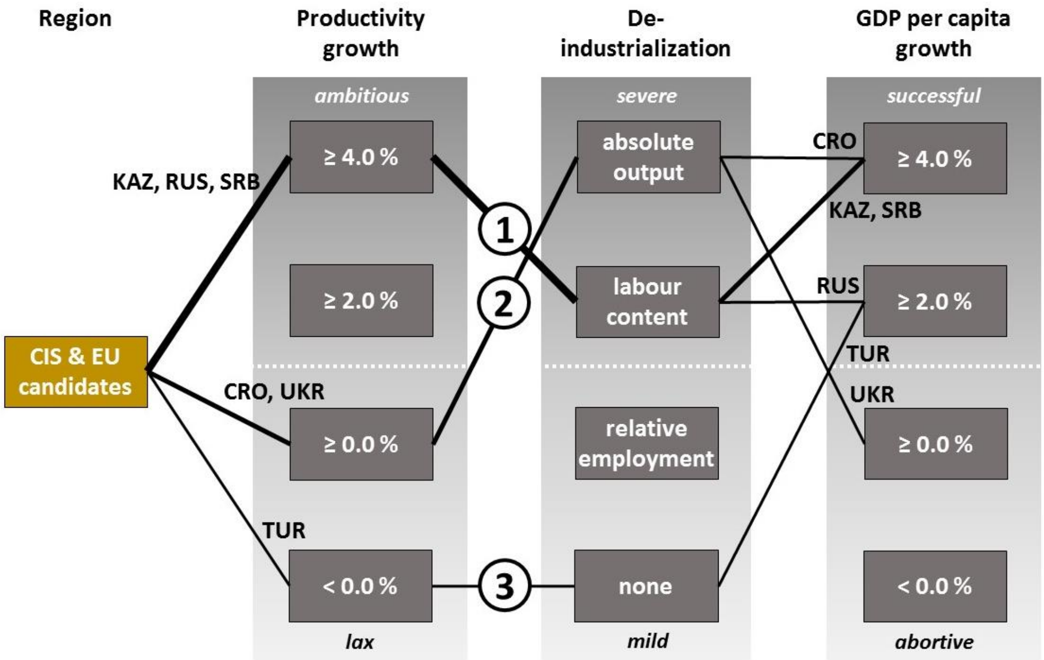
Turkey is the big exception in a group of states de-industrializing in any category apart from output. In this category, only Croatia and the Ukraine were facing losses. While the Ukraine suffered from extreme political swings between Eastern and Western orientation, Croatia paid the bill for its inconsequent industrial policies, resulting in a worsened competitive position of the Croatian manufacturing industry.

Table 7.21 Fulfilled de-industrialization definitions (CIS and EU aspirants)

	Labour content	Employment	Output
abso-lute	**LAB CONT** CAGR < 0.0 %: all w/o TUR	**ME (abs.)** CAGR < 0.0 %: all w/o TUR	**MO (abs.)** CAGR < 0.0 %: CRO, UKR
rela-tive		**ME (rel.)**: CAGR < 0.0 %: all w/o TUR CAGR ≤ -1.0 %: all w/o CRO, TUR	**MO (rel.)**: CAGR < 0.0 %: all

Source: Own compilation, 1993-2008 period

In Figure 7.12, the key findings are summarized by a graphical representation. The very ambitious industrial policies of Russia and Kazakhstan (path 1), involving very high productivity rises, are shown. As pointed out above, they can be related to certain crowding-out effects by the natural oil and gas sector. Serbia followed a comparable path, but on different grounds. After the Yugoslav wars, the country was so much destroyed that its growth can partly be attributed to reconstruction and gradually improved international exchange.



Source: Own calculations based on World Bank (2014a) and ILO (2014) data, 1993-2008 period

Figure 7.12 Key features of de-industrialization (CIS and EU aspirants)

Croatia and the Ukraine were not able to pursue successful industrial policies. Their productivity growth was rather low and their success in terms of output very limited. While Croatia could compensate the industrial failure by other sectors (e.g. tourism), so the national welfare rose fast, the Ukraine remained in the desolate state it already was in shortly after the end of the Soviet Union.

Turkey followed its unique industrial policies (path 3), collecting more and more industrial labour in less efficient industries, so no de-industrialization resulted. Concerning the high population growth rate, the Turkish rulers probably had only limited choice, since in the short term, high unemployment would have resulted from more ambitious progress.

7.3.3 East Asia

This analysis follows the same course as applied in the section on Latin America.

7.3.3.1 Macro-economic comparison

The macro-economic comparison is carried out analogously to that of Latin America. A macro-economic overview is rendered, complemented by an analysis of the volatility of change expressed by the standard deviation of change indicators.

Macro-economic overview

In Table 7.22, a comparative overview on the development of the investigated group of East European and Central Asian states is given. The key topics will be comparatively analysed, following the matrix columns from left to right. Comparisons will be made utilising categories introduced in chapter 6.

Table 7.22 Overview on economic developments (East Asia)

1993	**Pop.**	**GDP p/c**	**Exports**	**Trade**	**Unempl.**	**Agricult.**	**Manufacturing (VA)**		**VA/h**	**Fuel exp.**	**Services**	**KIBS**
2008	*Mn*	*k USD*	*% of GDP*	*% of GDP*	*% of active*	*% of empl.*	*% of empl.*	*bn USD*	*USD*	*% of ME*	*% empl.*	*% empl.*
CHI	1178.4	1.0	14.1	-1.9	2.6	50.8	13.9	392.3	1.9	6.1	28.9	6.3
	1324.7	3.7	35.0	7.7	4.2	35.8	13.0	1606.2	7.1	3.9	41.3	8.9
IND	921.1	0.6	9.7	0.0	4.0	60.7	1.7	82.3	6.5	5.9	23.6	n/a
	1174.7	1.2	23.6	-5.1	4.1	52.0	2.5	220.4	9.1	23.9	26.2	n/a
IDN	188.0	1.9	26.8	3.0	3.2	50.6	11.1	78.7	4.2	31.9	33.7	0.7
	234.2	2.7	29.8	1.1	8.4	40.3	12.2	177.5	6.5	37.1	40.9	1.4
KOR	44.2	10.4	24.5	0.4	2.9	14.7	24.2	113.0	9.2	3.0	51.8	7.1
	48.9	19.4	50.0	0.0	3.2	7.2	16.8	272.1	32.3	11.2	67.9	12.9
MYS	19.7	5.3	78.9	-0.1	4.1	21.1	23.4	27.0	6.8	11.5	46.9	6.5
	27.3	8.6	99.5	22.3	3.3	14.0	18.2	57.5	12.3	20.2	57.4	8.1
THA	58.1	3.0	38.0	-4.2	1.5	56.7	12.3	50.8	5.7	1.6	25.7	1.8
	66.2	4.6	76.4	2.6	1.2	42.5	13.8	105.5	8.2	7.7	38.0	2.9
VNM	69.6	0.5	28.7	-8.8	2.0	76.6	9.5	5.6	0.7	6.2	13.5	0.4
	85.1	1.2	70.3	-13.6	2.4	50.5	14.4	19.2	1.2	21.2	29.3	1.1
93-08	*CAGR (%)*	*CAGR (%)*	*CAGR (%)*	*5 y change*	*5 y change*	*CAGR (%)*	*CAGR (%)*	*CAGR (%)*	*CAGR (%)*	*average*	*CAGR (%)*	*CAGR (%)*
CHI	0.8	15.9	6.2	3.2	0.5	-2.3	-0.5	9.9	9.3	4.8	2.4	2.3
IND	1.6	5.0	6.1	7.5	-1.7	-1.0	2.4	6.8	2.3	6.0	0.7	n/a
IDN	1.5	2.5	0.7	-0.6	1.7	-1.5	0.7	5.6	3.1	31.7	1.3	4.7
KOR	0.7	4.2	4.9	-0.1	0.1	-4.7	-2.4	6.0	8.7	5.9	1.8	4.1
MYS	2.2	3.3	1.6	7.5	-0.3	-2.7	-1.6	5.2	4.0	11.4	1.4	1.5
THA	0.9	3.0	4.8	2.3	-0.1	-1.9	0.8	5.0	2.5	3.7	2.6	3.3
VNM	1.3	5.7	6.2	-1.6	0.1	-2.7	2.8	8.6	3.4	19.3	5.4	7.0

Sources Based on World Bank (2014a) and ILO (2014) data, constant 2010 prices. Own calculation of manufacturing value added per hour on this basis, also involving data on total hours annually worked (OECD, 2015) and total holidays (Wikipedia, 2015).

Population

With China and India, the world's most populated countries are part of the analysis. Each country has more inhabitants than the total of Latin America and Europe & Central Asia. Both are still growing, but China, due to its only-child policy, mainly due to growing life expectancy.

In total, all countries were growing. Some economies like Malaysia, India and Indonesia are growing very fast, at about the same pace as Latin-American countries. Korea and Thailand also grew, but at a modest rate.

In this sample group, no country is really small in population. The smallest (and fastest-growing), Malaysia, has for example more inhabitants than Romania, one of the larger European nations.

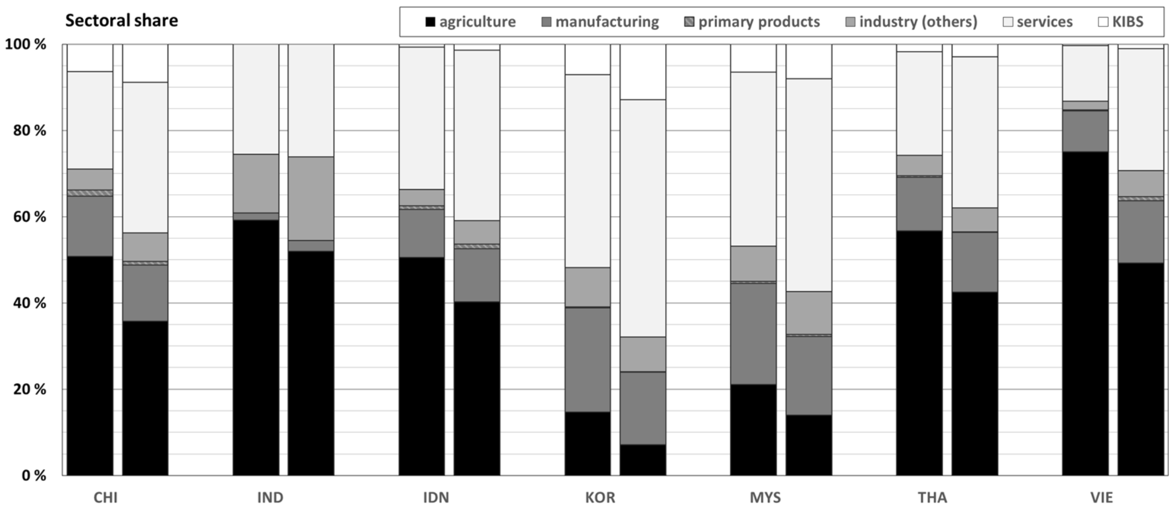
Structural shifts

Apart from Korea and, to a certain extent, Malaysia, all investigated East Asian countries were largely underdeveloped in the early 1990s, with between half and three thirds of their population working in agriculture.

15 years later, the situation has changed sizeably, but not radically. Only Korea, with some deductions also Malaysia, have developed a societal structure comparable to those of Western economies. In both countries, the industrial output grew fast – but still, the manufacturing share in the total workforce diminished. The same phenomenon also holds for China were the giant progress made was mainly achieved on the basis of rising productivity (see below).

Apart from these observations, the course of change is as expected, with growing industry and especially services. Within these, knowledge intensive business services were growing even faster.

Unfortunately, for India, the country which has gained a lot of reputation in IT (i.e. a KIBS sector), the data base is extraordinarily weak. It is well-known that the informal industrial sector is far larger than the official one (Dasgupta & Singh, 2006), so the results revealed in Figure 7.13 are largely distorted.



Source Own graph, based on World Bank (2014a) and ILO (2014) data

Figure 7.13 Sectoral shifts (East Asia), years 1993 and 2008

Unemployment

The situation on the official labour market is rather relaxed apart from Indonesia where unemployment has become an issue by 2008. It has to be kept in mind that not all work is registered, especially in India.

Manufacturing productivity

In 2008, the productivity expressed as average value added per hour has increased in all countries compared to 1993. Especially the growth rate in China was spectacular, taking the country from the second to last place of all investigated countries (just before Vietnam) in regions comparable to the less favoured East European countries like Bulgaria, Serbia and the Ukraine. The other Asian nations also arrived approximately on the level of East European countries, with two remarkable exceptions.

- Despite of certain progress, Vietnam has not managed to catch up to a comparable level but is still lagging far behind.
- On the other end, Korea has been able to raise its productivity very fast, now almost catching up to the investigated group of mature economies. In fact, as also the analysis in section 7.2.2.3 has shown, Korea has to be considered as an economically mature country since several years.

Trade

A view on the trade structures of East Asian countries is rendered in Table 7.23. Also in this group of states, the larger countries in tendency have a smaller share of international trade with export shares below those of the mature average. On the other hand, the smaller East Asian countries have rather high export rates. Most of their merchandise goes to high-income countries like Japan, the USA and the Gulf states.

Table 7.23 Overview on exports (2008), East Asian countries

	CHI	IND	IDN	KOR	MYS	THA	VIE	Mature
Total exports (% of GDP)	35.0	23.6	29.8	50.0	99.5	76.4	70.3	42.5
manufacturing (% of total export)	84.1	42.3	35.6	78.8	47.2	63.1	49.6	60.0
oil and gas (% of total exports)	2.0	11.9	26.7	8.2	16.0	5.5	18.2	4.3
ore and metals (% of total exports)	1.6	4.2	7.3	2.0	1.6	1.1	0.8	3.1
Manufacturing exports (% of GDP)	29.4	10.0	10.6	39.4	46.9	48.2	34.9	25.2
Merchandise exports to high-income countries (%)	78.2	66.0	67.8	53.0	68.5	62.1	71.5	81.1
Trade balance (%)	7.7	-5.1	1.1	0.0	22.3	2.6	-13.6	1.3

Sources Based on World Bank (2014a) and WTO (2014) data, own calculations
Mature: Unweighted mean value of results of sample group of mature countries

A grouping by intervals of 20 % of exports leads to the following results:

- Countries of very high export orientation (export rate 60+ %): Malaysia, Thailand, Vietnam

  According to the CIA (2015), Malaysia “has transformed itself since the 1970s from a producer of raw materials into an emerging multi-sector economy”. Still, a major share of the very high trade surplus is gained by primary products like palm oil, petroleum and natural gas, but the main contribution is from manufactured goods. Some of these involve high technology, e.g. semiconductors and electronic equipment.

  Thailand also sells computers and parts and is a supplier to the automotive industry (CIA, 2015). Compared to Malaysia, primary products play a minor role.

  Vietnam, the poorest and in its economic development latest country of the group, has exported fairly simple manufactured goods like clothes and shoes (i.e. the first products that are manufactured in the industrialization phase) and also rather primitive primary products like crude oil and seafood. The country largely needed to import machinery and equipment (CIA, 2015) to foster its catch-up modernization process.

- Countries of high export orientation (export rate 40-60 %): Korea

  Korea's fast rise from being one of the world's poorest countries to a true high-income country was mainly export-driven. After succeeding in ship-building, Korea introduced cars and more and more electronics to world markets. Due to commodity exports, but also intra-firm trade (common value chains), China is the target of a good quarter of the South-Korean exports (CIA, 2015).

- Countries of medium export orientation (export rate 20-40 %): China, India, Indonesia

  China has clearly based its very positive trade balance on its huge manufacturing sector, clearly dominating over some few raw material exports.

  India, despite of selling manufactured commodities like vehicles, machinery, iron and steel, chemicals, pharmaceutical products and also primary products like petroleum products and precious stones, is a net importer of goods. After it ended its autarkic policies in the early 1990s and opened its markets (CIA, 2015), it became more and more dependent on imports.

  Indonesia's industrial exports were mainly in manufacturing, but petroleum and natural gas also contributed significantly to the country's positive export balance and helped to keep Indonesia on a growth path also in the course of the world economic crisis 2008.

- Countries of low export orientation (< 20 %): n/a

Volatility of change

The East Asian results are listed in Table 7.24. India has developed quite continuously, probably due its large size which makes fast economic deflections rather unlikely. It has to be remembered that the figures must be treated with utmost care due to the poor level of quality of the Indian statistical data.

Korea and Vietnam also followed a pretty straight path. China's somewhat higher total volatility can mainly be attributed to positive effects like the very positive development of its GDP and manufacturing output.

Indonesia's relatively high volatility is partly due to rapid KIBS employment changes in the course of the Asian crisis 1997/98. Partly, it is also attributable to trade balance changes. Price changes on commodity markets flipped the balance rapidly. This effect was even more prominent in the smaller economies Malaysia and Thailand where it contributed to more than half of the total volatility.

Table 7.24 CAGR (%) volatility of de-industrialization indicators (East Asia)

	υ_T	$\sigma_{1,T}$ manu. empl.	$\sigma_{2,T}$ unem-ployment	$\sigma_{3,T}$ trade balance	$\sigma_{4,T}$ GDP p/c	$\sigma_{5,T}$ manu. output	$\sigma_{6,T}$ primary prod. exp.	$\sigma_{7,T}$ agricult. empl.	$\sigma_{8,T}$ KIBS empl.
CHI	**11.35**	3.05	0.43	3.08	1.28	1.84	0.23	1.05	0.39
IND	**11.01**	2.78	0.90	1.61	1.13	2.42	1.01	0.79	0.37
IDN	**18.92**	1.06	1.77	6.32	2.14	1.44	0.16	1.24	4.79
KOR	**13.14**	1.03	2.30	5.26	0.70	1.28	0.56	1.34	0.67
MYS	**18.86**	1.19	0.57	10.59	1.19	2.21	0.39	1.78	0.93
THA	**19.60**	1.10	1.36	10.73	2.29	1.81	0.75	0.57	1.01
VNM	**15.82**	2.98	0.45	5.47	0.57	1.36	0.59	1.05	3.34

Source: Own calculation, based on ILO (2014) and World Bank (2014a) data, 1998-2008 figures.

7.3.3.2 Economic scenarios

The modelled economic scenarios are derived from key indicators (see section 4.2, p. 95). Accordingly, the key indicators and specific developments in certain countries will be high-lighted before turning to the scenario analysis.

Key indicators

Generally speaking, East Asia is a region of industrial growth. Almost all indicators point into that direction, especially output and productivity which have developed positively in all investigated countries (Table 7.25). The very few exceptions from the industrialization diagnosis will be highlighted in the following.

Table 7.25 Overview on de-industrialization indicators (East Asia)

Indicator		CHI	IND*	IDN	KOR	MYS	THA	VNM	Mature
Empl. (%)	1993	13.9	1.7	11.1	24.2	23.4	12.3	9.5	18.0
	2008	13.0	2.5	12.2	16.8	18.2	13.8	14.4	13.9
	Rank 93→08	3→5	7→7	5→6	1→2	2→1	4→4	6→3	
1993-2008 CAGR (%)	Empl. (rel.)	-0.5	2.4	0.7	-2.4	-1.6	0.8	2.8	-1.8
	Empl. (abs.)	0.5	4.3	2.4	-1.7	1.1	2.2	5.2	-0.8
	Output	9.9	6.8	5.6	6.0	5.2	5.0	8.6	1.1
	Output/cap.	9.3	2.4	3.1	7.9	4.0	2.8	3.3	1.7
	Productivity	9.3	2.3	3.1	8.7	4.0	2.5	3.4	2.0
	Workload	0.0	0.1	0.0	-0.7	0.0	0.3	-0.1	-0.1
	Labour	0.5	4.5	2.5	-2.7	1.2	2.5	5.3	-0.9

Sources: Own calculation, evaluation based on ILO (2014) and World Bank (2014a) data. Mean value of mature states based on EU KLEMS (2012) data and own calculations, constant 2010 prices, mean value not weighted.

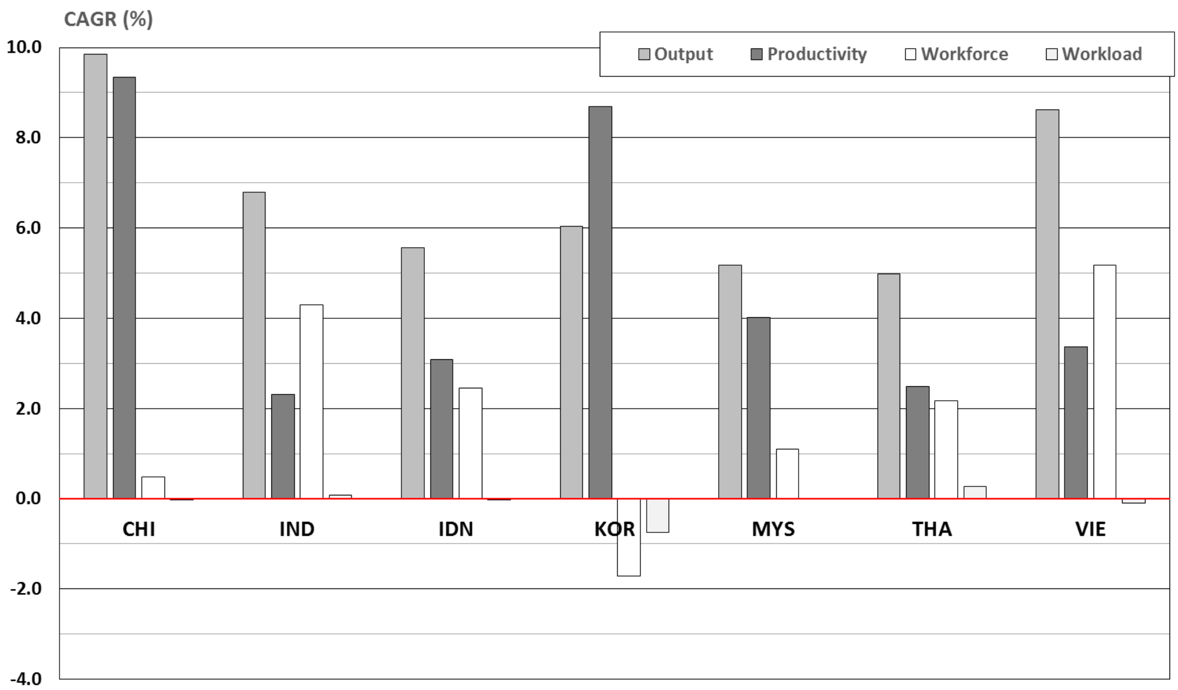
* Employees officially registered

Korea de-industrialized heavily in terms of manufacturing employment, though at the same time it could raise its output significantly on the basis of its impressively improved productivity. Despite of the reduced workload per worker and growing output, the total hours of work were diminished.

The other (small) exception is Malaysia which de-industrialized concerning relative manufacturing employment because of a higher growth rate of the total labour market compared to absolute sectoral growth.

The key results are graphically displayed in Figure 7.14. Please note the different scale of the y-axis compared to the other regions. It was necessary because of the extreme growth of productivity and output in several countries.

Again, it becomes clear that only Korea is an example for de-industrialization in terms of workforce reduction. The working conditions (workload) became easier in Korea and remained very much unaltered in all other countries.



Source: Own calculations, based on based on ILO (2014) and World Bank (2014a) data, CAGR 1993-2008,

Figure 7.14 Indicators of de-industrialization (East Asia)

Scenarios

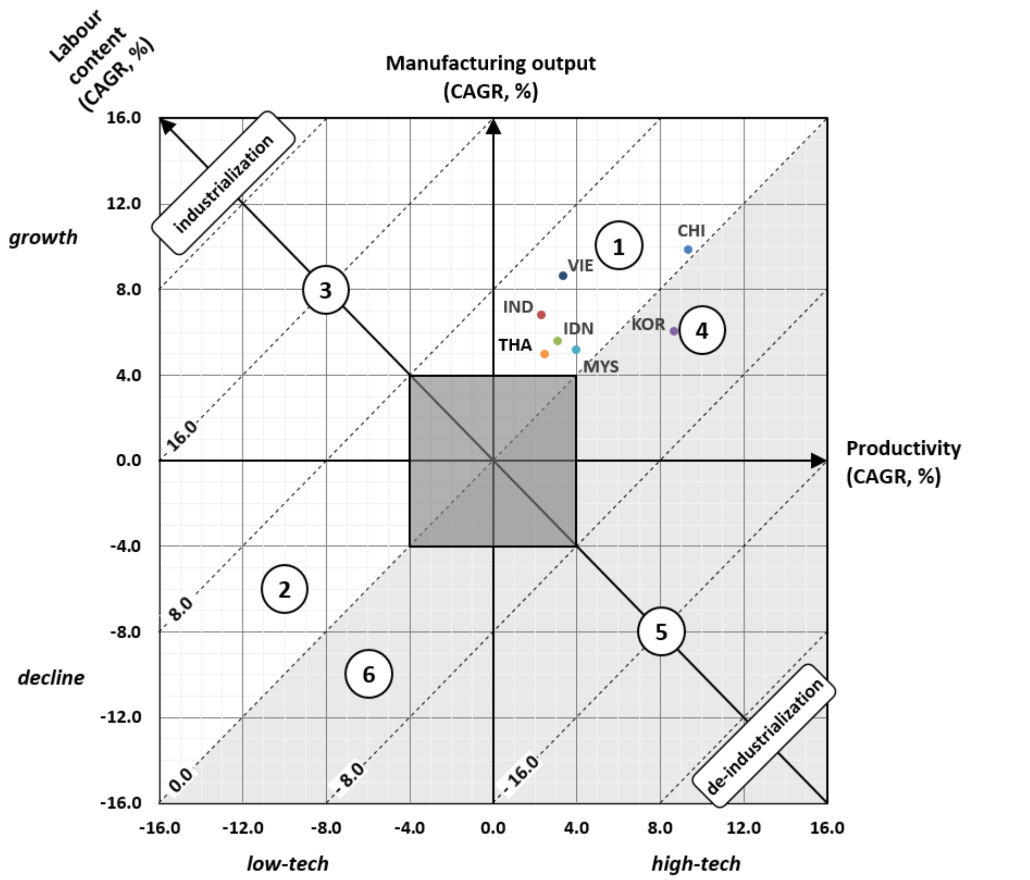
Resulting from the key indicators, the scenarios were as shown in Table 7.26. Apart from Korea, all East Asian states were industrializing, if total labour is taken as the key indicator. While the individual workload is reduced in the 1a-scenarion, it rose in the 1b scenario. As outlined above, the differences are rather marginal.

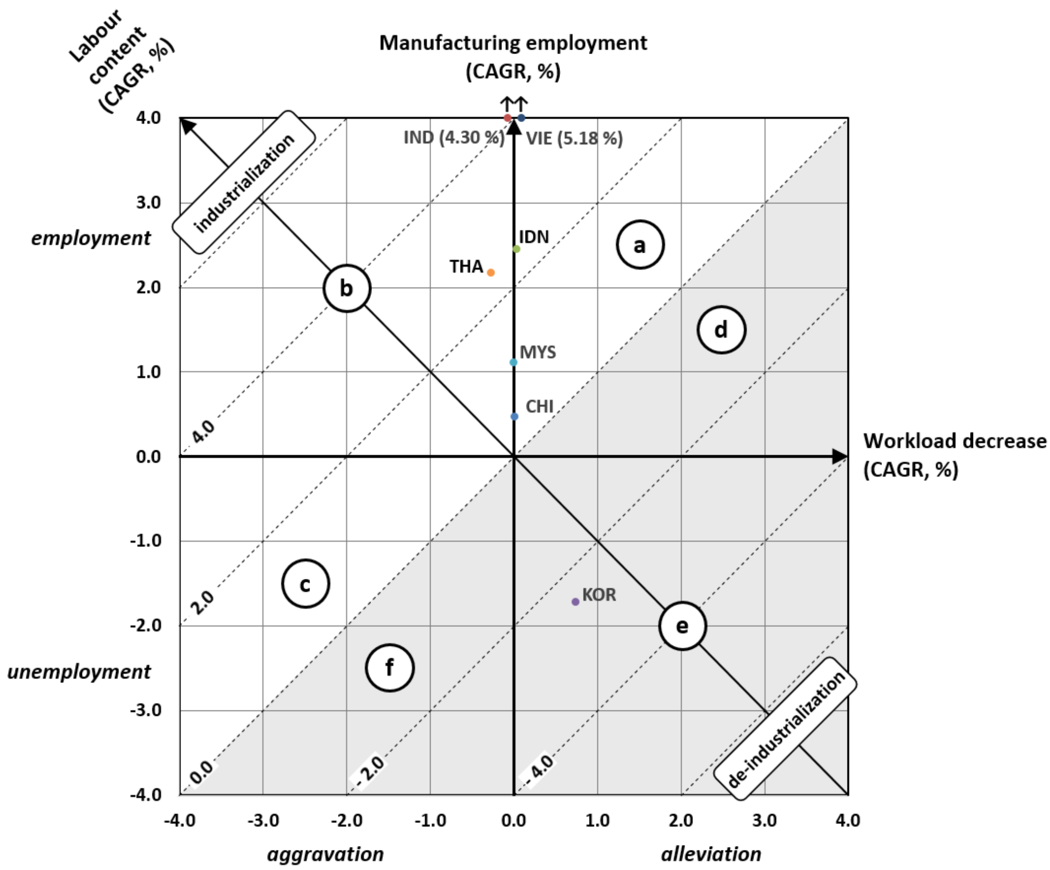
Table 7.26: 15-year scenarios of de-industrialization (East-Asia)

Country	CHI	IND	IDN	KOR	MYS	THA	VNM
Scenario	1a	1b	1a	4e	1b	1b	1a

Source: Own calculations, based on ILO (2014) and World Bank (2014a) data, 1993-2008

Korea followed the productive and healthy 4e path of de-industrialization, with producti-vity rises being partly transformed into reduced employee workload. Korea has developed into a mature economy, so its development is by no means to be classified as ‘premature’ de-industrialization. Korea is a fine example for a country that has followed the classical course of structural development from agricultural over industrial to service society. Due to rising efficiency in the first two sectors, the output of these was continuously growing despite of reductions in the respective numbers of employees.





Source: Own graph, based on Word Bank (2014a) and ILO (2014) data, 1993-2008

Figure 7.15 Scenarios for East Asia: demand/supply side (up/down)

7.3.3.3 Applied eclectic model of de-industrialization

As shown in the previous section, all investigated East Asian states raised both manufacturing output and productivity. Only in South Korea, the growth rate of productivity exceeded the growth of output, so the manufacturing workforce became reduced.

The eclectic model is not based upon this macro-economic view but on the role that manufacturing plays in a sociological sense, i.e. the share of manufacturing in the total workforce (relative employment). Since all East Asian states were growing quite strongly, any absolute workforce decline means relative de-industrialization; South Korea is a perfect example for this (Table 7.27).

Another possibility for de-industrialization in terms of a shrinking share of manufacturing employment is given when the manufacturing workforce grows at a certain (rather limited) pace, but the total workforce grows much faster due to population growth and/or a higher labour participation rate. An example for this is Malaysia where the manufacturing sector shrank relatively between 1993 and 1998 and also between 2003 and 2008; it also shrank between 1998 and 2003, but at a pace not reaching the hurdle rate of -1.0 %.

In all other countries apart from Indonesia, there was one five-year period of relative de-industrialization, but in the long run (15 years), the countries did not de-industrialize apart from Korea and Malaysia. In all of these cases, there was a corresponding shift to knowledge-intensive business services.

It may be concluded that de-industrialization happened in the most advanced countries of the sample group. Both cases are rather regular, i.e. they fit into the standard structural path and the peak is at significant levels of both manufacturing employment and average income per capita.

Yet, the tipping point (cf. Table 7.3, p. 361) is in both cases lower than the average of Western economies (cf. Figure 5.5, p. 118). An explanation might be that the more advanced East Asian economies adapted very fast (though not fully) to Western standards and productivity, so despite of continued industrial growth in terms of output, the relative employment could not rise. Additionally, there were shifts of simpler types of production to neighbouring countries with lower wages that were ready to take over.

Table 7.27 De-industrialization of East Asian states (eclectic model)

Country	Year	De-industrialization	Type	Shift to KIBS	Shift to primary products	Shift to agriculture	Shift to simple services	Reverse type
CHI	**93-08**	**no**						
	93-98	yes	positive	yes	no	no	no	no
	98-03	no						
	03-08	no						
IND	**93-08**	**no**						
	93-98	no						
	98-03	yes	positive	n/a	no	no	n/a	no
	03-08	no						
IDN	**93-08**	**no**						
	93-98	no						
	98-03	no						
	03-08	no						
KOR	**93-08**	**yes**	**positive**	**yes**	**no**	**no**	**no**	**no**
	93-98	yes	ambivalent	yes	no	no	no	no
	98-03	no						
	03-08	yes	ambivalent	yes	no	no	no	no
MYS	**93-08**	**yes**	**positive**	**yes**	**no**	**no**	**no**	**no**
	93-98	yes	positive	yes	no	no	no	no
	98-03	no						
	03-08	yes	positive	yes	possible	no	no	no
THA	**93-08**	**no**						
	93-98	no						
	98-03	no						
	03-08	yes	ambivalent	yes	no	no	no	no
VNM	**93-08**	**no**						
	93-98	yes	positive	yes	possible	no	no	no
	98-03	no						
	03-08	no						

Source: Own compilation, evaluation based on ILO (2014) and World Bank (2014a) data

In fact, the findings for the tipping of Korea and Malaysia are a logical continuation of the findings for Western economies tipping in the 1970s (cf. section 5.2.2.3, pp. 118) which said that industrial late movers do not reach the extreme peaks of manufacturing employment of their predecessors due to constantly rising sector productivity. Due to increased international competition, also the related GDP per capita will be lower. Catch-up modernization always goes in line with a low-cost proposition of manufacturers, so the corresponding value created cannot be as high as in the developed country transferring the technology.

7.3.3.4 Summative assessment of structural change in East Asia

East Asian states started catch-up modernization in recent decades. Korea has meanwhile managed to become a highly modern state with an export-oriented industry. Its development is an exemplar of a classical structural development path. Meanwhile, it is de-industrializing in the sociological sense, i.e. the share of manufacturing employment is shrinking (Table 7.28).

Due to extreme improvements in productivity, the total hours worked (labour content) and the total manufacturing employment were reduced likewise while both output indicators were still growing.

Table 7.28 Wealth (2008) and de-industrialization (East Asia)

Indicator / Country	CHI	IND*	IDN	KOR	MYS	THA	VNM
Income per capita	higher middle	lower middle	lower middle	high	higher middle	higher middle	lower middle
CAGR (%) volatility (total)	medium low	medium low	high	medium high	high	high	medium high
Scenarios	1a	1b	1a	4e	1b	1b	1a
De-industrialization	no	no	no	yes	yes	no	no
Type				positive	positive		
Shift to KIBS				yes	yes		
Shift to primary products				no	no		
Shift to agriculture				no	no		
Shift to simple services				no	no		
Reverse type				no	no		

Source: Own calculation, based on ILO (2014) and World Bank (2014a) data, years 1993-2008
Scenario categories as illustrated in Figure 4.4, p. 101
* limited availability of data

Even the contribution of manufacturing to the total output still grew despite of the growth in KIBS. Yet, the national economy of Malaysia became less influenced by manufacturing, as the reduced relative manufacturing output shows (Table 7.29).

Table 7.29 Fulfilled definitions of de-industrialization (East Asia)

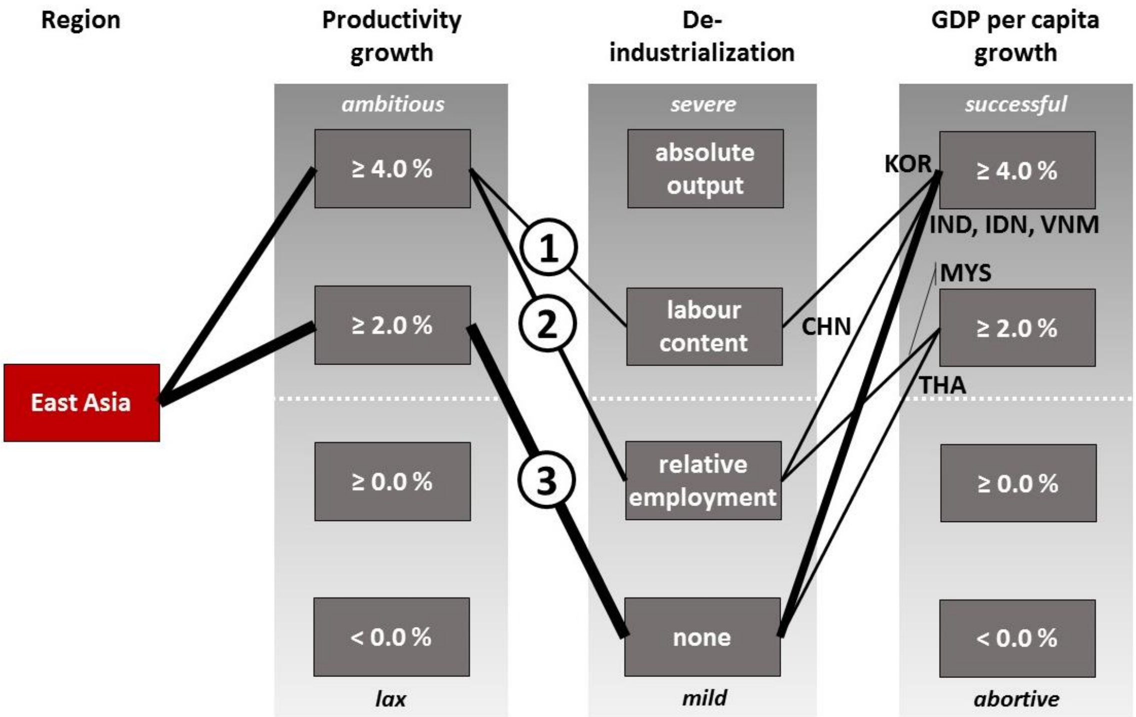
	Labour content	Employment	Output
abso-lute	**LAB CONT** CAGR < 0.0 %: KOR	**ME (abs.)** CAGR < 0.0 %: KOR	**MO (abs.)** CAGR < 0.0 %: none
rela-tive		**ME (rel.)**: CAGR < 0.0 %: CHI, KOR, MYS CAGR ≤ -1.0 %: KOR, MYS	**MO (rel.)**: CAGR < 0.0 %: CHI, MYS

Source: Own compilation, 1993-2008 period

China became the workshop of the world, but without increasing its share in manufacturing employment and in manufacturing output. The Chinese progress was achieved on the basis of enormous productivity rises, i.e. learning on the basis of technology transfer.

The other four states of the group showed no signs of de-industrialization in any of the categories over the 15-year period and are still amidst the catch-up modernization process.

Graphically, the key features of the change process are sketched in Figure 7.16. It shows the singular role of Korea (path 1), the specific ways of China and Malaysia which, like Korea, booked enormous productivity rises (path 2) and the successful path of catch-up industrialization that the other East Asian states followed (path 3).



Source: Own calculations based on World Bank (2014a) and ILO (2014) data, 1993-2008 period

Figure 7.16 Key features of de-industrialization (East Asia)

Summarizing the findings, all East Asian states were able to successfully pursue industrialization policies that fostered high or very high productivity rises and helped to increase the public welfare at high or even very high growth rates.

7.4 Comparative evaluation of 'premature' de-industrialization

The conclusive evaluation will be carried out in two sections. First, the regions will be compared by utilising the key indicators introduced in the previous chapters and applying available descriptions of varieties of capitalism. Second, the occurrence of 'premature' de-industrialization phenomena described in the literature summarized in chapter 2, especially the descriptions of Palma (2005) and Dasgupta & Singh (2006), will be comprehensively evaluated.

7.4.1 Comparison of regions

For a comparative analysis of regions, first, the key findings from the regional analyses were combined (Table 7.30) and put into relation (section 7.4.1.1). In a second stream of comparative analysis, available descriptions of varieties of capitalism (cf. section 2.2.2.3) were applied (section 7.4.1.2).

Table 7.30 Cross-regional comparison of key features, emerging economies

Changes	Range	Latin America	East Europe (EU)	CIS, EU aspirants	East Asia
Productivity	≥ 4 %	14%	40%	50%	43%
	≥ 2 %	14%	60%	0%	57%
	≥ 0 %	14%	0%	33%	0%
	< 0 %	57%	0%	17%	0%
CAGR (%) volatility	very high	29%	40%	33%	0%
	high	0%	40%	50%	43%
	medium high	71%	0%	17%	29%
	medium low	0%	20%	0%	29%
	low	0%	0%	0%	0%
De-industrialization	absolute output	14%	0%	33%	0%
	labour content	29%	20%	50%	13%
	rel. employment	29%	80%	0%	25%
	none	29%	0%	17%	63%
GDP p/c	≥ 4 %	0%	80%	50%	71%
	≥ 2 %	29%	20%	33%	29%
	≥ 0 %	71%	0%	17%	0%

Source: Own calculation, evaluation based on ILO (2014) and World Bank (2014a) data. The respective category most represented is highlighted by grey shading. Data for the 1993-2008 period.

7.4.1.1 Cross-regional economic comparison

Table 7.30 was compiled by putting the key findings from the previous chapters together. The number of countries falling within the respective categories was transferred into percentage values to ensure comparability.

From the results it becomes clear that there were large differences between the industrial policies and resulting economic development of the investigated regions:

- While the clear majority of states in East Europe and Asia pushed the productivity of their industries, this was not the case for most Latin-American states who even had lost productivity in 2008, compared to the 1993 status.

  Fear of job losses dominated in most Latin-American states over trying to maximize the international competitive position as most states in East Europe and Asia did.

  Latin-American economic thought seems to be rather self-content than with a view on international markets. This fits well to the fact that at average, Latin-American states are far less exposed to international trade than those of the other regions.

- In most states, the volatility of change was much higher than in Western mature economies.

  Even if change was for the better in most cases, it brought about severe unrest and the necessity to adapt rapidly to the new conditions of life.

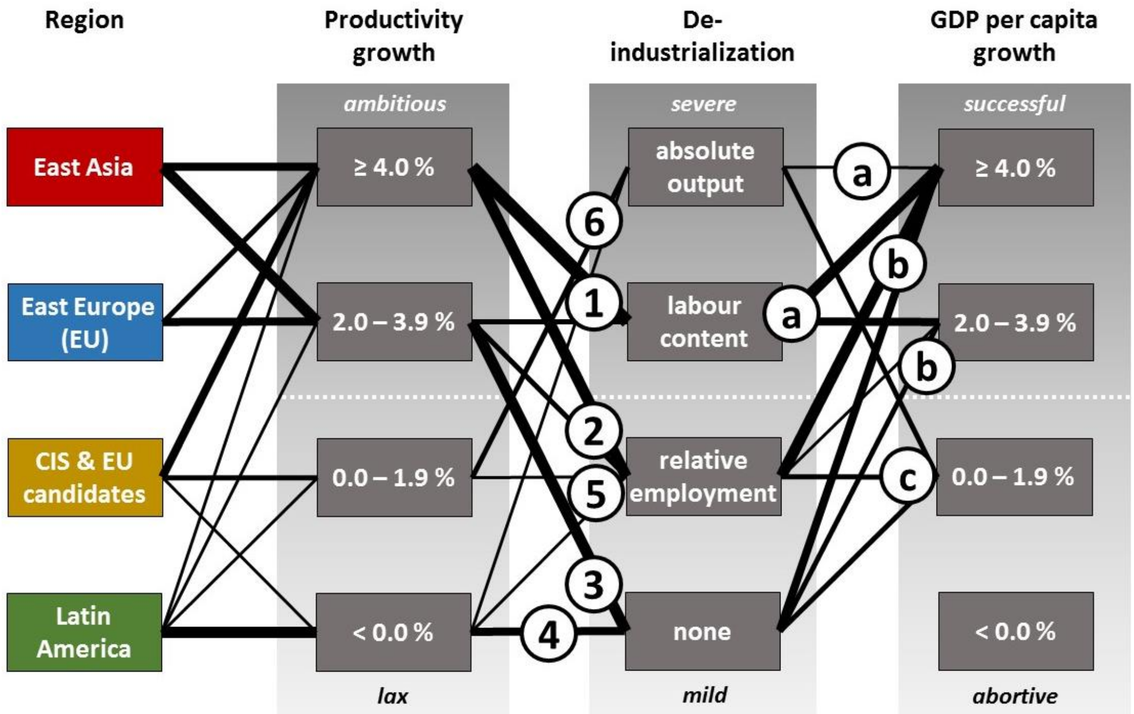
- The resulting industrial development and de-industrialization phenomena were quite different from region to region, with exceptions from average in each of these.

  In East Asia, industry was built up, so the economic development was largely related to the success of the industry. In East Europe’s EU member states, there was some very limited relative shrinking of the industry, but at rising output. Both regions fared very well, with high GDP p/c rises clearly being the predominant scenario.

  Latin America limited its de-industrialization by its very low productivity rises or even losses. Very little increases of the average wealth per capita were the logical consequence of such powerless efforts. Argentina and Chile pursued a different agenda. Their strict, if not neo-liberal policies assured high productivity rises and improvements in the national income per capita but also boosted the volatility of the change process.

The CIS and EU aspirants group shows a mixed picture. Most countries were tough modernizers which were pushing their productivity while accepting grave signs of de-industrialization. Some were able to boost their national income on primary products (Russia, Kazakhstan) or services (Croatia). The Ukraine could not keep pace with these countries. It arrived miserably and suffered from an eroded industrial base.

The different paths of regional development are further illustrated by Figure 7.17. This graph combines the findings of the regional analyses (Figure 7.7, Figure 7.11, Figure 7.12, Figure 7.16). Individual traceability of countries is not directly given; traces need to be followed in the regional graphs. In return, certain typical paths of industrial development can be identified which will be introduced in the following.



Source: Own calculations based on World Bank (2014a) and ILO (2014) data, 1993-2008 period

Figure 7.17 Key features of de-industrialization process (emerging economies)

The following paths of development can be distinguished:

- Ambitious industrializers (indicated paths 2b and 3b)

  These countries achieved an at least medium productivity growth and yet increased their total hours worked (labour content) and output.

All Asian states apart from Korea and all East European EU member states apart from Bulgaria fall into this category.

- Ambitious de-industrializers (path 1a)

  Countries that pushed their productivity regardless of job losses in the manufacturing industry. Crowding out by potentially more attractive industries (e.g. oil and gas, KIBS) often is in play.

  Argentina and Chile, Bulgaria, Russia and Kazakhstan, Korea fall into this category.

- Pre-cautious winners (paths 4b and 6a)

  Pursuing industrial policies avoiding rises in productivity is often a sign of fear of unemployment. There is only one state that could raise its income per capita despite of not being able to increase its manufacturing productivity (Turkey) and one state that was very successful despite of a low productivity growth (Croatia). In both cases, the increased wealth was generated in other sectors, especially services (tourism).

  This group is constituted by Croatia and Turkey.

- Pre-cautious losers (path 5c)

  These countries tried to avoid job losses in the industry at the expense of little productivity rises. As a result, the total economic growth was hampered, as the relatively low figures of GDP p/c growth reveal.

  These policies were exclusively (and almost ubiquitarily) pursued in Latin America. Brazil, Colombia, Mexico and Venezuela fall into this category.

- Industrial losers (path 6c)

  These countries could not achieve sufficient productivity rises and lost in competitiveness, so immediate industrial losses resulted which also had a negative influence on the GDP per capita growth which could not be compensated by other sectors.

  Ecuador and the Ukraine fall into this category.

7.4.1.2 Varieties of Capitalism in emerging states

For checking the path dependency associated with the VoC approach, the identified courses of development from the previous section were put into relation with the identified types of capitalism as summarized in Table 2.11, p. 50. The results are presented in Table 7.31.

Table 7.31 Development paths and types of capitalism (emerging countries)

Path	Country	Region	Affiliation	VoC
Ambitious industrializers	Czech Republic	EE & C. Asia	EU	- | **DME-1**
	Poland	EE & C. Asia	EU	- | **DME-1**
	Romania	EE & C. Asia	EU	- | **DME-2**
	Serbia	EE & C. Asia	EU FTA	- | **DME-2**
	Slovak Republic	EE & C. Asia	EU	- | **DME-1**
	China	East Asia		- | **SME-As1**
	India	East Asia		- | **SME-As1**
	Indonesia	East Asia	ASEAN	- | - **[HME]-As3**
	Malaysia	East Asia	ASEAN	- | - **[HME]-As3**
	Thailand	East Asia	ASEAN	- | - **[HME]-As3**
	Vietnam	East Asia	ASEAN	- | - **[SME]-As1**
Ambitious de-industrializers	Argentina	Lat. Am.	Mercosur	**HME-C1** | -
	Chile	Lat. Am.	Mercosur [1)]	**HME-C1** | -
	Bulgaria	EE & C. Asia	EU	- | **DME-2**
	Kazakhstan	EE & C. Asia	CIS	- | **SME**
	Russian Federation	EE & C. Asia	CIS	- | **SME**
	Korea, Rep.	East Asia	EU FTA [2)]	- | - **[SME]-As4**
Pre-cautious winners	Croatia	EE & C. Asia	EU	- | **DME-2**
	Turkey	EE & C. Asia	EU FTA	- | - **[HME**/SME**]**
Pre-cautious losers	Brazil	Lat. Am.	Mercosur	**HME-C2** | -
	Colombia	Lat. Am.	Mercosur [1)]	**HME-C3** | -
	Mexico	Lat. Am.	NAFTA	HME-C2 | - **[DME-1]**
	Venezuela	Lat. Am.	Mercosur	**HME-C3** | -
Industrial losers	Ecuador	Lat. Am.	Mercosur [1)]	**HME-C3** | -
	Ukraine	EE & C. Asia	CIS	- | **SME**

Source: Own compilation based on World Bank (2014a) data for 2008, affiliations as of 2012
Typologies: Schneider (2009) - Martínez Franzoni (2008) | Nölke (2010) - Witt & Redding (2013)
In bold: most relevant classification (own assessment)
In squared brackets: own assessment

When reading the table from top to bottom, it becomes clear that a significant number of East European and East Asian countries managed to increase their wealth on the basis of an expansion of their manufacturing activities. Their value proposition is based on their low-labour costs, allowing them to succeed in the export of consumer and capital goods and to participate in the middle of international value chains of MNCs. While the relatively small East European states have benefitted economically from their EU integration, they have at the same time become dependent on decisions in MNC headquarters. The business structures in Asia are largely different (cf. section 2.2.2.3), with China playing a key role by its economic power, strong leadership and also business links to South-East Asian nations supported by ethnicity.

The second group, though with alike economic results, is of a very heterogeneous nature. It comprises successful CIS exporters of primary products, the only Latin-American countries striving for higher productivity united by an institutional cluster of welfare policies, a EU member of relatively large distance to Western European markets, so its development is somewhat hampered, and the most successful Asian state in terms of innovation in recent years, Korea. In half of that group, the state plays a key role in industrial policies.

The pre-cautious group is characterized by very limited rises of productivity in order to avoid sectoral unemployment in the short term. In the two Mediterranean cases, these shortfalls could be compensated by other sectors, in all Latin-American cases, the policies failed. Inefficient institutions took their toll. All South American states, especially Venezuela, could not benefit from their abundance in natural resources. In Mexico, the weak bargaining position compared to MNCs, often from their US neighbour, added to that development.

The miserable group is formed by Ecuador and Ukraine, both states with ill-led policies and unfavourable institutions, located at the periphery of their respective regions.

As a conclusion from the analysis, there is a pretty clear picture at the top and at the bottom of the table and a mixed picture in the middle:

- The top is dominated by East European DBEs and Asian countries with their specific intertwinement of state and family-owned businesses.
- The bottom is constituted by encrusted Latin-American countries and a desolate Ukraine, grated by its Western and Eastern neighbours and corrupt politicians of the one or the other affiliation.
- The midfield consists of a technological star (South Korea) and a number of states struggling hard to improve their economic standards in very different ways.

7.4.2 De-industrialization phenomena in emerging states

The industrial policies and forms of de-industrialization were analysed in the previous section. In addition to that, a conclusive evaluation of the occurrence of de-industrialization phenomena described in literature is given here. It draws from the findings of the eclectic model of de-industrialization and the macro-economic analysis of section 7.2.

7.4.2.1 Shift to KIBS

As shown in the macro-economic overview of all regions, knowledge-intensive business services grew in all states apart from Venezuela. Accordingly, in all cases but the Venezuelan where a sufficient reduction of relative manufacturing employment was identified by the eclectic model (CAGR <= -1 %), a shift to KIBS was diagnosed.

In Venezuela, this shift was inhibited by crowding out effects of the oil industry which did not only have effects on the manufacturing sector, but also on KIBS as another possible sector for investments. Thus, the reduced Venezuelan workforce was attracted by sectors requiring little investment, quite often simple services.

7.4.2.2 Shift to primary products

Among the emerging states, relying on the production of primary products rather than on manufacturing is a strategy applied by several states who have an abundance in raw materials. Examples with respective industries and trade are (CIA, 2015):

- Latin America: Venezuela (oil), Ecuador (petroleum), Chile (copper, lithium, other minerals)
- CIS: Kazakhstan (oil, coal, iron ore, minerals), Russia (oil, gas)

With the exception of Ecuador, these states pursued ambitious (at least in comparison to its neighbouring countries in the case of Venezuela) industrial policies. They were boosting their productivity, possibly because their manufacturing sector was in sharp domestic competition with their primary products sector.

7.4.2.3 Reverse de-industrialization

Reverse de-industrialization was a commonplace phenomenon in East European countries after the mid-1980s. It could be testified in those cases where sufficient data was available, e.g. for Bulgaria and Romania. In the case of Serbia, reverse de-industrialization was aggravated by the destructions in the course of the Yugoslav wars.

Certain reverse phenomena were also diagnosed for the first five years under close examination (1993-98) in the CIS countries Kazakhstan, Russia and the Ukraine.

Due to temporal shrinking, also the Venezuelan manufacturing sector showed signs of reverse de-industrialization in the middle five-year period, but these can rather be quantified as symptoms of an economic downturn than as symptoms of structural change.

7.4.2.4 Backshift to agriculture

Despite of no backshift diagnosis, it has to be remarked that the relative sectoral employment in agriculture grew in one country: Ecuador. This again illustrates the relative backwardness of Ecuador and the backward orientation of its administration.

7.4.3 The influence of national culture

For evaluating the influence of national culture on the manufacturing sector, Hofstede's cultural dimensions were utilized (cf. section 6.3.4, p. 339). The results for the investigated sample of emerging countries are summarized in Table 7.32.

Regional specifics of data

The results within the group of emerging countries are very homogeneous, i.e. indifferent concerning certain aspects regardless of the investigated region:

- While in mature countries, most countries had rather little PDI values, the PDI of emerging countries is high with only very few exceptions (Argentina = 49, Czech Republic = 57).
- IDV is low with only very few East European exceptions (Czech and Slovak Republic, Poland).
- In all regions, there are rather feminine or masculine societies. With Slovakia (MAS = 100) and Ukraine (MAS = 27), the extremes even are neighbouring countries.

For some indicators, regional differences are very large.

- UAI is generally very high throughout Latin America and East Europe and Central Asia while it is low in East Asian countries apart from Korea and Thailand. It is very low in China.
- LTO scores are generally low in Latin America and mostly high in East Europe and East Asia, with South Korea at the top (LTO = 100).
- All Latin-American countries score very high in indulgence (Venezuela at extreme IND = 100) while countries of both other regions score low (Malaysia = 57 is the only country of these above 50).

Table 7.32 Data of Hofstede's cultural dimensions (emerging countries)

Latin America	ARG	BRA	CHL	COL	ECU	MEX	VEN	mean*
PDI	49	69	63	67	78	81	81	**68**
IDV	46	38	23	13	8	30	12	**27**
MAS	56	49	28	64	63	69	73	**57**
UAI	86	76	86	80	67	82	76	**81**
LTO	20	44	31	13	n/a	24	16	**25**
IND	62	59	68	83	n/a	97	100	**78**

East Europe, Central Asia	BUL	CRO	CZE	KAZ	POL	ROM	RUS	SRB	SVK	TUR	UKR	mean	Premature average
PDI	70	73	57	n/a	68	90	93	86	100	66	92	**80**	**75**
IDV	30	33	58	n/a	60	30	39	25	52	37	25	**39**	**31**
MAS	40	40	57	n/a	64	42	36	43	100	45	27	**49**	**51**
UAI	85	80	74	n/a	93	90	95	92	51	85	95	**84**	**72**
LTO	69	58	70	n/a	38	52	81	52	77	46	55	**60**	**51**
IND	16	33	29	n/a	29	20	20	28	28	49	18	**27**	**43**

East Asia	CHI	IND	IDN	KOR	MYS	THA	VIE	mean
PDI	80	77	78	60	100	64	70	**76**
IDV	20	48	14	18	26	20	20	**24**
MAS	66	56	46	39	50	34	40	**47**
UAI	30	40	48	85	36	64	30	**48**
LTO	87	51	62	100	41	32	57	**61**
IND	24	26	38	29	57	45	35	**36**

Source: Hofstede, Hofstede, & Minkov (2010); * w/o Ecuador

Correlation analysis

Like for mature economies, a correlation analysis of economic indicators versus cultural dimensions was performed for emerging countries. The results are given in Table 7.33.

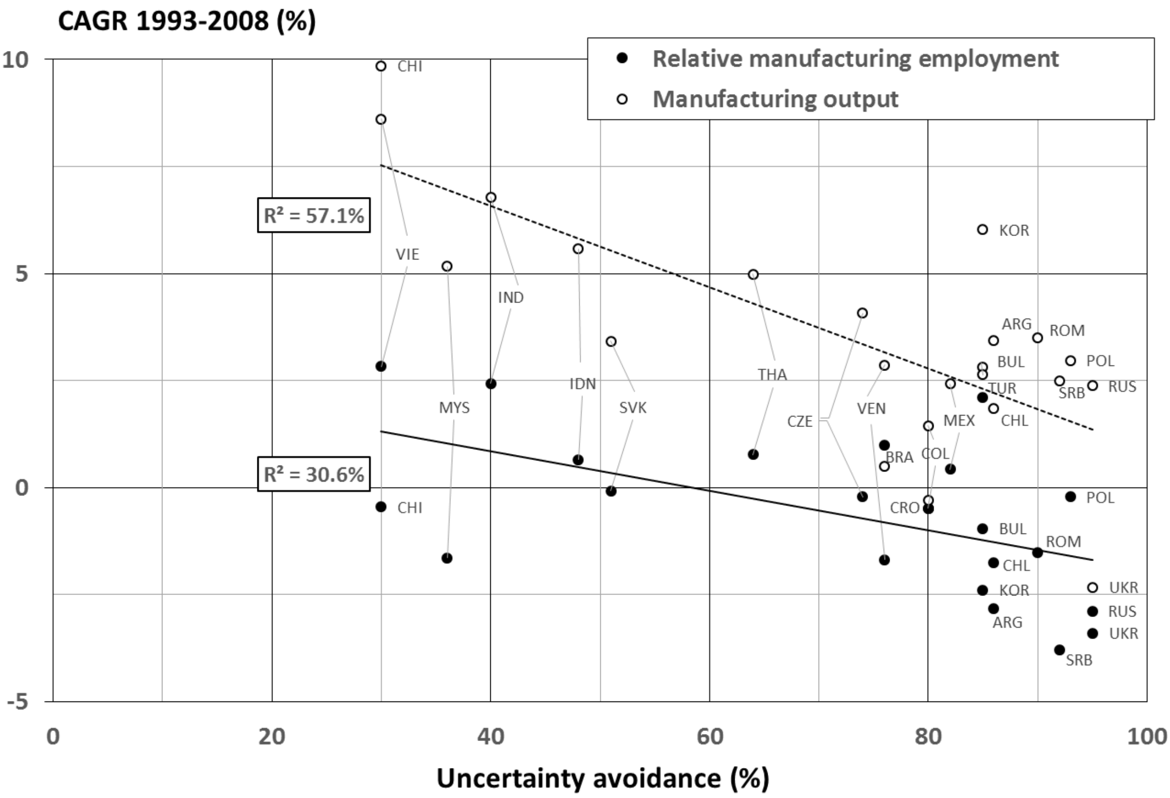
Table 7.33 Correlation of economic and cultural indicators (emerging countries)

R² (%), all premature countries	**PDI**	**IDV**	**MAS**	**UAI**	**LTO**	**IND**
De-industrialization CAGR (93-08)						
ME rel.	4.6	1.9	4.1	30.6	0.5	0.6
ME abs.	5.5	0.6	8.2	35.2	11.3	18.5
MO abs.	0.7	1.5	3.3	57.1	11.6	3.2
MO/cap.	1.5	0.3	0.5	4.2	38.5	29.4
productivity	1.0	0.4	0.2	4.4	38.6	26.7
workload	1.5	0.3	2.8	1.2	3.8	0.1
LAB CONT	4.2	0.4	6.3	32.1	12.2	16.2
Indicators (2008)						
ME rel. (%)	0.2	18.8	5.7	5.8	9.1	6.0
productivity (USD/h)	2.6	2.3	4.7	7.2	4.8	1.7
R² (%), Latin America	**PDI**	**IDV**	**MAS**	**UAI**	**LTO**	**IND**
De-industrialization CAGR (93-08)						
ME rel.	31.7	0.1	2.2	31.8	24.8	1.1
ME abs.	50.9	11.5	19.8	57.8	2.6	14.6
MO abs.	3.0	1.0	12.1	20.1	40.7	11.3
MO/cap.	31.1	7.7	2.2	49.1	14.1	1.4
productivity	31.7	6.1	4.0	46.7	12.2	2.1
workload	22.7	0.1	23.3	18.4	1.2	7.3
LAB CONT	48.5	8.5	21.9	51.3	2.1	14.8
Indicators (2008)						
ME rel. (%)	9.9	12.4	2.7	0.3	13.2	0.6
productivity (USD/h)	2.4	2.0	0.4	2.9	0.7	4.4
R² (%), East Europe & Central Asia	**PDI**	**IDV**	**MAS**	**UAI**	**LTO**	**IND**
De-industrialization CAGR (93-08)						
ME rel.	32.2	26.9	19.2	22.2	3.0	50.7
ME abs.	31.5	23.8	20.8	21.1	2.3	59.4
MO abs.	5.6	28.3	27.5	10.9	2.7	2.2
MO/cap.	12.2	0.0	0.0	2.9	8.7	39.4
productivity	15.6	0.1	1.1	0.5	12.2	42.3
workload	7.0	8.2	27.8	29.2	9.6	2.4
LAB CONT	34.8	18.4	12.6	12.7	3.9	57.9
Indicators (2008)						
ME rel. (%)	17.3	49.6	50.7	52.7	8.3	4.0
productivity (USD/h)	0.9	51.3	45.8	53.7	8.8	12.8
R² (%), East Asia	**PDI**	**IDV**	**MAS**	**UAI**	**LTO**	**IND**
De-industrialization CAGR (93-08)						
ME rel.	2.6	14.8	0.1	24.4	20.9	5.4
ME abs.	0.6	16.5	0.2	36.8	37.0	0.0
MO abs.	0.2	0.0	33.7	30.8	21.9	43.6
MO/cap.	1.1	11.9	17.4	2.7	71.5	20.7
productivity	1.9	12.4	13.5	4.9	77.5	21.3
workload	12.8	7.0	3.0	32.6	65.5	10.8
LAB CONT	1.6	16.1	0.0	40.7	43.9	0.3
Indicators (2008)						
ME rel. (%)	0.7	59.5	14.6	5.8	2.5	29.2
productivity (USD/h)	9.7	0.8	5.0	66.1	33.2	1.3

Sources: Own calculations, World Bank (2014a), ILO (2014), Hofstede, Hofstede, & Minkov (2010) data

The results reveal that uncertainty avoidance is highly influential on the change of two of the key indicators of de-industrialization, relative manufacturing employment and output. As shown in Figure 7.18 (p. 417), the higher the uncertainty avoidance, the lower the long-term growth of both indicators.

A deeper analysis of the effects of uncertainty avoidance shows large regional differences of the patterns. A very curios example is productivity. The 2008 absolute value is highly correlated with the UAI in East Europe and also in East Asia. In the first case, the correlation is negative (R = -73.2 %) while in the latter, it is positive (R = 81.3 %). Still, these findings are not contradictory, as will be explained in the following.



Source: Own calculations for emerging countries on the basis of World Bank (2014a), ILO (2014) and Hofstede, Hofstede, & Minkov (2010) data

Figure 7.18 Manufacturing employment and output vs. uncertainty avoidance

As was shown in the previous analyses, almost all East European states were de-industrializing in terms of relative employment while in most East Asian states the manufacturing sector still grew. While many East European companies have been part of Western MNC value chains where creativity and fast response count, East Asia is mainly involved in catch-up modernization and mass production of relatively simple goods. While the East European products and processes benefit from <u>low</u> uncertainty avoidance, catch-up processes are often managed in a *dirigiste* fashion, i.e. involving strong government influence which goes together well with <u>high</u> uncertainty avoidance.

The number of investigated Latin-American and East Asian states is low, and so is the sample size for correlation analysis. Hence, its significance is also limited. The only very strong influence on the development of the manufacturing sector of East Europe and Central Asia is indulgence, but since all states are within a small range concerning IND, also here, the explanatory power is very limited.

7.4.4 Conclusions for industrial policies of emerging economies

When trying to identify suitable industrial policies for emerging states, the actual results and the VoC-determined options for development need to be considered. Since no detailed analysis of institutions and no fine-grained analysis of technological weaknesses and strengths was performed, the advice needs to be generalist and on a macro-economic level. It will follow the identified groups from the comparative analysis of regions, taking into account the identified varieties of capitalism (section 7.4.1).

Ambitious industrializers

The actual top-performing group of East European DBEs and Asian countries with their specific intertwinement of state and family-owned businesses needs to make careful choices about MNCs as source of innovation by intra-firm transfer, but at the possible price of losing political control. This is the more the case, the less powerful the state of MNC activity is. The large SMEs China and Russia are to a certain extent able to dominate even powerful MNCs, while the smaller East European states largely depend on the benevolence of the MNCs.

Within their benevolent EU environment, the small industrial DME states could raise their national welfare rapidly. There are signs that some East European firms, especially from the Czech Republic, have meanwhile even become technology owners (Drahokoupil & Myant, 2015) which should be the next step of development after a successful export orientation (Andriesse, 2010).

Ambitious de-industrializers and pre-cautious winners

Besides a little less successful countries than those of the top group, but with similar targets and problems, the midfield includes a number of states with unique selling propositions in primary products or tourism. Having manufacturing crowded out in previously very industrialized states and losing the know-how is risky, as the recent examples of reduced earnings from oil and gas (Russia, Venezuela) and tourism (Turkey) show. Too much specialization, even if it is smart, creates a high vulnerability and is thus a highly risky policy, especially in the long term.

Pre-cautious losers and industrial losers

The actual bottom group needs to consequently strive for productivity rises to increase the living standard of the population. As a prerequisite, all signs of a failing state have to be removed (e.g. in the Ukraine and the pre-cautious Latin-American group). Socialist policies of hiding unemployment have probably helped in the short term but in the long run only resulted in more poverty and crisis.

8 Combined evaluation of mature and emerging economies

By this comprehensive evaluation, common phenomena of mature and emerging countries, but also the differences between the two are to be identified. It is based on the findings of the previous chapters and connects them to gain new insights.

8.1 Productivity as the key driver of structural change

When investigating de-industrialization phenomena in mature and emerging states, productivity was identified as a key performance indicator of industrial policies. Concerning the three indicators of economic success, the influence of productivity in mature countries is as follows:

- GDP per capita

  Rising productivity means potentially increased national wealth (GDP per capita). Both are positively correlated.

- Unemployment

  In the short term, unemployment can be elevated by rising productivity. In the long term, productivity is a pre-requisite for international competitiveness. Keeping workforce employed without a real need for labour is a form of camouflage by hiding unemployment. As was shown, it will take its economic toll in the medium or long term by leading to welfare losses. If pursued too long, it may lead to catastrophic results, as the collapse of the socialist Eastern Bloc showed.[*]

- Trade

  As shown in chapter 6, productivity is positively correlated with the trade balance, i.e. the more productive a country, the better are the chances to profitably sell its goods.

[*] This notwithstanding, it can be useful to overcome an acute and presumably short-term crisis like the Great Recession 2008/9 by Keynesian policies and direct state support, as the fine recovery of the German industry showed which was not bound to lay off its workers like in countries with very little employment protection. The neighbouring DMEs also benefitted from these policies (Leszczynski, 2015).

All mature countries recorded immense productivity rises, but in more recent years, several countries of the state-led group of CMEs (Spain, Italy, France, Japan) failed to follow the very ambitious path that the most technology-oriented countries like Austria and Germany, Finland and Sweden pursued. Accordingly, their economic growth was severely endangered by reduced success in trade and germinating unemployment (especially youth unemployment).

For emerging countries, productivity and especially the productivity growth rate are the central indicators for the path of industrialization or de-industrialization that these countries are on (cf. section 7.4.1). In principal, the above-made political considerations also hold for emerging countries. While most of them pushed their productivity very hard, several mostly Latin-American pursued socialist policies (pre-cautious and losing clusters, cf. section 7.4.1), resulting in a slowed economic growth and reduced international competitiveness.

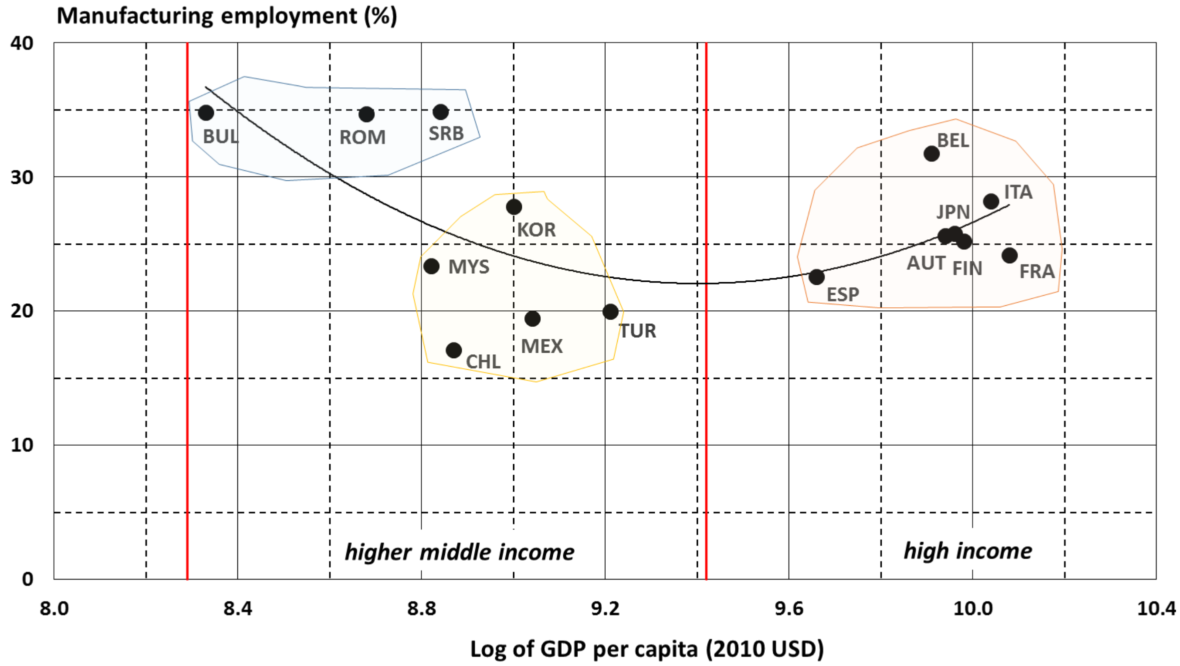
Still there is a huge gap between the productivity of Western countries and emerging catch-up modernizers. Only Korea has recently managed to almost close the gap. Starting off at less than 10 USD/h in 1993, it reached a productivity of around 37 USD/h in 2010. Korea has meanwhile caught up with the early Western industrializers (UK, Spain, Italy) of comparatively little productivity. It has also succeeded in making the difficult transition from export orientation to innovativeness and leading positions in international value and supply chains. Thus, Korea must no longer be considered as ‘premature’, but as a truly mature economy.

8.2 The formation and interpretation of tipping points

De-industrialization in terms of reductions in relative manufacturing employment was found in all mature countries, but also in certain emerging (‘premature’) countries. In this thesis, the term ‘premature’ is strictly defined as a certain level of national wealth, i.e. GDP per capita. According to literature (Rowthorn, 1994; Palma, 2005), the tipping point of manufacturing employment, i.e. the all-time high, is reached at a certain level of national wealth which was supposed to be falling over the years. In fact, the identified relations are somewhat different to these predictions from literature, as will be explicated in the following.

8.2.1 Comprehensive evaluation of mature and 'premature' tipping

In Figure 8.1, the identified tipping points of all investigated mature and emerging economies are summarized in one graph.



Source: Own graph, based on World Bank (2014a) data; 2nd degree polynomial trend

Figure 8.1 Tipping points of mature and emerging economies

Three groups are identified:

- Mature countries

  Belgium, Austria, Japan, France, Finland, Spain and Italy tipped in 1970-80 at around 25 % manufacturing employment.

- Socialist countries

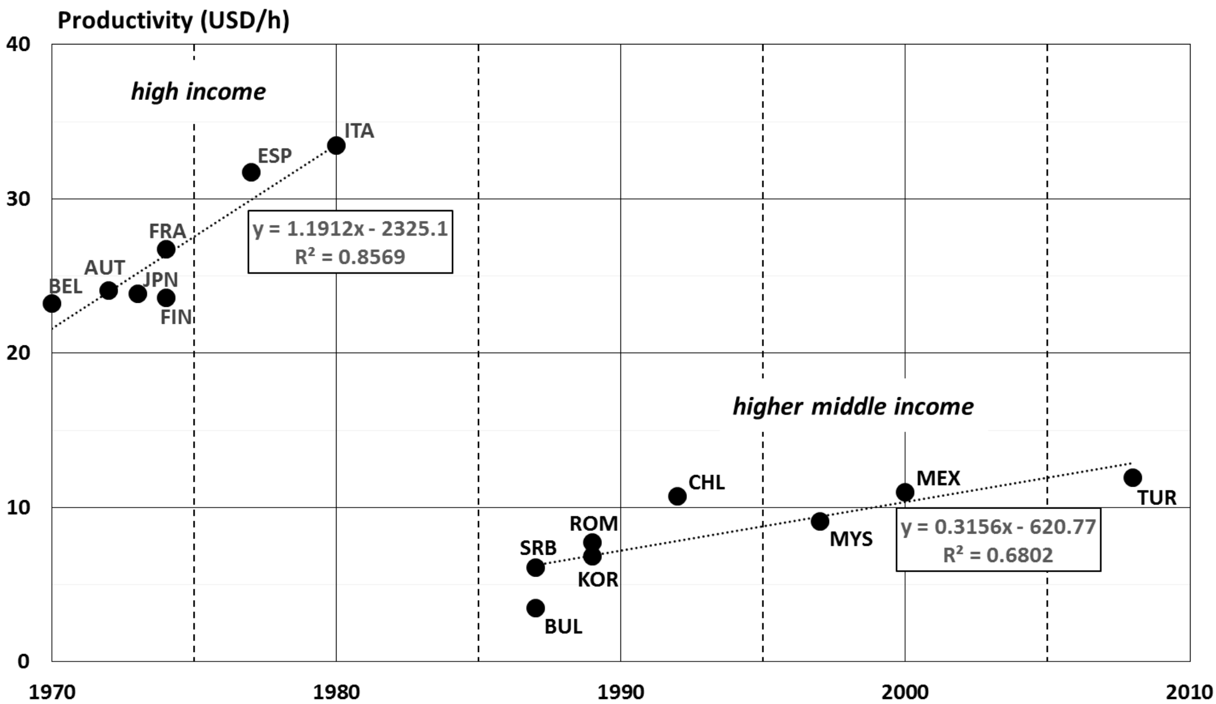
  Bulgaria, Serbia and Romania tipped in the late 1980s at about 35 % manufacturing employment.

- Emerging countries (catch-up modernizers)

  Korea, Chile, Malaysia, Mexico and Turkey tipped in the last two decades under investigation at around 20 %.

8.2.2 Productivity as the key indicator for tipping

The income differences between the groups are large. Since productivity is a key driver of national wealth, the productivity that was reached when tipping was analysed. The interrelation is depicted in Figure 8.2, depending on time. The result is astounding and – due to the very high R^2 values – very convincing. The productivity related to tipping is a straight function, but a different one for the (mature) high-income group and the ('premature') medium-high income group. Notably, the latter function unites the former socialist and actually emerging countries.



Source: Own graph, based on World Bank (2014a) data; linear trend

Figure 8.2 Productivity at tipping points of mature and emerging economies

In both cases, there is a certain productivity level that inhibits further transfer of workforce into the manufacturing sector. The sectoral output fulfils the actual demand, so further productivity rises would rather diminish the workforce than grow the market size and in this course require more workforce.

For emerging countries, the productivity within reach is controlled by external and internal demand of their goods. External demand for manufacturing goods of emerging countries is related to the willingness to pay and the bargaining power of their buyers in mature countries. Since in most cases, the offer of emerging countries does not involve cutting-edge but catch-up technology (East Asia) and middle positions in international supply chains (East European DMEs), the selling proposition is not unique and the achievable prices are rather low. As a consequence, so is the productivity and so is the national income per capita which determines the domestic demand. Since from both sources, external and internal, the willingness and ability to pay is low in tendency and so is the productivity that can be reached, lower-income countries tend to tip at lower productivity levels.

By the outlined mechanisms, a two-tier system of the maximum extension of manufacturing employment in relation to productivity evolves. This finding is very different from the predictions of structuralists and their successors which described a united system, a standard path of industrialization and de-industrialization. It is well in line with the VoC approach, putting the firm in the centre of considerations. The manufacturing sector is technologically driven by MNCs of Western, preferably managed CME style, home bases which allow to develop and maintain sector-specific advance. More simple steps of production of investment goods are often transferred to low-cost countries who also take over the production of mass commodities.

The different functions of both tipping clusters can be explained by the different level of technology produced in these groups. While the Western producers are original equipment manufacturers and technology owners, thus being able to have a high share of high-technology products in their portfolio and especially their part of international value chains, catch-up modernizers often act as sub-contractors and are not able to develop their own products. The created value is limited by the technological prowess. The macro-economic two-tier system has its origin and equivalent in the micro-economic value chains where the firms of the catch-up modernization countries are mostly placed in the lower deck.

For the late modernizers, it is hard to catch up as long as strong economies will defend their economic advance. The role of Mexico in comparison to the USA is a fine example to illustrate that process. Mexico could not change its role as a sub-supplier in international value chains and accordingly stagnated also in terms of national wealth. On the other hand, there are chances on the basis of close cooperation and open markets, as the improved living conditions in several East European countries like the Czech Republic illustrate.

Most impressive results were achieved by Korea which has fully caught up on the basis of consequent technological development, bringing its leading firms into the position of technological leadership. Korea has shown that it is possible to overcome the distance on the basis of the acquisition of technological know-how (ship-building, cars, consumer electronics, computers).

8.2.3 Assessing the country-specific level of maximum industrialization

The maximum level of relative manufacturing employment cannot easily be predicted. It is strongly influenced by national contingencies like the size and nature of domestic, regional and international markets for a country's product spectrum. Technological affinity, available natural resources and also institutions may also play a role.

If a country follows a certain growth path (increasing share of manufacturing employment and also productivity over time), its maximum manufacturing employment may well be predicted by calculating the year when the tipping productivity is reached and applying it to the relative employment vs. time function (cf. Figure 8.2).

8.3 The influence of national culture

In previous discussions on mature (section 6.3.4) and emerging (section 7.4.3) countries, the correlations between economic indicators and cultural dimensions were investigated. The strongest correlations ($R^2 > 50$ %) were found for

- productivity growth vs. PDI in mature countries (negative correlation),
- manufacturing output vs. UAI in emerging countries (negative correlation).

No common correlation was found for the mature and emerging group, so no further correlation was expected for the whole sample. Yet, the analysis was performed and yielded the results given in Table 8.1. Quite unexpectedly, two clear and meaningful correlations with the absolute labour productivity of the manufacturing sector reached in 2008 were found. It is negatively correlated with power distance and positively correlated with individualism.

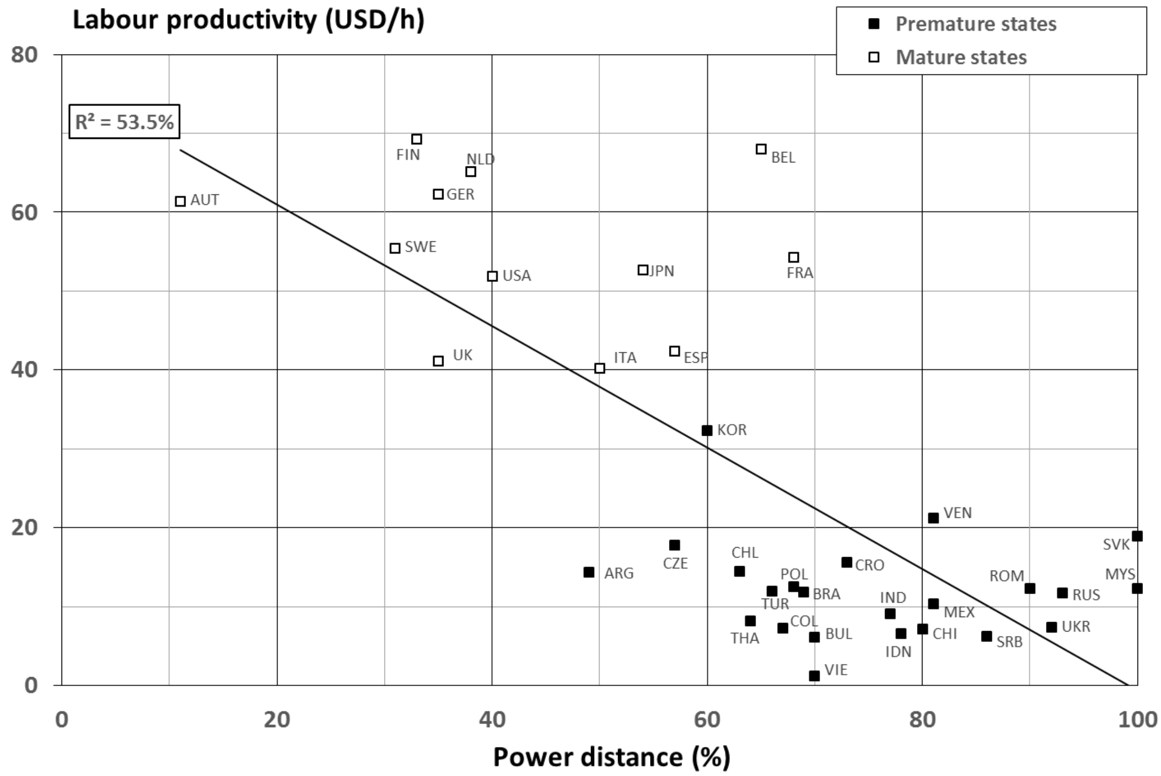
Table 8.1 Correlation of economic and cultural indicators (all countries)

R^2 (%)	PDI	IDV	MAS	UAI	LTO	IND
De-industrialization CAGR (93-08)						
ME rel.	1.5	7.0	0.7	11.8	1.3	0.3
ME abs.	1.3	11.2	0.5	13.9	13.4	6.0
MO abs.	4.7	19.6	0.0	24.7	1.2	4.9
MO/cap.	23.6	33.3	0.5	0.1	7.4	28.3
Labour productivity	1.5	3.0	0.1	3.2	22.3	21.2
Workload	0.7	0.3	6.7	0.6	5.4	0.2
LAB CONT	1.4	10.3	0.1	14.4	14.6	5.8
Indicators (2008)						
ME rel. (%)	3.2	0.7	3.8	7.8	6.6	11.9
Labour productivity (USD/h)	53.5	57.3	0.0	0.5	6.7	8.9

Source: Own calculations, World Bank (2014a), ILO (2014), Hofstede, Hofstede, & Minkov (2010) data

Since these correlations did not show within the specific country groups, they are characteristic for distinctions between both groups of countries. As shown in Figure 8.3, mature countries have a clear tendency towards a lower power distance while emerging countries have a clear tendency towards a high power distance. Both groups are neatly separated from each other.

There is a small number of countries in the middle range of power distance. For the mature countries, these countries are above average in PDI: Italy, Japan, Spain, Belgium and Spain. Apart from Belgium, these are exactly the four countries that did not manage to stay on a growth path concerning labour productivity. Thus, also within this group, the countries of comparatively high power distance have a tendency to become less successful under the competitive regime of globalization.

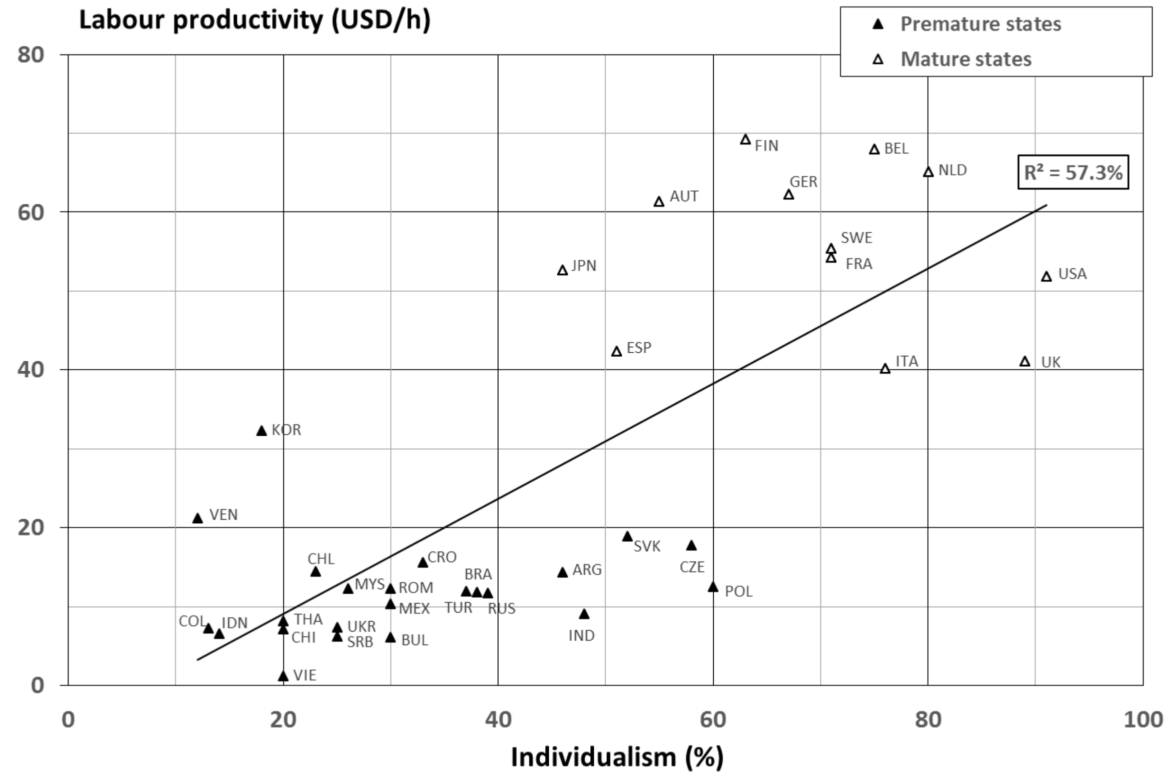


Source: Own calculations on the basis of World Bank (2014a), ILO (2014) and Hofstede, Hofstede, & Minkov (2010) data

Figure 8.3 Manufacturing productivity vs. power distance

Argentina, the Czech Republic and Chile are the countries with the lowest power distance within the group of emerging states. All three are comparatively successful in terms of labour productivity.

Whether the acquired wealth, here indicated by high productivity, involves a certain change in culture and supports a shift towards lower power distance or whether it is vice versa, i.e. the lower power distance allows to develop industrially is a question that cannot easily be answered. It is assumed that the economic development starts from certain cultural pre-conditions which then slowly become altered along with structural change, so both parameters are of mutual influence. For an actual industrial enterprise, lower power distance means that existing structures are more easily challenged. Thus, innovations are supported, crucial for the wellbeing of a globalizing firm. In return, a higher power distance becomes more and more an obstacle for making continuous improvements, be they incremental or even radical.



Source: Own calculations on the basis of World Bank (2014a), ILO (2014) and Hofstede, Hofstede, & Minkov (2010) data

Figure 8.4 Manufacturing productivity vs. individualism

Similar to a low power distance, high individualism is also in support of innovation mechanisms, as shown in Figure 8.4. The line of explanation goes like the one with power distance: The higher the individualism, the more creative and innovative is the society and the more successful is the manufacturing sector.

Again, the hen-and-egg problem, i.e. if individualism is rather the reason or the result of economic outperformance, cannot finally be solved. It is assumed that growing wealth supports security and thus allows a more individual lifestyle. Presumably, certain starting points in societies help to ignite the spark for self-supporting long-term developments.

8.4 Balancing manufacturing with other economic sectors

There is no standard and persistent answer to the question what an adequate share of manufacturing within a national economy should be compared to other sectors. In this section, a framework for the evaluation of industrial policies is introduced and then applied. It involves the VoC approach and refers to the eclectic model of de-industrialization.

8.4.1 A framework for assessment

When assessing the roles that other sectors might play in relation to the manufacturing sector, there are three aspects that have to be envisaged:

- Sectoral attractiveness

  The key question here is: How much profit can be gained in a certain sector, i.e. how attractive is an investment? If primary products are easily available, the appeal of this abundance often makes states and their firms take the line of the least resistance, disregarding other options. Dutch disease and other forms of crowding out are the visible result of such policies – but also the incredible wealth of the Gulf States.

- Sectoral competition vs. complementarity

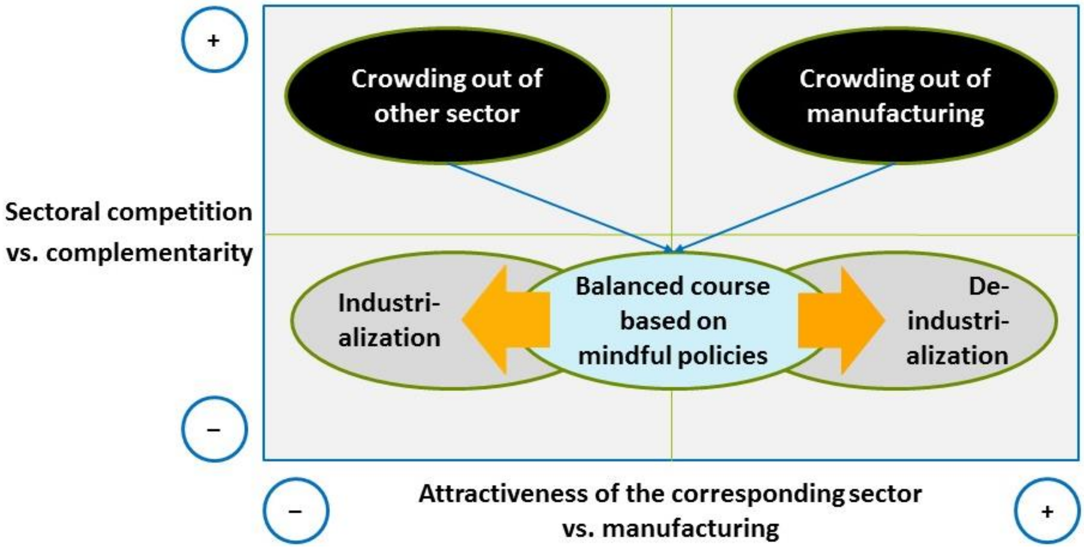
  While sectoral attractiveness deals with competition of sectors, very often, there are interdependencies. Certain services are necessary to carry out industrial operations and vice versa. Very often, products are sold (and can only be sold) with accompanying services. Efficient information and communication technology today is an indispensable factor for every manufacturing firm.

- Institutional fit

  As outlined by the authors of the VoC approach (Hall & Soskice, 2001b), developed national economies are characterized by a set of institutions that render frame conditions for the development of firms. The dichotomy of LME and CME contain very different complementary actors that translate into certain comparative institutional advantages.

  The economic set-up is very delicately balanced in each national economy, so changes have to be applied very carefully and without overburdening the players by too radical reforms. The institutional equilibria create a path dependency of national economies, making CMEs apt for incremental innovation in traditional fields of engineering including manufacturing due to intensive education and training, while LMEs are likely to be more apt for radical innovation due to less preliminary fixing of their high potentials to probably worn-out career paths and more available venture capital.

Available institutions and limited options for fast and radical change for the better have to be taken into account, so the scope of policies is rather narrow.



Source: Own graph

Figure 8.5 Options for industrial policies

Mindful politicians will balance these thoughts and carefully guide the course of national investments by available measures like e.g. tax increases or decreases or supportive measures like building up or subsidizing adequate training institutions (Figure 8.5).

It must be stated that there is no 'one size fits all' rule for policy makers. The national resources must be carefully weighed to come to adequate results. Probably, Margaret Thatcher's decision to seek economic salvation in other sectors than the industry was rude, but it reflected the British potential at that time. At least, it fit into the VoC analysis that was developed around two decades later.

Over-disregarding one sector like manufacturing over a long time brings about a certain dependence on imports, so it can be potentially dangerous, as oil-dependent economies like Venezuela and Russia have experienced in very recent years of low oil prices. Still it is better to have resources than to not have them; only an overemphasis and negligence of other sectors, in other words a massive crowding-out, will lead to serious problems.

8.4.2 Sectoral results

In the following sub-chapters, the intercourse of manufacturing with other sectors of economic activity will be discussed within the given framework.

8.4.2.1 Knowledge-intensive services

Knowledge-intensive services must not be considered as a threat to manufacturing, but as a necessary prerequisite for any developed economy. In all investigated countries but one, knowledge-intensive services gained in importance (workforce share) within the national economy. The only exception was Venezuela – a worrying fact for this country that depends so much on its abundance in oil.

8.4.2.2 Simple services

Simple services like cleaning or restauration to a certain extent are necessary for any society. In this sense, part of this sector is rather complementary than a threat to manufacturing.

Things might be different when opportunities from services come easier than taking the industrial toil, so crowding out of the industry results. An example for this is Croatia. With its long and beautiful coastline along the Mediterranean Sea and the relative proximity of rich Western countries, Croatia has become a favoured region of tourism. Thus, despite of losing industrial ground as one of the more developed inheritance of Ex-Yugoslavia, Croatia could raise its average income per capita significantly.

Jobs in the service industry are often more attractive for young people than the wearisome blue-collar industrial work, so the technological base has become more and more eroded. Along with that, investments in hotels and restaurants offer better opportunities than those in the industry which has thus been crowded out. One economic option became stunted, leaving the country in a higher dependency on imports of goods and foreign visitors.

8.4.2.3 Abundance of raw materials

Abundance of raw materials is a gift, but also a threat. The 'Dutch disease' and the British experience with North Sea oil are fine examples for the thin line that producers of primary products might be walking on.

- In the Netherlands, investments in other industries were soon crowded out in the 1960s since – apart from hindering necessary investments – also the national currency gained in value, worsening the export chances of its national companion industries (Ebrahim-Zadeh, 2003). On the other hand, Royal Dutch Shell has been a major contributor to the Dutch economy (Royal Dutch Shell, 2014).
- Also British North Sea oil is attributed to have slightly withdrawn from manufacturing (on the other hand, it presumably eased the UK's economic crisis around 1980).
- In Norway, the manufacturing output has even benefitted from its energy discoveries and higher oil prices (Bjørnland, 1998). Here, sectoral complementarity seems to be given.

Much more than in mature economies, an abundance of raw materials might endanger the manufacturing sector in emerging economies with its relatively little productivity and perspective for investors. If temptation goes along with incompetent or corrupt leadership, macro-economic disorders are expectable:

- In Russia and Kazakhstan, the average national income rose fast but manufacturing was crowded out and the industrial base kept eroding after presumably (precise data is lacking) already having peaked in the 1980s, i.e. in Soviet times.
- In Ecuador and Venezuela, a desirable industrial development has not taken place to the extent that might have been expected without the oil. The findings of oil promised returns at less effort.

Chile is a different story. With its ambitious neo-liberal economic agenda, the country raised its manufacturing productivity fast. At least a part of this fast rise might be attributed to the strong position of the competing raw materials industry which set parallel standards for investors, so high ambitions were a pre-requisite for survival.

8.4.2.4 Construction

The only case in which the construction sector was found to be a real threat to manufacturing is Spain. Especially in the last investigated period, its construction sector enjoyed a decade of high growth. It absorbed a lot of labour and capital from other sectors of the economy. The construction sector was found to be “plainly oversized” and called a “deformation” of the Spanish economy (Bielsa & Duarte, 2011).

While the construction sector is normally considered being rather complementary to manufacturing, in Spain, the manufacturing sector was clearly crowded out by the bubbles of the construction sector.

8.4.2.5 Agriculture

Under normal circumstances, agriculture is no threat to the manufacturing industry. Productivity gains in agriculture have been driven by mechanisation, so the agricultural workforce became largely diminished while industry grew. There is no natural way back to higher employment rates in agriculture. Only desperation, probably hunger, might bring people back to personally ploughing their soil.

Despite of descriptions in literature of backshift to agriculture forms of ‘premature’ de-industrialization (Palma, 2005), no long-term incidence of this form was found.

8.4.3 Support of policy-making by the models of de-industrialization

By the eclectic comprehensive model of de-industrialization, an algorithm was created to identify and classify de-industrialization phenomena created by workforce shifts on the basis of standard (and with some effort) available macro-economic indicators. To assure meaningful results, the threshold level for diagnosing de-industrialization was set to a compound annual growth rate of -1.0 %.

In available cases, the results correspond well with descriptions from literature. Thus, the model is considered as a useful and reliable tool of diagnosis of sectoral, i.e. societal shifts. It may well serve as the starting point of policy making.

In addition to the eclectic model, the economic scenario model was conceived on the basis of growth rates of manufacturing labour indicators. Further to the societal picture dealing with relative figures of employment, absolute figures of manufacturing output and related input (working hours) were evaluated. The results render a clear picture on the more severe forms of de-industrialization – less industrial working hours or even output reductions, i.e. reduced domestic supply of the population.

The macro-economic scenario model was found to be very useful and accurate for describing and categorizing industrialization and de-industrialization paths of development and related phenomena.

In combination and in comparison with the figures of other countries, both models are precise indicators of the state of development and theoretically available options. This information is necessary, but still insufficient for deriving economic policies. For a serious derivation of such policies, in line with VoC theory (cf. section 2.2.2.1), a sound analysis of concerned national or regional institutions is indispensable.

9 Conclusion, contributions and limitations

In this thesis, structural change involving forms of de-industrialization was investigated in 12 mature and 25 emerging countries, focusing on the 35-year period 1973-2008 with successive 15+5+15-year long sub-periods and seven successive 5-year sub-periods. As intended, on the basis of the model-based findings and additional socio-economic analyses different paths of industrial development were distinguished for mature and emerging economies with regard to their final outcome, i.e. the sectoral parameters and the resulting GDP per capita, employment and trade. From these findings, lessons to be learnt for policy makers were derived.

In the following sub-chapters, the achieved results are recapitulated. First, a resume will be drawn whether research objectives have been achieved. Thereafter, further contributions to scientific knowledge are outlined. Finally, the limitations of the study are described, concomitantly marking the scope of future research in the field.

9.1 Resume in terms of the research objectives

The three research objectives this study aimed at were: i) modelling of de-industrialization, ii) evaluation of de-industrialization in mature and emerging economies, iii) identifying best practices for industrial policies.

Overall, this thesis is a contribution to a rational debate instead of the emotional undercurrent often involved with the undifferentiated utilization of the term 'de-industrialization'. By the eclectic model, formerly isolated descriptions of phenomena became interconnected and explained. It helped to identify paths of industrial development (versions of industrialization complementary to those of de-industrialization), further illustrated by the scenario model which offers an instant comparative view on the industrial development of countries.

In the following sections, the results in terms of the research objectives will be recapitulated.

9.1.1 Modelling of de-industrialization

The study aimed at tackling the existing definitional ambiguity of the term 'de-industrialization' by building a comprehensive quantitative model of its manifestations. Two novel models were developed that are complementing one another:

- The eclectic model of de-industrialization was developed basing on the idea of assigning quantitative macro-economic indicators to concise descriptions of de-industrialization phenomena compiled by a literature review. The created model was transferred into an Excel-based tool which automatically identifies certain socio-economic phenomena when fed with the necessary data. Relative manufacturing employment is the key indicator of de-industrialization in this model.

  The model was adapted to de-industrialization processes of mature and emerging countries.

- The scenario model is a strictly economic model that is built on growth rates of sectoral macro-economic indicators. Absolute output and total labour content (sectoral hours worked) are the key indicators of de-industrialization in this model.

Both models were successfully applied on the full sample of 12 mature and 25 emerging countries. They delivered the desired output and rendered insight in the course of de-industrialization. The results were meaningful in their own right (cf. section 9.1.2), but also as the basis for evaluating the effects of industrial policies (cf. section 9.1.3).

On the basis of the combined key performance indicators of both models, different forms of de-industrialization could be distinguished. When abstracting from effects of demographic change and a higher labour participation rate, in downward order of magnitude these forms are:

- decline in output (absolute),
- decline of the labour content (total hours of work in manufacturing, absolute value),
- relative decline of manufacturing employment (standard definition in sociology).

This information was utilized for one of three key performance indicators (key features) of de-industrialization utilized in a condensed graphical representation of de-industrialization processes (e.g. Figure 6.16, p. 294 and Figure 7.16, p. 406).

Concluding the findings, the first research objective (RO 1) has been fully achieved by successful modelling of de-industrialization. A deeper understanding of the forms and gravity of structural change involving the manufacturing sector has been gained on the basis of a structured and ostensive distinction of paths of (de-)industrialization. The dual model in itself is considered as a contribution to scientific knowledge.

In this way, the eclectic model is a contribution to a rational debate instead of the emotional undercurrent often involved with the undifferentiated utilization of the term 'de-industrialization'. Several isolated descriptions of phenomena became interconnected and explained. The scenario model offers an instant comparative view on the industrial development of countries. It helped to identify paths of industrial development (versions of industrialization complementary to those of deindustrialization).

9.1.2 Evaluation of de-industrialization in mature and emerging economies

The study aimed at providing a comprehensive analysis of the socio-economic effects of de-industrialization in mature and emerging national economies based on the developed de-industrialization models. While the scenario model is similar for mature and emerging economies, the eclectic model was conceived in two adapted variants.

Further to indicators of de-industrialization, the general economic performance was evaluated in relation to industrial policies. The national economy was mainly judged by the achieved GDP per capita, unemployment rate and trade balance. The analysis comprised an assessment of the technological level by sectoral productivity and, in the case of mature economies, their share of high-tech manufacturing and North-North trade.

9.1.2.1 Mature countries

Forms of de-industrialization were found in all investigated mature countries:

- A relative decline of the manufacturing sector in terms of jobs was found in all investigated mature Western states over all periods. In these modern societies, the cultural influence of industrial work was dwindling.
- In most cases, due to productivity rises higher than those of the output, the total labour content was also reduced.
- For the long periods (35 years, 15 years), the most severe of all de-industrialization phenomena, a reduction of output, was only diagnosed in the United Kingdom (all periods) and in France (1993-2008).

Despite of partly divergent industrial policies and success, over the full period, all mature countries managed to increase their national wealth in terms of income per capita at moderate average growth rates of about 2 %. In most countries, unemployment was only a temporary major issue. Spain is a negative exception, since it has never got rid of its two-digit unemployment rate since 1980.[*]

In the mature national economy, manufacturing plays an important role in terms of the trade balance. Nations with a strong orientation towards manufacturing technology have become more and more export-oriented and dependent. Their technological virility shows in high productivity and share of high-technology products.

- Germany, Austria, Finland and Sweden are exponents of industry and export-minded nations. As predicted by VoC theory (Hall & Soskice, 2001a), they are CME countries (managed).
- The USA and the United Kingdom are rather the opposite, characterized by a lower sectoral productivity, less exports and a negative trade balance. As predicted by VoC theory, they are LME countries (managed). Spain also had these poor sectoral characteristics, but for different reasons.

[*] Youth unemployment is another issue that is very serious in Spain but also in other countries like France. Dealing with it is not part of this analysis, since it was not vital for this thesis. Nevertheless, discussing industrial decline with respect to forms of unemployment could be a topic of a worthwhile scientific analysis.

- Spain, Italy, France and Japan are states that in the last years of the investigated time period were not able to raise their productivity. Accordingly, their bargaining positions in exports were worsened and the trade balanced shifted in the negative direction. These states all had high state involvement in their CMEs (state-led according to Schmidt's (2003) classification).
- Belgium and the Netherlands play a special role as logistical hub in the heart of Europe. Much of their trade is just items in transit, i.e. their own industrial value creation and contribution to exports is comparatively low. In these states, a specific form of industrial crowding-out by trade-related activities is assumed.

Concluding the findings, the second research objective (RO 2) has -been fully achieved for mature economies. As intended, a clear picture of forms of de-industrialization in mature countries was obtained. Moreover, economic theory (VoC) could convincingly be linked to the findings.

9.1.2.2 Emerging countries

Industrial policies and forms of de-industrialization in emerging countries showed a very heterogeneous picture. Initially, a regional structure of analysis was pursued. Although the industrial development of nations within regions was by no means homogeneous, regional clusters of de-industrialization patterns were detected.

- In East Asia, industry was built up, so the economic development was largely related to the success of the industry. Restless catch-up modernization helped to increase the national wealth of all states. Industrialization in any investigated respect (workforce, total working time, output) was the normal case.

  China managed to raise its productivity by outstanding growth rates, so it could increase its industrial output without raising its number of people employed in the manufacturing sector.

  High GDP p/c rises were the predominant scenario in East Asia.
- The manufacturing sector in Latin America was found to be largely stagnating. Most Latin-American countries limited its de-industrialization in terms of employment by

its very low productivity rises or even losses. Very little increases of the average wealth per capita were the logical consequence of such powerless efforts.

Argentina and Chile pursued a different agenda. Their comparatively tough industrial policies assured high productivity rises and improvements in the national income per capita, but also boosted the volatility of the change process.

In Venezuela, with its abundance of oil, crowding out by its primary product sector prevented the manufacturing industry from growing. Yet, since this assured that only productive investments were made, the remaining manufacturing industry was relatively effective.

- In East Europe’s EU member states, there was some very limited relative shrinking of employment in the manufacturing industry, but at rising output.

  Like in East Asia, high GDP p/c rises were the predominant scenario. They were mostly achieved by becoming part of international value chains of MNCs, so the national economies turned into DBEs.

- The CIS and EU aspirants group shows a mixed picture. Most countries were tough modernizers which were pushing their productivity while accepting grave signs of de-industrialization. They were able to boost their national income on primary products (Russia, Kazakhstan) or services (Croatia).

  The Ukraine could not keep pace with these countries. It arrived quite miserably and with an eroded industrial base.

As in all mature states, also in almost all emerging states a shift out of agriculture (with the exception of Ecuador) and into services, especially KIBS (with the exception of Venezuela), was observed.

Abundance in natural resources helped a number of states (Kazakhstan, Russia, Venezuela) to increase their national income but hampered their manufacturing sector because of derouting necessary investments (‘Dutch disease’).

As intended, a clear picture of forms of de-industrialization also in emerging countries was obtained. Together with the findings for mature countries, research objective 2 was fully met.

9.1.2.3 Comprehensive findings for mature and emerging countries

The chosen grouping of the sample groups by their economic prowess and region helped to link the results to local and regional varieties of capitalism:

- For mature states, Schmidt's (2003) typology, containing an amendment to the original VoC typology, was found to be of high explicatory power. It links institutional conditions of firm development in manufacturing to patterns of innovation and success.
- For emerging economies, also three types of capitalism (HME, SME, DBE) were considered, introduced by different authors (Schneider, 2009; Nölke & Vliegenthart, 2009; Nölke, 2010). They focus on the interplay of the state, family-owned local businesses and MNCs. SMEs can enforce national strategies also in opposition to MNCs while DBEs are too small to do so. HMEs involve a special relation between rich families and state institutions. As a result from the differences, multiple patterns of innovation and market orientation emerge.

High state involvement was found to be of use in catch-up modernization (import substitution, export orientation) while it prevents countries from achieving full technology ownership. Accordingly, state involvement was found to be no obstacle in emerging countries but limiting economic capacity in mature countries of the state-led group. These findings are well in line with the preconditions determined by national culture. Power distance was high in emerging countries of little manufacturing productivity and low in mature states. With individualism, it was the other way round.

Further to these specific findings, the study has simply closed a gap in existing literature by connecting several regions and states of development in a comprehensive study with an integrated methodology.

Moreover, the time-wise grouping by maturity helped to discover the two-tier system of tipping points (cf. section 9.2.3 below).

9.1.3 Identifying best practices for industrial policies

By research objective 3, it was intended to identify suitable industrial policies for sustainable economic development basing on the socio-economic analysis. At macro-economic level, this was achieved by relating national characteristics and policies to the socio-economic phenomena that were identified when pursuing research objective 2:

- A detailed analysis was carried out for mature economies, including the influence of geography, government involving institutions and national culture (cf. sub-chapter 6.3).
- For emerging countries, the analysis was focused on the influence of varieties of capitalism in cross-regional comparison (cf. section 7.4.1) and national culture (cf. section 7.4.3).

The key results of these investigations are delineated in section 9.1.3.1. A scheme for analysis whether the national pre-conditions are apt to foster regional smart specialization by rendering the necessary institutional prerequisites will be discussed in section 9.1.3.2.

9.1.3.1 National macro-economic policies

From the investigation of structural shifts it became clear that economic success can be assured by different economic means, i.e. an emphasis on different industrial or service sectors, in the course of international division of labour.

Manufacturing, especially high-technology manufacturing, is one of the options to achieve economic success that several states pursued. In the globalized period (1993-2008), Austria and Germany, Finland and Sweden were the most successful of these states.

Focusing on manufacturing requires a sound know-how base which can be considered as a core competency. Furthermore, a continuous ambition to innovate products and processes is necessary to assure state-of-the-art products and a high productivity. Especially in the globalized economy of recent decades, characterized by merciless competition through open-market policies and neo-liberal politics, long-known economic success stories in manufacturing like those of Spain, Italy, France and Japan became jeopardized and their habitual policies scrutinized. Their mainly state-led policies sufficed for developing a strong manufacturing sector after World War II and being successful through the 1970s and 1980s, but in the globalized era, they were apparently more and more insufficient for sectoral and overall economic success.

Productivity was identified as the key driver and indicator of success in the manufacturing sector. Industrial policies need to aim at high productivity since competition today is on a global platform. Countries not being able to keep up with the speed are running the risk of trade losses and in that turn economic shortfalls. Short-term ‘social’ policies, i.e. those of retaining jobs instead of raising productivity, under these circumstances have little chances to lead to satisfactory results in the mid or long term as examples from Latin America, but also Spain and France prove.

On the other hand, oversteered neo-liberal policies can lead to very critical economic situations, especially if applied dogmatically at the wrong time and the wrong place, as the example of Finland around 1990 showed impressively. Such policies do not fit well with high-tech manufacturing which depends on institutions for training and education to be ready to create the incremental innovations that assure market success. According to the VoC theory, such innovations are attributed to CMEs. If the delicate interplay of institutions is interrupted by harsh interventions, the comparative institutional advantage of an economy will suffer. The case of Finland is exemplary for this.

While in Western economies, a constant increase in productivity over time was the normal case, four nations stepped out of line and stagnated:

- Spain, Italy (from around 1995)
- France (from around 2000)
- Japan (from around 2005)

In terms of productivity, the UK was lagging far behind in 1973. On the basis of merciless industrial policies, only the fittest manufacturing firms survived, so the productivity rose fast, but very high numbers of jobs became cut. The face of the British society changed by far most radically, even in relation to many former Eastern Bloc states.

The main lesson to be learned for achieving a solid macro-economy is that it is composed of many healthy and ambitious micro-economic units. This means two things:

- Private micro-economic units will not be able to organize adequate institutions to assure their human resources and an efficient state administration. From high market pressure and limited resources for the individual firm, market failure will result, i.e. the privatization of public goods will not work. Examples are the education sector and also basic research which need to be organized on a broad basis which individual firms will not provide. To put it more poignantly: Neo-liberalism will dig its own grave if taken too far, especially in CMEs.
- On the other hand, as the results of socialism, but also western *dirigisme* show, governments and their administrations are poor entrepreneurs. They are lacking creativity and drive to be innovative, so in a globalized economy, there is hardly a possibility for state-owned conglomerates to succeed in the top tier of global manufacturing.

While the latter is without any doubt correct for mature economies, see the failed attempt to grow 'national champions' in the UK, it has to be noted that catch-up industrialization can be and has been successfully organized by or with strong support of government in many states like France, Japan, Korea, recently in China. By state support, their infant industries could be taken over the first steps to marketability of their products.

But when reaching a certain stage of maturity, simply copying available know-how does not lead to further progress. Thus, especially late-moving states have to learn that old apodictic certainty has to be given up at a certain point if progress shall not come to a halt at that stage of development.

Bringing know-how into an emerging country is a delicate task for the government since it requires to cooperate with MNCs. In return, they will urge for political influence. In the case of East European DMEs, this influence has been taken very far, but it helped to raise the living standard rapidly. The feeling of a lack of control together with mental overburdening by the very rapid change has contributed to the recently growing success of nationalist parties, e.g. in Hungary and Poland. SMEs like China are powerful enough to stay in control even of large MNCs, so they allow them to invest but at the same time try to get into possession of their technology, be it legally or illegally.

Leaving familiar paths is not an easy task. It is even harder to work against the deeply internalized collective memory that is subsumed under the rubrum ‘national culture’. Policies need to consider the inherent values and the long-term impact of cultural coinage. E.g. a female society like the Swedish could hardly live with a form of predatory capitalism of Anglo-Saxon origin. Economic path dependency, as also present in the VoC theory, evolves from the deep roots of culture.

It appears that national culture is of major influence on the success of the national manufacturing sector. Countries with a lower power distance, i.e. less hierarchical thinking and management, were better able to increase their productivity, the most important indicator for sectoral ambition and predicator for success.

Finally, it has to be accepted that the world is the relevant market for firms in the manufacturing sector. More than ever, size and capital power are of essence. National or even regional competition can prevent firms from growing to the required size for the global market. Narrow thinking can be a hindrance to cooperate on a level necessary for economic success. Smart specialization is one option to work in the other direction, but it also involves risks that will be discussed in the following.

9.1.3.2 Appraisal of smart specialization on manufacturing

The smart specialization approach was introduced in section 2.2.3. As the initiators freely admit, it was neither based on sound theory nor empirical findings, but when it was introduced in 2008, the year of the Great Recession, it was the right idea at the right time – at least in regard of its fast adoption by the EU and OECD. Foray, David and Hall (2011, p. 3) speak of a “taboo concept” that became a “policy hit”. They write that

> […] the idea had been in the air for some years, decades even. But that idea was stifled and repressed as a result of the enormous conformity that has characterised innovation policy research and practices over the last decades in many international policy forums. The dogma stated that a good, tolerable and honourable policy aims to address market failures while not favouring any particular sector or technology based on certain “priorities”. According to the dogma, departing from such neutrality is always dangerous since it implies guessing the future developments of markets and technologies and this opens the door to all those little monsters that economists like to eradicate: wrong choices, picking winners, market distortions. According to the dogma, it is much better to leave any issue concerning sectoral strategies, specialisation, or

> direction to the “magical chaos of the blind watchmaker”. Any notion of specialisation policy was a taboo in policy discussion, particularly in the main policy institutions.

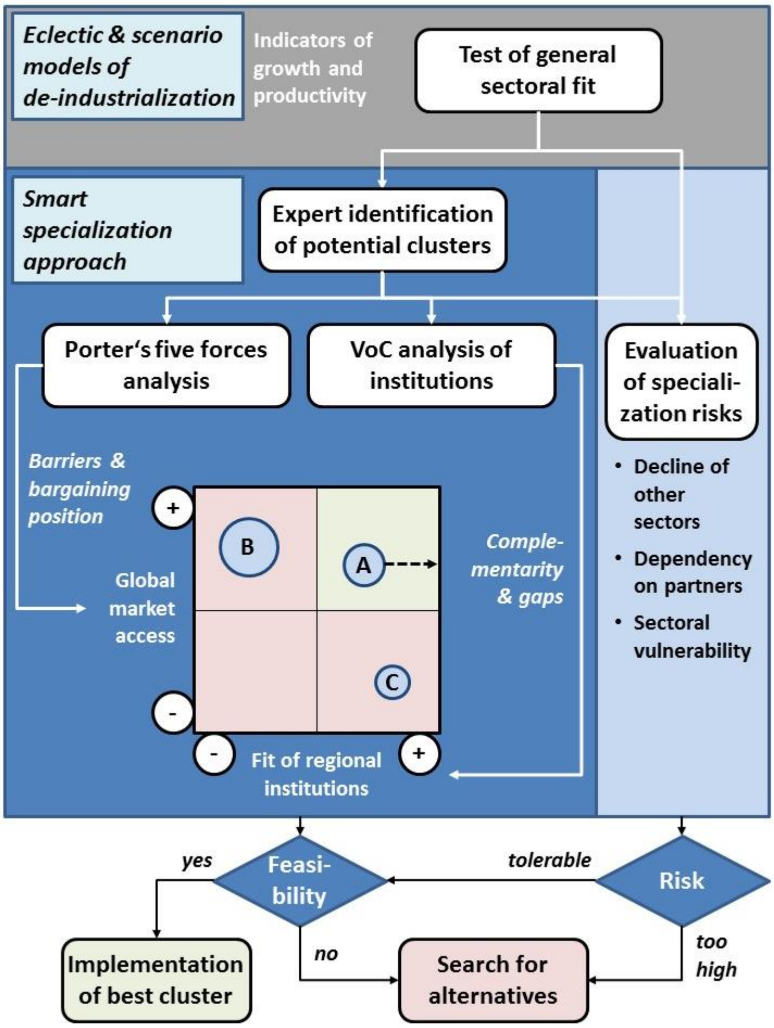
If theses objections are applied dogmatically, this may be wrong. But this does not mean that the objections are unsubstantiated. Albeit, very often, countries and regions went for smart specialization very fast, putting the vested concerns aside. In the crisis years, many regions and even countries were just desperate and chose smart specialization as their last resort. In this sense, the authors (Foray, David, & Hall, 2011, p. 3) continue:

> However, the last two years of crisis that have left many regions and countries with very few opportunities for economic recovery and restart and observation of the persistence of many coordination failures in systems of innovation as well as huge capacity asymmetries between regions and countries have exerted a certain amount of pressure to revise the dogma. Today we are witnessing a renaissance of “industrial policy” […]

The already 17 regional studies in the OECD report on smart specialization (OECD Secretariat, 2013) demonstrate that the policy has been applied on a large scale in surprisingly short time. On the EU smart specialization platform, 18 countries and 169 regions were registered by April 2016 (European Commission, 2016). Albeit this enormous success, basing on the findings of this research, some objections shall be raised. A modified approach for policy making will be introduced, involving necessary amendments and replenishment of the smart specialization approach (Figure 9.1, p. 447).

At the very heart of the smart specialization approach is the “entrepreneurial discovery process” (Foray, David, & Hall, 2011, p. 7), i.e. a group of somehow to be identified knowledgeable and authorized firm managers and other regional innovators, also from institutions of higher education, that select the right field of application and a related cluster of technology. As the authors indirectly acknowledge, this group is entitled to pick winners. Market distortions are accepted, also possibly wrong choices that will turn an already bad situation into a hardly reversible drama, since the approach involves to focus on only one central topic, thereby leaving other options consequently aside. If these risks are taken at all, they should be minimized by appropriate strategies. Besides making the wrong choice at best intentions, these risks appear to be very high:

1) Agency effects, i.e. interests within the group leading the cluster building process that are self-referred. Actors may not really be aiming at the best of the region but at the best for themselves.
2) Unrealistic market expectations, based on an insufficient ‘stuck in the middle’ selling proposition.
3) High trade-offs, i.e. decline of other sectors suffering from withdrawn resources.
4) High regional vulnerability due to an unbalanced economic ‘monoculture’.



Source: Own graph

Figure 9.1 Approach for industrial policy-making

The central approach of smart specialization ‘calls for an ‘entrepreneurial-driven’ allocation of resources” (Foray, David, & Hall, 2011, p. 31). When doing so, it implies dealing with actors who have their very own very serious (very often financial) interests. Not considering agency when doing so is at least naive. To employ a ‘smart switchman’ instead of a ‘blind watchmaker’ can lead to nasty surprises on the chosen direction and spending of resources. Checks and balances in decision-making bodies need to be introduced.

The smart specialization approach is very much driven from an internal perspective, mainly considering the available technological and cultural base of a region. As an addition, a sound market analysis should be carried out on each proposal of the central entrepreneurial technology-finding body before making hasty decisions. Preferably, more than one proposal should be discussed. The analysis should not only involve the target markets, but also make sure that necessary resources are constantly available. Porter’s five force provide an adequate framework of analysis.

In parallel, a risk analysis should be carried out, focusing on the negative effects in other sectors on total economic welfare. Here, a special accent should be on vulnerability caused by cyclic markets and damage caused by agency effects.

In the outlined approach, the enormous danger in putting all one’s risks in only one basket is critically counterbalanced. Still, administration remains a (hidden) key player in the game. Given the fact that state-led economies have proven to render the poorest results in the globalized economy, the question remains whether even more state administration and intervention, although in a camouflaged version, will be able to provide a cure.

The role of the developed models and presented macro-economic results within the policy-making process is to deliver an obtrusive long-term framework for discussion. Past experience (e.g. the failed market liberalization strategy in Finland around 1990) has also shown that abrupt changes of institutions, especially those counteracting the cultural coinage, may lead to disastrous results. Evidence for path-dependency as predicted by VoC theory has been gathered, so the chances for taking a certain economic course can be judged by drawing from the available results of the models.

9.1.3.3 Conclusion on industrial policies

More than ever, mindful policies are required, not relieving companies from necessary ambition but absorbing economic shocks in critical situations like the Great Recession of 2008/9. Sufficient economies of scale have to be adequate for the world market, not only the national home market. In extreme cases, there might be only one big national player left, but when the relevant market is not the national economy but the world, this must not be mistaken as a monopolistic situation.

The investigations have shown that intellectual participation at all levels of the firm will lead to superior economic results. Segregated societies with deprived lower classes and lacking middle class do not offer the necessary intellectual resources. A mindful form of the welfare state, equally distant from social hammock and atavistic neo-liberalism, adapted to national culture, is likely to render the most favourable conditions for a blossoming economy involving a strong manufacturing sector.

Mindful policies will provide as much state backing as necessary, but as little support as possible to keep burdens from administration low. Adequate and reliable constant frame conditions for a stable development are to be provided. The state budget needs a certain volume to assure institutions which provide adequate administration, jurisdiction, education and defence. Only a sufficiently strong state can assure the frame conditions for a successful market economy, assuring that environmental and societal externalities are kept within acceptable limits for a sustainable development of the nation and – in a globalized world – mankind. On the other hand, in mature economies, the state has in no available case of state-led economies (Schmidt, 2003) proven to be a good entrepreneur and innovator. Therefore, the actually popular smart specialization approach is seen through a critical lens and embedded in a risk-preventing environment.

Concluding the findings, the third research objective (RO 3) has to a large extent been achieved. Advice for industrial policy makers was systematically derived and, based on proper socio-economic investigations, is ready to be adapted to specific scientific purposes and/or consulting. To lead to concrete results for countries and regions, a detailed analysis of their respective institutions is required.

If the given advice is applied adequately, de-industrialization will not be a threat. In many cases, it is even an opportunity. Balanced strategies render opportunities including those for combining manufacturing and service sectors by co-invention. The developed models may serve as an indicative framework for finding a suitable direction.

9.2 Further insights

Further to the intended achievements, a number of new insights were gained in the course of this research. The results are estimated as being contributions to scientific knowledge and will be introduced in the following.

In the literature review, three economic theories were introduced:

- Nicholas Kaldor's 'laws' on the special role of manufacturing in a national economy (Kaldor, 1966) (cf. section 2.3.3.1),
- Rowthorn's hypothesis on tipping points, i.e. maximum relative manufacturing employment over GDP per capita (log) (Rowthorn, 1994) (cf. section 2.3.1).
- VoC theory (Hall & Soskice, 2001a) (cf. section 2.2.2).

These theories were applied and at the same time scrutinized in the course of investigations. The results are presented in sections 9.2.2 and 9.2.3.

Before turning to these theories, the necessary length of time for achieving meaningful results on de-industrialization processes and related economic success will be discussed.

9.2.1 De-industrialization is a long-term process

In the course of the literature review of the actual research, the fear of very negative, even destructive societal consequences were manifest in many publications of the 1970s and 1980s (e.g. Bacon & Eltis, 1976; Cairncross, 1979; Corden & Neary, 1982; Singh, 1977). In these publications, a sensible anxiety for the future is backed by economic figures and considerations mostly related to developments over relatively short and nearby time periods.

Now, almost forty years later, the validity of long-term extrapolations of then only available short-term data on de-industrialization is ready to be scrutinized. By taking the most dramatic example for de-industrialization, the UK, it can clearly be stated that the prophecies of doom did not fulfil. Although the UK's industrial base became more and more eroded, the country could increase its national wealth and reduce the dramatic rates of unemployment by the time around 1980. Nevertheless, in recent years, national policy advisers have advocated to support the manufacturing sector, especially its small and medium-sized companies (Kitson & Michie, 2014).

In the light of these findings, the conclusion is drawn that a meaningful evaluation of structural change requires to cover long periods of time. Under normal circumstances, only the investigated full 35-year and the 15-year periods (long periods) lead to meaningful and comparable results. Even the 5-year periods investigated were too short to judge the underlying long-term processes because of their distortions by economic trends and small shocks.

This notwithstanding, also the 5-year investigations carried out made sense in some cases and from a specific point of view. They were utile to illuminate the consequences of unscheduled events like the collapse of the Soviet Union and resulting fall of the Iron Curtain and also the Yugoslav wars, i.e. in the rare incident of truly revolutionary events and/or economic shocks.

9.2.2 Manufacturing is not the only driver of an economy

Kaldor's 'laws' circle around the assumption that the manufacturing sector plays a special and largely indispensable role within any national economy. As this research has demonstrated, a strong and successful manufacturing sector can be one source of comparative advantage, but by far not the only one. Kaldor could not envisage the technological development in fields like ICT that in high-technology service sectors rendered productivity levels even superior to high-tech manufacturing, so these sectors can also render a source of positive economic development, even at the expense of a declining manufacturing sector.

The findings for sectoral growth have significantly underlined the assumption derived from VoC theory that CMEs are more in favour of manufacturing than LMEs. In accordance with this, Kaldor's 'laws' were chiefly disproved in their country of origin, the UK. Following the 'laws' more in detail:

1) *GDP growth is positively related to the growth of the manufacturing output.*

   As can be seen from the British example, this is not necessarily the case. The British GDP grew at a CAGR of 2.4 % between 1973 and 2008 while the manufacturing output decreased by a CAGR of –0.7 %.

2) *The productivity of the manufacturing sector is positively related to the growth of the manufacturing output.*

   This is not necessarily the case, as the scenario analysis shows. Demand-side scenario 5 (cf. Figure 4.2, p. 98) involves that output falls despite of rising productivity, so far less labour is required. This scenario was reality in the United Kingdom for many years, in fact most years from 1973 until 2008 (cf. Figure 5.67, p. 234).

   Moreover, also demand-side scenario 2 is opposed to Kaldor's second 'law'. Output grows despite of falling productivity, so much more labour is required. Also this scenario has become economic reality, e.g. in Brazil, Colombia and Mexico in the years from 1993 to 2008 (cf. Table 7.8, p. 371).

3) *The productivity of the non-manufacturing sector is positively related to the growth of the manufacturing output.*

   Again, the example of the UK proved the opposite. While the manufacturing output shrank between 1973 and 2008, the productivity of all sectors grew strongly and persistently (cf. Figure 2.1, p. 229).

Over the investigated time period, Kaldor's 'laws' were all falsified in certain economic settings. Yet, neglecting manufacturing too much may make a country very dependent on imports. If such a country like the UK leaves its economic space, here the EU by the BREXIT as foreseen by the time that this thesis is handed in, the economic risks are very high. Although autarchy is not feasible for almost any country in the world, too much import dependency should be avoided.

9.2.3 The existing theory of the tipping point needs to be modified

Rowthorn and Wells (1987) calculated the tipping points of relative manufacturing employment versus the GDP per capita. Adding to the findings them, it was observed that the country-specific maximum of relative employment in manufacturing is reached at a threshold productivity that can be calculated by two different linear functions of productivity over time, related to mature and emerging economies, respectively. These correspond with the relative position of the national industries in international value chains.

Unlike predicted by authors in the field (e.g. Palma, 2005; Rowthorn & Wells, 1987), the industrialization and eventual de-industrialization of emerging countries does not follow the economic path purported by the western predecessors. The tipping points of emerging countries in relative manufacturing vs. GDP per capita correspond to lower tiers (middle positions) in international value chains, so the national income per capita at tipping is much lower. The described two-layered system results. Maximum relative employment can be calculated by inserting the year of reaching the threshold productivity into the derived function of relative employment over time.

Only Korea could proceed from the 'premature' into the truly mature group over the last years under investigation. This involved a process of catch-up modernization followed by subsequent detachment of creativity by adequate policies, backed up by a national culture of low power distance compared to most other emerging countries.

The findings are considered to be a very important addendum to existing knowledge, or better a necessary amendment.

9.3 Limitations of the study

The main limitations of this study lay in the availability of data and resources.

- Data was only available from public resources. Sometimes, public access was restricted to a certain extent.
- In very many cases, especially for emerging countries, available data was incomplete or not fully reliable. In these cases, inter- and extrapolation steps and also choices made were carried out on a most reasonable and comprehensible basis (cf. Appendix 2).
- Currency relations had an impact on many of the results, e.g. on manufacturing productivity data where this effect is unavoidable (cf. Sørensen & Schjerning, 2003). In international trade, the currency impact is for real, so it must be included. To assure a minimum of distortion from currency relations, the USD was chosen as reference currency. The dollar area is the biggest currency area worldwide, so the highest number of states possible could be included.

This work was solely done by the author. No support of staff for collecting and processing data was available, so the work needed to be restricted on a number of countries. Moreover, the approach is comparative and generalist, i.e. micro-economic considerations could not be followed in very much detail.

The actual study is focussed on the time period from 1973 to 2008 and covers a limited sample of countries. Future research may cover additional years and regions and more detail, especially concerning emerging countries. The influence of changes in currency exchange rates might be investigated. Hopefully, the available data especially in emerging countries will be more complete and reliable.

Additional data on value added would help to refine the possible analysis which is of specific importance for analysing value chains and trade flows. In this respect, the EU KLEMS database has proven to be a very helpful tool for research on mature countries.

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