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The impact of boardroom internationalisation on online disclosures of S&P 500

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Abstract

Purpose - The purpose of this study is to analyse the level of online disclosure of firms in the USA and to evaluate the impact of diversity in terms of director nationality (boardroom internationalisation) on online disclosure.

Design/methodology/approach – The authors apply, for the first time, a new modified scoring system to measure online disclosure levels by securing more detailed information on each of the items in the voluntary disclosure index. Regarding the percentage of foreign board members, unlike in previous research, the authors calculate two additional proxies to more accurately specify the level of international diversity on the board: the Blau Index and the Shannon Index. Moreover, the authors use a cross-sectional model for the sampled non-financial S&P500 firms using both ordinary least squares (OLS) and heteroskedasticity-corrected estimates to analyse the impact of boardroom internationalisation on the level of online disclosure.

Findings - The findings reveal that the average online disclosure level for the sample in question is 64% for the 0–1 index and 57% for the 0–4 index. In addition, the results of the regression analysis confirm the study's proposed hypothesis, which is that the presence of international board members correlates with an improvement in the level of online disclosure. This can be attributed to the fact that foreign directors bring unique skills and knowledge from their home

countries and thus, increase board discussion, creativity and innovation, which has a positive impact on the level of online disclosure.

Research Limitations/Implications - Financial firms are subject to capital requirement regulations; consequently, disclosure practices can be influenced. Therefore, these firms were excluded from the sample of the study.

Originality/Value - This research contributes to the body of literature on nationality diversity of firm boards and corporate online disclosure in several respects. Firstly, the study adds an international dimension to the existing literature. Secondly, this study provides new evidence that foreign diversity on the board can improve firm value, insofar as the corresponding enhancement of online disclosure leading to positive capital market implications. Thirdly, the authors use, for the first time, a new scoring system approach to measure the level of online disclosure. Finally, it contributes to the corporate governance literature by basing its analysis on a multi-theoretical approach.

Keywords Online disclosure, Foreign board member, Boardroom, Corporate governance, Corporate website Paper type Research paper

1. Introduction

The purpose of information disclosure via website is to allow investors to assess a firm's current performance and evaluate its prospects to make informed financial decisions. Furthermore, information disclosure via websites helps improve investing efficiency and reduces the agency problem by mitigating information asymmetry between managers and investors (Aly et al., 2010). Over the past few decades, many sizeable economic crises and corporate collapses, which have had a massive impact on the global economy, have brought debate on corporate information disclosure to the fore. Corporate stakeholders need key relevant information regarding firms' activities to assess their own financial position (Zeghal

and El Aoun, 2016). Responding to these events, regulatory agencies have been obliged to reassess corporate policy basics in this regard (Beltratti and Stulz, 2012).

The present study aims to answer the following question: what is the impact of director nationality (boardroom internationalisation) on online disclosure? Dewayanto et al. (2017) suggest that this type of diversity in particular may render the board with a unique understanding of the strategies used in outside markets, which can prove useful to domestic firms, especially those who plan to expand into foreign markets. In addition, internationally diverse boards are thought to be more effective in terms of transferring corporate governance practices across nations (Iliev and Roth, 2018).

The majority of prior studies refer to both agency theory and signalling theory to highlight the importance of board diversity and its potential impact on firm value, disclosure levels and corporate governance behaviour. According to the agency model, the inclusion of foreign board members may improve the board's independence and efficiency. Independent boards are cognisant of their fiduciary duty to shareholders and therefore, endeavour to ensure corporate transparency and prevent opportunistic or self-serving behaviour by management, which results in better online disclosure practices (Armstrong et al., 2010). From the signalling theory perspective, firms with a high percentage of foreign board members are keen to signal their positive performance to shareholders by voluntarily disclosing sufficient information online. This theory also refers to the special knowledge, skills and experience foreign directors bring to the table.

In addition, we use a new modified scoring system to measure online disclosure levels by securing more detailed information regarding each of the items in the voluntary disclosure index. We argue that increasing the boardroom's internationalisation improves the effectiveness of the board and the standard of information disclosed to the public, which in turn reduces the agency costs postulated by the agency model.

This research contributes to the body of literature on nationality diversity of the board and corporate online disclosure in several respects. Firstly, our study adds an international dimension to the existing literature. In particular, we assert that increasing international diversity on the board can improve information disclosure and thus reduce agency costs and information asymmetry. As such, this study is part of an emerging body of research focusing on the broader effects of boardroom internationalisation. Secondly, most recent empirical studies have assessed international diversity on the board using the traditional measurements associated with studying foreign diversity, i.e. the percentage of foreign board members on the board and/or a dummy variable signifying the presence of at least one foreign director in the boardroom (Masulis et al., 2012; Marinova et al., 2016; Saada, 2018). However, these measurements did not take the homogeneity of the board into account. A board can be composed entirely of foreign members. Hence, the Blau and Shannon Indexes are used to measure the variety and balance of the board in this research.

The rest of this article is organised as follows: Section 2 provides a review of previous literature and presents the hypotheses of the study; Section 3 outlines the methodology, data collection procedures, variables of study and the construction of a disclosure index; Section 4 presents the findings of the analysis; and Section 5 concludes the paper.

2. Related literature and hypothesis development

The influence of different factors on the online disclosure level has been examined in prior literature. These factors are divided into two main groups. The first of these is firm specific characteristics, such as size of the firm, profitability, leverage, liquidity, industry type, auditor size, firm age and foreign listing (Oyelere et al., 2003; Abdelsalam and Street, 2007; Aly et al., 2010; Aqel, 2014; Basuony and Mohamed, 2014). The second group is related to corporate

governance concept, such as board size, non-executive directors, CEO duality, family members on the board and ownership (Oyelere et al., 2003; Abdelsalam et al., 2007; Abdelsalam and El-Masry, 2008; Waweru, et al., 2019). Therefore, the weakness of the previous empirical studies has been the neglect of factors related to the personal characteristics of directors as potential determinants for online disclosure. It is worth noting that calls have been made for researchers to investigate the corporate governance concept, which has become an increasingly significant issue.

Board diversity can be defined as the variety of director characteristics present in a given board's composition (Saggar and Singh, 2017). Within this broad definition, the more specific foreign diversity issue has generated an especially high level of debate with regard to its influence on boardroom dynamics and broader corporate impact. The corporate board influences wide-ranging factors including the operating and investment decisions of management and the quantity and quality of information disclosed to the public, which in turn, influences the level of information asymmetry faced by the external market.

Abdullah et al. (2016) state that appointing foreign members to the board can convey a good impression to investors with respect to the quality of a firm's corporate governance practices. Ujunwa (2012), for example, concludes that nationality diversity on the board has a positive impact on firm performance, and Oxelheim and Randøy (2003) observe that higher firm values are correlated with a higher proportion of foreign board members. Moreover, related studies by Du et al. (2017) find that foreign presence on the board can help mitigate earnings management practices and enhance earnings' quality. Although two further studies by Ibrahim and Hanefah (2016) and Khan (2010) reveal a positive relationship between international presence on the board and corporate social reporting (CSR). Furthermore, Zaid et al. (2020) analyse the impact of board diversity on the extent of corporate sustainability performance in Palestine using the Blau Index and the Shannon Index. They find that there is an insignificant

positive impact of both nationality and gender diversity on corporate sustainability performance.

Other studies, however, fail to establish support for the notion that foreign board members perform their duties more effectively than their domestic colleagues. According to Barako and Brown (2008), international presence on the board has no significant correlation with CSR disclosure. Barako and Brown (2008) also argue that foreign board members most likely act in the interest of foreign shareholders and that their presence on the board may thus provide these owners with an alternative means of accessing information outside of standard disclosure practices. However, it may also be the case that foreign board members are less effective in the monitoring role than domestic board members, thus reducing the board's overall effectiveness in performing its disciplinary function (Masulis et al., 2012).

In addition, several studies analyse the impact of gender diversity on disclosure. For example, Zahid et al. (2020) examine the impact of boardroom gender diversity on corporate sustainability disclosure in Malaysia and find that women directors have a significant positive impact on corporate sustainability disclosures. Tingbani et al. (2020) investigate the ongoing debate regarding women's role in the boardroom by analysing the influence of gender diversity on voluntary disclosure and find a significant positive impact of gender diversity on voluntary disclosure. Moreover, Liao et al. (2015) argue that a board with more gender diversity has higher voluntary disclosure of greenhouse gas emissions in the UK. Furthermore, Nalikka (2009) confirms that firms with female chief financial officers are associated with higher voluntary disclosure. Although Cabeza-García et al. (2018) use a probit model for Spanish firms and find that a higher percentage of women in boardrooms implies better CSR disclosure. These studies, however, did not examine the impact of boardroom internalisation.

The previous literature on boardroom diversity is descriptive in nature and makes little explicit reference to theoretical models. Several theoretical approaches from various academic fields can be used to explain the potential impact of international diversity on a firm's information environment and disclosure decisions. In the present study, we focus on agency theory and signalling theory.

According to the agency model, foreign board members play a role in the effective monitoring of management insofar as that they are able to exploit their position as representatives of international shareholders to prevent self-interested managerial behaviour. They can bring a high degree of insight and improved monitoring capacity to the boardroom, and they may be highly active board members who are more inclined to ask the types of questions typically avoided by domestic board members.

Therefore, the presence of foreign board members can enhance the board's independence and efficiency. Independent boards are motivated by their fiduciary duty to shareholders and thus take action to promote corporate transparency and curb opportunistic or self-serving behaviour on the part of management, which results in improved online disclosure practices (Armstrong et al., 2010). In other words, a higher proportion of foreign board members may help to improve the transparency and information disclosure practices of a firm.

From the perspective of signalling theory, firms with a high proportion of foreign directors will be eager to signal their positive performance to stakeholders by voluntarily disclosing ample information online. This theory also refers to the distinct knowledge, skills and experience brought to the board by foreign directors. Similarly, stakeholder theory assumes that international directors will positively affect boards and improve the level of voluntary online information disclosure, based on the fact that foreign directors bring important social capital to a firm in the form of critical international connections.

Based on the predictions of the theories discussed previously, this paper argues that the presence of international board members will improve the level of online disclosure. Whereby increasing the existence of foreign board members enhances the transparency and information disclosure practices of a firm. Therefore, the hypothesis of this study is as follows:

H1. There is a positive relationship between foreign board members and the level of online disclosure.

3. Data and methodology

To explore the impact of boardroom internationalisation on the online disclosure practices of nonfinancial USA firms listed on the S&P500, we draw data from several sources, including Compustat, BoardEx and the Financial Ratios Suite by WRDS. Our sample is constructed using annual data for the year 2019. We first use Compustat to create a list of all non-financial firms listed on the S&P500 that had non-negative total assets for the year in question. Compustat also provided our accounting data for these firms and this was then matched with data from the Financial Ratios Suite by WRDS to compute variables, such as ROA. The data was also matched with corporate governance data (e.g. board size and director nationalities) from the BoardEx database.

This research contributes to the literature on international diversity and online disclosure practices, specifically with respect to firms listed on the S&P500 index, whose 500 indexed firms cover approximately 80% of available market capitalisation. The index boasts over US\$9.9tn, either indexed or benchmarked to the index, with indexed assets comprising approximately US\$3.4tn of this total. The S&P500 is therefore commonly regarded as the most important index for large-cap US equities.

Following prior research (Elzahar and Hussainey, 2012; Adznan and Nelson, 2014; Hassanein and Hussainey, 2015; Nelson, 2016), we exclude financial firms from the sample because they are subject to capital requirement regulations, which are thought to influence disclosure practices. Moreover, banks and insurance firms are subject to different disclosure regulations, and the nature of their transactions and asset portfolios differs substantially from those of non-financial firms. Thus, our final sample for the study consists of data from 331 non-financial firms, all of which are listed on the S&P500 index.

3.1 Measurement of online disclosure using a disclosure index

To comprehensively assess the level of online disclosure based on the integration of the key dimensions used in previous investigations; this study constructs a unique compound measurement tool or disclosure index, which includes four key components: content (i.e. general, financial, corporate governance and investor relationship information), technology, user support and timeliness. The first dimension of content measures the availability of corporate information alongside the type of information disclosed (i.e. financial versus non-financial). The technology dimension assesses whether, and how, firms use more advanced tools. The user support component evaluates the firm's website layout and design, and the timeliness dimension refers to the timeline in which the information was disclosed, e.g. stock price information and press release availability. The final index, as categorised into these four dimensions, includes a total of 68 items.

3.1.1 Measurements of the disclosure index. Voluntary disclosure levels can be evaluated through either a weighted or an un-weighted approach. As noted previously, the majority of earlier empirical studies investigating voluntary online disclosure have used the un-weighted approach, with proponents of this method noting that it has the advantage of giving equal importance to all information, irrespective of the type of user. Ferguson et al.(2002) further stipulate that the

unweighted approach eliminates the unavoidable bias inherent in examining the importance of items disclosed with respect to various user groups (e.g. regulators, creditors, investors, etc.). Thus, an unweighted index is most appropriate for studying a wide array of user groups.

Al-Janadi et al. (2012), however, assert that the un-weighted method fails to take into account the extent to which each item is disclosed because it uses only a dummy variable of 1 or 0. This technique disregards the amount of information provided with respect to each item, as well as how the information is presented, e.g. in graphs, charts or tables. Furthermore, Coy and Dixon (2004) claim that subjectivity is an important element in this type of analysis, which is neglected in the use of an un-weighted index.

Based on these arguments and to overcome this limitation, the current study uses a modified scoring system, which extends the measurement to five levels of disclosure (0, 1, 2, 3 and 4), in addition to the usual un-weighted approach (using only 0 and 1). This new method of measurement allows more detailed information to be captured for each item in the voluntary disclosure index. The five levels of the extended scoring system are outlined as

follows: firstly, level A (scored as 4) is given to items that are fully published, include both quantitative and qualitative information and are followed by graphs, charts or tables. Secondly, level B (scored as 3) is given to the item if it is published and provides both quantitative and qualitative information. Thirdly, level C (scored as 2) is given to the item if it is published and provides either qualitative or quantitative information followed by graphs, charts or tables. Fourthly, level D (scored as 1) is given to the item if it is published and provides either qualitative information, quantitative information or graphs, charts or tables. Lastly, level E (scored as 0) is given to the item if it is not used in any manner.

3.2 Measures of boardroom internationalisation

In this study, nationality diversity on the board of directors was quantified in several ways. Firstly, we calculated the nationality diversity variable using the ratio of number of foreign board members to the total number of directors in the boardroom. Secondly, we noted the existence of foreign board members on the board using a dummy variable equal to 1 if the board had at least one foreign board member and 0 otherwise. Both of these techniques have been extensively and traditionally used in previous research on boardroom diversity.

However, as noted previously, they do not always provide a true measure of diversity because a board comprised solely of either domestic or foreign board members registers as a homogenous board.

We therefore use two additional measures of international diversity in the current study. The first of these is known as the Blau Index (Blau, 1977), which can be considered a measure of “variety” insofar as it assesses whether a board includes representatives from both the foreign and domestic categories. It is calculated as:

$$\text{Blau Index} = 1 - \sum_{i=1}^n P_i^2 \quad (1)$$

where P_i represents the proportion of foreign board members in each category (i.e. foreign or domestic) and n is the number of categories (i.e. in this case, two). The maximum and minimum possible values for this variable are, respectively, 0.5 (when numbers for foreign and domestic board members are equal) and 0 (when only one of the two categories is represented).

The second of these additional measures is known as the Shannon Index (Shannon, 1948), which is considered a measure of “balance”, i.e. it assesses how equally the two categories of directors are represented on the boardroom. It is calculated as:

$$\text{Shannon Index} = - \sum_{i=1}^n P_i \ln P_i \quad (2)$$

where P_i and n are defined as previously in the Blau Index. In this case, the range of values falls between 0 (i.e. no nationality diversity) and 0.69 (i.e. when the proportions are equal). These last two indexes are considered analogous, though the Shannon Index is more sensitive to slight differences in board composition.

A board is thus considered diverse in terms of nationality when it contains both foreign and domestic board members, and a board comprised only of members from either one of the two categories would not be considered diverse in this regard. The two additional indexes help to expand on these differences. However, it should be noted that they both reach their maximum value when the two categories are represented equally, i.e. they make no additional allowance for boards comprising a majority of foreign board members.

However, this is not considered to be a significant issue because such high concentrations of foreign board members are very rare and the number of foreign board members is usually quite low. Nonetheless, for this reason, these indexes are included in this study as complements, rather than alternatives, to the standard proportion and dummy variable techniques. In other words, they are included to improve the robustness of our findings. Moreover, only a small number of studies use metrics, such as the Blau Index and Shannon Index, for diversity (Ali et al., 2014; Ararat et al., 2015; Talavera et al., 2018; Unite et al., 2019; Zaid et al., 2020), which are better measures of diversity (Aggarwal et al., 2019). Therefore, following Aggarwal et al. (2019), Unite et al. (2019) and Zaid, et al. (2020), the Blau Index and Shannon Index are used.

3.3 Model of study

This article hypothesises that the composition of the board of directors can influence a firm's online disclosure practices. In particular, we argue that board composition geared towards the reduction of information asymmetry between investors and the management increases the likelihood of firms disclosing more information online. Following this general hypothesis, the primary independent variable of this study is foreign board members. In addition, although not the focus of our study, we attempt to control for several other factors that could also explain variation in online disclosure level. These include two corporate governance variables:

- (1) the percentage of non-executive directors; and
- (2) board size as the logarithm of the total number of directors.

Also included are several of the variables commonly controlled for in similar studies on online disclosure practices, i.e. firm size, profitability and leverage.

To evaluate the impact of foreign board members on online disclosure, we use a cross-sectional model involving both a baseline (i.e. excluding the key variable of nationality diversity) and an extended (i.e. including this key variable) form. These two models are written as follows:

Baseline model:

$$OD_i = \beta_0 + \beta_1 FS_i + \beta_2 ROA_i + \beta_3 LEV_i + \beta_4 BS_i + \beta_5 NONEX_i + \varepsilon$$

Extended model:

$$OD_i = \beta_0 + \beta_1 FS_i + \beta_2 ROA_i + \beta_3 LEV_i + \beta_4 BS_i + \beta_5 NONEX_i + \beta_6 ND_i + \varepsilon$$

where the index i denotes a firm, OD_i is the online disclosure index score, FS_i is firm size as measured by the logarithm of total assets, ROA_i is profitability as

measured by return on total assets, LEV_i is debt to assets ratio, BS_i is board size as measured by the logarithm of the total number of directors and $NONEX_{i,t}$ is the fraction of non-executive directors as measured by the total number of non-executive directors divided by board size.

In the extended model and in accordance with the proposed hypothesis, the primary corporate governance independent variable is that of nationality diversity on the board of directors (ND_i). As explained previously, this study uses four measures to assess this variable: the percentage of foreign board members divided by total board size; a dummy variable equal to 1 if the board has at least one foreign board members and 0 otherwise; the Blau Index to measure “variety”, i.e. whether the board includes representatives from both foreign and domestic categories; and the Shannon Index to measure “balance”, i.e. how equally the two categories of foreign and domestic directors are represented on the boardroom.

4. Empirical results

4.1 Descriptive analysis

To establish the extent of online disclosure level, the current study has developed a unique checklist as a research instrument. Both the total online disclosure score and its primary components are assessed using un-weighted disclosure indexes, which involves two scales, i.e. 0–1 and 0–4. Hence, it is important to ensure that the disclosure index actually measures the online disclosure level and that the measurement correctly assesses the “goodness of a measure”. It is possible to identify the goodness of a measure by conducting a reliability test for the disclosure index. A well-favoured test for the reliability of internal consistency is Cronbach’s coefficient alpha, which measures inter-item correlation (Sekaran and Bougie, 2003). In this study, the result of Cronbach’s alpha for all internet financial

reporting (IFR) components is higher than 0.7, indicating that the IFR component's indices are reliable.

Furthermore, to ascertain the current level of online disclosure for the S&P500 non-financial firms in our sample, we perform a descriptive analysis. Measuring the frequency of online disclosure level and its various components can yield a more comprehensive understanding of general disclosure level, and this can illuminate which items are most and least readily disclosed online. The aim of this section is thus to present a clear descriptive picture of the current online disclosure practices of the study's sample of non-financial S&P500 firms.

The content dimension of the index includes 37 items, which have been classified into the following four groups: general information (7 items), financial information (16 items), corporate governance (9 items) and investor relations (5 items). The results in Table 1 show that the minimum disclosure values for general information and investor relations are 0%, indicating that some firms did not disclose any information related to these categories on their websites. On the contrary, some firms demonstrate high levels of online disclosure in this regard, notably Cisco Systems Inc., ebay Inc. and Autodesk Inc.

Scale	N = 331	Minimum (%)	Maximum (%)	Mean (%)	SD (%)
0–1	General information items	0	100	59	23
	Financial information items	19	75	50	10
	Corporate governance items	11	89	55	11
	Investor relation items	0	100	71	21
	Technology dimension Customer support dimension Timeliness dimension Total score	33	100	74	13
		14	95	72	9
		0	100	63	15

General information items	29	82	64	7
0–4 Financial information items	0	79	38	13
Corporate governance items	20	70	48	10
Investor relation items	3	55	23	8
Technology dimension Customer	0	100	82	14
support dimension Timeliness	33	100	74	13
dimension Total score	14	95	72	9
	0	100	63	15
	27	72	57	6

Table 1. Descriptive analysis of online disclosure for non-financial S&P500

Table 1 reveals a somewhat higher overall level of online disclosure with respect to the categories of general information and investor relations compared to the corporate governance category, though values for the financial information category are lower. In fact, financial information disclosed online was generally very low overall, suggesting that non-financial firms listed on the S&P500 need to improve in this regard.

With respect to the dimension of technology, Table 1 shows that the average disclosure level is 74%. Furthermore, the minimum value for this variable is 33%, whereas the maximum value is 100%, with 31 of the sampled firms achieving the maximum score (e.g. Exelon Corp., ebay Inc., Microsoft Corp., Cisco Systems Inc. and Costco Wholesale Corp.). This demonstrates that the sampled firms generally disclose more information related to technology compared to other content dimensions.

The customer support dimension also exhibit higher general levels of online disclosure. It can be seen in Table 1 that the average value for this dimension is

72%, and all of the sampled firms include at least some information in this regard, with the lowest value being 14%. The maximum value for this variable is 95%, which Disney (Walt) Company achieved. This indicates that firms in our sample generally have a strong interest in customer support.

Similarly, to the technology and customer support dimensions, the timeliness dimension also has a relatively high overall level of disclosure, averaging 63%. The minimum value, however, is 0%, whereas two firms (Universal Health Svcs Inc. and Huntington Ingalls Ind Inc.) achieved the maximum value of 100%.

4.2 Correlation and independent samples t-test analysis

Table 2 presents the results of the independent samples t-test, which aims to analyse the mean differences in online disclosure for both the 0–1 and 0–4 scales between firms with foreign directors in the boardroom (173 firms) and those without (158 firms). The results show that the average for the 0–1 index for firms with foreign directors in the boardroom is 65.27% (58.6% for 0–4) compared with 61.87% (55.91% for 0–4) for firms without foreign directors, indicating a mean difference of 3.4% (2.68% for 0–4) and significance at the 1% level. This clearly indicates that firms with foreign board members have a higher level of online disclosure compared with firms without foreign board members. Table 3 presents the results of the correlation analysis and these reveal a significant positive correlation between online disclosure and international representation on the board. This indicates that the sampled firms with higher numbers of non-American board members tend to disclose more information online than their counterparts with boards comprised entirely of Americans.

Group statistics					t-test for equality of means				
Scale	Foreign directors	N	Mean	SD	t	Sig.	Mean difference	Std. error difference	
0–1	With 173	65.27%	6.87%	4.384	0.000***	3.40%	0.78%	Without 158	61.87%
			7.23%						
0–4	With	173	5.60%	5.71%	4.258	0.000***	2.68%		0.63%
	Without	158	5.91%	5.74%					

Notes: Table 2 reports the results of the independent samples t-test used to test the mean differences in the level of online disclosure index (0–1 and 0–4) between firms that had an international presence on the board and those that did not. The symbol *** denotes statistical significance at the level of 1%

Table 2. Independent sample t-test analysis

	0–1	0–4	FS	ROA	LEV	BS	NONEX	ND%	Blau	Shannon
0–1	1	–	–	–	–	–	–	–	–	–
0–4	0.940***	1	–	–	–	–	–	–	–	–
FS	0.246***	0.215***	1	–	–	–	–	–	–	–
ROA	0.092*	0.069	–0.254***	1	–	–	–	–	–	–
LEV	0.298***	0.274***	0.357***	–0.104*	1	–	–	–	–	–
BS	0.253***	0.256***	0.403**	–0.130**	0.256***	1	–	–	–	–
NONEX	0.248***	0.221***	0.289***	–0.076	0.205***	0.279***	1	–	–	–
ND%	0.263***	0.252***	0.097*	–0.003	0.093*	0.111**	0.082	1	–	–
Blau	0.239***	0.224***	0.097*	–0.019	0.105	0.167***	0.105*	0.883***	1	–
Shannon	0.239***	0.226***	0.105*	–0.026	0.110**	0.181***	0.113**	0.872***	0.998***	1

Notes: Table 3 reports the results of the correlation analysis, assessing the correlation between nationality diversity and the level of online disclosure index (0–1 and 0–4) for the sampled non-financial S&P500 firms. The following abbreviations are used in the table. BS = board size, NONEXC = percentage of non-executive directors, FS = size of the firm, LEV = leverage, ROA = return on

assets. This study uses four measurements for nationality diversity (ND). These are as follows. ND%: percentage of foreign board members divided by board size; NDD: a dummy variable equal to 1 if the board includes at least one foreign board members and 0 otherwise; Blau: the Blau Index measuring “variety”, i.e. whether boards include representatives of both foreign and domestic categories; and Shannon: the Shannon Index measuring “balance”, i.e. how equally foreign and domestic directors are represented on the board. The symbols *******; ******; and ***** denote statistical significance at the levels of 1%, 5% and 10%, respectively.

Table 3. Correlation analysis

4.3 Regression analysis

The variance inflation factor (VIF) is commonly used to check if there is any strong correlation between the explanatory variables. The result of VIF for all our variables is less than 1.5, suggesting the absence of multicollinearity.

Moreover, we use White’s test to check for heteroskedasticity and the result[1] is significant at 1%, indicating that heteroskedasticity is present in our data.

Therefore, we use both OLS and heteroskedasticity-corrected models (HCMs).

4.3.1 Baseline model results. As discussed previously, we begin our analysis by estimating the baseline model, which excludes the nationality diversity variable to assess only the impact of the firmlevel and corporate governance control variables. These results are presented below in Table 4. The OLS and heteroskedasticity-corrected results for this model are consistent with our theoretical predictions, and all coefficients are shown to be highly statistically significant.

The results of the regression analysis for the variable of board size clearly indicate a significant positive correlation with online disclosure for both the 0–1 and 0–4 scales. The results are also significant at the 1% level for all models except

the first model, which remains significant at the 5% level. Based on this finding, it can be said that increasing board size will improve online disclosure levels. However, it should be noted that increasing board size may also result in an increase in representation by non-executive directors, which can also improve corporate information disclosure. This suggests that firms with larger boards tend to disclose more information on the firm’s website. According to agency theory, a greater number of board members improves monitoring and enhances transparency, with large boards being less vulnerable to dominance by management (Hashim, et al., 2014). Therefore, Felo (2010) claims that firms with small boards disclose less information than those with larger boards. Having more directors on the board can lead to greater diversity of director expertise, for example, in relation to financial reporting. Moreover, larger boards tend to represent the interests of a range of stakeholders regarding experience and opinion.

Table 4. Regression analysis for baseline model

	0-1	0-	0-1	0-4	DV
N = 331	OLS	OLS	HCM	HCM	
R2	0.181	0.15006	0.1864	0.16222	
Adj. R ²	0.166	0.13432	0.17133	0.14671	
F(6, 324)	11.93	9.53	12.37	10.46	
P-value(F)	(0.000)	(0.000)	(0.000)	(0.000)	
Const.	0.244	0.280	0.207	0.265	
FS	(0.000)	(0.000)	(0.003)	(0.000)	
ROA	0.018	0.010	0.016	0.010	
LEV BS	(0.035)	(0.146)	(0.055)	(0.123)	
NONEX	0.170	0.111	0.167 (0.000)	0.097	
Gender ratio	(0.001)	(0.007)		(0.002)	

0.056	0.042	0.050	0.038
(0.000)	(0.000)	(0.000)	(0.001)
0.113	0.108	0.144	0.121
(0.021)	(0.007)	(0.001)	(0.001)
0.193 (0.004)	0.131 (0.017)	0.215 (0.002)	0.143 (0.018)

Notes: Table 4 reports the results of the regression analysis for the baseline model, which excludes the nationality diversity variable, to analyse the impact of the control variables on the level of online disclosure index (0–1 and 0–4) for the sampled non-financial^{0.050 (0.238)} S&P500 firms, using^{0.030} both^(0.389) OLS and heteroskedasticity-corrected^{0.044 (0.266)} estimates.^{0.033 (0.298)} The abbreviations used in the table are as follows. BS = board size, NONEXC = percentage of non-executive directors, FS = size of the firm, LEV = leverage, ROA = return on assets, gender ration = percentage of female directors to the board size; p values shown in parentheses

Additionally, improving a firm’s monitoring ability is likely to ameliorate an organization’s disclosure policy. Agency theory explains this result by stipulating that firms with larger boards may use online disclosure as a means of legitimising themselves to the external market. Furthermore, our results are consistent with several recent empirical studies, for example, Ezat and El-Masry, (2008), Hashim, et al. (2014), Sandhu and Singh (2019), Husted and de Sousa-Filho (2019), which claim that board size correlates positively with disclosure level.

With respect to the second corporate governance control variable, i.e. ratio of board size to nonexecutive directors, the results of the regression analysis reveal

a significant positive correlation with the level of online disclosure for both the 0–1 and 0–4 scales, as well as for both the OLS and HCMs, with results significant at a level of 5%. Agency theory stipulates that with respect to the monitoring function of the board, non-executive directors tend to be more credible than directors who also hold executive positions within the firm because such directors have no self-interest in the firm and will thus be more likely to act solely in the interests of shareholders. Non-executive directors are thus important as supervising mediators who can reduce the level of conflict between shareholders and corporate insiders. They can also help improve matters of transparency and disclosure, thus reducing information asymmetry and increasing the board's integrity and capacity to avoid conflicts of interest. For this reason, a high ratio of non-executive directors on the board is generally thought to be a sign of good governance, which is likely to correspond with high levels of transparency and, hence, as in the case of this study, online disclosure practice. Thus, a large number of non-executive directors on a firm's board can signify quality corporate governance and normally, a high level of transparency (Crowther and Jatana, 2007). In a similar vein, Weir and Laing (2003) and Chau and Leung (2006) argue that a large number of outside directors improve the monitoring capacity of the board because they are not associated with the firm as officers or employees and can therefore act independently in relation to shareholders' interests. We also used gender diversity as another control variable, which we measured by calculating the percentage of female directors on the board, as well as based on the number of board meetings. However, the results show that the impact of these control variables on online disclosure is insignificant.

The results of the regression with respect to the firm-level control variable of firm size reveal a significant positive correlation with the level of online disclosure. In the existing literature, a near consensus exists regarding the relationship between firm size and corporate information transparency, which is that small

firms are less likely to release adequate financial information. There are three potential reasons for this:

- (1) the high costs associated with gathering such information;
- (2) a lack of manager awareness regarding the benefits of information disclosure; and (3) the assumption that increasing disclosure might undermine their performance and competitive advantage within the market.

Similarly, it is thought that large firms are more likely to engage in ample information disclosure for several reasons. First of all, because agency costs are thought to be higher for larger firms, managers of large firms may be more likely to use disclosure as a means to reduce such costs. Secondly, large firms tend to receive more media attention, which creates a need to justify the firm's existence. Thirdly, large organisations tend to be viewed as economically significant by various groups of actual and potential stakeholders and are thus subject to greater scrutiny by analysts, which in turn, creates added pressure around releasing more information, both electronically and through other means. Fourthly, large firms tend to have greater access to the capital and expertise necessary to produce more information on their activities and the implications of these activities. Finally, large firms that wish to continue growing require external capital to do so, and such capital is much more obtainable when potential stakeholders have access to high quality information about the firm.

The results of the regression, with respect to the firm-level control variable of profitability, reveal a significant positive correlation with the level of online disclosure for both the 0–1 and 0–4 scales, as well as for both the OLS and HCMs, with all results significant at a level of 1%. This indicates that more profitable firms tend to disclose more information via the website than less profitable ones. It is thought that profitability acts as a motive for online information disclosure in several ways. From the perspective of the signalling model, more successful firms

have an incentive to distinguish themselves from their less successful counterparts to reduce the cost of capital. Furthermore, using a corporate website to communicate with the external market can be viewed as a way to signal the high quality of a firm's management. This means that managers may see improving the level of online disclosure as a

way to boast about the firm's uniqueness compared to its competitors. Profitability is naturally considered an indicator of high-quality management and investment potential, so it makes sense that profitable firms wish to share such information. Moreover, signalling theory can be applied to online reporting practices because such information disclosure is voluntary. The argument is that profitability spurs management to disclose more information as a means of inspiring investor confidence, which in turn can increase manager compensation. Similarly, it has been found that highly profitable firms also tend to have greater levels of information disclosure in their annual reports.

The term "leverage" refers to a firm's use of financial resources, such as debt or equity, to increase shareholder returns. As with the findings for the profitability variable, the regression results for leverage indicate a significant positive correlation with the level of online disclosure for both the 0–1 and 0–4 scales, as well as for both the OLS and HCMs, with all the results significant at a level of 1%. This means that firms with higher levels of debt tend to disclose more information via the website.

4.3.2 Extended model results. We can now move on to a discussion of the findings regarding the hypothesis of our study. As noted previously, this involves extending the baseline model by adding the key variable of proportion of foreign board members to the corporate governance and firm-level control variables already examined to uncover any potential correlations with the level of online disclosure practices. Estimations are calculated using both the OLS

(Table 5) and HCMs (Table 6), and the findings are in line with theoretical predictions, with all coefficients demonstrating high statistical significance.

Moreover, a measure of the percentage of foreign directors on the board wrongly assigns foreign diversity value to firms with a board comprising more than 50% foreigners. This is due to boards with a larger number of foreign members being less diverse than boards with an equal number of foreign and domestic members. Very few studies have used metrics, such as the Blau Index and Shannon Index for diversity (Ali et al., 2014; Ararat et al., 2015; Talavera et al., 2018; Unite et al., 2019; Zaid et al., 2020), which are superior measures of diversity (Aggarwal et al., 2019). Therefore, following Aggarwal et al. (2019), Unite et al. (2019), Zaid et al. (2020), the percentage of foreign directors (Models 1–2), a dummy variable equals to 1 if the board has at least one foreign board members and 0 otherwise (Models 3–4), the Blau Index (Models 5–6) and the Shannon Index (Models 7–8) were used in this study (Tables 4 and 5). The Blau Index and the Shannon Index more accurately specify the level of international diversity on the board. More specifically, the former is a measure of “variety”, assessing whether a board includes representatives from both a “foreign” and a “domestic” category, and the latter is a measure of “balance”, assessing how evenly foreign and domestic board members are represented on a board.

The percentage of foreign directors revealed nationality diversity as a percentage of the board size; however, as noted previously, this does not necessarily provide a true measure of diversity because a board comprised solely of either domestic or foreign board members is deemed to be a

homogenous board. Regardless of the proxy of nationality diversity, the regression results reveal that nationality diversity amongst board directors demonstrated a significant positive correlation with the level of online disclosure for both the 0–1 and 0–4 scales as well as for both the OLS (Table

4) and HCM (Table 5), with all results significant at a level of 1%. This implies that the presence of foreign directors on the board for the sampled firms enhanced the level of online disclosure. In this regard, the implication of the results is that higher numbers of international directors seem to increase the likelihood of website use for disclosing information based on its efficiency and global accessibility.

This may be related to the notion that international board members bring unique skills and knowledge to the boardroom which can improve transparency and, correspondingly, the levels of online information disclosure. Moreover, foreign board members tend to have a unique understanding and superior knowledge of the external markets that the firm is present in. Such knowledge may add value to any future expansion of the firm (Dewayanto, et al., 2017). In addition, it has been shown that foreign directors can enhance the board's independence (Carter et al., 2003). Boards with international membership may be considered to be an effective mechanism for transferring governance across countries. Therefore, this may lead to an increase in the level of online disclosure. Signalling theory likewise predicts that firms with greater numbers of foreign directors will want to signal their positive performance to the market by voluntarily sharing more information via the website. Foreign representation on the board may also improve corporate performance based on these directors' unique knowledge, skills and experience. Stakeholder theory also predicts that foreign board members will lead firms towards higher levels of voluntary disclosure levels of voluntary disclosure based on the social capital they bring to the table in terms of international connections. All of these theories support our hypothesis that a positive correlation exists between a foreign presence on the board and the level of online disclosure for our sample of non-financial firms listed on the S&P500 index.

Table 5. Regression analysis for extension model

DV	0-1		0-4		0-1		0-4		0-1		0-4		
	OLS	(0.000)	OLS	(0.000)	OLS	(0.000)	OLS	(0.000)	OLS	(0.000)	OLS	(0.000)	
R^2	0.222	(0.000)	0.189	(0.000)	0.173	(0.000)	0.210	(0.000)	0.175	(0.000)	0.209	(0.000)	
Adj. R^2	0.206		0.172		0.155		0.193		0.157		0.192		
$F(6, 324)$	13.20		10.77		9.67		12.25		9.81		12.18		
P -value(F)		(0.000)		(0.000)		(0.000)		(0.000)		(0.000)		(0.000)	
Const.	0.262	(0.000)	0.294	(0.000)	0.303	(0.000)	0.265	(0.000)	0.297	(0.000)	0.267	(0.000)	
FS	0.017	(0.050)	0.009	(0.195)	0.010	(0.157)	0.018	(0.037)	0.010	(0.156)	0.018	(0.037)	
ROA	0.162	(0.001)	0.105	(0.009)	0.111	(0.006)	0.166	(0.001)	0.108	(0.007)	0.167	(0.001)	
LEV	0.053	(0.000)	0.040	(0.001)	0.040	(0.001)	0.053	(0.000)	0.040	(0.001)	0.053	(0.000)	
BS	0.100	(0.035)	0.099	(0.013)	0.089	(0.028)	0.083	(0.054)	0.093	(0.020)	0.092	(0.059)	
NONEX	0.179	(0.006)	0.120	(0.027)	0.119	(0.029)	0.178	(0.007)	0.120	(0.028)	0.178	(0.007)	
Gender ratio	-0.035	(0.406)	-0.018	(0.602)	-0.024	(0.494)	-0.038	(0.367)	-0.021	(0.547)	-0.039	(0.356)	
ND-%	0.071	(0.000)	0.056	(0.000)	-	-	-	-	-	-	-	-	
ND-Dummy	-	-	-	-	0.018	(0.003)	0.061	(0.001)	0.046	(0.002)	-	-	
Blau	-	-	-	-	-	-	-	-	-	-	0.041	(0.001)	
Shannon	-	-	-	-	-	-	-	-	-	-	-	0.032	(0.002)

Notes: Table 5 presents the results of the regression analysis for the extended model, which analyses the impact of nationality diversity on the level of online disclosure index (0-1 and 0-4) for the non-financial S&P500 firms in our sample, using OLS models. The variables used are as follows. BS = board size, NONEX = percentage of non-executive directors, FS = size of the firm, LEV = leverage, ROA = return on assets, gender ratio = percentage of female directors to the board size. In addition, this study uses four measurements for nationality diversity (ND), ND-%; percentage of foreign directors divided by total board size; ND-Dummy: a dummy variable equal to 1 if the board has at least one foreign director and 0 otherwise; Blau: the Blau Index measuring "variety", i.e. whether boards include representation by both foreign and domestic directors; Shannon: the Shannon Index measuring "balance", i.e. how equally foreign and domestic directors are represented on the board; p values shown in parentheses

Table 6. Regression analysis for extended model

DV	0-1	0-4	0-1	0-4	0-1	0-4	0-1	0-4
N = 331	HCM	HCM	HCM	HCM	HCM	HCM	HCM	HCM
R ²	0.303	0.249	0.250	0.209	0.274	0.213	0.277	0.211
Adj. R ²	0.288	0.233	0.234	0.192	0.258	0.196	0.262	0.194
F(6, 324)	20.06	15.33	15.38	12.21	17.43	12.48	17.70	12.32
F-value(F)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Const.	0.241 (0.000)	0.274 (0.000)	0.221 (0.001)	0.275 (0.000)	0.223 (0.000)	0.276 (0.000)	0.222 (0.000)	0.277 (0.000)
FS	0.019 (0.006)	0.011 (0.041)	0.021 (0.005)	0.012 (0.040)	0.020 (0.005)	0.012 (0.040)	0.020 (0.008)	0.012 (0.041)
ROA	0.118 (0.000)	0.084 (0.008)	0.171 (0.000)	0.100 (0.002)	0.161 (0.000)	0.100 (0.003)	0.165 (0.000)	0.100 (0.003)
LEV	0.031 (0.010)	0.031 (0.001)	0.040 (0.001)	0.032 (0.002)	0.040 (0.001)	0.031 (0.002)	0.041 (0.001)	0.032 (0.002)
BS	0.113 (0.002)	0.107 (0.003)	0.116 (0.004)	0.107 (0.003)	0.124 (0.001)	0.099 (0.006)	0.128 (0.000)	0.101 (0.005)
NONEX	0.186 (0.003)	0.125 (0.021)	0.190 (0.003)	0.122 (0.028)	0.182 (0.005)	0.131 (0.015)	0.180 (0.005)	0.128 (0.019)
Gender ratio	0.012 (0.738)	-0.009 (0.767)	-0.026 (0.491)	-0.015 (0.603)	-0.019 (0.613)	-0.018 (0.550)	-0.016 (0.676)	-0.020 (0.512)
ND. %	0.077 (0.000)	0.067 (0.000)	-	-	-	-	-	-
ND-Dumm	-	-	0.024 (0.000)	0.020 (0.000)	-	-	-	-
Blau	-	-	-	-	0.064 (0.000)	0.053 (0.000)	-	-
Shannon	-	-	-	-	-	-	0.043 (0.000)	0.036 (0.000)

Notes: Table 6 presents the results of the regression analysis for the extended model, which analyses the impact of nationality diversity on the level of online disclosure index (0-1 and 0-4) for the non-financial S&P500 firms in our sample, using HCMs. The variables used are as follows. BS = board size; NONEX = percentage of non-executive directors; FS = size of the firm; LEV = leverage; ROA = return on assets; gender ratio = percentage of female directors to the board size. In addition, this study uses four measurements for nationality diversity (ND). ND. %: percentage of foreign directors divided by total board size; ND-Dumm: a dummy variable equal to 1 if the board has at least one foreign director and 0 otherwise; Blau: the Blau Index measuring "variety", i.e. whether boards include representation by both foreign and domestic directors; Shannon: the Shannon Index measuring "balance", i.e. how equally foreign and domestic directors are represented on the board; *p* values shown in parentheses

To account for potential heteroskedasticity in the error term in our analysis, we estimate the coefficients tstatistics with heteroskedasticity-consistent errors (Table 5), clustered by firm (Petersen, 2009). Furthermore, and as discussed previously, to quantify the variable of boardroom internationalisation, we use new measures, i.e. the Blau Index, to assess variety, and the Shannon Index to assess balance. The results for these measures remain qualitatively similar, with the hypothesis of the study confirmed with respect to the inclusion of both firm-level and corporate governance control variables in the models. The results confirm that international board members are likely to broaden the range of knowledge and experience available to the board, thus improving board effectiveness and increasing the overall quality of corporate governance. In addition, international board members may have increased capacity to coordinate a firm's resources compared to less diverse boards given the increased experience and exposure to global markets of foreign directors in the boardroom.

5. Conclusion

This research investigated the relationship between boardroom internationalisation and the level of online disclosure for a sample of non-financial US firms listed on the S&P500 index. Our study contributes to the existing literature on online disclosure by introducing a new variable (i.e. boardroom internationalisation).

The results of the regression analysis support the hypothesis of our study, i.e. that international representation on the board enhances online disclosure levels for the sample of non-financial S&P500 firms. This implies that firms with a higher proportion of foreign board members are more likely to have a higher level of online disclosure. This may relate to the unique skills, knowledge and experience of foreign board members, which they are able to bring to the boardroom and

which may have a positive impact on levels of online disclosure. Moreover, the results indicate that firm size, profitability, leverage, board size and non-executive directors enhance online disclosure levels.

Our findings provide evidence for policymakers that boardroom internationalisation enhances online disclosure and thus, the transparency of the firm. The findings can be used, also, by corporate governance institutions to raise awareness of the advantages of having foreign members on the board. The study will be of value to academic researchers in the field of corporate governance, internet reporting and disclosure, as well as to users of online reporting for decision-making. We focus only on S&P 500. However, we believe that the same hypotheses are worth testing in other countries. Moreover, cross-country analyses can be incorporated.

Note

1. White's test: LM = 60.3738 (with p -value = 0.000).

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