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BOARD NATIONALITY DIVERSITY: ITS MEASUREMENT, DETERMINANTS, AND IMPACTS ON FIRM VALUE AND ACCOUNTING CONSERVATISM

A THESIS SUBMITTED TO THE UNIVERSITY OF NOTTINGHAM FOR THE DEGREE OF DOCTOR OF PHILOSOPHY IN FINANCE AND RISK (ACCOUNTING)

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ABSTRACT

The composition of corporate boards has been under intense scrutiny by regulators since the collapse of Enron in 2002. An aspect of board composition is board diversity, which has gained the attention of regulators since 2003. Yet, empirical evidence on the outcomes of board diversity is inconclusive. One potential reason for the inconclusive results on board nationality diversity is that it has upside and downside aspects that should be accounted for simultaneously. In particular, I propose that any outcome of this diversity is the sum of the effects of two opposing forces: the level of diversity and the strength of cultural separation. Drawing on theories of resource dependence and groupthink, the level of dissimilarity in directors' nationalities expands the pool of resources at the board's disposal and mitigates the harmful behaviour of groupthink. However, nationality diversity among board members is accompanied by differences in their cultural backgrounds, which may serve as bases for cultural separation. This separation may cause poor communication, internal conflicts, and lack of trust between board members.

The objective of this thesis is to provide a better understanding of how the above contrasting aspects of board nationality diversity may shape its outcomes. To this end, I distinguish between the upside and downside aspects of diversity in the first essay of this thesis. In this essay, I review the theoretical and empirical constructs of board diversity. I then introduce dissimilarity of director nationalities as a multi-categorical measure that accounts for the composition of foreign board members, to capture the level of board nationality diversity. The second essay investigates the determinants and the performance outcome of board nationality diversity, after

accounting for its upside and downside aspects. Firm value is chosen to be the first outcome variable in this thesis as it is one of the most widely used proxies for board performance. In the third essay, accounting conservatism is chosen to be my second outcome variable. This is because diverse boards are found to adopt less risky financial policies. Therefore, I expect nationality-diverse boards and audit committees to demand greater accounting conservatism.

The empirical tests in this thesis are based on large samples of UK firms over the period from 1999 to 2018. On the determinants of board nationality diversity, I find that the level of diversity is driven by the magnitude of foreign activities (measured by the proportion of foreign sales), rather than the number of geographical regions in which a firm operates. On the outcomes of board nationality diversity, I find that the level of diversity is associated with higher firm value. This association is not significantly mitigated by the strength of board cultural separation, but it is mitigated by the level of operational complexity. In addition, I find that levels of nationality diversity on the board and its audit committee positively impact accounting conservatism, whereas the strength of board cultural separation is not significantly related to accounting conservatism.

This thesis makes five main contributions to the literature on board diversity, firm performance, and accounting conservatism. First, it proposes that the upside of diversity in multi-categorical attributes, such as nationality, is captured by the level of diversity. This level is maximized when each board member is unique in terms of the attribute under investigation. Second, it extends prior work on why foreign nationals exist on corporate boards by exploring why firms choose a given level of nationality diversity on their boards. Third, it accounts for both the positive and the negative aspects of board nationality diversity simultaneously, to identify its net impacts on firm value and accounting conservatism. Fourth, it provides robust evidence that board nationality diversity is positively associated with firm value and this association is moderated by levels of firm complexity. Fifth, it provides robust evidence that nationality diversity on the board and its audit committee positively impact accounting conservatism.

The findings of this thesis have implications for board diversity in both research and practice. First, it suggests that both the positive and the negative aspects of board diversity should be accounted for simultaneously. Second, it reviews a set of theoretical and empirical constructs of diversity that could be applied to diversity within other workgroups (e.g., top management teams and audit teams). Third, it cautions against the use of empirical proxies that do not map onto the theoretical construct under investigation. Fourth, it directs companies' attention to unique boards, in which, each board member is dissimilar to other board members in terms of a non-binary diversity attribute. This board structure maximizes (minimizes) the positive (negative) aspect of diversity in a non-binary attribute such as nationality. Fifth, it shows that board nationality diversity provides net benefits to shareholders only under certain circumstances (i.e., when firms are complex). Sixth, it identifies a new source of variation in accounting conservatism by providing robust evidence that nationality diversity on the board and its audit committee matter for conservatism in financial reporting. This study could therefore be of interest to academics, companies, investors, and regulators.

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Dedication

I dedicate this thesis to my children, Tayemallah and Tageldin.

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Introduction

1.1. Research Problem

Board diversity refers to differences in director attributes such as gender, age, and nationality (Harrison and Klein, 2007). Board diversity research is an extension of group dynamics research, which studies human behaviour within and between social groups, with attempts to understand, predict, and improve groups' processes and interactions and, hence, improve groups' effectiveness. The literature on board diversity is rooted in the fact that organizations do not make decisions, but people in charge do (Kachelmeier, 2010). It is also based on the premise that differences in director attributes capture conscious and subconscious differences in mentality and behaviour among board members (Riordan and Wayne, 2008).

Recommendations for best practice in relation to board structure in the UK are contained in the Corporate Governance Codes, which are updated every few years, informed at times by reports from business leaders. The Higgs Review of the Role and Effectiveness of Non-Executive Directors is one such report (Higgs, 2003). Research commissioned by the review committee chairman, Derek Higgs, revealed that only 6% of UK non-executive directors were female, and only 7% were non-British. These findings motivated the UK regulator[1] to commission the Dean of London Business School, Laura Tyson, to prepare a report on 'The Recruitment and Development of Non-Executive Directors' (Tyson, 2003). In it, Tyson argues that board diversity is an important area for improvement on UK boards. She talks about diversity in relation

[1] At the time, this was the Department for Trade and Industry, the DTI.

to *"background, experience, age, gender, ethnicity and nationality"*. Both Higgs (2003) and Tyson (2003) discuss the benefits of increasing ethnic diversity on boards, an issue which is addressed more thoroughly in the Parker Report (Parker, 2017). This report acknowledges that board diversity is a multi-dimensional concept, which includes many dimensions other than gender such as ethnicity and nationality. The report then makes the business case for ethnic diversity, citing positive benefits such as the reduction of groupthink, increasing the board's ability to deal with a more diverse range of stakeholders, access to a global talent pool, and improved understanding of cultural sensitivities in a global supply chain. The same benefits apply to nationality diversity, which is regarded in the report as a potential source for ethnic-diverse candidates with valuable expertise. Although the benefits of ethnic diversity and nationality diversity may overlap, the two constructs are different. In a second report by Sir Parker, firms are encouraged not to use director nationality (among other constructs) as a proxy for director ethnicity in their annual reports; rather they are recommended to distinguish clearly between these constructs (Parker, 2020).

These shifts in attitude to the composition of UK boards, and evidence of changes in practice, have sparked a stream of literature which attempts to quantify the determinants and consequences of board diversity in various ways. Yet, this stream of research has yielded inconclusive results on the outcomes of board nationality diversity. For example, Estélyi and Nisar (2016) find that foreign nationals on UK boards are associated with higher firm performance. Delis, Gaganis, Hasan and Pasiouras (2017) argue that differences in genetic origins between board members bring creative approaches for solving corporate problems. Using a sample of UK- and

North American-listed firms, they find a positive association between board genetic diversity and firm performance. In contrast, Frijns, Dodd and Cimerova (2016) find that nationality diversity on UK boards brings cultural differences that negatively affect firm performance. Hahn and Lasfer (2016) find that UK firms with foreign non-executive board members have lower board meeting frequency. The fewer board meetings are then associated with lower shareholder returns and higher compensation for the CEO and the chairman. Further, Miletkov, Poulsen and Wintoki (2017) use a sample of 62,066 firm-years from eighty countries, including the UK, to investigate the impact of foreign independent directors on firm performance. They find, on average, no significant differences in firm value between firms with and without foreign independent board members. However, the presence of these board members is negatively associated with shareholder value when their home countries have lower quality legal institutions than those of the firm's host country. Empirical UK-based evidence on the value of board nationality diversity is therefore inconclusive. This issue thus merits further investigation.

One potential reason for the inconclusive results is that board nationality diversity has upside and downside aspects that should be accounted for simultaneously. The upside aspect refers to the level of dissimilarity in directors' nationalities, which is maximized when the nationality of each board member is unique (i.e., dissimilar to the nationalities of other board members). The downside aspect refers to the strength of cultural subgrouping, which is maximized when board members are subdivided into two equal-sized subgroups who are at the opposite endpoints of a set of cultural dimensions (Harrison and Klein, 2007; Carton and

Cummings, 2013). The first essay of this thesis establishes that board diversity has different aspects, such as the level of uniqueness in directors' nationalities and the strength of cultural separation on the board. It also demonstrates that each of these aspects (constructs) should be measured differently. Therefore, this essay investigates two main questions. First, what are the theoretical constructs of board diversity? Second, how should each construct be measured?

In my second and third essays, I draw on theories of resource dependence (Salancik and Pfeffer, 1978) and groupthink (Janis, 1972) to argue that nationality-diverse boards can be more effective than homogeneous (all-domestic) boards. This is because unique board members, who do not share the same nationality with any other members of the same board, expand the pool of resources at the board's disposal and mitigate the harmful behaviour of groupthink. I also build on the faultline theory (Lau and Murnighan, 1998) to suggest that a strong separation between cultural subgroups may reduce the overall effectiveness of the board. Accordingly, the level of board nationality diversity can be beneficial, but it may be accompanied by strong cultural separation that is detrimental to board performance. To capture board cultural separation, I follow Frijns *et al.* (2016) and attach four cultural scores to each board member based on their country of nationality. According to Hofstede (2001), the scores quantify four dimensions of national culture: (i) the individualism score measures the disintegration level of individuals from their families or other groups in a society; (ii) the masculinity score captures the degree of social preference for achievement, heroism, assertiveness and material rewards for success; (iii) the power distance score quantifies the degree of social acceptance for an unequal distribution of power among individuals; (iv) the uncertainty avoidance score proxies for the degree of intolerance towards risk and ambiguity.

I then ask three main questions in the second essay. First, what are the determinants of the level of board nationality diversity? Second, does this diversity add value to shareholders? Third, do board cultural separation and firm complexity moderate any relationship between this diversity and firm value? The third question, thus, considers two potential moderators: board cultural separation and firm complexity. The former is based on the argument that diversity costs are higher for firms with stronger board cultural separation compared to those without (Frijns *et al.*, 2016). The latter is based on the proposition that diversity benefits are higher for firms with higher complexity of operations compared to those without (Anderson, Reeb, Upadhyay and Zhao, 2011).

The third essay extends the debate on whether nationality diversity is beneficial or detrimental to the effectiveness of the board and its audit committee in monitoring the firm's financial reports. In particular, I argue that higher nationality diversity on the board and its audit committee will reduce risk taking in financial reporting, leading to greater conservatism in financial reporting. This is because theories of groupthink (Janis, 1972) and resource dependence (Salancik and Pfeffer, 1978) suggest that this diversity improves the independence and the expertise of boards and audit committees. Diverse boards are then found to adopt less risky financial policies. For example, Bernile, Bhagwat and Yonker (2018) find that higher diversity on boards is associated with less reliance on debt financing. Diverse boards are also more likely to distribute free cash flow as dividend payouts, thereby mitigating agency costs (Bernile *et al*., 2018; Chen, Leung and Goergen, 2017). Therefore, the third essay investigates the following question: do nationality diversity on the board and the audit committee (which is responsible for monitoring the firm's financial reporting) affect accounting conservatism?

1.2. Research Importance

Since the collapse of Enron in 2002, there have been considerable concerns among investors, academics, practitioners, and regulatory authorities of different countries about the appropriate composition of corporate boards which would contribute to effective decision making and value creation (Kim, Mauldin and Patro, 2014; Gul, Hutchinson and Lai, 2013; Masulis, Wang and Xie, 2012). An aspect of board composition is board diversity, which has recently gained the attention of regulators, market participants, and the media (Bernile *et al*., 2018).[2]

One justification for the importance of board diversity is to ensure social justice (Dijk, Engen and Paauwe, 2012). Scholars and regulators have also offered some economic-based justifications. For example, diversity mitigates 'groupthink', which is cited in relation to the collapse of Enron (O'Connor, 2003) and the Volkswagen emissions scandal (Glebovskiy, 2019). From a resource dependence perspective (Salancik and Pfeffer, 1978), diversity expands the pool of talents, skills and knowledge that are available at the board's disposal. In contrast, the faultline theory cautions that diversity may lead to subgroup formation on boards, causing internal

[2] Other aspects of board composition include whether the board follows a two-tier or one-tire structure and whether the board has any committees.

conflicts between subgroups within the boardroom (e.g., Lau and Murnighan, 1998; Van Peteghem, Bruynseels and Gaeremynck, 2018).

The objective of this thesis is to provide a better understanding of how these contrasting theories may shape the outcomes of board nationality diversity. To this end, I distinguish between the different views of this diversity. Proponents of diversity emphasise its positive aspect (i.e., the level of diversity). However, this diversity is accompanied by some negative aspects (e.g., cultural separation). I contribute to this debate by introducing dissimilarity proportion as a proxy for the level of diversity in a multi-categorical attribute (e.g., nationality). This measure maps onto the way in which diversity is seen from the resource dependence and the groupthink perspectives. This is because it accounts for the nationality composition of foreign directors rather than considering all of them as a homogeneous set of people. At the same time, I account for the faultline view of diversity by employing a measure of the strength of cultural faultlines as a proxy for cultural separation on nationality-diverse boards. Therefore, this thesis offers a more nuanced story on the outcomes of board nationality diversity.

1.3. Research Methodology

This thesis begins, in Essay 1, by distinguishing categorical-scaled attributes (e.g., gender and nationality) from continuous-scaled attributes (e.g., age and cultural dimensions). Next, it distinguishes between three theoretical constructs of diversity for categorical-scaled attributes: case-based asymmetry, balanced diversity, and unique diversity.

Case-based asymmetry refers to favouring or disfavouring certain directors of interest (the case directors) over other directors (the base directors). For example, female-based asymmetry reaches its maximum when all board members are women. This construct is typically measured by using the percentage of female directors on the board (e.g., Gul, Srinidhi and Ng, 2011; Lai, Srinidhi, Gul and Tsui, 2017; Levi, Li, and Zhang, 2014; Chen *et al*., 2017; Liu, Wei, and Xie, 2014; Liao, Luo, and Tang, 2015; Haque, 2017; McGuinness, Vieito, and Wang, 2017; Ahern and Dittmar, 2012; Sila, Gonzalez and Hagendorff, 2016; Dong, Girardone and Kuo, 2017).

Harrison and Klein (2007) refer to balanced diversity and unique diversity as two forms of diversity as variety, which is defined as qualitative differences that reflect dissimilarity in information, knowledge, or experience among board members. I argue that balanced diversity and unique diversity are different theoretical constructs. Balanced diversity refers to an equal board representation of two or more categories of an attribute (e.g., gender balance), whereas unique diversity refers to the distinctiveness of board members from each other. Unique diversity reaches its maximum when every board member is unique (or dissimilar to all other board members) in terms of the attribute under investigation. For example, nationality diversity is maximized when the nationality of each board member is unique (or distinctive) from the nationalities of other board members, indicating that each director is a distinctive resource (Harrison and Klein, 2007).

For each of the three theoretical constructs, I develop a set of desirable properties (or criteria) for an empirical construct that maps onto it. I then review four potential proxies for each construct to identify the best current proxy for it.

In addition, the first essay demonstrates that unique diversity applies to continuous-scaled attributes (e.g., age). This diversity reaches its theoretical maximum when a continuous-scaled attribute is evenly distributed among board members such that each point along a continuum is represented (Harrison and Klein, 2007). I then introduce a new measure, called Uniqueness index, to capture this type of diversity. I also distinguish this type of diversity from other types, including diversity as separation, which is introduced by Harrison and Klein (2007).

I next move on to find a setting where different theoretical constructs (aspects) of diversity may have led to inconclusive results in the literature. Board nationality diversity in the UK is chosen because: (i) the literature has mainly regarded foreign directors as a homogeneous set of actors, thereby masking variations among them; (ii) variations in directors' nationalities are deemed relatively high in the UK compared to US samples (Frijns *et al*., 2016); (iii) empirical UK-based evidence on the outcomes of board nationality diversity is inconclusive (e.g., Estélyi and Nisar, 2016; Frijns *et al*., 2016). I then follow an archival research methodology in my second and third essays, employing large samples of UK-domiciled non-financial firms that are listed on the London Stock Exchange over twenty years from 1999 to 2018. Board data is mainly collected from BoardEx database. I fill in missing age and nationality data for board members using FAME database whenever available. Financial data is obtained from Worldscope, except for data on foreign and institutional ownership and stock returns that are collected from Datastream database.

In both essays, ordinary least squares (OLS) regressions are used to obtain the baseline results. A major concern with these results is the potential endogenous nature of the relationships of board nationality diversity with firm value and accounting conservatism. In the second (third) essay, the endogeneity problem occurs when foreign directors are not randomly distributed among firms, and their representation on boards is indirectly related to firm value (accounting conservatism). To mitigate this concern, I allow board nationality diversity (and audit committee nationality diversity) to be endogenous and implement instrumental variable tests using two-stage least squares (2SLS) regressions. The instrumental variables are mainly defined as the average values of the endogenous variables for firms headquartered within the same postcode area. The instruments are motivated by the role of the location of a firm's headquarters in attracting foreign directors. For example, foreign directors are more likely to sit on boards of firms headquartered within 100 km of a large airport (Masulis *et al.*, 2012) or within a large metropolitan area (Frijns *et al.*, 2016). Accordingly, geographical proximity between firms' headquarters can drive similar levels of nationality diversity on their boards.[3] My instruments are thus likely to be correlated with a firm's board nationality diversity level, but unlikely to have a direct association with firm value or accounting conservatism.

1.4. Research Findings

For categorical-scaled attributes of diversity, I find that case-based asymmetry, balanced diversity, and unique diversity are best captured by using the proportion of case directors (e.g., female directors and Anglo-American directors), proportional

[3] Prior studies have considered similarity in firm size (Faleye, 2015) and firm industry (Van Peteghem *et al.*, 2018; Faleye, 2015) to drive similar corporate governance practices. Likewise, similarity in the postal area of firms' headquarters can be regarded as another driver for firms to adopt similar governance practices.

balance, and dissimilarity proportion, respectively. These findings suggest that different aspects (types) of board diversity should be measured differently. My first essay thus responds to calls for refining the measurement of board characteristics (Carcello, Hermanson, and Ye, 2011).

In the second essay, I find that the level of board nationality diversity is driven by the magnitude of foreign activities (measured by the proportion of foreign sales), rather than the number of geographical regions in which a firm operates. This result is robust to a battery of control variables and is based on a two-limit Tobit estimation, which accounts for the fact that my measure of board nationality diversity is censored as its values range between zero and one. This result indicates that firms choose their level of board nationality diversity based on the magnitude of the economic benefits that they are likely to drive from it. This suggests that foreign nationals are appointed to the board for economic reasons. This is different from female directors, for example, who may be appointed to corporate boards to ensure social justice (Dijk *et al*., 2012).

Next, I find that higher diversity is associated with higher firm value, after controlling for a wide range of board-level, firm-level, industry, and year controls. This relationship holds after addressing potential endogeneity by implementing an instrumental variable approach using 2SLS regressions. The results also hold after controlling for firm value in previous years (i.e., one and two lags of Tobin's Q). Additionally, I find that my measure of the level of board nationality diversity is positively and significantly related to firm value after controlling for prior measures of diversity, including the proportion of foreign board members, the proportion of foreign non-executive board members, genetic diversity (Delis *et al*., 2017) and cultural diversity (Frijns *et al.*, 2016). Further, I find that the strength of board cultural separation does not significantly mitigate the positive impact of diversity on firm value. In particular, the coefficients on the interactions of my diversity measure with measures of board cultural separation have the expected signs but are not statistically significant, suggesting that board cultural separation increases the costs of diversity but not to the extent that they outweigh its benefits. Yet, I find that the positive impact of diversity on firm value is mitigated by levels of operational complexity, suggesting that board nationality diversity provides significant net benefits only for complex firms.

In the third essay, I find that higher nationality diversity on the board and the audit committee is associated with greater accounting conservatism. The association is stronger for firms with high diversity on both the board and its audit committee. The results hold after addressing potential endogeneity by implementing instrumental variable tests using 2SLS regressions. The results are also robust to the use of fixed-effects models and the inclusion of a battery of board-level, firm-level, industry, and year controls. The findings suggest that foreign nationals who qualify for audit committee membership negatively impact its appetite for risk-taking in financial reporting. This effect is strengthened when nationality diversity on the audit committee is supported with a high level of nationality diversity on the board. The strength of cultural separation on the board is however not significantly related to accounting conservatism.

1.5. RESEARCH CONTRIBUTION

This thesis contributes to the literature on board diversity, board effectiveness and accounting conservatism in several ways.

First, for categorical-scaled attributes, it distinguishes between balanced diversity and unique diversity as two different theoretical constructs of diversity, thereby extending the work of Harrison and Klein (2007), who regard both constructs to be the same. It also adds case-based asymmetry as a third theoretical construct. For each of the three constructs, I develop a set of desirable properties (or criteria) for an empirical measure that maps onto it. Based on these criteria, this study identifies the most appropriate available empirical proxy for each construct. Also, this study introduces combinations, as an alternative to categories, that allow for the measurement of balanced diversity across multiple categorical-scaled attributes of diversity. For example, the combinations in terms of directorship-type and gender are: (i) outside female directors; (ii) outside male directors; (iii) inside female directors; (iv) inside male directors. Diversity can then be constructed as balance between the four combinations. Accordingly, it reaches its maximum when the representation level of each combination is equal to that of the others.

Second, this study demonstrates that unique diversity applies to continuous-scaled attributes and introduces a new measure to capture it. Also, for continuous-scaled attributes, this study uncovers the potential of 'pairwise distances', which captures differences between pairs of board members in an attribute, as a consistent measurement basis to be used in measuring diversity constructs, including unique diversity and separation.

Third, it accounts for the nationality composition of foreign directors by introducing a set of new measures to capture the level of nationality diversity, the strength of cultural faultlines, and the presence of marginalized foreign minorities on corporate boards. This measurement approach thus accounts for both the upside and the downside aspects of diversity: the level of diversity and the strength of cultural separation. This study also proposes the strength of cultural subgrouping along faultlines and the marginalization of foreign minorities as two channels through which board cultural separation may reduce the value of diversity to shareholders. Identifying these channels complements the work of Frijns *et al.*, (2016), who find cultural differences among board members to be detrimental to firm value.

Fourth, it extends earlier work on why foreign nationals exist on corporate boards (e.g., Estélyi and Nisar, 2016) by exploring why firms choose a given nationality diversity level on their boards. The findings suggest that the magnitude, rather than the number, of foreign activities matters for the level of board nationality diversity. Furthermore, this study provides evidence that board nationality diversity provides significant net benefits only for complex firms.

Fifth, it responds to calls for exploring group dynamics on specialized committees of the board (Adams, Hermalin and Weisbach, 2010 and Carcello *et al.*, 2011) by examining the impact of nationality diversity within the audit committee, which is responsible for monitoring the firm's financial reporting, on accounting conservatism. An area that has not been investigated in the accounting literature to date. This study also provides robust evidence that nationality diversity on the board and its audit committee positively impact accounting conservatism.

This thesis has a set of implications for academic research on board diversity. First, it suggests that both the positive and the negative aspects of board diversity should be accounted for simultaneously. Second, it reviews a set of theoretical and empirical constructs of diversity that could be applied to diversity within other workgroups (e.g., top management teams and audit teams). Third, it cautions against the use of empirical proxies that do not map onto the theoretical construct under investigation. Fourth, it introduces geographical proximity between firms' headquarters as a potential driver for similar corporate governance practices.

The thesis also has some practical implications. First, it directs companies' attention to unique boards as diverse boards with potentially no faultlines nor marginalized members. This could help companies in the design of their optimal board diversity structures. Second, the thesis shows that board nationality diversity creates value for shareholders only when firms are complex. This could help investors in developing a better understanding of the shareholder-value implications of board nationality diversity. Third, it identifies a new source of variation in conditional conservatism. This suggests that regulators could advocate higher levels of nationality diversity on corporate boards to achieve greater conservatism in financial reporting, thereby facilitating efficient contracting between market participants (including shareholders, debtholders, and managers).

This study could therefore be of interest to academics, companies, investors, and regulators.

ESSAY 1

THEORETICAL AND EMPIRICAL CONSTRUCTS OF BOARD DIVERSITY

ABSTRACT

There is a debate on whether board diversity is beneficial or detrimental to board performance. Drawing on theories of groupthink and resource dependence, board diversity may reduce groupthink and enlarge the pool of expertise at the board's disposal. Other theoretical frameworks, such as faultline theory, suggest that board diversity may cause separation and conflicts between board members. Therefore, board diversity has several theoretical and empirical aspects (constructs). This essay reviews these constructs. I distinguish between three constructs of diversity in categorical-scaled attributes: case-based asymmetry, balanced diversity, and unique diversity. I then develop three sets of criteria to assess how well current empirical proxies map onto these constructs. The study provides some guidance for enhancing the consistency of measurement in board diversity research.

JEL classification: G30; G38; C10

Keywords: Diversity; board of directors; governance; review of measurement

2.1. INTRODUCTION

Board diversity has a general definition, multiple dimensions, and a set of different theoretical constructs (types). It is generally defined as differences in the attributes of board members. Its dimensions refer to the diversity attributes such as: gender, age, nationality, race, religion, social class, level of education, directorship-type (outside directors vs. inside directors), tenure, political affiliation, network size and even hobbies and social club memberships. The theoretical constructs of board diversity refer to the conceptualizations of board diversity. Harrison and Klein (2007) distinguish between three theoretical constructs of group diversity: variety, separation, and disparity. Variety refers to qualitative differences among board members that reflect dissimilarity in information, knowledge, or experience. This construct has been regarded as the upside of diversity as it enlarges board resources and reduces groupthink (Salancik and Pfeffer, 1978 and Janis, 1972). Under this construct, the qualitative differences imply that the measurement scale of the diversity attribute must be categorical. In contrast, Harrison and Klein (2007) argue that separation and disparity apply only to continuous-scaled attributes. Accordingly, separation refers to quantitative differences in the position of board members along a continuum of a continuously scaled attribute. It has been regarded as a downside aspect of diversity as it may generate conflicts between subgroups of directors on the board (Lau and Murnighan, 1998 and Van Peteghem *et al*., 2018). Finally, disparity refers to inequality in the distribution of valued resources, such as pay and status, among board members. For example, a CEO pay disparity may reflect her/his privilege or power over other board members (Vo and Canil, 2019).

Guided by various theories, scholars have adopted different theoretical constructs of diversity, leading to inconclusive results on the outcomes of group diversity (Harrison and Klein, 2007). Less clear is how current empirical proxies map onto the different theoretical constructs of diversity. This essay attempts to fill this gap by asking two main questions. First, what are the theoretical constructs of board diversity? Second, how should each construct be measured?

To answer these questions, I begin by distinguishing between nominal-scaled categorical attributes (hereafter referred to as categorical attributes) and interval-scaled and ratio-scaled attributes (hereafter referred to as continuous attributes) of diversity. For categorical attributes (e.g., gender), the differences between categories of directors (e.g., male directors and female directors) are qualitative. These differences are therefore referred to as dissimilarities. For continuous attributes (e.g., age), the differences between directors vary in length. These differences are therefore referred to as distances. Both dissimilarities and distances have a minimum value of zero, which occurs when two directors are identical in any attribute. The maximum value for a pairwise dissimilarity between two directors is often assumed to be one, however no assumption is generally made about the maximum length of a pairwise distance between a pair of directors. A pairwise dissimilarity is therefore a special case of pairwise distances because it is assumed to have a fixed-length pairwise distance of one.

Next, I extend the work of Harrison and Klein (2007) by distinguishing between three theoretical constructs of diversity in categorical attributes: case-based asymmetry, balanced diversity, and unique diversity. First, case-based asymmetry refers to favouring or disfavouring certain directors of interest (the case directors) over other directors (the base directors). This construct is asymmetric because it implies a bias for or against the case directors. It reaches its maximum when the board is composed entirely of the case directors. For example, female-based asymmetry reaches its maximum when all board members are women. Other examples include outsider-based asymmetry, Anglo-American-based asymmetry, and the asymmetry of outside Anglo-American directors. Under this construct, the interest is in the separate effect of the case directors regardless of the composition of the base directors. For binary attributes, I refer to this construct as asymmetric homogeneity because it reaches its maximum when the board is homogeneous. From an agency perspective, for instance, outside directors are argued to be effective monitors of inside directors (Fama and Jensen, 1983; Weisbach, 1998; Hermalin and Weisbach, 1998). In this setting, the existence of inside directors on the board is not especially interesting. The interest, however, is in the representation level of outside directors. Accordingly, asymmetric homogeneity, rather than diversity, is the theoretical construct. It reflects the level of representation (concentration) of outside directors on the board; in other words, it is the level of board homogeneity in terms of outside directors. It reaches its maximum (minimum) when all board members are outside (inside) directors. This homogeneity construct is therefore asymmetric (i.e., biased towards outside directors).[4] Although asymmetric homogeneity is a special case of case-based asymmetry that applies only to binary attributes, the construct of case-based asymmetry also applies to multi-categorical attributes, such as nationality, and across

[4] Unlike the asymmetric homogeneity construct, a symmetric one will not differentiate between two cases of board homogeneity: homogeneity of outside directors and homogeneity of inside directors.

multiple categorical-scaled attributes of diversity. For example, the asymmetry of outside female directors implies that these directors are the case directors and other directors (including, outside male directors, inside female directors, and inside male directors) are the base directors.

Second, balanced diversity refers to an equal board representation of two or more categories of an attribute. Under this construct, the interest is in the achievement of equality or fairness in the board representation of the categories. For example, gender balance on the board is advocated from a social justice perspective (Dijk, Engen and Paauwe, 2012). Thus, the notion of equity or fairness underlying balanced diversity is different from that underlying the construct of disparity, which is based on the notion of equality in the distribution of valued resources, such as pay and status, among board members.

Third, unique diversity refers to the distinctiveness of board members from one another. For categorical attributes, it is maximized when every board member is distinctive or unique (i.e., dissimilar to all other board members) in terms of the attribute under investigation. For example, nationality diversity is maximized when the nationality of each board member is unique (or distinctive) from the nationalities of other board members, indicating that each director is a distinctive resource (Harrison and Klein, 2007). This construct reflects the resource dependence perspective on board diversity, where the interest is in the amount of non-overlapping skills, networks, and expertise that are available at the board's disposal (Salancik and Pfeffer, 1978). It is therefore the purest construct of board diversity.

Harrison and Klein (2007) refer to balanced diversity and unique diversity as two forms of diversity as variety. I argue that balanced diversity and unique diversity are different constructs and provide evidence that their empirical proxies rank boards differently.[5] The definition of diversity as variety is more aligned to unique diversity (Harrison and Klein, 2007), whereas balance on the board can be an aspect of categorical separation (Carton and Cummings, 2013). This seems to run counter to the argument by Harrison and Klein (2007) that separation does not apply to categorical attributes. Yet, prior research (e.g., Lau and Murnighan, 1998 and Van Peteghem *et al.*, 2018) has shown that separation between subgroups of board members depends not only on continuous attributes, but also on categorical attributes of diversity. Since separation can form along a single diversity attribute (Harrison and Klein, 2007 and Lau and Murnighan, 1998), balanced diversity can be a form of categorical separation. If such is true, there are four constructs of diversity: asymmetry (i.e., case-based asymmetry), uniqueness (i.e., unique diversity), separation (including diversity as balance), and disparity.

This study then moves on to investigate how each diversity construct (type) should be measured. For each of the three constructs of diversity that apply to categorical attributes, I develop a set of criteria to assess how well current empirical proxies map onto it. My assessment finds three guidelines for future research: (i) a proportion of case directors (e.g., outside directors) better captures case-based asymmetry compared to a dummy indicator or the number of these directors on the

[5] This evidence is presented in Table 4.

board; (ii) proportional balance excluding null categories[6] (Carton and Cummings, 2013) is preferred to capture balanced diversity rather than minority proportion, Blau's (1977b) index, and Teachman's (1980) index; (iii) a dissimilarity proportion (Simpson, 1949 and Rae and Taylor, 1970) is the best available empirical proxy for unique diversity in categorical attributes.

This essay responds to recent calls to explore group dynamics in the boardroom and refine the measurement of board characteristics (Carcello, Hermanson, and Ye, 2011). The essay makes theoretical and empirical contributions to board diversity research. On the theoretical side, it extends the work of Harrison and Klein (2007) by distinguishing between balanced diversity and unique diversity. It also adds case-based asymmetry as a third theoretical construct. In addition, it demonstrates that the construct of unique diversity applies to continuous attributes. For these attributes, unique diversity is maximized when a continuous attribute is evenly distributed among board members such that each point along a continuum is represented (Harrison and Klein, 2007). This means that both unique diversity and separation apply to any diversity attribute regardless of its underlying scale of measurement (categorical or continuous).

On the empirical side, it develops a set of criteria that are used to identify the most appropriate empirical proxy for each the three theoretical constructs of diversity in categorical attributes. Further, it introduces combinations, as an alternative to categories, that allow for the measurement of balanced diversity across multiple

[6] When none of the board members belong to a category, this category is null.

categorical attributes of diversity. For example, the combinations in terms of directorship-type and gender are: (i) outside female directors; (ii) outside male directors; (iii) inside female directors; (iv) inside male directors. Diversity can then be constructed as balance between the four combinations. Accordingly, it reaches its maximum when the representation level of each combination is equal to that of the others. In terms of continuous attributes, I am aware of no available empirical proxy for unique diversity. Therefore, I develop a new measure, called Uniqueness index, to fill this gap. Finally, this essay extends the study of Biemann and Kearney (2010) by uncovering the links between dissimilarity proportion, mean Euclidean distance (*MED*), and Gini coefficient as proxies for unique diversity, separation, and disparity, respectively. Together, *MED*, Gini coefficient, and Uniqueness index can enhance the consistency of measurement across the three constructs of diversity that apply to continuous attributes because these proxies employ a consistent measurement basis, called pairwise distance.[7]

The rest of this essay proceeds as follows. Section 2.2 provides a review of the theoretical and empirical constructs of diversity in accounting, finance, and other fields of social science. Section 2.3 develops a set of criteria to assess how well current empirical proxies map onto the theoretical constructs of case-based asymmetry, balanced diversity, and unique diversity. Section 2.4 applies the construct of unique diversity to continuous attributes and distinguishes it from other constructs of diversity in continuous attributes. Section 2.5 demonstrates how multiple attributes of diversity can be combined using the concepts of combinations and faultlines.

[7] A pairwise distance captures the difference between a pair of directors in an attribute.

Section 2.6 discusses the potential of pairwise distance as a consistent measurement basis in board diversity research. Section 2.7 discusses my findings and concludes.

2.2. Related Literature

The literature on board diversity in accounting and finance has mainly investigated the separate effects of certain directors of interest (e.g., female directors) on board/firm outcomes (e.g., Gul, Srinidhi and Ng, 2011; Lai, Srinidhi, Gul and Tsui, 2017; Levi, Li, and Zhang, 2014; Chen, Leung and Goergen, 2017; Liu, Wei, and Xie, 2014; Liao, Luo, and Tang, 2015; Haque, 2017; McGuinness, Vieito, and Wang, 2017; Sila, Gonzalez and Hagendorff, 2016; Dong, Girardone and Kuo, 2017). The theoretical arguments in this literature typically imply a bias against or in favour of board members who belong to one or more categories of an attribute (e.g., female directors, outside directors, or Anglo-American directors), or one or more combinations of categories across two or more attributes (e.g., outside female directors, outside Anglo-American directors, or outside Anglo-American female directors). I refer to the directors of interest as the case directors. Directors other than those of interest are referred to as the base directors. In this context, case-based asymmetry is the relevant theoretical construct. It reflects the level of representation (concentration) of the case directors on the board. It is asymmetric because it favours or disfavours case directors over base directors on the board. Examples of this construct include the asymmetry of outside directors (Weisbach, 1998), retirement-age directors (Van Peteghem *et al.*, 2018), and outside Anglo-American directors (Oxelheim and Randøy, 2003).

From an agency perspective, for instance, a majority of outside directors on boards of large organizations (such as listed companies) is desired to enhance board independence and, hence, board effectiveness (Weisbach, 1998; Hermalin and Weisbach, 1998). This is because outside directors usually hold senior positions in other large organizations which means: (a) that they possess expertise relevant to their monitoring role; and (b) the potential loss to their human capital from failing to provide effective scrutiny provides sufficient motivation for them to exercise their duty of care (Fama and Jensen, 1983). Another example is provided by Van Peteghem *et al*. (2018), who posit that directors' career concerns decline as they approach retirement, suggesting that retirement-age directors (who are older than 65 years) are less effective monitors than their younger counterparts. In both examples, a single category is favoured (e.g., outside directors) or disfavoured (retirement-age directors) than the other categories of board members. Both are thus examples of asymmetry in terms of a single dimension of diversity (directorship-type or age).

Case-based asymmetry is also applicable across two or more dimensions of diversity. For example, using a sample of firms headquartered in Norway or Sweden, Oxelheim and Randøy (2003) view outsider Anglo-American board membership as a signal of a firm's willingness to expose itself to improved corporate governance systems. In this setting, directors are classified based on two dimensions (attributes): directorship-type (outside directors vs. inside directors) and nationality (Anglo-American directors: American, British, and Canadian directors vs. other directors). Out of many potential combinations, the authors focus on the case of outside Anglo-American directors.

Asymmetric homogeneity is a special form of case-based asymmetry that reaches its maximum when the board is homogeneous. This form applies only to binary attributes and regards diversity as dissimilarity from a base-case category of directors such as inside directors or male directors. It reaches its minimum (maximum) when the board is composed entirely of the base (the case) directors. Therefore, it is not symmetric in its treatment of the two cases of board homogeneity.

Case-based asymmetry also applies to multi-categorical attributes and across multiple categorical attributes. In this setting, the base directors or the case directors may belong to mixed categories of directors, thereby masking variations among them. For example, the asymmetry of Anglo-American directors involves classifying directors into Anglo-American directors (the case directors) versus other directors (the base directors). In this example, both the case directors and the base directors may belong to mixed categories. Another example is the foreigner-based asymmetry that involves classifying directors into foreign directors (the case directors) versus domestic directors (the base directors). In the second example, the case directors may belong to many mixed categories (i.e., nationalities), but the base directors belong to a single homogeneous category (nationality).

In terms of the empirical constructs of board diversity, the accounting and finance research has frequently employed binary-categorization measures such as dummy variables, the size of case directors on the board, and the proportion of case directors on the board. These measures involve a classification of board members into case directors and base directors.

In the dummy-variable measurement approach, a board diversity indicator takes a value of one if a firm has at least one female director on board and zero otherwise (e.g., Gul *et al*., 2011; Srinidhi, Gul and Tsui, 2011; Gul, Hutchinson and Lai, 2013; Lai *et al*., 2017; Abbott, Parker and Presley, 2012); one female outside (non-executive) director on board and zero otherwise (e.g., Adams and Ferreira, 2009; Srinidhi *et al*., 2011; Gul *et al*., 2013); one female audit committee member on board and zero otherwise (e.g., Srinidhi *et al*., 2011; Gul *et al*., 2013); a critical mass of three female directors on board and zero otherwise (e.g., Liu *et al*., 2014); a critical mass of five female directors on board and zero otherwise (e.g., Gul *et al*., 2011); one female or foreign director on board and zero otherwise (e.g., Haque, 2017); one foreign director on board and zero otherwise (e.g., Estélyi and Nisar, 2016; Giannetti, Liao and Yu, 2015); one foreign independent director on board and zero otherwise (e.g., Masulis, Wang and Xie, 2012); one outside Anglo-American director, who is a citizen of either the US, Canada or the UK, on board and zero otherwise (e.g., Oxelheim and Randøy, 2003); one director with foreign working experience, foreign education, or both, and zero otherwise (Giannetti *et al*., 2015).

The size-of-case-directors approach counts the number of case directors on a board and uses that number or the natural logarithm of that number plus one as a proxy for board diversity. The number of female directors (Gul *et al*., 2011) and the number of directors with either foreign working experience, foreign education or both (Giannetti *et al*., 2015) are two examples of the measures employed under this approach.

Unlike the size-of-case-directors approach, the proportion-of-case-directors approach involves scaling the number of case directors by board size or by a subgroup of board members. Under the latter approach, board diversity is typically measured by using proportions or percentages such as: female directors as a percent of all directors on a board (e.g., Gul *et al*., 2011; Lai *et al*., 2017; Levi *et al*., 2014; Chen *et al*., 2017; Liu *et al*., 2014; Liao *et al*., 2015; Haque, 2017; McGuinness *et al*. 2017; Sila *et al*., 2016; Dong *et al*., 2017); female independent directors as a percent of all directors on board (e.g., Chen *et al*., 2017; Liu *et al*., 2014); female inside (executive) directors as a percent of all directors on board (e.g., Chen *et al*., 2017; Liu *et al*., 2014); male independent directors as a percent of all directors on board (e.g., Chen *et al*., 2017); female outside (non-executive) directors as a percent of outside (non-executive) directors on board (e.g., Adams and Ferreira, 2009; Gul *et al*., 2011); female directors as a percent of shareholder-elected directors on board (e.g., Bøhren and Staubo, 2014; Bøhren and Strøm, 2010); foreign directors as a percent of all directors on board (e.g., Giannetti *et al*., 2015; Dong *et al*., 2017); foreign non-executive directors as a percent of non-executive directors on board (e.g., Hahn and Lasfer, 2016); foreign independent directors as a percent of independent directors on board (e.g., Masulis *et al*., 2012).

Although case-based asymmetry has been the most frequently used construct of diversity in the accounting and finance research, a few studies in this stream of research have adopted other theoretical constructs of diversity. For example, Frijns, Dodd and Cimerova (2016) conceptualize board nationality diversity as cultural separation between board members. To proxy for this construct of diversity, the authors introduce a modified version of the mean Euclidean distance (*MED*) measure of separation. Disparity is another theoretical construct of diversity that has been adopted by Vo and Canil (2019) in examining two contrasting hypotheses on CEO pay disparity: efficient contracting and managerial power. Both separation and disparity have been introduced as theoretical constructs of group diversity by Harrison and Klein (2007) in the management literature. Therefore, I will discuss both constructs in detail below.

Harrison and Klein (2007: 1200) develop three different constructs (types) of group diversity: variety, separation, and disparity. Variety refers to *"differences in kind or category, primarily of information, knowledge, or experience among unit members."* This construct of diversity applies only to categorical attributes. In contrast, separation and disparity apply only to continuous attributes. The former is defined as *"differences in position or opinion among unit members"*, whereas the latter refers to *"differences in concentration of valued social assets or resources such as pay and status among unit members—vertical differences that, at their extreme, privilege a few over many."* The authors also propose two alternative proxies for each of the three constructs. Blau index and Teachman index are proxies for variety. Separation can be measured by using the standard deviation or *MED*. Coefficient of variation and Gini coefficient are alternative measures of disparity.

None of the above three constructs has been widely used in the accounting and finance research on board diversity. Yet, the constructs of variety and separation have been frequently adopted in other disciplines—e.g., the management literature; organisational studies; sociology and psychology research (Harrison and Klein, 2007).

In their paper, Harrison and Klein (2007) refer to equal group representations of two or more categories of an attribute and the distinctiveness of group members from each other as two forms of diversity as variety. I extend their work by arguing that these two forms are different and providing evidence that the empirical proxies for these constructs do rank boards differently. I refer to the former (latter) as balanced diversity (unique diversity). Both constructs are discussed below.

First, theories underpinning balanced diversity are free from any conceptual bias for or against certain directors of interest. Under this construct, diversity is conceptualized as an equal board representation of two or more categories of an attribute, or four or more combinations of categories across two or more attributes. Drawing on a social justice perspective, for instance, gender diversity is theoretically constructed as an equal representation of both female directors and male directors (Dijk *et al.*, 2012). This construct of balance on the board is based on the notion of equity or fairness in the board representation of the categories/combinations. This is obviously different from the notion of equality, underlying the construct of disparity, in the distribution of valued assets or resources among board members.

Second, the resource dependence theory (Salancik and Pfeffer, 1978) and theories of information/decision making (Williams and O'Reilly, 1998) suggest that diversity on the board enlarges its resources in terms of expertise, networks, and so forth. Such theories construct diversity as uniqueness, which refers to the distinctiveness of board members from each other. Under this construct, the interest is in the amount of non-overlapping skills, networks, and expertise that every director brings to the board. For categorical attributes, this construct should be at a maximum when the number of categories on the board is equal to board size, indicating that each director belongs to a distinctive category (Harrison and Klein, 2007). For example, when the number of board members' nationalities equals board size, nationality diversity as uniqueness reaches its maximum.

The definition of diversity as variety is more aligned to unique diversity (Harrison and Klein, 2007), whereas balance on the board can be an aspect of categorical separation (Carton and Cummings, 2013). This seems to run counter to the argument by Harrison and Klein (2007) that separation does not apply to categorical attributes. Yet, prior research (e.g., Lau and Murnighan, 1998 and Van Peteghem *et al.*, 2018) has shown that separation between subgroups of board members depends not only on continuous attributes, but also on categorical attributes of diversity. Since separation can form along a single diversity attribute (Harrison and Klein, 2007 and Lau and Murnighan, 1998), balanced diversity can be a form of categorical separation. If such is true, there will be four refined constructs of diversity: asymmetry (i.e., case-based asymmetry), uniqueness (i.e., unique diversity), separation (including diversity as balance), and disparity. The first construct applies only to categorical-scaled attributes, whilst the last one applies only to ratio-scaled attributes. Contrary to both constructs, separation and uniqueness apply to both categorical and continuous attributes. The next section reviews available empirical proxies for the three constructs that apply to categorical attributes: case-based asymmetry, balanced diversity, and unique diversity.

2.3. DIVERSITY CONSTRUCTS FOR CATEGORICAL-SCALED ATTRIBUTES

2.3.1. CASE-BASED ASYMMETRY

By definition, case-based asymmetry requires a binary categorization of board members into case directors vs. base directors. To capture this construct, only a bi-categorical measurement approach is applicable. Four empirical measures belong to this approach: a single-director dummy indicator, a critical-mass dummy indicator, the size of case directors on the board, and the proportion of case directors on the board. To evaluate how well each of these measures captures case-based asymmetry, I use five assessment criteria: (i) the measure reaches its maximum only when the board is composed entirely of the case directors, i.e., when the number of these directors is equal to board size; (ii) it does not assign the same value to several distinctive levels of board representation of the case directors; (iii) it accounts for variations in board size in a systematic and unbiased way (Biemann and Kearney, 2010); (iv) it occupies a tidy range of variation from zero to unity (Teachman, 1980; Harrison and Klein, 2007); (v) it is simple to understand and interpret (Coulter, 1989). The last three properties are general criteria.[8] The criteria are not equally important.

Although a single-director dummy indicator may work well for research on the characteristic(s) of an individual leader (e.g., the CEO and the CFO), its use in a group setting (such as the board of directors) is sometimes questionable. For case-based asymmetry, this measure does not satisfy Criteria (i) to (iii). However, it does meet Criterion (iv) as it ranges from zero, which indicates the absence of case directors on

[8] General criteria are desired for any empirical proxy of case-based asymmetry, balanced diversity, or unique diversity.

the board, to one, which is assigned to boards with different representation levels of the case directors. Similarly, a critical-mass dummy indicator satisfies Criterion (iv). It ranges from zero, which indicates the absence of a certain number (or percentage) of the case directors on the board, to one, which is assigned to boards with at least that certain number (or percentage) of the case directors on the board. Both dummy indicators are simple to understand and interpret, and thus, meet Criterion (v). To sum up, these indicators satisfy only two out of the five criteria (see Panel A of Table 1).

[Table 1 about here]

Both the size and the proportion of case directors satisfy Criteria (i) and (ii) because they distinguish between all levels of board concentration in terms of the case directors. These measures also meet Criterion (v).[9] Only the proportion measure, however, satisfies Criteria (iii) and (iv). This is due to scaling the size of case directors by board size.[10] This proportion is hence the most appropriate empirical proxy for case-based asymmetry.

Nevertheless, the use of dummy indicators can be justified in certain settings. For example, a single-director dummy indicator may be valid for use under the signalling theory, where the presence of at least one director of interest on the board is regarded as a signal to stakeholders (e.g., Oxelheim and Randøy, 2003). In such

[9] Criterion (v) is not met in the case of using the natural logarithm of one plus the size of case directors. This is because the mathematical logic underlying the logarithmic formulation in this version is harder to understand compared to the simple version of counting the number of case directors (Coulter, 1989).

[10] Criterion (iii) is not satisfied in the case of scaling by a subgroup of board members. For example, the proportion of foreign directors among independent board members (Masulis *et al*., 2012).

settings, the proportion of case directors may proxy for the strength of the signal. Also, a critical-mass dummy indicator can be employed to capture firms' compliance with a board diversity quota that requires boards to have a targeted number (or percentage) of certain directors of interest (e.g., female directors). This indicator, however, does not capture how much further a board is above or below the quota target (Greene, Intintolia and Kahle, 2020).

2.3.2. *Balanced Diversity*

Balanced diversity requires scaling director attributes as categorical. Accordingly, if p_i is the proportion of directors in the ith category/combination, $\sum p_i$ must equal unity (Simpson, 1949; Teachman, 1980). This theoretical construct of diversity reaches its maximum when all p_is are equal.[11] Panel B of Table 1 presents nine desirable properties (criteria) for an empirical construct that maps onto balanced diversity, as follows.

(a) It reaches its maximum only when each category (in the case of a single attribute) or combination (in the case of two or more attributes) includes an equal number of directors, i.e., all p_is are equal (Blau, 1977a).

(b) It can summarize variations among multiple categorical proportions of directors (p_is), where each p_i belongs to one category/combination (Teachman, 1980).

(c) It is not biased towards one category/combination over another. It then should

[11] Blau (1977a) refers to balanced diversity as heterogeneity. He then argues that the more evenly divided people are among multiple ethnic groups, the higher the ethnic heterogeneity.

take the same value for all boards that have the same p_is, regardless of which p_i belongs to which category/combination. It also should capture all cases of board homogeneity, i.e., it reaches its minimum value if any p_i takes a value of one, indicating that all directors fall into the same category/combination (Teachman, 1980).

(d) It does not assign the same value to several distinctive levels of categorical/combinational balance.

(e) It increases (decreases) by the same value per each director replacement that increases (decreases) the balance between two categories/combinations. This indicates equal weighting of all directors regardless of whether they belong to a unique, minority, or majority category/combination.

(f) It is flexible to include or exclude null categories/combinations, i.e., those with p_i = zero (Coulter, 1989).

(g) It accounts for variations in board size in a systematic and unbiased way (Biemann and Kearney, 2010).

(h) It occupies a tidy range of variation from zero to unity (Teachman, 1980; Harrison and Klein, 2007).

(i) It is simple to understand and interpret (Coulter, 1989).

Four empirical measures meet the shape at the maximum property of balanced diversity, Criterion (a), and are therefore included in my review. The first one, minority proportion, belongs to the bi-categorical measurement approach. Whereas the other three proxies (the Blau index, the Teachman index, and proportional balance; Blau, 1977b, Teachman, 1980, and Carton and Cummings, 2013) apply not only to bi-categorical attributes but also to multi-categorical attributes and across two or more attributes. I evaluate each of these measures below.

Minority proportion is a piecewise linear transformation of the proportion of a single category (e.g., female directors) on the board. It is given by the following formula:

$$Minority\ proportion = \begin{cases} p_1 & | \ p_1 \leq 0.5 \\ 1 - p_1 & | \ p_1 > 0.5 \end{cases} \tag{1}$$

where: p_1 is the number of directors who belong to a single category of a bi-categorical attribute, as a proportion of all board members. Minority proportion reaches its maximum of 0.5 only when $p_1 = p_2$, where p_2 is the proportion of the other category of directors on the board. Minority proportion, therefore, satisfies Criterion (a). Yet, it fails to meet Criterion (b) because it is not applicable in cases of a multi-categorical attribute or two or more attributes.

Unlike the proportion of case directors, minority proportion is not biased towards certain directors in the boardroom.[12] The latter proportion also distinguishes between all cases of bi-categorical balance on the board. It increases (decreases) by the same value per each director replacement, which increases (decreases) that balance.

[12] Using the proportion of case directors to capture bi-categorical balance on a board is justifiable only if this proportion is less than or equal to 0.5 for all firm-year observations.

This value is equal to one divided by board size (Panel A of Table 2 presents an example). Minority proportion thus meets Criteria (c) to (e). When a category is null, the minority proportion reaches its minimum value of zero. It is therefore not flexible to include/exclude the null category (if any), thereby failing to meet Criterion (f). Like the proportion of case directors, minority proportion satisfies Criteria (g) and (i). However, it does not meet Criterion (h), as it ranges from zero to 0.5.

[Table 2 about here]

Multi-categorical measurement approach offers two alternative indices: the Blau index (Blau, 1977b) and the Teachman index (Teachman, 1980).[13] The former is based on a combinatorics model, whilst the latter is based on an entropy model (Coulter, 1989). The two indices are given in equations (2) and (3), respectively.

$$Blau\ index = 1 - \sum_{i=1}^{K} {p_i}^2 \tag{2}$$

$$Teachman\ index\ = -\sum_{i=1}^{K} [p_i \times \ln{(p_i)}] \tag{3}$$

[13] Teachman (1980) points out that his index is originally developed by Shannon (1948) as a measure of uncertainty in communication.

where: p_i is the proportion of board members in the ith category (of an attribute) or combination (across two or more attributes). K is the number of all possible categories/combinations.

Harrison and Klein (2007) note that the maximum value for each of the two indices depends on K. This value is $(K - 1)/K$ and $ln(K)$ for the Blau index and the Teachman index, respectively.[14] The maximum is reached when each of the K categories/combinations has an equal number of board members, satisfying Criterion (a). Given this equality, the higher the value of K, the higher the maximum value. Table 3 presents examples of the shape of balanced diversity at its maximum using a diversity attribute with six categories. As shown in Panel B of Table 3, the maximum values of the two indices are constant for any K, regardless of board size.

[Table 3 about here]

Contrary to the minority proportion, both indices apply to multi-categorical attribute(s), thereby meeting Criterion (b). The indices also satisfy Criteria (c) and (d). This is due to their equal treatment of all categories (or combinations) and their ability to distinguish between different cases of bi-categorical and multi-categorical balance on the board.

The maximum value for the Blau index is always below one, yet the maximum value for the Teachman index exceeds unity in cases of $K > 2$. None of these indices thus satisfy Criterion (h), despite each of them having a minimum value of zero. The

[14] Harrison and Klein (2007) state that the maximum limit for the Teachman index is $-1 \times \ln\left(\frac{1}{K}\right)$, which is the same as $\ln(K)$.

indices account for variations in board size, but not in a systematic and unbiased way (Biemann and Kearney, 2010). Therefore, they do not meet Criterion (g).

The indices differ in the complexity level of their underlying mathematical logic. The Blau index is relatively simple to understand compared to the Teachman index. The former index is interpreted as the probability that a randomly and independently selected pair of directors will be diverse, i.e., the two directors belong to different categories (Simpson, 1949). In contrast, the mathematical logic underlying the logarithmic formulation of the latter index makes it harder to understand and interpret (Coulter, 1989). Criterion (i) is hence met by the former index, but not the latter.

Although Harrison and Klein (2007) refer to balanced diversity as a form of diversity as variety, Carton and Cummings (2013) suggest that balance on board is more aligned to separation. Under the latter suggestion, it could be desirable to assign the same score to balanced boards, regardless of whether these boards have null categories/combinations or not. The Blau and Teachman indices are not flexible to do this, as they always exclude null categories, thereby assigning a lower (higher) score to balanced boards with (without) null categories/combinations (see Table 3).[15] None of these indices then satisfy Criterion (f).

According to Panel A of Table 2, both indices yield a decreasing incremental value per each director replacement towards attaining bi-categorical balance. This

[15] For the Blau index, this is due to the simple mathematical rule that zero squared equals zero. For the Teachman index, this is because the natural logarithm of zero is undefined.

suggests that the indices account for the scarcity of the directors, thereby higher scarcity results in higher incremental value. This is more aligned to the construct of unique diversity rather than balanced diversity. Both indices then do not meet Criterion (e). In conclusion, even though these indices reach their maximum when there is a balance on the board, they are better described as biased measures of unique diversity than as proxies for balanced diversity.

It is worthwhile noting that the Blau index belongs to a family of three diversity indices. Each of them is a different mathematical transformation of a concentration index that is first introduced by Simpson (1949) in the ecology literature.[16] The complement, the inverse, and the negative of this concentration index are used as diversity indices by Blau (1977b), Laakso (1977), and Bernile, Bhagwat and Yonker (2018), respectively. Unlike the Blau index, the second index ranges from one to K, and the third ranges from -1 to $-1/K$. Apart from that, all share similar characteristics and receive the same evaluation in terms of the nine criteria in Panel B of Table 3.

My last approach to capture balanced diversity is using a proportional balance (Carton and Cummings, 2013). Its computational formula is as follows.

$$Proportional\ balance = -STDEV(p_i) = -1 \times \sqrt{\frac{\sum_{i=1}^{K}(p_i - \frac{1}{K})^2}{K}} \tag{4}$$

[16] The same index and the square root of it have been introduced in economics by Herfindahl (1950) and Hirschman (1945), respectively. That is why the index is also known as the Herfindahl–Hirschman index.

where: p_i is the proportion of board members in the ith category (of an attribute) or combination (across two or more attributes). K is the number of all possible categories/combinations. In equation (4), I apply the standard deviation to the proportions, rather than the sizes, of categories/combinations. This ensures a tidy range of variation for the values of this measure from −0.5 to zero.[17] It also guarantees that the same score is given to balanced boards with null categories/combinations (in case of including them), regardless of the size of each non-null category/combination. Table 3, for example, includes null categories/combinations in computing size-based balance and yields −3.30 and −2.83 for Boards (1) and (2), respectively. Yet, proportional balance yields the same value of −0.12 for both boards.

Like the minority proportion, the proportional balance satisfies Criteria (a), (c), (d), (e), and (i). The latter measure applies to multi-categorical attribute(s), thereby offering a major advantage over the former. Both measures occupy a tidy range of variation, yet none of them ranges from zero to one. The proportional balance thus meets Criterion (b), but not Criterion (h).

Criterion (f) is satisfied by proportional balance because the standard deviation in (4) is flexible to include or exclude zero-sized (null) categories/combinations. Panel B of Table 3 presents some examples for both versions of proportional balance:

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[17] The maximum value of the standard deviation for a continuous variable, which ranges from l to u, is $(u - l)/2$ (Harrison and Klein, 2007). In equation (4), the categorical proportions range from zero to one. The maximum value for the standard deviation of these proportions is then $(1 - 0)/2$. Since I multiply by −1 in (4), the minimum value for proportional balance is $-1 \times (1 - 0)/2$. This value can be reached in case of K=2 and any of the two p_is takes a value of one. Similarly, if the number of non-null categories/combinations (k) is unity, it is reasonable to assume the existence of a null category so that balance can be computed. In such a case, the value of this measure is set to its minimum of −0.5, instead of zero.

including null categories (cat.) and excluding them. When these categories are included, the measure yields lower (higher) values for balanced boards with (without) them. This is similar to Blau and Teachman indices. However, when these categories are excluded, the same maximum value of zero is assigned by this measure to all boards with equal positive p_is.[18] Only the latter version accounts for variations in board size in a systematic and unbiased way, meeting Criterion (g). This is because the former version includes null categories that do not contribute to board size (n). Overall, my results suggest proportional balance (excluding null categories) to be the most appropriate proxy for balanced diversity.

2.3.3. *Unique Diversity*

In Panel C of Table 1, I provide a checklist of nine desirable properties (criteria) for an empirical measure of unique diversity in a categorical attribute, as follows.

(1) It reaches its maximum when each category of an attribute includes only one director (i.e., each $p_i = 1/board\ size$), indicating that each director brings in a distinctive source of talent, expertise, networks, and so forth (Teachman, 1980; Harrison and Klein, 2007).

(2) It can summarize variations among multiple categorical proportions of directors (p_is), where each p_i belongs to one category (Teachman, 1980).

[18] In the case of excluding null categories/combinations, board balance and the number of non-null categories/combinations (k) are regarded as two aspects of balanced diversity. A balanced board with k = 2 and each k has at least two directors may suffer from stronger separation problems than other balanced boards with any other k (Carton and Cummings, 2013). This is because a single diversity attribute can provide a basis for separation or faultlines (Harrison and Klein, 2007; Lau and Murnighan, 1998).

(3) It is not biased towards one category over another. It then should take the same value for all boards that have the same p_is, regardless of which p_i belongs to which category. It also should capture all cases of board homogeneity, i.e., it reaches its minimum value if any p_i takes a value of one, indicating that all directors fall into the same category (Teachman, 1980).

(4) It does not assign the same value to several distinctive levels of unique diversity.

(5) It systematically accounts for changes in board diversity according to the scarcity of the category in which a new director falls, thereby higher scarcity results in higher incremental value (Shannon, 1948; Harrison and Klein, 2007). This is consistent with the economic law of diminishing returns underlying the resource dependence theory (Salancik and Pfeffer, 1978).

(6) Commencing from a complete homogeneity case where all directors fall into a single category, the measure yields a fixed rate of decrease in the incremental value brought by each additional replacement of a director from that single category by another director who falls in a given alternative category.

(7) It accounts for variations in board size in a systematic and unbiased way (Biemann and Kearney, 2010).

(8) It occupies a tidy range of variation from zero to unity (Teachman, 1980; Harrison and Klein, 2007).

(9) It is simple to understand and interpret (Coulter, 1989).

I review four potential proxies for unique diversity. The first two proxies are the proportion of unique directors and categories ratio, which are defined in equations (5) and (6), respectively.

$$Proportion\ of\ unique\ directors = \frac{Number\ of\ unique\ directors}{n} \tag{5}$$

$$Categories\ ratio = \frac{k}{n} \tag{6}$$

where: unique directors are board members who do not share the same category with any other board member; n is board size; k is the number of non-null categories on the board. For example, a board with three Australian directors and one British director has 0.25 unique directors and 0.5 categories ratio (i.e., nationalities ratio).[19]

The proportion of unique directors sums up only p_is that have a value of $1/n$ each. However, it ignores any p_i that has a value below or above $1/n$. It reaches its maximum when each $p_i = 1/n$, indicating that each director brings in a distinctive source of talent, expertise, networks, and so forth. Therefore, it satisfies Criterion (1). Although this proportion applies to multi-categorical attributes, it cannot summarize

[19] Nationalities ratio has been used as a control variable by Frijns, Dodd and Cimerova (2016).

variations among multiple p_is (as it excludes some of them). That is why this proportion does not meet Criterion (2).

Similarly, categories ratio does satisfy Criterion (1), but not Criterion (2). This ratio accounts for the existence of each category, but not its size, on the board. It then reaches its maximum when each category includes only one director, meeting Criterion (1). Criterion (2) is not met because of equally weighting all non-null categories, regardless of their sizes.

Both proxies exclude null categories. Therefore, they assign the same maximum value of unity to all unique boards,[20] regardless of whether these boards have null categories or not. Accordingly, a unique board with three unique directors is given the same score, of one, as another unique board with four or more unique directors.

Both proxies involve scaling by board size and are simple and not biased towards one category over another.[21] Both thus meet Criteria (7), (9), and (3), respectively. Each of the two proxies has a maximum value of one, yet both differ in their respective minimum values. The minimum limit for the proportion of unique directors is zero, whereas $1/n$ is the minimum limit for categories ratio. Criterion (8) is hence satisfied by the former proxy, but not the latter.[22] Both proxies, however, fail to meet Criteria (4) to (6).

[20] A board with each positive $p_i = 1/n$ is a unique board.

[21] Criterion (7) is not met in cases of using the number of unique directors or the number of categories on the board, because these proxies do not involve scaling by board size.

[22] Criterion (8) is not satisfied in the case of using the number of unique directors on the board, because this proxy ranges from zero to n.

My next potential proxy for unique diversity is an adjusted version of the Teachman index. It has been proposed by Biemann and Kearney (2010) to reduce the board-size bias in the original Teachman index. The adjusted index is defined as follows.

$$Adjusted\ Teachman\ index = Teachman\ index \times \frac{n}{n-1}$$

(7)

where: $Teachman\ index$ is the original index as defined in equation (3); n is board size. The adjusted index has a maximum limit of $ln(K)\times(K/(K-1))$. This limit is reached when $K = n$, indicating that each category includes only one director. The adjusted index thus meets the shape at the maximum property of unique diversity, Criterion (1).

Like the first two proxies, the adjusted Teachman index does exclude null categories. Yet, the impact of that exclusion is different, as it restricts unique boards with null categories from reaching the maximum limit of the index. The maximum is only reached by unique boards without null categories. This could be regarded as an advantage under the assumption that diversity on unique boards increases as their sizes increases, suggesting that the size of a unique board reflects the set of unique resources at its disposal (Harrison and Klein, 2007).

Nevertheless, this potential advantage is accompanied by a board-size bias and, hence, a failure by the adjusted index to meet Criterion (7). Biemann and Kearney (2010) acknowledge this in their description of the index as a simple approximation to attenuate, but not eliminate, the bias of the original index. They also note that attempts to create a completely unbiased version of the original index are complex. This is attributable to the complexity of the logarithmic formulation, which makes entropy-based indexes harder to understand (Coulter, 1989). The adjusted index, therefore, does not satisfy Criterion (9). Also, like the original index, the adjusted index meets Criteria (2) and (3), but not Criterion (8).

The adjusted index captures and distinguishes between different cases of unique diversity, satisfying Criterion (4). It systematically accounts for the scarcity of board members. Under this index, Panel B of Table 2 shows a decreasing incremental value for each replacement of a male director by a female one. That is, the higher the scarcity of the category in which a new director falls, the higher the incremental value, meeting Criterion (5). However, the rate of decrease is variable. Criterion (6) is hence not satisfied by this index.

My last potential proxy for unique diversity is a dissimilarity proportion (Simpson, 1949 and Rae and Taylor, 1970). It is specified as follows.

$$Dissimilarity\ proportion = 1 - \frac{\sum_{i=1}^{K} n_i(n_i - 1)}{n\,(n-1)} \tag{8}$$

where: n_i is the number of board members in the ith category; n is board size. Like the Blau index, dissimilarity proportion is the complement of a concentration index that is originally developed by Simpson (1949). In his paper, Simpson (1949) introduces $\sum_{i=1}^{K} n_i(n_i - 1) \div n\,(n-1)$ as a bias-corrected version of the concentration index included in equation (2), i.e., $\sum_{i=1}^{K} p_i^2$. He illustrates that the corrected version is unbiased because it results from dividing the number of homogeneous pairs in a group, $\frac{1}{2}\sum_{i=1}^{k} n_i(n_i - 1)$, by the total number of all possible pairs in the same group, $\frac{1}{2}n\,(n-1)$. When any $n_i = n$, the unbiased concentration index reaches its maximum value of one, indicating that all directors are identical in terms of the attribute(s) under investigation. The complement of this index then represents the number of dissimilar pairs in a group, $\frac{1}{2}n\,(n-1) - \frac{1}{2}\sum_{i=1}^{k} n_i(n_i - 1)$, as a proportion of all possible pairs in the same group, $\frac{1}{2}n\,(n-1)$. Therefore, I refer to that proportion as a dissimilarity proportion.[23]

Like the first two proxies, the dissimilarity proportion reaches its maximum value of unity when each $p_i = 1/n$, satisfying Criterion (1). This value is assigned to all unique boards, regardless of the presence or absence of null categories. The dissimilarity proportion is also unbiased in its accounting for board-size variations (Simpson, 1949; Rae and Taylor, 1970; Biemann and Kearney, 2010) and its treatment of various categories. It hence meets Criteria (7) and (3), respectively.

Similar to the proportion of unique directors, the dissimilarity proportion ranges from zero to unity, meeting Criterion (8). The latter proportion can be interpreted as the proportion of pairwise dissimilarities among board members out of all possible pairwise dissimilarities that can exist in that board. This proportion, therefore, satisfies

[23] Biemann and Kearney (2010) refer to this proportion as a bias-corrected Blau index, because it can be obtained by applying the correction term $n/(n-1)$ to the Blau index. The same term is used to adjust the Teachman index in equation (7). Dissimilarity proportion is also known as Rae and Taylor's (1970) index.

Criterion (9).

Like the adjusted Teachman index, the dissimilarity proportion meets Criteria (2), (4) and (5). Contrary to the former proxy, the latter yields a fixed rate of decrease in the incremental value brought by each additional replacement of a director from one category by another director who falls into a given alternative category. Panel B of Table 2 presents an example, where the rate of decrease is fixed to $K/(n(n-1)/2)$. The latter proxy thus meets Criterion (6). In sum, my evaluation suggests that the dissimilarity proportion is the best current proxy for unique diversity in categorical attributes. Unique diversity in continuous attributes is discussed separately in Section 7.

Table 4 presents evidence that the dissimilarity proportion, as a proxy for unique diversity, and the proportional balance (excluding null categories), as a proxy for balanced diversity, rank boards differently. In this table, I compare the ranks of 42 cases which represent all possible categorizations of ten-sized boards. The number of non-null categories then rages from one to ten. Finally, Table 5 summarizes my evaluation results.

[Tables 4 and 5 about here]

2.4. DIVERSITY CONSTRUCTS FOR CONTINUOUS-SCALED ATTRIBUTES

Harrison and Klein (2007: 1200) have introduced two constructs of diversity for continuous attributes: separation and disparity. The former refers to difference in position between board members, whereas the latter refers to differences in the concentration of resources between them. An example of the former is cultural separation (Frijns *et al*., 2016), whist CEO pay disparity is an example of the latter (Vo and Canil, 2019). I extend their work by introducing uniqueness (unique diversity) as a third construct that applies to continuous-scaled attributes. Uniqueness is maximized when a continuous attribute is evenly distributed among board members such that each point along a continuum is represented (Harrison and Klein, 2007).

Under the resource dependence perspective, scholars have attempted to proxy for diversity in continuous attributes without re-scaling them into nominal categorical attributes. For example, Bernile *et al*. (2018) and Delis, Gaganis, Hasan and Pasiouras (2017) employ the standard deviation (*STDEV*) of age and genetic scores, respectively, to capture board diversity under this perspective. Contrary to the arbitrary classification of directors into age categories, the former study explicitly favours using *STDEV* of age as *"it does not induce mechanical changes in age diversity due to directors transitioning from one age bucket to the next."* [p.593] Harrison and Klein (2007), however, point out that *STDEV* of age is a proxy for separation because it reaches its maximum when board members are polarized: half very old and half very young. At that shape of diversity, mean Euclidean distance (*MED*) of age also reaches its maximum. None of these measures thus captures unique diversity. A proxy for unique diversity in continuous attributes is therefore needed.

Measuring unique diversity in nominal categorical attributes is facilitated by the assumption that categories in each attribute are equally weighted. Under this assumption, differences between categories are equal. In terms of continuous attributes, board members also fall into categories, but differences between these categories are not assumed to be equal. For example, a board with four directors of different ages has four different age categories, where each director falls into a separate age category.

Unique diversity reaches its theoretical maximum when a continuous attribute is evenly distributed among board members such that each point along a continuum is represented (Harrison and Klein, 2007). Since boards are relatively small-sized groups, it is very difficult (if not impossible) to reach this maximum shape of diversity in the boardroom. Therefore, I operationalize the maximum to be attained when a board, in a sample, has a desired pairwise distance of the same length between consecutive directors, who are ascendingly ranked along a continuum of an attribute (e.g., age). This desired distance depends on sample specification and board size, as follows.

$$Desired\ Distance = \frac{r}{n-1} \tag{9}$$

where r is the sample age range, and n is board size. For instance, if the age range in the sample is 30 years, a board with director ages of 40, 50, 60, and 70 years is unique in age diversity. This is because pairwise distances between the first, second, and third pair of directors (who are ascendingly ranked in age) are equal to the desired distance of 10 years. The latter distance is computed as $30/(4-1)$. To proxy for unique diversity, I then develop an adjusted version of the standard deviation formula. This version captures deviations of the pairwise distances from the desired distance, as follows.

$$Uniqueness\ Index\ = -\sqrt{\frac{\sum_{i=1}^{n-1}(S_j - S_i - \frac{r}{n-1})^2}{n-1}} \qquad \forall\, S_j \geq S_i$$

(10)

where: i is director rank, in ascending order, in terms of age; S_i is the age of the ith director on the board; S_j is the age of the closest director next to the director (i); r is sample age range; n is board size. Uniqueness index ranges from $-r$ to zero. The minimum is reached when a board has two directors of identical age, indicating a homogeneous board.[24]

Table 6 presents an example of a sample of six boards. In this table, I compare the $STDEV$ of age to my adjusted version in equation (10). The table, therefore, starts with a board of polarized directors: half 75 years old and half 30 years old. In this case, Board (1), STDEV of age is at its maximum value of 22.50. Uniqueness index assigns a value of -14.14 to that board. For Boards (2) to (5), as directors become more spread along the age continuum, the value of the latter (former) proxy increases (decreases). The latter index then reaches its maximum in the case of Board (5). In Board (6), both proxies decrease in value compared to their respective values in Board (5). This is because Board (6) has smaller age deviations from mean age and larger pairwise deviations from the desired pairwise distance compared to Board (5).

[Table 6 about here]

[24] Uniqueness index, however, yields values greater than – r as homogeneous boards expand in size over two directors. For these boards, the value of the index should be set to – r.

In Table 6, r is defined as maximum age minus minimum age within a sample. It is therefore determined by only one or two observations within the sample. This increases the potential influence of outliers over the index. To address this concern, r can be defined as the average maximum age minus the average minimum age within the sample. The latter definition makes use of all observations within a sample and can alleviate concerns about age outliers. Under the latter definition, the minimum value of the index is still $-r$, whereas its maximum value can exceed zero. Despite that, I recommend using the latter definition to mitigate the potential influence of age outliers.

2.5. COMBINING MULTIPLE ATTRIBUTES OF DIVERSITY

2.5.1. COMBINATIONS

In this subsection, I consider the possibility of applying proportional balance to combinations across two or more diversity attributes. For example, in Germany, a gender quota has been effective since January 2016. It requires a 30% female representation on supervisory boards of the top 100 firms that are publicly traded and subject to the Codetermination Act. According to this Act, the supervisory boards of these large firms should have 50% employee representatives. In this setting, from a social justice perspective, diversity in gender and representational type can be conceptualized as balanced diversity. Consequently, board diversity can be calculated by applying proportional balance (as in equation 4) to four combinations: (i) female employee representatives; (ii) female shareholder representatives; (iii) male employee representatives; (iv) male shareholder representatives. This measure then reaches its maximum when each combination has a 25% board representation.

In this example, diversity is operationalized as multi-combinational balance across two bi-categorical attributes. This operationalization implies two assumptions: categories in each attribute are equally weighted, and each attribute is equally weighted. The former assumption is general, and even desirable, for all proxies of balanced diversity, as suggested by Criterion (c) in Panel B of Table 1. The latter assumption has been followed typically in constructing composite measures of diversity across more than one attribute (Bernile *et al*. 2018; Van Peteghem *et al*., 2018). Both assumptions can be justified following the social justice perspective underlying balanced diversity in the above example.

If neither of the two assumptions is palatable and scholars are interested in the separate effects of the combinations, case-based asymmetry is the theoretical construct. In this case, four variables (e.g., proportions) can be used to capture the separate effects.[25]

Although multi-combinational balance can be employed across many categorical attributes in groups with very large sizes, I do not recommend using it for more than two bi-categorical attributes in board settings. This is because sizes of boards are relatively small, making it difficult for several combinations to include board members.

[25] Similarly, if the first assumption is not accepted for categories within a single attribute, case-based asymmetry is the alternative.

2.5.2. FAULTLINES

Faultline theory (Lau and Murnighan, 1998) suggests that multiple similarities (or ties) and dissimilarities (or distances) among members in a diverse group can provide bases for fragmentations along faultlines. These faultlines signify potential internal conflicts that result from subdividing a diverse group into smaller subgroups. This theory drives its value from the psychological behavioural framework underlying individuals' tendencies to compare, attract and categorize one another. These tendencies are captured by social comparison theory (Festinger, 1954), similarity attraction theory (Bryne, 1961), and social-categorization theories (social identity theory and self-categorization theory; Tajfel, 1978 and Turner, 1985). Together, these theories support potential faultline formation within a diverse group and predict potential internal conflicts between subgroups when these faultlines are activated.

Following Harrison and Klein (2007), group diversity under faultline theory is conceptualized as separation. Yet, faultlines can form along not only continuous attributes, but also categorical ones. This is because social comparisons between board members are likely to depend on both types of attributes. Board members are then likely to form stronger (weaker) relationships with other members who are similar (dissimilar) to themselves in terms of multiple attributes, leading to subgroup formation within the boardroom.[26] The level of separation between subgroup is then expected to be detrimental to the overall performance of the board.

[26] See Appendix A for an illustration of how faultlines may form along multiple attributes.

2.6. TOWARD A CONSISTENT MEASUREMENT IN BOARD DIVERSITY RESEARCH

In this section, I uncover the potential of 'pairwise distance' as a measurement basis in board diversity research. A pairwise distance captures the difference between a pair of directors in an attribute. The distance can vary in length between different pairs of directors. When two directors are identical in any categorical or continuous attribute, the length of this distance reaches its minimum value of zero, indicating pairwise homogeneity.[27] The maximum value of this distance, however, depends on the measurement scale of the attribute under investigation.

For categorical attributes, any pairwise distance is typically assumed to have a maximum length of one. This assumption applies to bi-categorical attributes (e.g., gender) and multi-categorical attributes (e.g., nationality). It implies that any pair of directors who belong to two different categories of a categorical attribute has a fixed-length pairwise distance of unity, indicating pairwise dissimilarity. Pairwise dissimilarity is therefore a special case of pairwise distance. In contrast, for continuous attributes, no assumption is generally made about the maximum length of pairwise distances.

Operationalizing differences in director attributes as pairwise distances maps onto the definition of board diversity. This operationalization goes beyond the simple rule of 'one director one vote' to account for pairwise director interactions that can affect their behaviour and, hence, their votes on the board. The use of pairwise distances in diversity measurement is therefore consistent with behavioural theories

[27] Pairwise homogeneity is sometimes referred to as pairwise similarity. I prefer the former term as it highlights that directors are identical, rather than similar, in an attribute.

of group dynamics, such as the theory of groupthink (Janis, 1972) and faultline theory (Lau and Murnighan, 1998), which refute that simple rule. Pairwise dissimilarities also map onto theories underpinning unique diversity, such as resource dependence theory (Salancik and Pfeffer, 1978) and theories of information/decision making (Williams and O'Reilly, 1998).

Pairwise distance provides a measurement basis for measures of unique diversity (e.g., dissimilarity proportion and Uniqueness index). It also serves as a basis to measure diversity as separation by using mean Euclidean distance (*MED*). This is because dissimilarity proportion, which maps onto unique diversity, is a special case of mean Euclidean distance (*MED*), which maps onto separation (see a proof in Appendix B). Furthermore, pairwise distance is the measurement basis of the Gini coefficient, which maps onto diversity as disparity (see Appendix C, which uncovers the link between *MED* and Gini coefficient). Given that, pairwise distance can serve as a consistent measurement basis across three diversity constructs: unique diversity, separation, and disparity.

2.7. Discussion and Conclusion

Empirical evidence on the relationship between board diversity and board effectiveness is mixed. Understanding the diversity paradox has, therefore, inspired scholars in different fields. Drawing on the seminal work of Harrison and Klein (2007), I aim to contribute to unlocking that paradox.

My study distinguishes between three theoretical constructs of board diversity in categorical attributes: case-based asymmetry, balanced diversity, and unique diversity. The first construct emphasises the representation level of certain directors of interest (the case directors) on the board. In contrast, all directors are equally weighted under the second construct, which is concerned with equal board representations of dissimilar categories of directors. Whereas the third construct underscores the distinctiveness and scarcity of every single board member. It is therefore the purest construct of board diversity.

Unique diversity is not a completely new construct. While distinguishing variety from separation and disparity, Harrison and Klein (2007) have questioned:

"is diversity maximized when the attribute in question is evenly distributed among unit members such that each point along the continuum or each category is represented?" [p.1201]

In their paper, however, Harrison and Klein (2007) refer to even representation (i.e., balanced diversity) and unique representation (i.e., unique diversity) of group members as two forms of diversity as variety. I extend their work by distinguishing between balanced diversity and unique diversity as two different constructs. The former construct is more aligned to separation (Carton and Cummings, 2013), whereas variety is more aligned to the latter. Under variety, diversity attributes should be categorical. Unlike variety, I argue that unique diversity applies not only to categorical attributes, but also to continuous attributes (i.e., along continuums, in line with the above quote).

Future research is needed on the costs and benefits of balanced diversity. Considering it as a form of categorical separation does not necessarily mean that categorical balance adversely affects board effectiveness. For example, board gender balance may enhance mental independence and monitoring effectiveness, yet it may create relational conflicts on the board.

Table 7 integrates my constructs with those proposed by Harrison and Klein (2007). In this table, I consider balanced diversity as categorical separation. Consequently, there are four different theoretical constructs of group (board) diversity: asymmetry, separation, uniqueness, and disparity. The first construct applies only to categorical-scaled attributes, whilst the last one applies only to ratio-scaled attributes. Contrary to both constructs, separation and uniqueness apply to categorical and continuous attributes. All constructs, except the first one, are at their minimum limits whenever a board is homogeneous. The first construct reaches its minimum limit only if case directors are not represented on the board. The maximum limit for each construct is yet different.

[Table 7 about here]

In terms of measurement, I review four potential proxies per each construct that applies to categorical attributes. For each construct, I develop a set of desirable properties (or criteria) for an empirical construct that maps onto it. My assessment criteria reveal that proportion of the case directors, proportional balance (excluding null categories/combinations), and dissimilarity proportion are the best available proxies for case-based asymmetry, balanced diversity, and unique diversity, respectively. I then provide evidence that those proxies do rank boards differently. I also introduce a new way to proxy for board balance across diversity attributes by using combinations.

For constructs that applies to interval-scaled or ratio-scaled attributes, I discuss the potentials of pairwise distance to serve as a consistent measurement basis for their empirical proxies. Based on pairwise distance, I develop Uniqueness index as a proxy for unique diversity in continuous attributes. In comparison with standard deviation and coefficient of variation,[28] I identify one advantage for *MED* and Gini coefficient as potential proxies for separation and disparity in continuous-scaled and ratio-scaled attributes, respectively. The advantage is their use of pairwise distance as their underlying measurement basis. That basis maps onto the definition of board diversity as differences in director attributes. It is also consistent with behavioural theories of board dynamics (e.g., the theory of groupthink and faultline theory; Janis, 1972 and Lau and Murnighan, 1998) and theories advocating board diversity as uniqueness (e.g., resource dependence theory and theories of information/decision making; Salancik and Pfeffer, 1978 and Williams and O'Reilly, 1998). Consequently, Table 7 specifies *MED* and Gini coefficient as potential proxies for separation and disparity. Nevertheless, future research may provide a more comprehensive comparison between potential measures of diversity constructs that applies to interval-scaled or ratio-scaled attributes.

In conclusion, board diversity has different theoretical constructs with several potential proxies. Selecting the proper construct along with the appropriate proxy is a key to conclusive results. My study provides some guidance in this direction. This could be of interest to scholars and managers who are concerned with board diversity.

[28] Harrison and Klein (2007) state that standard deviation and *MED* are alternative proxies for separation, whereas coefficient of variation and Gini coefficient are alternative proxies for disparity.

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Table 1 – Assessment of Current Empirical Proxies for Diversity Constructs

Panel A: Case-based Asymmetry

	Single-director Dummy Indicator	*Critical-mass Dummy Indicator*	*Size of Case Directors*	*Proportion of Case Directors*
Minimum	0	0	0	0
Maximum	1	1	n	1
Criteria				
(i)			✓	✓
(ii)			✓	✓
(iii)				✓
(iv)	✓	✓		✓
(v)	✓	✓	✓	✓
Score	**2/5**	**2/5**	**3/5**	**5/5**

The above panel provides a checklist of five desirable properties (criteria) for an empirical measure that maps onto case-based asymmetry. The criteria are defined as follows:

- (i) It reaches its maximum only when the board is homogeneous in terms of the directors of interest (the case directors), i.e., when the number of these directors is equal to board size (n).
- (ii) It does not assign the same value to several distinctive levels of board concentration (homogeneity) in terms of the case directors.
- (iii) It accounts for variations in board size in a systematic and unbiased way (Biemann and Kearney, 2010).
- (iv) It occupies a tidy range of variation from zero to unity (Teachman, 1980; Harrison and Klein, 2007).
- (v) It is simple to understand and interpret (Coulter, 1989).

Panel B: Balanced Diversity

	Minority Proportion	*Blau Index*	*Teachman Index*	*Proportional Balance*
Minimum	0	0	0	−0.5
Maximum	0.5	$(K-1)/K$	$ln(K)$	0
Criteria				
(a)	✓	✓	✓	✓
(b)		✓	✓	✓
(c)	✓	✓	✓	✓
(d)	✓	✓	✓	✓
(e)	✓			✓
(f)				✓
(g)	✓			✓
(h)				
(i)	✓	✓		✓
Score	**6/9**	**5/9**	**4/9**	**8/9**

K is the number of all possible categories/combinations. The above panel provides a checklist of nine criteria for an empirical measure that maps onto balanced diversity. The criteria are defined as follows:

(a) It reaches its maximum only when each category (in case of a single attribute) or combination (in case of two or more attributes) includes an equal number of directors, i.e., all p_is are equal (Blau, 1977b).

(b) It can summarize variations among multiple categorical proportions of directors (p_is), where each p_i belongs to one category/combination (Teachman, 1980).

(c) It is not biased towards one category/combination over another. It then should take the same value for all boards that have the same p_is, regardless of which p_i belongs to which category/combination. It also should capture all cases of board homogeneity, i.e., it reaches its minimum value if any p_i takes a value of one, indicating that all directors fall into the same category/combination (Teachman, 1980).

(d) It does not assign the same value to several distinctive levels of categorical/combinational balance.

(e) It increases (decreases) by the same value per each director replacement that increases (decreases) the balance between two categories/combinations. This indicates that equal weight is assigned to every director regardless of whether they belong to a unique, minority, or majority category/combination.

(f) It is flexible to include or exclude null categories/combinations, i.e., those with p_i = zero (Coulter, 1989).

(g) It accounts for variations in board size in a systematic and unbiased way (Biemann and Kearney, 2010).

(h) It occupies a tidy range of variation from zero to unity (Teachman, 1980; Harrison and Klein, 2007).

(i) It is simple to understand and interpret (Coulter, 1989).

Panel C: Unique Diversity in Categorical Attributes

	Proportion of Unique Directors	*Categories Ratio*	*Adjusted Teachman Index*	*Dissimilarity Proportion*
Minimum	0	$1/n$	0	0
Maximum	1	1	$ln(K)\times(K/(K-1))$	1
Criteria*				
(1)	✓	✓	✓	✓
(2)			✓	✓
(3)	✓	✓	✓	✓
(4)			✓	✓
(5)			✓	✓
(6)				✓
(7)	✓	✓		✓
(8)	✓			✓
(9)	✓	✓		✓
Score	**5/9**	**4/9**	**5/9**	**9/9**

The above panel provides a checklist of nine criteria for an empirical measure that maps onto unique diversity in categorical attributes. The criteria are defined as follows:

(1) It reaches its maximum when each category of an attribute includes only one director (i.e., each $p_i = 1/board\ size$), indicating that each director brings in a distinctive source of talents, expertise, networks, and so forth (Teachman, 1980; Harrison and Klein, 2007).
(2) It can summarize variations among multiple categorical proportions of directors (p_is), where each p_i belongs to one category (Teachman, 1980).
(3) It is not biased towards one category over another. It then should take the same value for all boards that have the same p_is, regardless of which p_i belongs to which category. It also should capture all cases of board homogeneity, i.e., it reaches its minimum value if any p_i takes a value of one, indicating that all directors fall into the same category (Teachman, 1980).
(4) It does not assign the same value to several distinctive levels of unique diversity.
(5) It systematically accounts for changes in board diversity according to the scarcity of the category in which a new director falls, thereby higher scarcity results in higher incremental value (Shannon, 1948; Harrison and Klein, 2007). This is consistent with the economic law of diminishing returns underlying the resource dependence theory (Salancik and Pfeffer, 1978).
(6) Commencing from a complete homogeneity case where all directors fall into a single category, the measure yields a fixed rate of decrease in the incremental value brought by each additional replacement of a director from that single category by another director who falls in a given alternative category.
(7) It accounts for variations in board size in a systematic and unbiased way (Biemann and Kearney, 2010).
(8) It occupies a tidy range of variation from zero to unity (Teachman, 1980; Harrison and Klein, 2007).
(9) It is simple to understand and interpret (Coulter, 1989).

Table 2 – Gender Diversity on Ten-sized Boards

Panel A: Potential Proxies for Balanced Diversity

No. of Female Directors	***Minority Proportion***		***Blau Index***		***Teachman Index***		***Proportional Balance***	
	Value	**Δ**	**Value**	**Δ**	**Value**	**Δ**	**Value**	**Δ**
0.00	0.00		0.00		0.00		-0.50	
1.00	0.10	0.10	0.18	0.18	0.33	0.33	-0.40	0.10
2.00	0.20	0.10	0.32	0.14	0.50	0.18	-0.30	0.10
3.00	0.30	0.10	0.42	0.10	0.61	0.11	-0.20	0.10
4.00	0.40	0.10	0.48	0.06	0.67	0.06	-0.10	0.10
5.00	**0.50**	**0.10**	**0.50**	**0.02**	**0.69**	**0.02**	**0.00**	**0.10**
6.00	0.40	-0.10	0.48	-0.02	0.67	-0.02	-0.10	-0.10
7.00	0.30	-0.10	0.42	-0.06	0.61	-0.06	-0.20	-0.10
8.00	0.20	-0.10	0.32	-0.10	0.50	-0.11	-0.30	-0.10
9.00	0.10	-0.10	0.18	-0.14	0.33	-0.18	-0.40	-0.10
10.00	0.00	-0.10	0.00	-0.18	0.00	-0.33	-0.50	-0.10

Panel B: Potential Proxies for Unique Diversity in Categorical Attributes

No. of Female Directors	*Proportion of Unique Directors*			*Categories Ratio*			*Adjusted Teachman Index*			*Dissimilarity Proportion*		
	Value	Δ	Rate of Change	Value	Δ	Rate of Change	Value	Δ	Rate of Change	Value	Δ	Rate of Change
0.00	0.00			0.10			0.00			0.00		
1.00	0.10	0.10		0.20	0.10		0.36	0.36		0.20	0.20	
2.00	0.00	-0.10	-0.20	0.20	0.00	-0.10	0.56	0.19	-0.17	0.36	0.16	-0.04
3.00	0.00	0.00	0.10	0.20	0.00	0.00	0.68	0.12	-0.07	0.47	0.11	-0.04
4.00	0.00	0.00	0.00	0.20	0.00	0.00	0.75	0.07	-0.05	0.53	0.07	-0.04
5.00	0.00	0.00	0.00	0.20	0.00	0.00	0.77	0.02	-0.05	0.56	0.02	-0.04
6.00	0.00	0.00	0.00	0.20	0.00	0.00	0.75	-0.02	-0.04	0.53	-0.02	-0.04
7.00	0.00	0.00	0.00	0.20	0.00	0.00	0.68	-0.07	-0.05	0.47	-0.07	-0.04
8.00	0.00	0.00	0.00	0.20	0.00	0.00	0.56	-0.12	-0.05	0.36	-0.11	-0.04
9.00	0.10	0.10	0.10	0.20	0.00	0.00	0.36	-0.19	-0.07	0.20	-0.16	-0.04
10.00	0.00	-0.10	-0.20	0.10	-0.10	-0.10	0.00	-0.36	-0.17	0.00	-0.20	-0.04

Table 3 – Balanced Diversity vs. Unique Diversity: Shape at Maximum

Panel A: Board Data in Terms of a Diversity Attribute with Six Categories

	Number of Directors								
Board ID:	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**
Categories:									
(A)	7.00	6.00	1.00	6.00	5.00	1.00	5.00	4.00	1.00
(B)	7.00	6.00	1.00	6.00	5.00	1.00	5.00	4.00	1.00
(C)	7.00	6.00	1.00	6.00	5.00	1.00	5.00	4.00	1.00
(D)	7.00	6.00	1.00	6.00	5.00	1.00	5.00	4.00	1.00
(E)	0.00	0.00	0.00	6.00	5.00	1.00	5.00	4.00	1.00
(F)	0.00	0.00	0.00	0.00	0.00	0.00	5.00	4.00	1.00
Board Size	**28.00**	**24.00**	**4.00**	**30.00**	**25.00**	**5.00**	**30.00**	**24.00**	**6.00**

Panel B: Proxies for Balanced Diversity*

Board ID:	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**
Blau index	0.75	0.75	0.75	0.80	0.80	0.80	0.83	0.83	0.83
Teachman index	1.39	1.39	1.39	1.61	1.61	1.61	1.79	1.79	1.79
Size-based balance (including null cat.)	-3.30	-2.83	-0.47	-2.24	-1.86	-0.37	0.00	0.00	0.00
Proportional balance (including null cat.)	-0.12	-0.12	-0.12	-0.07	-0.07	-0.07	0.00	0.00	0.00
Proportional balance (excluding null cat.)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

* This panel excludes Minority proportion as it does not apply to multi-categorical attributes.

Panel C: Proxies for Unique Diversity in Categorical Attributes

Board ID:	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**
Proportion of unique directors	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00
Categories ratio	0.14	0.17	1.00	0.17	0.20	1.00	0.20	0.25	1.00
Adjusted Teachman index	1.44	1.45	1.85	1.66	1.68	2.01	1.85	1.87	2.15
Dissimilarity proportion	0.78	0.78	1.00	0.83	0.83	1.00	0.86	0.87	1.00

Table 4 – Balanced Diversity vs. Unique Diversity: Board Rank

Board ID	Board Composition (42 Cases)	Categorical Proportions (p_is)										Balance		Uniqueness	
		p_1	p_2	p_3	p_4	p_5	p_6	p_7	p_8	p_9	p_{10}	Value	Rank	Value	Rank
(1)	10+0	1.00	0.00									-0.50	1	0.00	1
(2)	9+1	0.90	0.10									-0.40	2	0.20	2
(3)	8+2	0.80	0.20									-0.30	4	0.36	3
(4)	8+1+1	0.80	0.10	0.10								-0.33	3	0.38	4
(5)	7+3	0.70	0.30									-0.20	9	0.47	5
(6)	7+2+1	0.70	0.20	0.10								-0.26	5	0.51	6
(7)	6+4	0.60	0.40									-0.10	22	0.53	7
(8)	7+1+1+1	0.70	0.10	0.10	0.10							-0.26	6	0.53	7
(9)	5+5	0.50	0.50									0.00	35	0.56	8
(10)	6+3+1	0.60	0.30	0.10								-0.21	8	0.60	9
(11)	6+2+2	0.60	0.20	0.20								-0.19	10	0.62	10
(12)	5+4+1	0.50	0.40	0.10								-0.17	11	0.64	11
(13)	6+2+1+1	0.60	0.20	0.10	0.10							-0.21	7	0.64	11
(14)	6+1+1+1+1	0.60	0.10	0.10	0.10	0.10						-0.20	9	0.67	12
(15)	5+3+2	0.50	0.30	0.20								-0.12	17	0.69	13
(16)	4+4+2	0.40	0.40	0.20								-0.09	23	0.71	14
(17)	5+3+1+1	0.50	0.30	0.10	0.10							-0.17	12	0.71	14
(18)	4+3+3	0.40	0.30	0.30								-0.05	32	0.73	15
(19)	4+4+1+1	0.40	0.40	0.10	0.10							-0.15	14	0.73	15
(20)	5+2+2+1	0.50	0.20	0.20	0.10							-0.15	14	0.73	15
(21)	5+2+1+1+1	0.50	0.20	0.10	0.10	0.10						-0.15	13	0.76	16
(22)	4+3+2+1	0.40	0.30	0.20	0.10							-0.11	18	0.78	17
(23)	5+1+1+1+1+1	0.50	0.10	0.10	0.10	0.10	0.10					-0.15	15	0.78	17
(24)	3+3+3+1	0.30	0.30	0.30	0.10							-0.09	25	0.80	18
(25)	4+2+2+2	0.40	0.20	0.20	0.20							-0.09	25	0.80	18
(26)	4+3+1+1+1	0.40	0.30	0.10	0.10	0.10						-0.13	16	0.80	18

Table 4 – Continued

Board ID	Board Composition (42 Cases)	Categorical Proportions (p_is)										Balance		Uniqueness	
		p_1	p_2	p_3	p_4	p_5	p_6	p_7	p_8	p_9	p_{10}	Value	Rank	Value	Rank
(27)	3+3+2+2	0.30	0.30	0.20	0.20							-0.05	30	0.82	19
(28)	4+2+2+1+1	0.40	0.20	0.20	0.10	0.10						-0.11	20	0.82	19
(29)	3+3+2+1+1	0.30	0.30	0.20	0.10	0.10						-0.09	24	0.84	20
(30)	4+2+1+1+1+1	0.40	0.20	0.10	0.10	0.10	0.10					-0.11	19	0.84	20
(31)	3+2+2+2+1	0.30	0.20	0.20	0.20	0.10						-0.06	29	0.87	21
(32)	3+3+1+1+1+1	0.30	0.30	0.10	0.10	0.10	0.10					-0.09	23	0.87	21
(33)	4+1+1+1+1+1+1	0.40	0.10	0.10	0.10	0.10	0.10	0.10				-0.10	21	0.87	21
(34)	2+2+2+2+2	0.20	0.20	0.20	0.20	0.20						0.00	35	0.89	22
(35)	3+2+2+1+1+1	0.30	0.20	0.20	0.10	0.10	0.10					-0.07	26	0.89	22
(36)	2+2+2+2+1+1	0.20	0.20	0.20	0.20	0.10	0.10					-0.05	32	0.91	23
(37)	3+2+1+1+1+1+1	0.30	0.20	0.10	0.10	0.10	0.10	0.10				-0.07	27	0.91	23
(38)	2+2+2+1+1+1+1	0.20	0.20	0.20	0.10	0.10	0.10	0.10				-0.05	31	0.93	24
(39)	3+1+1+1+1+1+1+1	0.30	0.10	0.10	0.10	0.10	0.10	0.10	0.10			-0.07	28	0.93	24
(40)	2+2+1+1+1+1+1+1	0.20	0.20	0.10	0.10	0.10	0.10	0.10	0.10			-0.04	33	0.96	25
(41)	2+1+1+1+1+1+1+1+1	0.20	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10		-0.03	34	0.98	26
(42)	1+1+1+1+1+1+1+1+1+1	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.00	35	1.00	27

The above table compares the ranking of all different compositions of ten-director boards in terms of balanced diversity and unique diversity. For categorical attributes, board composition refers to how directors are categorised. In Board (2), for example, nine members fall in one category and only one member belongs to a different category (9+1). All categories are equally weighted. Balanced diversity is measured by using the proportional balance (excluding null categories). Unique diversity is measured by using a dissimilarity proportion. The boards are ranked in ascending order in terms of unique diversity.

Table 5 – Main Assessment Results

Theoretical Construct	Shape at Minimum	Shape at Maximum	Best Available Empirical Proxy
Case-based Asymmetry	None of the board members is a director of interest.	All board members are case directors.	Proportion of case directors.
Balanced Diversity	All board members belong to a single category (combination).	Two or more categories (combinations) of directors are equally represented on the board.	Proportional balance (excluding null categories/ combinations).
Unique Diversity	All board members belong to a single category.	Each board member belongs to a distinctive category.	Dissimilarity proportion.

Table 6 – Age Diversity as Uniqueness in a Sample of Ten-sized Boards

	Director Age					
Board ID:	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Director:						
(A)	30.00	30.00	30.00	30.00	30.00	35.00
(B)	30.00	30.00	30.00	30.00	**35.00**	38.00
(C)	30.00	30.00	30.00	**35.00**	**40.00**	41.00
(D)	30.00	30.00	**35.00**	**40.00**	**45.00**	44.00
(E)	30.00	**35.00**	**40.00**	**45.00**	**50.00**	47.00
(F)	75.00	**70.00**	**65.00**	**60.00**	**55.00**	50.00
(G)	75.00	75.00	**70.00**	**65.00**	**60.00**	53.00
(H)	75.00	75.00	75.00	**70.00**	**65.00**	56.00
(I)	75.00	75.00	75.00	75.00	**70.00**	59.00
(J)	75.00	75.00	75.00	75.00	75.00	62.00
STDEV of Age	**22.50**	**21.59**	**19.91**	**17.50**	**14.36**	**8.62**
Uniqueness Index	**-14.14**	**-10.80**	**-7.45**	**-4.08**	**0.00**	**-2.00**

Table 7 – Diversity Typology

Theoretical Construct (Type)	Measurement Scale	Suggested Empirical Proxy
Case-based Asymmetry	Categorical	Proportion of case directors
	Continuous	—
Separation (Including Balanced Diversity)	Categorical	Proportional balance (excluding null categories/combinations)
	Continuous	Mean Euclidean distance (*MED*)
Uniqueness (i.e., Unique Diversity)	Categorical	Dissimilarity proportion
	Continuous	Uniqueness index
Disparity	Categorical/Interval	—
	Ratio	Gini coefficient

Appendix A

Table A1 – An Illustration of Faultlines Across Multiple Attributes

	Board I				Board II			
Director ID:	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**
Gender	**Male**	**Male**	Female	Female	Male	Male	**Female**	**Female**
Nationality	**British**	**British**	Chinese	Chinese	British	**Chinese**	**Chinese**	British
Age	**65**	**64**	45	42	65	**45**	64	**42**

Suppose there are two equal-sized boards with the above data on directors' social attributes: gender, nationality, and age. In each board, there are four members. Although both boards have the same percentages of female directors (50%), Chinese directors (50%), and old directors (50%), the distribution pattern of these attributes among board members is different in the two boards. The pattern (or structure) of diversity in Board I potentially creates a strong faultline that would split the board into two subgroups (A and B versus C and D). However, the pattern in Board II does not suggest the existence of such a strong split.

APPENDIX B

Proof A1 – The Link between Dissimilarity Proportion and MED

This appendix provides a proof that dissimilarity proportion, a measure of unique diversity, is a special case of *MED*, which is a proxy for separation. Let L = the length of pairwise Euclidean distances in a group (I assume that L is constant); *AED* = actual pairwise Euclidean distances in a group; *NAED* = number of *AED*; *NPED* = number of all possible pairwise Euclidean distances in a group; *NZED* = number of zero-length pairwise Euclidean distances in a group. Then:

$$\sum AED \;=\; L \;\times\; NAED$$

$$\frac{\sum_{i=1}^{n}\sum_{j=1}^{n}|S_i - S_j|}{2} = L \;\times\; [\,NPED - NZED\,]$$

(Where the left-hand side is divided by 2 to account for repetition)

$$\frac{\sum_{i=1}^{n}\sum_{j=1}^{n}|S_i - S_j|}{2} = L \;\times\; [\frac{n\,(n-1)}{2} - \frac{\sum n_i\,(n_i-1)}{2}]$$ Multiply both sides by 2 gives

$$\sum_{i=1}^{n}\sum_{j=1}^{n}|S_i \;-\; S_j| = L \;\times\; [\,n\,(n-1) - \sum n_i\,(n_i - 1)\,]$$

$$\sum_{i=1}^{n}\sum_{j=1}^{n}|S_i \;-\; S_j| = n\,(n-1) - \sum n_i\,(n_i - 1) \qquad (1)$$ This is assuming $L = 1$

$$MED = \frac{\sum_{i=1}^{n}\frac{\sum_{j=1}^{n}\sqrt{(S_i - S_j)^2}}{n-1}}{n}$$ This is *MED*, according to Biemann and Kearney (2010).

$$\because \sum_{i=1}^{n}\sum_{j=1}^{n}\sqrt{(S_i \;-\; S_j)^2} = \sum_{i=1}^{n}\sum_{j=1}^{n}|S_i \;-\; S_j|$$

$$\therefore MED = \frac{\sum_{i=1}^{n}\sum_{j=1}^{n}|S_i - S_j|}{n\,(n-1)}$$ Substitute from (1), assuming unity-length distances, gives

$$MED = \frac{n\,(n-1) - \sum n_i\,(n_i - 1)}{n\,(n-1)}$$

$$MED = \frac{n\,(n-1)}{n\,(n-1)} - \frac{\sum n_i\,(n_i-1)}{n\,(n-1)} = 1 - \frac{\sum n_i\,(n_i-1)}{n\,(n-1)} = \textit{Dissimilarity proportion}$$

∴ *Dissimilarity proportion* = *Unity-length MED* *Q.E.D.*

APPENDIX C

Proof B1 – The Link between MED and Gini Coefficient

This appendix provides a proof that Gini coefficient, a measure of disparity, equals MED (a measure of separation) divided by twice the group mean value of an attribute.

$$MED = \frac{\sum_{i=1}^{n} \frac{\sum_{j=1}^{n} \sqrt{(S_i - S_j)^2}}{n-1}}{n}$$ This is *MED*, according to Biemann and Kearney (2010).

$$\because \sum_{i=1}^{n} \sum_{j=1}^{n} \sqrt{(S_i - S_j)^2} = \sum_{i=1}^{n} \sum_{j=1}^{n} |S_i - S_j|$$

$$\therefore MED = \frac{\sum_{i=1}^{n} \sum_{j=1}^{n} |S_i - S_j|}{n\,(n-1)} \qquad (2)$$

$$Gini = \frac{\sum_{i=1}^{n} \sum_{j=1}^{n} |S_i - S_j|}{2\,n\,S_{mean}\,(n-1)}$$ This is the Gini coefficient by Biemann and Kearney (2010).

$$Gini = \frac{\sum_{i=1}^{n} \sum_{j=1}^{n} |S_i - S_j|}{n\,(n-1) \times 2\,S_{mean}}$$ This is after a reorganization of the Gini's denominator.

$$Gini = \frac{MED}{2\,S_{mean}}$$ This is after substituting from (2). *Q.E.D.*

ESSAY 2

THE DETERMINANTS AND VALUE OF BOARD NATIONALITY DIVERSITY: THE ROLE OF THE NATIONALITY COMPOSITION OF FOREIGN DIRECTORS

ABSTRACT

The nationality composition of foreign directors determines three core elements of board nationality diversity: (i) the level of diversity, (ii) the strength of cultural faultlines, and (iii) the marginalization of foreign minorities. I examine the determinants and the performance outcome of diversity, after accounting for the composition of foreign directors' nationalities. I find the magnitude, rather than the number, of foreign activities to be a positive determinant of the diversity level. I next find that boards with higher levels of nationality diversity are associated with higher firm value. This relationship holds after addressing potential endogeneity by using 2SLS regressions. I further find no significant role for the strength of board cultural separation in moderating the above relationship. Yet, I find this relationship to be moderated by levels of firm complexity, suggesting that diversity provides net benefits only for complex firms. My study could be of interest to regulators and firms.

JEL classification: G30; G32; G38; D70.

Keywords: director nationality; board diversity; cultural faultlines; firm performance.

Data availability: Data are available from the public sources cited in the text.

3.1. Introduction

I examine the demand side and the outcome side of diversity, after accounting for the nationality composition of non-domestic (foreign) directors. This composition can play a vital role in shaping board dynamics as it determines three elements of diversity: (i) the level of board nationality diversity, (ii) the strength of cultural subgrouping along faultlines, and (iii) the possible presence of marginalized foreign minorities. These elements have not yet been directly investigated in the literature on the antecedents and consequences of board nationality diversity. I fill this gap.

On the demand side of diversity, earlier research has mainly investigated why foreign directors exist on corporate boards (Oxelheim, Gregorič, Randøy and Thomsen, 2013; Estélyi and Nisar, 2016; Miletkov, Poulsen and Wintoki, 2017). In this investigation, non-domestic directors from different foreign countries have been regarded as similar. I extend earlier work by exploring why firms choose a given level of nationality diversity on their boards. I conceptualize board nationality diversity as uniqueness. In this context, a unique board is one in which each member's nationality is unique from (or dissimilar to) the nationalities of other members. A board with two domestic directors and two non-domestic directors will then be less (more) diverse if the non-domestic directors are (are not) from a single foreign country. This means that national-origin dissimilarities among foreign directors contribute to the level of diversity. I introduce dissimilarity of director nationalities (*DDN*) as a multi-categorical measure that accounts for the composition of foreign board members, to capture the level of board nationality diversity. From a resource dependence perspective (Salancik and Pfeffer, 1978), dissimilarities in directors' nationalities could bring valuable expertise and networks of help to the operation of corporate boards. If pure economic reasons are behind firms' choice of the diversity level on their boards, we would expect the level of diversity each year to be more strongly driven by the magnitude, rather than the number, of foreign activities in the preceding year.

On the outcome side of diversity, I explore the circumstances under which diversity might or might not be a good thing. As noted earlier, from a resource dependence perspective, nationality diversity might enlarge board resources in terms of expertise and networks. Building on the theory of groupthink, prior studies have also attributed poor decision-making to cohesive homogeneous boards (Chen, Leung and Goergen, 2017; Lai, Srinidhi, Gul and Tsui, 2017). Nationality diversity could then encourage directors to engage in critical discussions rather than the detrimental behaviour of groupthink. If diversity enlarges the board's resources and reduces groupthink, the level of diversity will be positively associated with firm value.

However, nationality diversity among board members is accompanied by differences in their cultural backgrounds, which may serve as bases for cultural separation. Such separation could push the costs of diversity up to outweigh its benefits. Drawing on theories of faultline (Lau and Murnighan, 1998) and critical mass (Joecks, Pull and Vetter, 2013), cultural differences may sub-divide the board into opposing cliques or marginalize singleton directors.[29] Both sub-categorization and marginalization of directors are forms of board cultural separation, which may

[29] Throughout the study, the term 'clique' refers to a subgroup of at least two board members who share similar cultural backgrounds. The term 'singleton director' refers to a board member who does not share the same nationality with any other members of the same board.

provoke communication breakdowns, misunderstandings, internal conflicts, and lack of trust between board members, to the detriment of board's operation (Frijns, Dodd and Cimerova, 2016; Van Peteghem, Bruynseels and Gaeremynck, 2018; Tajfel and Turner, 1979). Board cultural separation is therefore expected to mitigate any positive impact of board nationality diversity on firm value.

In addition, earlier work has suggested that complex firms benefit more from the diverse expertise brought by board diversity (Anderson, Reeb, Upadhyay and Zhao, 2011). Frijns *et al*. (2016) also find that the adverse impact of board cultural differences on firm performance is mitigated by firm complexity. Firm complexity is thus another potential moderator of the relationship between board nationality diversity and the firm value.

In light of the above, I ask three main questions. First, what are the determinants of the level of board nationality diversity? Second, does this diversity add value to shareholders? Third, do board cultural separation and firm complexity moderate any relationship between this diversity and firm value? To answer these questions, I employ a dataset of 11,384 firm-years of UK-domiciled non-financial firms that are listed on the London Stock Exchange over the period from 1999 to 2018. I use a UK sample for two main reasons. First, variations in directors' nationalities are deemed relatively high in the UK compared to US samples (Frijns *et al*., 2016; Delis, Gaganis, Hasan and Pasiouras, 2017). Second, empirical UK-based evidence on the value of board nationality diversity is inconclusive (Estélyi and Nisar, 2016; Delis *et al*., 2017; Frijns *et al*., 2016; Hahn and Lasfer, 2016).

I find that the level of diversity is driven by the magnitude of foreign activities (measured by the proportion of foreign sales), rather than the number of geographical regions in which a firm operates. This result is robust to a battery of control variables and is based on a two-limit Tobit estimation, which accounts for my use of a censored dependent variable (*DDN*) with a lower limit of zero and an upper limit of one. I next find that higher diversity is associated with higher firm value, after controlling for a wide range of board-level, firm-level, industry, and year controls. This relationship holds after addressing potential endogeneity by implementing an instrumental variable approach using two-stage least squares (2SLS) regressions. The results also hold after controlling for firm value in previous years (i.e., one and two lags of Tobin's Q). Additionally, I find that my measure of the level of board nationality diversity (*DDN*) is positively and significantly related to firm value after controlling for prior measures of diversity, including the proportion of foreign board members, the proportion of foreign non-executive board members, genetic diversity (Delis *et al.*, 2017) and cultural diversity (Frijns *et al.*, 2016). I further find that the presence of strong cultural faultlines or marginalized directors on boards do not significantly mitigate the positive impact of diversity on firm value. Yet, I find this impact to be mitigated by levels of operational complexity, suggesting that board nationality diversity contributes to firm value only under certain circumstances (i.e., when firms are complex).

My study makes three contributions to the literature on board diversity. First, it responds to recent calls for refining of the measurement of board diversity (Carcello, Hermanson, and Ye, 2011) by accounting for the nationality composition of foreign directors. I introduce a set of new measures to capture the level of nationality diversity, the strength of cultural faultlines, and the presence of marginalized foreign minorities on corporate boards. My measurement approach thus accounts for both the upside and the downside aspects of diversity: the level of diversity and the strength of cultural separation. To measure the former, I develop a set of nine criteria to assess how well available empirical proxies map onto the theoretical construct of board nationality diversity as uniqueness. I then find that *DDN* is the best available proxy for that construct. In measuring the latter, I identify the strength of cultural subgrouping along faultlines and the marginalization of foreign minorities as two channels through which board cultural separation may reduce the value of diversity to shareholders. Second, I extend earlier work on why foreign nationals exist on corporate boards (e.g., Estélyi and Nisar, 2016) by exploring why firms choose a given nationality diversity level on their boards. My findings suggest that the magnitude, rather than the number, of foreign activities matters for the level of board nationality diversity. Third, my study provides evidence that board nationality diversity creates value for shareholders only for complex firms.

This essay proceeds as follows. Section 3.2 provides a review of related literature and develops my hypotheses. Section 3.3 presents a discussion on my measurement of nationality diversity and cultural separation on corporate boards. Section 3.4 specifies my empirical models, and Section 3.5 describes the data. I then report the results of my univariate, bivariate, and multivariate analyses in Sections 3.6, 3.7, and 3.8, respectively. Section 3.9 concludes.

3.2. LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

Earlier research has mainly investigated why foreign directors exist on corporate boards (Oxelheim *et al*., 2013; Estélyi and Nisar, 2016; Miletkov *et al*., 2017). In this investigation, non-domestic directors from different foreign countries have been regarded as similar. This treatment does not account for the nationality diversity within foreign directors as an integral component of the overall diversity level of the whole board. For example, a board with two non-domestic directors from two different countries is more diverse than a board with two non-domestic directors from a single foreign country.

From a resource dependence perspective (Salancik and Pfeffer, 1978), dissimilarities in directors' nationalities could bring valuable expertise and networks of help to the operation of corporate boards. Going back to the above example, the former board is then expected to tap into more international expertise and networks than the latter one. This suggests that firms need to increase the level of nationality diversity on their board to gain higher international expertise, networks, and other valuable resources. Yet, the economic benefits from these resources are likely to depend on the magnitude of a firm's foreign operations. Investing in such resources is therefore less attractive if a firm's foreign operations contribute only a little to its key performance indicators (e.g., its overall sales revenue). This should be the case regardless of the number of these foreign operations. For example, a firm operating in three foreign countries with a foreign sales proportion of 50% will be more willing to invest in board nationality diversity than a firm operating in five foreign countries with a foreign sales proportion of 10%. Accordingly, I expect that the mere existence of a bigger number of foreign operations in a year is not sufficient to trigger higher nationality diversity in the next year because some of these operations may not be economically significant to justify the economic cost of adding more foreign and dissimilar board members. The appointment of dissimilar foreign nationals to the board is therefore expected to rely on the magnitude or the economic significance of foreign operations (i.e., their contribution to the key performance indicators of the firm such as its overall sales revenue).

In my first research hypothesis, I extend prior work on why foreign directors exist on corporate boards (Oxelheim *et al*., 2013; Estélyi and Nisar, 2016; Miletkov *et al*., 2017) by exploring why firms choose a given level of nationality diversity on their boards. I conceptualize board nationality diversity as uniqueness, which refers to the distinctiveness of board members from one another. Drawing on the resource dependence theory (Salancik and Pfeffer, 1978), the economic benefits a firm drive from its foreign board members depend on the use of these human resources to support existing foreign operations that are economically significant to the overall performance of the firm. Therefore, I expect the magnitude of a firm's foreign operations in year (*t-1*) to be a key factor in determining the magnitude (level) of board nationality diversity in year (*t*). I also expect this factor to be a more significant determinant of the diversity level than the number of foreign countries in which the firm operates. This extends earlier work by Estélyi and Nisar (2016) that find the latter factor to be a key determinant of the presence of at least one foreign director on the board. Put another way, the number of foreign operations is found to be a key determinant of the existence of at least one foreign director on the board, but it is less likely to be a key determinant of the magnitude (level) of nationality diversity on the board. Rather, the magnitude of such diversity is likely to depend on the magnitude of foreign operations (as measured by the proportion of foreign sales). This leads to the following hypothesis:

Hypothesis 1: *The level of board nationality diversity in a year will be more strongly driven by the magnitude, rather than the number, of foreign activities in the preceding year.*

Research on the outcomes of board diversity typically adopt the notion that firms do not make decisions, but people in charge do (Kachelmeier, 2010). The board of directors is charged with a dual role of simultaneously advising and monitoring corporate management (Brickley and Zimmerman, 2010). In discharging this role, directors give consultations and make decisions that are shaped by factors such as their expertise (Xie, Davidson, and DaDalt, 2003; Dhaliwal, Naiker and Navissi, 2010; Adams, Akyol and Verwijmeren, 2018) and independence (Fama and Jensen, 1983; Weisbach, 1988; Byrd and Hickman, 1992; Hermalin and Weisbach, 1998). The level of board nationality diversity can influence both the pool of expertise and the independence of the board. I discuss this below.

From a resource dependence perspective, nationality diversity enlarges board resources in terms of expertise and networks (Salancik and Pfeffer, 1978). These resources reduce external dependencies, uncertainty, and transactions costs (Dass, Kini, Nanda, Onal and Wang, 2013). Masulis, Wang and Xie (2012) find that US firms with foreign independent directors exhibit higher returns from cross-border acquisitions when the targets are from the home regions of the foreign directors. This is attributed to the overseas task-relevant expertise of foreign directors. In addition to overseas expertise and networks, foreign nationals may bring distinctive talents that are not available domestically. For example, Delis *et al*. (2017) argue that differences in genetic origins between board members bring creative approaches for solving corporate problems. In support of their argument, they find a positive association between board genetic diversity and firm performance—measured by Tobin's Q and risk-adjusted returns. Giannetti and Zhao (2019) find that differences in ancestral origins among board members are positively associated with firm innovation in terms of the number of patents and their average number of citations. Such expertise, networks, and talents are valuable resources to firms with overseas and complex operations (Estélyi and Nisar, 2016; Anderson *et al*., 2011).

Related work emphasises differences in the quality of corporate governance and investor protection systems between a board's host country and the home countries of foreign directors. For example, Oxelheim and Randøy (2003) propose that outsider Anglo-American directors are employed by Norwegian and Swedish firms to signal their willingness to expose themselves to improved corporate governance systems. In support of their proposition, they find that outsider Anglo-American directors are associated with higher firm value—measured by Tobin's Q. Using 62,066 firm-years from eighty countries, Miletkov *et al*. (2017) find, on average, no significant differences in firm value between firms with and without foreign board members. However, the presence of these board members is positively associated with shareholder value when their home countries have higher quality legal institutions than those of the firm's host country. The authors also find that the announcement returns of cross-border acquisitions are higher for firms with foreign independent directors from countries with stronger investor protection systems. Both studies thus suggest that foreign directors add to (distort) shareholder value through their exposure to relatively higher (lower) quality systems of corporate governance and investor protection in their home countries.

Another potential reason for hiring foreign directors is to meet the demand of foreign shareholders (Estélyi and Nisar, 2016). Unlike domestic directors, foreign nationals tend to have weaker ties with domestic management and share more interests with foreign shareholders. This could make it easier for foreign agents to fulfil their duty to dissent when needed. Accordingly, foreign owners may exercise pressure on firms to have foreign agents on their boards. From an agency perspective, foreign board members may enhance board independence by reducing 'groupthink', originally defined as

> *"a mode of thinking that people engage in when they are deeply involved in a cohesive in-group, when the members' strivings for unanimity override their motivation to realistically appraise alternative courses of action"* (Janis, 1972, p.9).

Drawing on the theory of groupthink, prior studies have attributed higher governance quality to firms with gender-diverse boards compared to those with all-male boards (Chen *et al*., 2017; Lai *et al*., 2017). This is based on the premise that diverse boards are less susceptible to groupthink compared to homogeneous boards. Contrary to nationality-diverse boards, all-domestic boards are more likely to share a homogeneous cultural background. The latter are therefore more cohesive, and their consequent susceptibility to groupthink is higher than the former. Bénabou (2013) points out two symptoms of groupthink: an ex-ante dissent-aversion (i.e., willful blindness) and an ex-post denial of bad news (i.e., wishful thinking). This dysfunctional behaviour by board members has been blamed for high-profile business failures, such as the collapse of Enron Corporation (Banerjee, Humphery-Jenner, and Nanda, 2015). If groupthink features less on diverse boards, foreign directors will contribute to board independence and effective monitoring. In support of this argument, Oxelheim *et al.* (2013) find evidence to suggest that Nordic firms employ foreign board members to satisfy foreign shareholders' need for monitoring, whereas nationals with international experience are put in office for advice on overseas operations. Estélyi and Nisar (2016) further find that UK firms with higher foreign ownership are more likely to have foreign board members. The authors also find that firms with foreign directors have a higher performance—measured by the natural logarithm of Tobin's Q and return on assets.

To sum up, prior studies have attributed some benefits to the existence of foreign directors on corporate boards. For example, these directors bring overseas expertise and networks to the board (e.g., Masulis *et al.*, 2012; Estélyi and Nisar, 2016) and tend to have week ties with domestic management (Oxelheim *et al.*, 2013). Yet, these studies do not consider the nationality composition of foreign directors. Taking this composition into account is crucial as it determines the level of distinctive international expertise, networks, and talents that is brought by nationality diversity to the board. Drawing on theories of resource dependence (Salancik and Pfeffer, 1978) and groupthink (Janis, 1972), I expect the distinctiveness of board members from each other to contribute to the pool of expertise and the independence of the board. The level of board nationality diversity is therefore expected to improve board decisions and create value for shareholders. This reasoning leads to the following hypothesis:

Hypothesis 2: *The level of board nationality diversity will have a positive impact on firm value.*

Nationality diversity among board members comes with potential logistical and cultural challenges. The logistical challenge stems from the geographical distance of foreign directors from the country of corporate headquarters. For example, Masulis *et al*. (2012) find that independent non-US-domiciled directors are more likely than their US-domiciled counterparts to have a poor attendance record (below 75%) of board meetings. Together with their lack of domestic networks and less familiarity with the US environment, the former are then argued to be less effective than the latter in monitoring corporate management. In support of this argument, the authors find that firms with independent non-US-domiciled directors are associated with aggressive CEO compensation, lower likelihood of firing CEOs with poor performance, and a higher probability of intentional financial misreporting. Yet, the geographical location of the UK is more easily accessible to many foreign nationals than that of the US, which requires a longer time to cross the Atlantic Ocean. Empirical evidence in support of this argument is provided by Estélyi and Nisar (2016), who find that foreign nationals on UK boards are unlikely to miss the 75% board meeting attendance threshold.

Related work has compared the frequency of board meetings between diverse and domestic boards. Hahn and Lasfer (2016) find that UK firms with foreign non-executive board members have lower board meeting frequency. The fewer board meetings are then associated with lower shareholder returns and higher compensation for the CEO and the chairman. In the US, Giannetti and Zhao (2019) find that diversity in directors' ancestral origins is associated with higher board meeting frequency and higher director turnover, which is not related to firms' performance. The US findings are then interpreted, by the authors, as indicative of difficulties and disagreements in the decision-making process on diverse boards. This interpretation relates to the concept of cultural separation among members of diverse boards.

Cultural separation is another potential challenge to boards with foreign nationals. This challenge stems from differences in board members' cultural backgrounds that could serve as bases for cultural separation. Such separation could diminish the board's functionality and have devastating consequences on shareholder value. Empirical evidence in support of this argument is provided by Frijns *et al.*, (2016). Their findings relate higher cultural differences among board members to lower firm performance—measured by Tobin's Q and return on assets.

One form of cultural separation is cultural faultlines. Faultlines are hypothetical dividing lines that may divide a heterogeneous set of actors into subgroups based on one or more attributes of these actors (Lau and Murnighan, 1998). In the case of board cultural faultlines, subgroups form along cultural attribute(s) of directors. Cultural faultlines are therefore defined as the degree of separation between cliques that may form based on one or more cultural dimensions. A clique is a subgroup of two or more board members who share similar cultural backgrounds. The higher the cultural similarities within each clique, and the cultural differences between cliques, the stronger the faultline(s) on the board (Meyer and Glenz, 2013; Van Peteghem *et al*., 2018). Individual board members are then expected to favour, trust, and cooperate with those belonging to their clique more than those who do not (Tajfel and Turner, 1979). The strength of the separation between cliques along faultline(s) is hypothesized to diminish the overall effectiveness of the board through poor communication, conflicts, and distrust between board members (Tajfel and Turner, 1979; Harrison and Klein, 2007; Van Peteghem *et al*., 2018). In support of this hypothesis, Van Peteghem *et al*. (2018) find that stronger board faultlines are associated with lower firm performance, aggressive CEO compensation, and lower sensitivity of CEO turnover to firm performance.

Another form of cultural separation is the marginalization of singleton directors. Singleton directors are unique-nationality board members who do not share an identical national culture with any other members of the same board. When all board members are singleton directors, nationality diversity reaches its maximum, and cultural faultlines reach their lowest possible level for a diverse board. Singleton directors are therefore instrumental in the design of an effective board nationality diversity policy. Underrepresentation of these directors may suppress their potential. This argument finds its roots in the critical mass hypothesis, which stipulates that the influence on board decisions of minority directors remains insignificant until their representation exceeds a critical threshold level (Joecks *et al*., 2013). Evidence in line with this hypothesis is provided by Liu Wei and Xie (2014).

In sum, nationality diversity among board members is not without potential problems. Examples of challenges that could face nationality-diverse boards include logistical challenges arising from the geographical distance of foreign directors from the country of corporate headquarters (Masulis *et al*., 2012) and cultural challenges emanating from cultural differences among board members (Frijns *et al*., 2016). The former challenges are less likely in the UK setting compared to the US setting (Estélyi and Nisar, 2016). Therefore, I focus on the latter challenges that may negatively impact the dynamics of nationality-diverse boards. Building on theories of faultline (Lau and Murnighan, 1998) and critical mass (Joecks *et al*., 2013), these boards may face serious cultural challenges in the forms of strong cultural faultlines and marginalized foreign minorities. The strength of cultural subgrouping along faultlines may generate conflicts and lack of trust, leading to limited cooperation and information sharing across cultural divides (Tajfel and Turner, 1979; Harrison and Klein, 2007; Van Peteghem *et al*., 2018). The marginalization of foreign minorities is also expected to limit their contributions to the board. Both forms of cultural separation could increase the costs of diversity to offset or exceed its benefits. Board cultural separation is then expected to mitigate the positive impact of diversity on firm value. This leads to the following hypothesis:

Hypothesis 3: The strength of board cultural separation (cultural faultlines, marginalized directors) will moderate the relationship between the level of board nationality diversity and firm value.

Next, I discuss other prior studies on the circumstances under which diversity might or might not add net benefits to shareholders. For example, Anderson *et al.* (2011) argue that diversity benefits are higher for firms with higher complexity of operations compared to those with lower complexity. The authors then find that firm complexity mitigates the positive impact on firm value of board diversity, measured by using a composite diversity index across six dimensions (including education, professional experience, board experience, age, gender, and ethnicity). Frijns *et al.* (2016) also find that the complexity of operations moderates the negative association between board cultural differences and firm performance.

I extend the work of Anderson *et al.* (2011) by using nationality as another dimension of diversity that is specifically relevant to firms with international complex operations. Unlike Anderson *et al.* (2011) and Frijns *et al.* (2016), my measure of operational complexity considers not only the number of business segments but also the number of geographical regions in which the firm operates. I also extend the work of Frijns *et al.* (2016) by investigating the impact of firm complexity on the performance outcome of board nationality diversity as uniqueness, rather than board cultural separation. Accordingly, if the level of complexity has a bearing on the benefits derived from the level of board nationality diversity, I would expect firm complexity to influence the association between diversity and firm value. Based on this reasoning, I formulate my final hypothesis as follows:

Hypothesis 4: *Firm complexity will moderate the relationship between the level of board nationality diversity and firm value.*

3.3. Measurement of Nationality Diversity and Cultural Separation

Guided by various theoretical backgrounds, corporate governance scholars have proxied for aspects of nationality diversity by applying different measurement scales to director nationality. One approach is to scale director nationality as a binary attribute. For example, Estélyi and Nisar (2016) classify directors into domestic directors (i.e., the base case) and foreign directors. Similarly, Masulis *et al.* (2012) categorize directors into foreign independent directors and other directors. This approach often assumes foreign directors to be a homogeneous set of actors, thereby masking variations between them. A second approach involves attaching country-specific value(s) to board members based on their respective nationalities. This approach changes the measurement scale of director nationality from a categorical scale to an interval scale. Frijns *et al.* (2016) have adopted this approach in developing a measure for cultural diversity as separation. Delis *et al.* (2017) have also employed this approach to develop a proxy for genetic diversity.

Panel A of Table 1 presents examples of both approaches and shows that current empirical evidence on the value of board nationality diversity to shareholders is inconclusive. For instance, Estélyi and Nisar (2016) and Frijns *et al.* (2016) employ

UK samples to examine the impacts on firm performance of two diversity aspects: the existence of foreign board members and cultural diversity, respectively. Estélyi and Nisar (2016) conclude that diversity is useful as firms, on average, do accrue a net positive value from having foreign nationals on their boards. In contrast, Frijns *et al*. (2016) conclude that the costs of diversity outweigh its benefits because cultural differences among board members negatively affect firm value. In light of these results, I distinguish between the level of board nationality diversity and the strength of board cultural separation as two diversity aspects with potential opposing effects on board performance which can influence shareholder value.

First, I measure the level of board nationality diversity as uniqueness using *DDN*. It captures national-origin dissimilarities and reaches its maximum when each director comes from a different country. This measure is given by the following formula (Simpson, 1949; Rae and Taylor, 1970):

$$DDN = 1 - \frac{\sum_{i=1}^{K} n_i(n_i - 1)}{n\,(n-1)} \tag{1}$$

where: n_i is the number of board members in the ith nationality; n is board size. *DDN* is the complement of Simpson's (1949) concentration index, which is the number of pairs with identical nationality in a board, $\frac{1}{2}\sum_{i=1}^{k} n_i(n_i - 1)$, over the total number of all possible pairs in the board, $\frac{1}{2}n\,(n-1)$. *DDN* then represents the number of pairs with dissimilar nationality in a board, $\frac{1}{2}n\,(n-1) - \frac{1}{2}\sum_{i=1}^{k} n_i(n_i - 1)$, as a proportion of all possible pairs in the board, $\frac{1}{2}n\,(n-1)$. Therefore, I refer to that proportion as dissimilarity of director nationalities.

[Table 1 about here]

In Panel B of Table 1, I develop nine desirable properties (criteria) for a measure of board nationality diversity as uniqueness. Based on these criteria, I compare *DDN* to the binary-categorization measures, which involve scaling director nationality as a binary attribute. I find that dummy indicators satisfy only two out of the nine criteria. The proportions of foreign or foreign non-executive directors on the board meet three of the desired criteria. In contrast, *DDN* meets all nine criteria.

Similar to *DDN*, Delis *et al*. (2017) argue that *Genetic diversity* captures the upside aspect of board nationality diversity.[30] I summarize the main differences between the two measures in Panel C of Table 1. *DDN* involves a multi-categorical scaling of director nationality and reaches its maximum only when each director comes from a different country. In contrast, *Genetic diversity* involves applying the standard deviation to genetic diversity scores that are attached to directors' nationalities on the board. The standard deviation, as Harrison and Klein (2007) point out, is a proxy for separation because it reaches its maximum when board members are polarized: half of them are at the highest endpoint, and the other half are at the lowest endpoint of a continuum. This is the genetic score continuum in the case of

[30] Delis *et al*. (2017: 231) state: *"We hypothesize that diversity … may result in board members who have (among other things) developed different perspectives, skills, and abilities that allow them to interpret and solve problems differently."* Their verbal theorizing is therefore more aligned to the upside rather than the downside aspect of diversity.

Genetic diversity. *Genetic diversity* is therefore a measure of genetic separation on the board. The separation between board members is theoretically constructed as a downside aspect of diversity (Harrison and Klein, 2007). Unlike *Genetic diversity*, *DDN* captures unique diversity, which represents the upside aspect of diversity.[31] *DDN* also follows a more conservative definition of director similarity, which considers directors to be similar only if they possess an identical nationality. This is in line with my conceptualization of board nationality diversity as uniqueness. Like *Genetic diversity*, *DDN* consistently assigns the same value to the same board regardless of other boards in the sample. Both measures are therefore unbiased towards sample specification. Unlike *Genetic diversity*, *DDN* applies to all countries of director nationality. Examples of countries with no available genetic diversity scores include Belize, Cyprus, Iceland, Liechtenstein, Luxembourg, Malta, Mauritius, Singapore, Slovakia, Taiwan, and Trinidad and Tobago.

Second, board cultural separation may take two forms: subgrouping along faultlines or marginalization of foreign minorities. I measure the strength of cultural faultlines using the degree of separation between cultural subgroups within each board. Its computation involves three steps. In step 1, I follow Frijns *et al*. (2016) and attach four cultural scores to each director based on their country of nationality. According to Hofstede (2001), the scores quantify four dimensions of national culture: (i) the individualism score measures the disintegration level of individuals from their families or other groups in a society; (ii) the masculinity score captures the degree of social preference for achievement, heroism, assertiveness and material rewards for

[31] Harrison and Klein (2007) refer to unique diversity as a form of diversity as variety.

success; (iii) the power distance score quantifies the degree of social acceptance for an unequal distribution of power among individuals; (iv) the uncertainty avoidance score proxies for the degree of intolerance towards risk and ambiguity. In step 2, I cluster members of each board into cultural subgroups based on the four cultural scores. The strength of cultural faultlines (*Cultural faultlines*) is computed in step 3. The last two steps are executed simultaneously using a clustering algorithm, developed by Meyer and Glenz (2013). The clustering step stops only when a clustering solution has a maximum value of the average silhouette width. A silhouette width quantifies how well a director *i* fits into one cluster (cultural subgroup) in comparison to another. Its computational formula is as follows:

$$Silhouette\ width\ (i) = \frac{b_i - a_i}{max\ (a_i, b_i)} \tag{2}$$

where: a_i is the average cultural distances between director *i* and all directors within her cluster, and b_i is the minimum average cultural distances between director *i* and all directors of any other clusters. Cultural distances are computed using the following formula:

$$Cultural\ Distance\ (i,j) = \sqrt{\sum_{d=1}^{4}(I_{di} - I_{dj})^2},\ \forall\ i < j \tag{3}$$

where: I_{di} is the culture score on dimension *d* for director *i*; I_{dj} is the culture score on dimension *d* for director *j*; *d* is one of the four cultural dimensions (individualism, masculinity, power distance, or uncertainty avoidance). The maximum value of the average silhouette width is my proxy for the strength of cultural faultlines.[32]

A comparison between *Cultural faultlines* and *Cultural diversity* is provided in Panel C of Table 1. The former maps onto a specific form of cultural separation, i.e., cultural subgrouping, whereas the latter captures overall cultural differences among board members. Both employ 'pairwise distance' as a basis of measurement. A pairwise cultural distance captures the difference between a pair of directors in one of the four cultural dimensions. The faultline measure (*Cultural faultlines*) involves clustering directors into cliques and reaches its maximum when the board is split into two equal-sized cliques who are at the opposite endpoints of all the four cultural dimensions. *Cultural diversity* reaches its maximum when board members are polarized: half of them are at the highest endpoint, and the other half are at the lowest endpoint of all the four cultural dimensions. Both measures are therefore similar in terms of their shape at the maximum. *Cultural diversity*, however, involves scaling cultural differences by in-sample variances, resulting in different cultural diversity scores for the same board depending on other boards in the sample. In contrast, the faultline measure (*Cultural faultlines*) is unbiased towards sample specification because it yields the same value for each board regardless of other boards in the sample. Both measures follow a broad definition of director similarity, under which directors with different nationalities can be similar in terms of certain cultural dimensions. For example, German and British directors are assigned the same

[32] See Appendix A for an illustration of the difference between the strength of cultural faultlines and cultural diversity. Appendix B provides a numerical example of how the strength of cultural faultlines is computed.

Hofstede's culture scores of 66 and 35 for the cultural dimensions of masculinity and power distance, respectively. The data required to compute both measures are also not available for all countries of nationality. Examples of countries with no available cultural scores include Belize, Bolivia, DR Congo, Georgia, Kazakhstan, Liechtenstein, and Paraguay.[33]

The other form of cultural separation is the marginalization of singleton directors. I consider singleton directors to be marginalized if they represent less than 25% of board members. Together with my proxy for the strength of cultural faultlines, my measures map onto specific mechanisms through which cultural separation may reduce firm value. To illustrate these mechanisms, Figure 1 presents four example cases of eight-sized boards. In Case (1), there is no nationality diversity, as all directors are British (i.e., domestic). Cultural separation is therefore not an issue in that case. In Case (2), the board is composed of two balanced cliques, who are separated by a single faultline. This case demonstrates that complete homogeneity of foreign directors, on a nationality-diverse board, poses a high risk for unintended formation of a strong cultural faultline that would split the board into two equal-sized opposing cliques: four British directors versus four American directors.[34] This subgroup configuration can trigger more severe internal conflicts and other sub-categorization problems between board members (Carton and Cummings, 2013). Another cultural

[33] To address concerns on the potential subjectivity and data availability of the cultural scores, an indicator for having two nationality subgroups on the board (i.e., having a single nationality-based faultline) is employed in a supplementary analysis as another proxy for a strong faultline formation.

[34] Replacing the four American directors with four directors from a non-Anglo-Saxon country may increase the severity of the resultant cultural faultline. This is accounted for when computing the strength of cultural faultlines.

separation problem appears in Case (3), where I expect the singleton Chinese director to be marginalized. Case (4) seems better than the other three cases. Unlike Case (1), the diversity of board expertise and networks is expected to be higher, and groupthink is less likely, in Case (4). The likelihood of both cultural faultlines and marginalization of singleton directors is also lower in Case (4) compared with Cases (2) and (3).

[Figure 1 about here]

3.4. Empirical Models

I start with a model of diversity determinants. Unlike earlier models (e.g., Estélyi and Nisar, 2016; Miletkov *et al*., 2017), my model employs a new dependent variable (*DDN*) which captures the level of nationality diversity on boards. I expect the level of diversity to be driven by the magnitude of foreign activities (measured by the proportion of foreign sales), rather than the number of geographical regions in which the firm operates. To test this proposition, I include both the proportion of foreign sales and the natural logarithm of the number of geographical segments as potential determinants in my model. I also include other potential determinants that are deemed important in explaining the representation of foreign directors on boards (Oxelheim *et al*., 2013; Estélyi and Nisar, 2016; Miletkov *et al*., 2017).

My model comprises potential firm-level and board-level determinants of diversity. Following Hwang and Kim, (2009), board selection decisions are determined by past values, rather than current values, of the economic determinants. Yet, these decisions are likely influenced by the current governance structure. My firm-level variables are therefore based on lagged values, whereas board-level variables are current values. I also include industry and year controls. My determinants model is hence specified as follows.

$$
\begin{aligned}
DDN_{i,t} = \beta_0 &+ \beta_1 Foreign\ sales_{i,t-1} + \beta_2 Ln(Geographical\ segments_{i,t-1}) \\
&+ \beta_3 Foreign\ ownership_{i,t-1} + \beta_4 Institutional\ ownership_{i,t-1} \\
&+ \beta_5 Firm\ size_{i,t-1} + \beta_6 Leverage_{i,t-1} + \beta_7 Capital\ intensity_{i,t-1} \\
&+ \beta_8 Sales\ growth_{i,t-1} + \beta_9 Stock\ return_{i,t-1} \\
&+ \beta_{10} Ln(Director\ ownership_{i,t}) + \beta_{11} Independent\ directors_{i,t} \\
&+ \beta_{12} Ln(Director\ tenure_{i,t}) + \beta_{13} Busy\ directors_{i,t} \\
&+ \beta_{14} Retirement\ age\ directors_{i,t} + \beta_{15} Female\ directors_{i,t} \\
&+ \beta_{16} Ln(Board\ size_{i,t}) + \beta_{17} CEO\ duality_{i,t} + \Sigma\ \beta_x\ INDUSTRY_x \\
&+ \Sigma\ \beta_t\ YEAR_t + \eta_{i,t}
\end{aligned}
\tag{4}
$$

where: $DDN_{i,t}$ is the dissimilarity of director nationalities, as defined in Eq. (1), for firm *i* in current year *t*; $Foreign\ sales_{i,t-1}$ is sales generated from overseas operations in last year *t-1* as a proportion of net sales in the last year; $Ln(Geographical\ segments_{i,t-1})$ is the natural logarithm of a firm's number of geographical segments in the last year; $Foreign\ ownership_{i,t-1}$ is lagged proportion of common shares held by foreign investors owning 5% or more; $Institutional\ ownership_{i,t-1}$ is lagged proportion of common shares held by investment banks or other institutions owning 5% or more and seeking a long-term return; $Firm\ size_{i,t-1}$ is the natural logarithm of opening total assets; $Leverage_{i,t-1}$ is opening long-term liabilities over opening total assets; $Capital\ intensity_{i,t-1}$ is opening property, plant and equipment (PPE) over opening total assets; $Sales\ growth_{i,t-1}$ is lagged sales growth; $Stock\ return_{i,t-1}$ is last year's ending stock price minus last year's opening stock price, scaled by last year's opening stock price; *Ln(Director ownership$_{i,t}$)* is the natural logarithm of mean director ownership on the board, where the ownership represents the total value of equity held by a director at the end of the current year; *Independent directors$_{i,t}$* is the proportion of independent directors on the board; *Ln(Director tenure$_{i,t}$)* is the natural logarithm of mean director tenure on the board; *Busy directors$_{i,t}$* is the number of directors with at least three current appointments, scaled by board size; *Retirement-age directors$_{i,t}$* is the number of directors whose age is at least 65 years, scaled by board size; *Female directors$_{i,t}$* is the proportion of female directors on the board; *Ln(Board size$_{i,t}$)* is the natural logarithm of the number of directors on the board; *CEO duality$_{i,t}$* is a dummy indicator that equals one if the CEO serves as the chair of the board, and zero otherwise; $INDUSTRY_x$ is a set of industry controls; $YEAR_t$ is a set of year controls; $\eta_{i,t}$ is an error term. The independent variables do not include an indicator for whether the CEO is a foreigner to avoid introducing a mechanical association between the indicator and *DDN*: a foreign CEO indicator would have a value of one only when *DDN* is positive.

Next, I model firm value (measured by Tobin's Q) as a function of *DDN* and a wide range of control variables, including board-level, firm-level, industry, and year controls. To qualify for inclusion in my controls, a variable must be a potential determinant of firm value, board nationality diversity, or both. Controlling for the determinants of board nationality diversity in my value model reduces concerns about the problem of correlated omitted variables.[35] Potential determinants of firm value in

[35] This problem occurs if the value model omits an independent variable that is correlated with both the dependent variable and one (or more) of the included independent variables. If this happens, OLS will produce biased and inconsistent estimates.

my model are defined as in Van Peteghem *et al*. (2018). I add to my controls a dummy indicator for whether the CEO is a foreign national (*Foreign* $CEO_{i,t}$). This is because foreign CEOs may bring valuable specialized non-domestic expertise and networks to their firms (Conyon, Haß, Vergauwe and Zhang, 2019). The value model is then specified as follows.

$$
\begin{aligned}
Tobin's\ Q_{i,t} = \beta_0 &+ \beta_1 DDN_{i,t} + \beta_2 Ln(Director\ ownership_{i,t}) \\
&+ \beta_3 Independent\ directors_{i,t} + \beta_4 Ln(Director\ tenure_{i,t}) \\
&+ \beta_5 Busy\ directors_{i,t} + \beta_6 Retirement\ age\ directors_{i,t} \\
&+ \beta_7 Female\ directors_{i,t} + \beta_8 Ln(Board\ size_{i,t}) + \beta_9 CEO\ duality_{i,t} \\
&+ \beta_{10} Foreign\ CEO_{i,t} + \beta_{11} Foreign\ sales_{i,t} \\
&+ \beta_{12} Ln(Geographical\ segments_{i,t}) + \beta_{13} Foreign\ ownership_{i,t} \\
&+ \beta_{14} Institutional\ ownership_{i,t} + \beta_{15} Firm\ size_{i,t} + \beta_{16} Leverage_{i,t} \\
&+ \beta_{17} Capital\ intensity_{i,t} + \beta_{18} Sales\ growth_{i,t} + \beta_{19} Stock\ return_{i,t} \\
&+ \Sigma\ \beta_x\ INDUSTRY_x + \Sigma\ \beta_t\ YEAR_t + \varepsilon_{i,t}
\end{aligned} \tag{5}
$$

where: *Tobin's* $Q_{i,t}$ is my proxy for firm value and is computed as total assets plus the market value of equity minus the book value of equity, scaled by total assets; $DDN_{i,t}$ proxies for the level of board nationality diversity and is defined in Eq. (1); $\varepsilon_{i,t}$ is an error term. I provide full definitions of all variables in Table 2.

[Table 2 about here]

Finally, I consider two potential moderators of the relationship between the level of board nationality diversity and the firm value. The first potential moderator is the strength of board cultural separation, which has two aspects: sub-categorization and marginalization. To capture the first aspect, I employ a dummy indicator (*Strong faultlines*$_{i,t}$) that takes a value of one if the strength of board cultural faultlines (*Cultural faultlines*$_{i,t}$) is at least equal to its 90th percentile value (0.9), and zero otherwise. *Cultural faultlines*$_{i,t}$ captures the strength of cultural separation between cultural subgroups on the board. It ranges from a minimum value of zero, indicating no faultlines, to a maximum value of one. To capture the second aspect, I use a dummy indicator (*Marginalized directors*$_{i,t}$) that takes a value of one if the board has unique-nationality directors who represent less than 25% of board members, and zero otherwise. The 25% threshold is based on the work of Bilimoria (2006), who measures the presence of a critical mass of women in top management team by using a dummy indicator for having at least 25% female representation on the team. Similarly, Harris (2014) employs the same threshold to measure the presence of a critical mass of female directors on the board. Below this threshold, minority groups (e.g., female directors or unique-nationality directors) are likely to be marginalized.

The second potential moderator is the level of operational complexity, measured by a dummy indicator (*Low complexity*$_{i,t}$) that takes a value of one if the total number of business and geographical segments in a given year is below its sample median for the same year, and zero otherwise. I use the same control variables as in Eq. (5). $Y_{i,t}$ is an error term. My moderation model is then specified as follows.

$$
\begin{aligned}
Tobin's\ Q_{i,t} = {} & \beta_0 + \beta_1 DDN_{i,t} + \beta_2 Strong\ faultlines_{i,t} \\
& + \beta_3 DDN_{i,t} \times Strong\ faultlines_{i,t} + \beta_4 Marginalized\ directors_{i,t} \\
& + \beta_5 DDN_{i,t} \times Marginalized\ directors_{i,t} + \beta_6 Low\ complexity_{i,t} \\
& + \beta_7 DDN_{i,t} \times Low\ complexity_{i,t} + \beta_8 Ln(Director\ ownership_{i,t}) \\
& + \beta_9 Independent\ directors_{i,t} + \beta_{10} Ln(Director\ tenure_{i,t}) \\
& + \beta_{11} Busy\ directors_{i,t} + \beta_{12} Retirement\ age\ directors_{i,t} \\
& + \beta_{13} Female\ directors_{i,t} + \beta_{14} Ln(Board\ size_{i,t}) + \beta_{15} CEO\ duality_{i,t} \\
& + \beta_{16} Foreign\ CEO_{i,t} + \beta_{17} Foreign\ sales_{i,t} \\
& + \beta_{18} Ln(Geographical\ segments_{i,t}) + \beta_{19} Foreign\ ownership_{i,t} \\
& + \beta_{20} Institutional\ ownership_{i,t} + \beta_{21} Firm\ size_{i,t} + \beta_{22} Leverage_{i,t} \\
& + \beta_{23} Capital\ intensity_{i,t} + \beta_{24} Sales\ growth_{i,t} + \beta_{25} Stock\ return_{i,t} \\
& + \Sigma\, \beta_x\, INDUSTRY_x + \Sigma\, \beta_t\, YEAR_t + \Upsilon_{it}
\end{aligned} \tag{6}
$$

3.5. Data

Board diversity has gained the attention of regulators since 2003. In this year, Norway has become the first nation in the world to adopt a gender quota on corporate boards (Matsa and Miller, 2013). In the same year, the UK regulator has commissioned the Dean of London Business School, Laura Tyson, to prepare a report on 'The Recruitment and Development of Non-Executive Directors' (Tyson, 2003). In it, she has argued that diversity is an important area for improvement on UK boards. More recently, Lord Davies and Sir Parker have been calling for greater diversity on corporate boards, including diversity in gender, ethnicity, and nationality (Davies, 2011 and 2015; Parker, 2017). Thus, UK boards have been officially encouraged to embrace board diversity as a multi-dimensional concept that *"is not solely limited to gender, but also includes many aspects of the human condition"* (Parker, 2017).

However, empirical evidence on the outcomes of board diversity is inconclusive. For example, Ahern and Dittmar (2012) report substantial drops in firm value and operating performance following the imposition of a 40% quota for female board members in Norway. However, Liu *et al.* (2014) find that gender diversity on Chinese boards is positively associated with firm performance. Carter, D'Souza, Simkins and Simpson (2010) look at both gender and ethnic diversity on US boards and find no association between either of these diversity attributes and firm performance. In a later sample, Guest (2019) continues to find no evidence that ethnic diversity on the board affects firm performance.

In terms of nationality diversity, Estélyi and Nisar (2016) find that foreign nationals on UK boards are associated with higher firm performance. Delis *et al.* (2017) argue that differences in genetic origins between board members bring creative approaches for solving corporate problems. Using a sample of UK- and North American-listed firms, they find a positive association between board genetic diversity and firm performance. In contrast, Frijns *et al.* (2016) find that nationality diversity on UK boards brings cultural differences that negatively affect firm performance. Hahn and Lasfer (2016) find that UK firms with foreign non-executive board members have lower board meeting frequency. The fewer board meetings are then associated with lower shareholder returns and higher compensation for the CEO and the chairman. Further, Miletkov *et al.* (2017) use a sample of 62,066 firm-years from eighty countries, including the UK, to investigate the impact of foreign independent directors on firm performance. They find, on average, no significant differences in firm value between firms with and without foreign independent board members. However, the presence of these board members is negatively associated with shareholder value when their home countries have lower quality legal institutions than those of the firm's host country. Empirical UK-based evidence on the value of board nationality diversity is therefore mixed.

Despite that, nationality diversity on UK boards has been increasing over time.[36] The average UK board has also been one of the most nationality-diverse boards in the world. For example, Delis *et al.* (2017) have reported the mean value of their board diversity measure to be higher in their UK sample (0.011) than their US sample (0.006). Similarly, Frijns *et al.* (2016) have found the percentage of firm-years with foreign independent directors in their UK sample to be around four times that in the US sample of Masulis *et al.* (2012).

Thus, earlier research has shown that the presence of foreign directors on corporate boards is relatively high in UK samples compared to US samples, yet UK-based empirical evidence on the value of board nationality diversity is inconclusive. This issue thus merits further investigation in the UK setting.

To construct my UK sample, I begin by merging available UK board data from the BoardEx database with their respective financial data from the Worldscope database, excluding unlisted firms and those with missing industry classification

[36] Despite some slight decreases in the average proportion of foreign nationals on the board (*FDs*), an overall upward trend is observed across my sample period: from an average of 0.12 in the year 1999 to an average of 0.18 in the year 2018.

benchmark (ICB) code.[37] My study period extends over twenty years, starting from the earliest available month, January 1999, on the BoardEx database to December 2018. To ensure the accuracy of my merge, I require any difference in corporate annual reporting date between BoardEx data and Worldscope data to be less than or equal to one month.[38] In cases where the difference is at least 358 (365 − 7) days, I check if this difference is due to the Worldscope mid-January rule. This rule stipulates a cut-off date of 15 January of each year as the basis for classifying non-US firms' financial data into years on the Worldscope platform (Worldscope, 2013, p. 41). Accordingly, if a firm's fiscal year ends before mid-January in year *t*, its financial data will be classified by Worldscope as belonging to year *t-1*. However, this firm's board data will still be classified by BoardEx as belonging to year *t*. The rule then can result in a difference of a year between reporting dates on the BoardEx and Worldscope databases. My correction procedures for this rule involve dropping firm-years with a reporting year that is more than seven days above or below 365.

The merge results in an initial sample of 24,805 firm-year observations for 2,795 unique firms. Panel A of Table 3 shows that some firm-years are then excluded due to one of the following criteria: (1) belonging to the financial or real-estate sectors—ICB industry codes of 30 and 35, respectively; (2) domiciled outside the UK;[39] (3) missing age data for at least one board member; (4) missing nationality data for at least one

[37] The ICB code is launched by the FTSE Russell Group to classify firms by industry.

[38] The BoardEx database follows a monthly, rather than a daily, reporting of firms' fiscal year end. A firm's annual report date on the BoardEx database is hence reported at the beginning of the month in which the firm's fiscal year ends. Therefore, I allow a difference of one month between reporting dates on the BoardEx database and the Worldscope database, while merging the data from both databases.

[39] The second exclusion criterion ensures that firms traded in currencies other than GBP are excluded from the sample.

board member; (5) having a board size of fewer than three directors; (6) missing data of some required variables. I end up with a final sample of 11,384 firm-years from 1,457 unique firms. Panel B of Table 3 provides a breakdown of the final sample by industry and across years.

[Table 3 about here]

The sample comprises 80,500 director-years from 74 countries. Panel C of Table 3 decomposes the number of directors by nationality and across years. Foreign directors represent 15.61% of my sample of directors. The top-nine foreign countries of director nationality include: (i) the US, which accounts for 34% of foreign directors; (ii) five UK-neighbour countries (Ireland, France, the Netherlands, Germany, and Sweden); (iii) three founding nations of the commonwealth (Australia, South Africa, and Canada). Despite some slight decreases in the average proportion of foreign nationals on the board (*FDs*), an overall upward trend is observed across my sample period: from an average of 0.12 in the year 1999 to an average of 0.18 in the year 2018. A similar pattern is observed for the level of board nationality diversity, measured by *DDN*. It has increased from an average of 0.18 in the year 1999 to an average of 0.27 in the year 2018.

Panel D of Table 3 splits my sample of boards into 6,238 board-years with a single nationality per each board (i.e., homogeneous boards) and 5,146 observations with two or more nationalities per each board (i.e., diverse boards). The sample of homogeneous boards contains a few cases where the board is composed entirely of foreign directors with an identical nationality. The sample of diverse boards, which represents 45.2% of my final sample, consists of 2,309 board-years with a single foreign director each and 2,837 observations with at least two foreign nationals on the board. Overall, the number of nationalities (foreign directors) on a board has a maximum value of 9 (15).

3.6. UNIVARIATE ANALYSIS

Before conducting my analyses, I winsorize continuous financial variables at their 1st and 99th percentiles to reduce the influence of outliers. Table 4 reports descriptive statistics for my variables. The statistics show an average board size of seven directors, including 13.7% foreign nationals (*FDs*) and 65.69% of them are non-executive directors (*FNEDs*). The percentage of firms with foreign CEOs (*Foreign CEO*) is 13% of the cases, and the average genetic diversity score (*Genetic diversity*) is 0.002. My measure of dissimilarity in directors' nationalities (*DDN*) ranges from a minimum value of zero, indicating homogeneous boards, to a maximum value of one, indicating a board of unique-nationality (singleton) directors. According to this measure, the nationality diversity level for the average board is 0.21. Since more than 50% of the firm-years have homogeneous boards, the median for all diversity-related variables is equal to zero. This includes *DDN*, *FDs*, *FNEDs*, *Genetic diversity*, *Cultural diversity*, *Strong faultlines*, and *Marginalized directors*. *Cultural diversity* has an average score of 0.871.[40] The percentage of boards with strong faultlines (marginalized directors) is 8.8% (28.7%) of my sample. For the average board, the mean value of

[40] For countries with no available country-specific cultural scores, I use average cultural scores of their neighbour countries.

equity held per director is 6,310,903 USD.[41] About 21% of board-years have the CEO as the chair. Firm value (measured by *Tobin's Q*) has a mean of 1.919, with a median of 1.443 and a range from 0.518 to 10.539.

[Table 4 about here]

Table 5 presents the results of univariate comparisons, using the difference of means tests, between firm-years with diverse boards (*DIVERSE*) and those with homogeneous boards (*HOMOGENEOUS*). The nationality diversity level (*DDN*) for the average diverse board is 0.47, which is more than double its value for the average board if homogeneous boards are included. The percentage of boards with strong faultlines (marginalized directors) is 19.5% (63.5%) of the diverse board sample. Director ownership is significantly higher in diverse boards compared to homogeneous ones: 8,056,452 USD versus 4,870,924 USD, respectively. CEO duality is less frequently observed among diverse boards compared with homogeneous boards. The difference between the two sets of boards in the percentage of independent directors (7%) further indicates that diverse boards have, on average, a higher level of independence. The average director tenure per diverse (homogeneous) board is 5.36 (6.16) years, with an overall average of 5.8 years. I also observe a higher average representation of female directors on diverse boards (9.4%) than homogeneous ones (7.1%).

[41] Director ownership data is obtained from the BoardEx database, where values are reported in US dollars.

Nevertheless, the percentage of directors aged at least 65 years is 2.7% higher among diverse boards compared with homogeneous ones. On average, directors on diverse boards are also busier than those on homogeneous boards. While director age and business may reflect director experience and expertise (Dao, Huang and Zhu, 2013; Field, Lowry and Mkrtchyan, 2013), some prior works find retirement-age and busy directors to be associated with weaker monitoring of corporate management (Masulis, Wang, Xie, and Zhang, 2018; Fich and Shivdasani, 2006).

Turning to firm characteristics, firms with diverse boards have significantly greater average firm value (*Tobin's Q*) than those with homogeneous boards: 1.99 versus 1.86, respectively. The former is, on average, bigger and has a higher sales growth rate than the latter. The average diverse-board firm is more capital intensive and exhibits higher leverage than the average firm with a homogeneous board. Differences between both firms in stock returns and institutional ownership are marginally significant and insignificant, respectively. On average, measures of foreign orientation, including *Foreign sales*, *Foreign ownership*, and the number of geographical segments in which the firm operates (*Geographical segments*), are all significantly higher for firms with diverse boards than those without. Finally, 35.7% (52.9%) of the former (latter) have low complexity of operations (*Low complexity*). Firms with diverse boards are therefore more likely to have complex operations compared to those with homogeneous boards.[42]

[42] When I set missing values for the number of business segments to a value of one, I obtain similar results (untabulated).

[Table 5 about here]

3.7. BIVARIATE ANALYSIS

Panel A of Table 6 shows Pearson correlations between my measure of board nationality diversity (*DDN*) and other diversity-related measures, including my proxy for the strength of board cultural faultlines (*Cultural faultlines*) and four prior measures of diversity (*FDs*, *FNEDs*, *Genetic diversity*, and *Cultural diversity*). All variables are defined in Table 2. The correlations are quite high between the variables in the full sample (n = 11,384) because all of them have the same value of zero for firms with all-domestic boards (n=6225). Excluding these firms yields 5,159 observations of firms with at least one foreign board member. In this set of firms, the correlations of *DDN* with *Cultural faultlines*, *FDs*, *FNEDs*, *Genetic diversity*, and *Cultural diversity* are −0.30, 0.83, 0.68, 0.35, and 0.68, respectively. The correlations decrease to −0.28, 0.65, 0.53, 0.29, and 0.61, respectively, for firms with at least two foreign board members (n=2,850). This is consistent with my expectations that my measure of diversity (*DDN*) is not highly correlated with my faultline measure (*Cultural faultlines*), and both measures are different from prior measures of diversity.

Prior to multivariate analysis, I report Pearson correlations between main regression variables in Panel B of Table 6. My measure of nationality diversity (*DDN*) is positively correlated with *Ln(Board size)* and *Firm size*: the correlation coefficients are 0.29 and 0.30, respectively. *DDN* is also correlated with measures of foreign orientation: *Foreign CEO* (0.56), *Foreign sales* (0.45), *Foreign ownership* (0.29), and the natural logarithm of the number of geographical segments, *Ln(Geographical segments)*, (0.28). Overall, pairwise correlations among control variables are not high enough to introduce issues of multicollinearity to my multivariate tests, which are presented below.

[Table 6 about here]

3.8. MULTIVARIATE ANALYSIS

This section reports the results of my multivariate tests on the determinants of diversity, the value of diversity, and the potential moderators of the relationship between diversity and firm value.

3.8.1. THE DETERMINANTS OF DIVERSITY

In the determinants model, Eq. (4), I investigate the relationship between the magnitude of last-year's foreign activities (measured by lagged foreign sales) and the level of board nationality diversity (measured by *DDN*), after controlling for a wide array of variables including the number of geographical regions in which the firm operates. I use a two-limit Tobit to estimate the determinants model. The Tobit estimation accounts for the specific distribution of my dependent variable (*DDN*), which is censored from both sides with a right-censoring limit of zero and a left-censoring limit of one.[43] The estimation is based on firm clustered standard errors to account for serial correlation. Table 7 reports the estimation results. I find the magnitude of foreign activities in the last year to be positively and significantly

[43] Two-limit Tobit models have also been estimated using other dependent variables that are censored from both sides. Examples include the percentage of shareholder-elected foreign directors on the board (Oxelheim *et al.*, 2013) and the percentage of foreign independent directors (Miletkov *et al.*, 2017).

associated with the level of diversity in the current year. The estimated coefficient on lagged foreign sales (*Foreign* $sales_{i,t-1}$) is positive and significant at the 1% level (coefficient = 0.496 and *t*-stat. = 13.30), indicating that the proportion of foreign sales in year *t-1* is positively associated with the level of diversity in year *t*. The results further indicate no significant association between the natural logarithm of the number of geographical segments in year *t-1* and the level of diversity in year *t*. The results lend support to my proposition that the magnitude, rather than the number, of foreign activities matters when it comes to determining the level of diversity. In particular, the higher the economic significance of a firm's foreign operations (as measured by the proportion of foreign sales) in a year, the more likely that the firm will increase its level of nationality diversity in the following year to support these foreign operations. Yet, the mere existence of a bigger number of foreign operations in a year is not sufficient to trigger higher nationality diversity in the next year because some of these operations may not be economically significant to justify the economic cost of adding more foreign board members.

The results also show that firms with higher lagged institutional ownership have lower nationality diversity level on their board. This finding runs counter to the argument of Estélyi and Nisar (2016) that institutional activism facilitates the appointment of foreign nationals to UK boards. This argument does not account for institutional differences between a foreign director's home country (i.e., the sending country) and the country of the recruiting firm (i.e., the receiving country). These differences are deemed to instigate frictions and result in bearing extra costs. For example, Van Veen, Sahib and Aangeenbrug (2014) find that the institutional distance between the sending country and the receiving country has a significantly negative impact on the proportion of directors from the sending country on the boards of the receiving country. Accordingly, domestic institutional investors are not expected to actively demand higher levels of board nationality diversity in its broader sense, rather they are expected to be less reluctant to the appointment of foreign board members only when they come from institutionally more similar countries. Another possible reason for why domestic institutional investors may prefer domestic board members over foreign board members is the existence of domestic networks between domestic institutional investors and domestic directors. Such networks could be valuable to the domestic institutional investors. The signs on the coefficients of other control variables are generally in the expected directions.

Lastly, I re-estimate the model using lagged values of the potential board-level determinants of diversity to address timing issues. I find similar results (untabulated), except that the coefficient on lagged firm size is significant. To sum up, the results strongly support my first hypothesis (*H1*) that the level of diversity is more strongly driven by the magnitude, rather than the number, of foreign activities.

[Table 7 about here]

3.8.2. The Value of Diversity

3.8.2.1. Main Results

I now examine the relationship between the level of board nationality diversity and firm value. In Panel A of Table 8, Model (1) reports my baseline results using OLS estimation of the value model, Eq. (5).[44] The coefficient on dissimilarity of director nationalities (*DDN*) is positive and significant (coefficient = 0.393 and *t*-stat. = 2.51), suggesting that board nationality diversity is positively associated with firm value. Consistent with Van Peteghem *et al*. (2018), coefficient estimates on the natural logarithm of mean director ownership and the proportions of independent directors and female directors are positive and significant. The natural logarithm of mean director tenure has a significant negative coefficient, and CEO duality has a marginally significant one, indicating adverse impacts on firm value. The natural logarithm of board size and the proportion of busy directors are positively and significantly related to firm value. The coefficients on the proportion of directors aged at least 65 years and the indicator for having a foreign CEO have the expected signs but are not statistically significant. Coefficient estimates on firm-level controls are generally in line with expectations.

A potential interpretation of the OLS results, in Model (1), is that board nationality diversity creates value for shareholders by alleviating groupthink on corporate boards and enlarging their resource pool. A major concern with this interpretation is the potential endogenous nature of the relationship between board nationality diversity and firm value. In particular, the endogeneity problem occurs when foreign directors are not randomly distributed among firms, and their

[44] Variance inflation factors for $DDN_{i,t}$, $Foreign\ CEO_{i,t}$, $Foreign\ sales_{i,t}$, $Foreign\ ownership_{i,t}$, and $Ln(Geographical\ segments_{i,t})$ are 1.99, 1.47, 2.09, 1.15, and 1.87, respectively. The factors for $Ln(Board\ size_{i,t})$ and $Firm\ size_{i,t}$ are 2.05 and 3.40, respectively. Overall, variance inflation factors indicate that multicollinearity is not a problem. All models are estimated using robust t-statistics, which are based on standard errors adjusted for heteroskedasticity (White, 1980) and clustered at the firm level (Petersen, 2009).

representation on boards is indirectly related to firm value (Masulis *et al*., 2012). This implies that my measure of board nationality diversity (*DDN*) may be correlated with the error term in Eq. (5) causing OLS estimates to be biased. To mitigate this concern, I allow *DDN* to be endogenous and implement an instrumental variable approach using 2SLS regressions. To be relevant, the instrument should be strongly correlated with *DDN* and satisfy the exclusion restriction of being uncorrelated with the error term from the second-stage regression. This restriction requires no association between the instrument and the dependent variable (*Tobin's Q*) when the endogenous regressor (*DDN*) is held constant.

I employ the average value of my endogenous variable (*DDN*) for firms headquartered within the same postcode area as my instrumental variable (*Local diversity*). This instrument is motivated by the role of a firm's headquarters location in attracting foreign directors. For example, foreign directors are more likely to sit on boards of firms headquartered within 100 km of a large airport (Masulis *et al*., 2012) or within a large metropolitan area (Frijns *et al*., 2016). Accordingly, geographical proximity between firms' headquarters can drive similar levels of nationality diversity on their boards.[45] My instrument is thus likely to be correlated with a firm's board nationality diversity level, but unlikely to have a direct association with firm value. In Panel A of Table 8, Models (2) and (3) present the results of the first and second stages of the 2SLS estimation. Tests for the relevance of my instrument indicate that it is

[45] Prior studies have considered similarity in firm size (Faleye, 2015) and firm industry (Van Peteghem *et al*., 2018; Faleye, 2015) to drive similar corporate governance practices. Likewise, similarity in the postal area of firms' headquarters can be regarded as another driver for firms to adopt similar governance practices.

correlated with the endogenous regressor (*DDN*),[46] and the correlation is not weak.[47] The first stage results show that the coefficient on the instrument (*Local diversity*) is positive and significant at the 1% level, confirming my expectations. In the second stage results, I find that the coefficient on *Instrumented DDN* has bigger magnitude and stronger significance than that reported on *DDN* in the OLS results: coefficient = 2.244 and *t*-stat. = 2.66 versus coefficient = 0.393 and *t*-stat. = 2.51, respectively. The 2SLS results thus confirm my OLS results. Together, the results indicate that board nationality diversity positively affects firm value, supporting my second hypothesis (*H2*).

[Table 8 about here]

3.8.2.2. Controlling for Previous Performance

Given that my dependent variable is a measure of firm performance, both the current firm performance and the current level of diversity maybe determined by previous firm performance (i.e., firm value in previous years). If this is the case, omitting previous performance from the value model would result in a spurious relationship between board nationality diversity and firm value. To mitigate this concern, I control for firm value in the last two years by adding one and two lags of the dependent variable to the right-hand side in Eq. (5). The resultant new equations are subsequently estimated by using OLS and 2SLS regressions. Panels B and C of

46 The p-value of the Kleibergen-Paap-LM statistic is 0.0000. Therefore, I reject the null hypothesis that the first-stage model is under-identified.

47 The first stage results reveal that the Kleibergen-Paap Wald F statistic on the excluded instrument is 77.043, which is greater than the threshold value of 10 (Staigler and Stock, 1997), and the value of Cragg-Donald F-statistic is 428.272, which is larger than the Stock-Yogo critical value of 16.38 (Stock and Yogo, 2005). Both statistics indicate that my instrument is not weak.

Table 8 report the results after controlling for one and two lags of *Tobin's Q*.[48] In Panel B, Model 1 shows that lagged firm value (*Tobin's* $Q_{i,t-1}$) is a significant determinant of contemporaneous firm value. The inclusion of lagged firm value has not taken away the significance of the *DDN*'s coefficient, which continues to be positive but smaller in magnitude than its value in the absence of a lagged *Tobin's Q*. In Model (2), lagged *Tobin's Q* has an insignificant coefficient in the first stage results of the 2SLS estimation, where *DDN* is the dependent variable. The second stage results, in Model (3), further confirm that board nationality diversity has a positive and significant impact on firm value after mitigating endogeneity concerns about the direction of causality between the two variables. In Panel C, I re-estimate the models reported in Panel A while controlling for two lags of *Tobin's Q*. The results reconfirm that board nationality diversity matters for firm value, providing further support to my second hypothesis (*H2*).

3.8.2.3. Controlling for Prior Measures of Diversity

The corporate governance literature has advanced different measures to capture aspects of board nationality diversity other than uniqueness. I control for these measures by including each of them in the right-hand side of the value model, Eq. (5). I then estimate the resultant new equations by using OLS with robust *t*-statistics, which are based on standard errors adjusted for heteroskedasticity (White,

[48] In Panels B and C of Table 8, the maximum variance inflation factor is 3.02 and 2.05 for the lags of *Tobin's Q* and *DDN*, respectively. For 2SLS regressions in these panels, I re-test the strength of my instrumental variable (*Local diversity*) and find that: (i) the p-value of the Kleibergen-Paap-LM statistic is 0.0000; (ii) the Kleibergen-Paap Wald F statistic on the instrument (64.518 and 57.025, respectively) is greater than the threshold value of 10; (iii) the value of Cragg-Donald F-statistic (336.606 and 276.846, respectively) is larger than the Stock-Yogo critical value of 16.38. Therefore, I conclude that the instrument is still relevant in both panels.

1980) and clustered at the firm level (Petersen, 2009). Estimation results are reported in Table 9. In Models (1) to (4), I control for the proportion of foreign directors on the board (e.g., Dong, Girardone and Kuo, 2017), the proportion of foreign non-executive directors on the board (e.g., Hahn and Lasfer, 2016), genetic diversity (Delis *et al.*, 2017), and cultural diversity (Frijns *et al.*, 2016), respectively. The results show that my measure of board nationality diversity as uniqueness (*DDN*) has positive and significant coefficients throughout the four models, whereas none of the other measures has a significant coefficient, except for cultural diversity (*Cultural diversity*), which has a significant negative coefficient.[49] Model (5) reports the results of the full model, which are largely consistent with those presented in Models (1) to (4). Coefficient estimates on other control variables are generally consistent with expectations.

To address the potential multicollinearity problem in Model (5), I decompose my measure of diversity (*DDN*) into two components (predicted part and unpredicted part) by using a 2SLS procedure. In the first stage, I regress *DDN* on the four prior measures of diversity without industry or year controls. From the first stage, I get the residual, which represents the part of *DDN* that is not explained by the prior measures of diversity (the unpredicted part). I also get the predicted part as the difference between *DDN* and the unpredicted part. In the second stage, I estimate the value model, Eq. (4), after replacing *DDN* with its components. The second stage results

[49] The maximum variance inflation factor for all variables in Models (2) to (4) is 4.36, while the factor for the variables in Model (1) is 7.74. To address the potential collinearity problem between my measure (*DDN*) and the proportion of foreign board members (*FDs*), I re-estimate Model (1) after excluding my measure. Untabulated results reveal that the proportion of foreign board members is an insignificant determinant of firm value (coefficient = 0.338 and t-stat. = 1.60).

(untabulated) show that the coefficient on the unpredicted part is positive and significant at the 1% level, whereas the coefficient on the predicted part is positive but insignificant: coefficient = 1.015 and *t*-stat. = 3.12 versus coefficient = 0.239 and *t*-stat. = 1.47, respectively. The results thus indicate that the information content of *DDN* is empirically different from those of the earlier measures.

In summary, the results of this final set of tests for my second hypothesis (*H2*) confirm that board nationality diversity as uniqueness (*DDN*) has a positive and significant impact on firm value and this impact is not explained by earlier measures of diversity. I next investigate whether this impact depends on the strength of board cultural separation and the complexity of firm operations.

[Table 9 about here]

3.8.3. MODERATION

In this subsection, I investigate the conditions under which the benefits of board nationality diversity exceed its costs. In particular, I examine the roles of board cultural separation and firm complexity in moderating the relationship between board nationality diversity and firm value. This is motivated by the discussion in Section 3.2, which suggests: (a) that diversity costs are higher for firms with stronger board cultural separation compared to those without and (b) diversity benefits are lower for firms with lower complexity of operations compared to those with higher complexity.

3.8.3.1. Board Cultural Separation

I employ two proxies for board cultural separation: *Strong faultlines* and *Marginalized directors*. The former takes a value of one if the strength of board cultural faultlines (*Cultural faultlines*) is at least equal to its 90th percentile value (0.9), and zero otherwise. The latter takes a value of one if the board has unique-nationality directors who represent less than 25% of board members, and zero otherwise. To test the impact of board cultural separation on the relationship between board nationality diversity and firm value, I interact each of the two proxies with board nationality diversity, as in Models (1) and (2) of Table 10.[50] In Model (1), I examine changes in the significance and the direction of this relationship for firms with strong board cultural faultlines relative to those without. The results show that board nationality diversity (*DDN*) has a positive and significant impact on firm value in the absence of strong faultlines. The coefficient on the interaction term of *DDN* times *Strong faultlines* has a negative sign, as expected, but it is insignificant.[51] Similarly, Model (2) investigates changes in the significance and the direction of the above relationship for firms with marginalized board members compared to those without. The results in Model (2) indicate that board nationality diversity positively impacts firm value in the absence of marginalized directors. The interaction term of *DDN* times *Marginalized directors* has a negative, albeit insignificant, coefficient. Taken together, the coefficients on the interactions of my diversity measure with measures of board cultural separation have

[50] In Table 10, all models are estimated using OLS with robust t-statistics, which are based on standard errors adjusted for heteroskedasticity (White, 1980) and clustered at the firm level (Petersen, 2009).

[51] I re-estimate Model (1) after replacing *Strong faultlines* with an indicator for having two nationality subgroups on the board (i.e., having a single nationality-based faultline) as another proxy for a strong faultline formation (Carton and Cummings, 2013), I find similar results (untabulated).

the expected signs but are not statistically significant, providing no statistically significant support to my third hypothesis (*H3*). In particular, the results suggest that, on average, board cultural separation increases the costs of diversity but not to the extent that they outweigh its benefits. One potential explanation for these results is that the compound effect of board cultural separation, measured by cultural diversity (*Cultural diversity*) in Table 9, could be stronger than the separate effects of its component parts: the strength of cultural subgrouping along faultlines (*Strong faultlines*) and the marginalization of foreign minorities (*Marginalized directors*). Future research could also add new channels, other than strong cultural faultlines and marginalized directors, through which board cultural separation may reduce the value of diversity to shareholders. In addition, the insignificant role for strong cultural faultlines in moderating the relationship between board nationality diversity and firm value could be due to the fact that only 19.5% (8.8%) of my diverse-board sample (all-firms sample) have strong faultlines. This indicates that boards with strong faultlines are not common in my sample, suggesting that most firms with nationality-diverse boards are actively avoiding the creation of such strong faultlines.

[Table 10 about here]

3.8.3.2. FIRM COMPLEXITY

To proxy for firm complexity, I use an indicator (*Low complexity*) that takes a value of one if the total number of business and geographical segments in a given year is below its sample median for the same year, and zero otherwise. In Model (3) of Table 10, I introduce an interaction term of that indicator times board nationality diversity (*DDN*) to examine the impact of firm complexity on the value of diversity to shareholders. Specifically, Model (3) examines changes in the significance and the direction of the diversity-value relationship among firms with low versus high complexity of operations. The findings show a positive and significant coefficient on board nationality diversity as a stand-alone term, indicating that diversity provides net benefits for complex firms. However, the coefficient estimate on the interaction of *Low complexity* times *DDN* is negative and significant, implying that the relationship between diversity and firm value is significantly different between firms with high complexity and those without. The results thus attribute a significant role for firm complexity in mitigating the impact of diversity on firm value, supporting my final hypothesis (*H4*).[52]

Model (4) reports the estimation results of the full moderation model, Eq. (6). The results in Model (4) are consistent with those reported in Models (1) to (3). Throughout all models, control variables are generally in line with expectations. In sum, moderation results reveal that the strength of board cultural separation does not significantly mitigate the positive impact of board nationality diversity on firm value. Rather, this impact does depend on the complexity of firm operations, suggesting that diversity provides net benefits only under certain circumstances (i.e., when firms are complex).

[52] When I set missing values for the number of business segments to a value of one and re-estimate Model (3), I obtain similar results (untabulated).

3.9. CONCLUSION

This essay studies the determinants of board nationality diversity and its impact on firm value. On the determinants side, earlier research has regarded foreign directors as a homogeneous set of actors, thereby masking variations among them. I go beyond the existence of one or more foreign directors on the board to explore the composition of foreign directors, to capture the level of diversity. I then find the level of diversity to be more strongly driven by the magnitude of foreign activities (measured by the proportion of foreign sales), rather than the number of geographical regions in which the firm operates.

On the value side, prior studies have mainly captured a single aspect of nationality diversity. I extend earlier work by accounting for both the upside and the downside aspects of diversity. Drawing on theories of resource dependence and groupthink, the level of uniqueness in directors' nationalities (the upside aspect of diversity) is deemed beneficial as it enlarges the board's resource pool and mitigates groupthink. On the other hand, theories of faultline and critical mass suggest that cultural separation (the downside aspect of diversity) may give rise to severe sub-categorization and marginalization problems. I introduce a new proxy for the level of uniqueness in board members' nationalities. I also employ two other measures to capture the strength of board cultural faultlines and the marginalization of unique-nationality directors as mechanisms through which cultural separation may undermine board effectiveness. My results indicate that board nationality diversity as uniqueness has a positive impact on firm value. Levels of board cultural separation do not mitigate this impact, but levels of firm complexity mitigate it. These results suggest that board nationality diversity is not always a good thing.

While my results survive a battery of robustness checks to mitigate sources of endogeneity, including self-selection bias and reverse causality, I cannot completely rule out endogeneity concerns. Another possible limitation is that only 19.5% of my diverse board sample have strong faultlines. A possible reason for this is that most firms with nationality-diverse boards are actively avoiding the creation of such strong faultlines on their boards to get the most out of diversity.

My study has implications for future research as it suggests that both the positive and the negative aspects of board diversity should be accounted for simultaneously. The study also reviews a set of theoretical and empirical constructs of diversity that could be applied to nationality diversity within other workgroups (e.g., top management teams and audit teams). This study could be of interest to regulators and companies alike.

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I – List of Figures

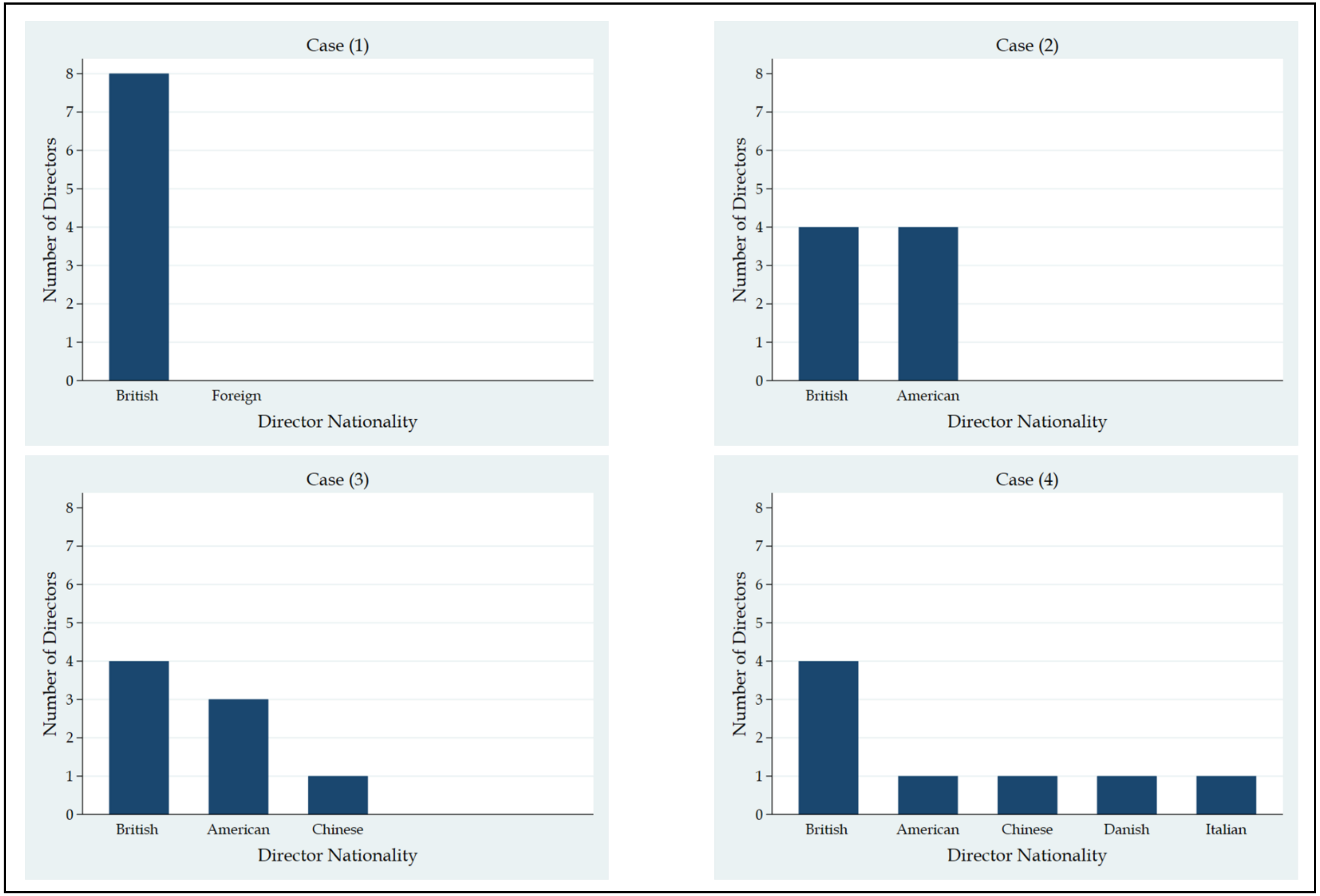

Figure 1: Four Cases of Nationality Diversity on Eight-sized Boards.

II – List of Tables

Table 1 – Measurement of Nationality Diversity and Cultural Separation

Panel A: Earlier Measurement Approaches

Source	Country of study	Explanatory variable	Dependent variable(s)	Results
Binary-categorization Group:				
Estélyi & Nisar (2016)	UK	*Foreign director indicator*	*Ln (Tobin's Q)* and *ROA*	Positive impact
Oxelheim & Randøy (2003)	Norway & Sweden	*Anglo-American director indicator*	*Ln (Tobin's Q)*	Positive impact
Masulis *et al*. (2012)	US	*Foreign independent director indicator*	*Tobin's Q* and *ROA*	Negative impact
Miletkov *et al*. (2017)	Eighty countries	*Foreign non-executive director indicator*	*ROA*	No significant impact
Dong *et al*. (2017)	China	The proportion of foreign directors (*FDs*)	Bank efficiency	No significant impact
Hahn and Lasfer (2016)	UK	The proportion of foreign non-executive directors (*FNEDs*)	Total shareholder returns	Negative impact
Interval-scale Group:				
Delis *et al*. (2017)	UK & North America	*Genetic diversity*	*Tobin's Q* and *risk-adjusted ROA*	Positive impact
Frijns *et al*. (2016)	UK	*Cultural diversity*	*Tobin's Q* and *ROA*	Negative impact

The above panel classifies prior research on the relationships between aspects of board nationality diversity and firm performance into two groups: binary-categorization group and interval-scale group. The former comprises studies that classify board members into one of two mutually exclusive categories. The latter consists of studies that assign country-specific values to board members based on their respective countries of nationality. The explanatory variables are defined as follows:

First: Binary-categorization Measures

- *Foreign (Anglo-American) director indicator* is a dummy indicator that takes a value of one if the board has a foreign (an Anglo-American) director, and zero otherwise.
- *Foreign independent (non-executive) director indicator* is an indicator that takes a value of one if the board has a foreign independent (non-executive) director, and zero otherwise.
- *FDs* is the proportion of foreign directors on the board.
- *FNEDs* is the proportion of foreign non-executive directors on the board.

Second: Interval-scale Measures

- *Genetic diversity* is the standard deviation of genetic diversity scores that are attached to directors' nationalities on the board.
- *Cultural diversity* = $\sum_{i,j} \sqrt{\sum_{d=1}^{4} \left\{ \left(I_{di} - I_{dj}\right)^2 / V_d \right\}} \div n\,(n-1), \forall\, i \neq j$, where I_{di} is the culture score on dimension d for director i, I_{dj} is the culture score on dimension d for director j, and V_d is the in-sample variance of the score for the specific Hofstede cultural dimension. This formula is equivalent to $\sum_{i,j} \sqrt{\sum_{d=1}^{4} \left\{ \left(I_{di} - I_{dj}\right)^2 / V_d \right\}} \div (n\,(n-1)/2), \forall\, i < j$ (Frijns *et al*., 2016).

Panel B: DDN versus Binary-categorization Measures

Criterion	*Dummy Indicators*	*FDs*	*FNEDs*	*DDN*
(1) to (6)				✓
(7)		✓	✓	✓
(8)	✓	✓	✓	✓
(9)	✓	✓	✓	✓
Score	**2/9**	**3/9**	**3/9**	**9/9**

In this panel, I compare *DDN* as a proxy for the level of board nationality diversity to the binary-categorization measures defined in Panel A. The comparisons are based on nine desirable properties (criteria) for a measure of board nationality diversity as uniqueness. The criteria are:

(1) It reaches its maximum only when each director comes from a different country, indicating that each director brings in a distinctive source of talents, expertise, and networks (Harrison and Klein, 2007).

(2) It can summarize variations among multiple categorical proportions of directors (p_is), where each proportion (p_i) belongs to one nationality (Teachman, 1980).

(3) It is not biased towards one nationality over another. It then should take the same value for all boards that have the same p_is, regardless of which p_i belongs to which nationality. It also should capture all cases of board homogeneity, i.e., it reaches its minimum value if any p_i takes a value of one, indicating that all directors share the same nationality (Teachman, 1980).

(4) It does not assign the same value to several distinctive levels of nationality diversity as uniqueness.

(5) It systematically accounts for changes in board diversity according to the scarcity of the nationality in which a new director falls, thereby higher scarcity results in higher incremental value (Shannon, 1948; Harrison and Klein, 2007). This is consistent with the economic law of diminishing returns underlying the resource dependence theory (Salancik and Pfeffer, 1978).

(6) Commencing from an all-domestic board, the measure yields a fixed rate of decrease in the incremental value brought by each additional replacement of a domestic director by a non-domestic director from a given foreign country.

(7) It accounts for variations in board size in a systematic and unbiased way (Biemann and Kearney, 2010).

(8) It occupies a tidy range of variation from zero to unity (Teachman, 1980; Harrison and Klein, 2007).

(9) It is simple to understand and interpret (Coulter, 1989).

Dummy indicators include *Foreign director indicator*, *Anglo-American director indicator*, *Foreign independent director indicator*, and *Foreign non-executive director indicator*. *DDN* is computed as $1 - [\sum_{i=1}^{K} n_i(n_i - 1) \div n\,(n-1)]$, where n_i is the number of directors in the ith nationality on the board and n is board size.

Panel C: DDN and Cultural Faultlines versus Interval-scale Measures

	National Origins		Cultural Separation	
	DDN	***Genetic diversity***	***Cultural faultlines***	***Cultural diversity***
Which aspect of nationality diversity is captured?	Unique diversity	Genetic differences	Cultural subgrouping	Cultural differences
Which measurement scale is employed?	Categorical	Interval	Interval	Interval
Which definition of director similarity is adopted?	Narrow	Broad	Broad	Broad
Is it unbiased towards sample specification?	Yes	Yes	Yes	No
Is its computational data available for all countries of nationality?	Yes	No	No	No

The above panel summarizes the main differences between my measures (*DDN* and *Cultural faultlines*) and the two interval-scale measures (*Genetic diversity* and *Cultural diversity*) defined in Panel A. *DDN* is defined in Panel B. *Cultural faultlines* is the strength of cultural separation between cultural subgroups on the board. The comparisons are based on the following criteria:

Diversity Aspects:

- Unique diversity refers to national-origin dissimilarities. It reaches its maximum when each director comes from a different country.
- Genetic differences refer to genetic deviations among board members. It reaches its maximum when board members are polarized: half of them are at the highest endpoint, and the other half are at the lowest endpoint of the genetic score continuum.
- Cultural subgrouping refers to the strength of separation between cultural subgroups on the board. It reaches its maximum when the board is split into two equal-sized cliques who are at the opposite endpoints of all the four cultural dimensions.
- Cultural differences refer to cultural distances among board members. It reaches its maximum when board members are polarized: half of them are at the highest endpoint, and the other half are at the lowest endpoint of all the four cultural dimensions.

Measurement scale:

- Categorical refers to nominal-scaling of the diversity attribute (i.e., nationality).
- Interval refers to interval-scaling of the diversity attribute (as defined in Panel A).

Director Similarity Definitions:

- The narrow definition considers directors to be similar only if they share the same nationality.
- The broad definition allows directors to have different distances from each other based on their respective genetic or cultural backgrounds. For example, German and British directors are assigned the same Hofstede's culture scores of 66 and 35 for the cultural dimensions of masculinity and power distance, respectively. However, different Hofstede's culture scores are assigned to these directors for individualism and uncertainty avoidance.

Bias Towards Sample Specification:

- It means that the measure yields different scores for the same board, depending on other boards in the sample.

Data Availability:

- Genetic and cultural scores are not available for some countries of nationality. Examples of countries with no available genetic diversity scores include Belize, Cyprus, Iceland, Liechtenstein, Luxembourg, Malta, Mauritius, Singapore, Slovakia, Taiwan, and Trinidad and Tobago. Examples of countries with no available cultural scores include Belize, Bolivia, DR Congo, Georgia, Kazakhstan, Liechtenstein, and Paraguay.

Table 2 – Variable Definitions and Data Sources

Variable	Source	Definitions
Board characteristics		
Dissimilarity of director nationalities (DDN)	BoardEx and FAME	$= 1 - \left[\sum_{i=1}^{K} n_i(n_i - 1) \div n\,(n - 1) \right]$, where: n_i is the number of directors in the ith nationality on the board, and n is board size (Simpson, 1949; Rae and Taylor, 1970).
Ln(Director ownership)	BoardEx	= The natural logarithm of mean director ownership on the board, where the ownership represents the total value of equity held by a director at year-end (Van Peteghem *et al*., 2018).
Independent directors	BoardEx	= The proportion of independent directors on the board.
Ln(Director tenure)	BoardEx	= The natural logarithm of mean director tenure on the board.
Busy directors	BoardEx	= The number of directors with at least three current appointments/board size.
Retirement-age directors	BoardEx and FAME	= The number of directors whose age is at least 65 years/board size (Van Peteghem *et al*., 2018).
Female directors	BoardEx	= The proportion of female directors on the board.
Ln(Board size)	BoardEx	= The natural logarithm of the number of directors on the board.
CEO duality	BoardEx	= A dummy indicator that equals one if the CEO is the board's chair, and zero otherwise.
Foreign CEO	BoardEx and FAME	= A dummy indicator that equals one if the CEO is not British, and zero otherwise.
Firm characteristics		
Tobin's Q	Worldscope	= (Total assets + market value of equity − book value of equity)/total assets.
Foreign sales	Worldscope	= Sales generated from operations in foreign countries/net sales.
Ln(Geographical segments)	Worldscope	= The natural logarithm of the number of geographical segments in which the firm operates.
Foreign ownership	Datastream	= The proportion of common shares held by foreign investors owning 5% or more.
Institutional ownership	Datastream	= The proportion of common shares held by investment banks or other institutions owning 5% or more and seeking a long-term return.
Firm size	Worldscope	= The natural logarithm of total assets.
Leverage	Worldscope	= Long-term liabilities/total assets.
Capital intensity	Worldscope	= Property, plant, and equipment (PPE)/total assets.
Sales growth	Worldscope	= (Net sales in the current year − net sales in the previous year)/net sales in the previous year.
Stock return	Worldscope	= (Ending stock price − beginning stock price)/beginning stock price.

Table 2 – Continued

Variable	Source	Definitions
Instrumental variable		
Local diversity	BoardEx and FAME	= The average value of my endogenous variable (*DDN*) for firms headquartered within the same postcode area.
Prior measures of diversity		
FDs	BoardEx and FAME	= The proportion of foreign directors on the board (e.g., Dong *et al*., 2017).
FNEDs	BoardEx and FAME	= The proportion of foreign non-executive directors on the board (e.g., Hahn and Lasfer, 2016).
Genetic diversity	BoardEx and FAME	= The standard deviation of genetic diversity scores, that are attached to directors' nationalities, on the board (Delis *et al*., 2017).
Cultural diversity	BoardEx and FAME	$= \frac{\sum_{i,j}\sqrt{\sum_{d=1}^{4}\left\{\left(I_{di}-I_{dj}\right)^{2}/V_{d}\right\}}}{n\,(n-1)}\ \forall\ i \neq j$, where I_{di} is the culture score on dimension d for director i, I_{dj} is the culture score on dimension d for director j, and V_d is the in-sample variance of the score for the specific Hofstede cultural dimension (Frijns *et al*., 2016).
Diversity-value moderators		
Strong faultlines	BoardEx and FAME	= A dummy indicator that equals one if the strength of board cultural faultlines has a value of at least 0.9, and zero otherwise. The strength of board cultural faultlines (*Cultural faultlines*) is a proxy for the strength of cultural separation between cultural subgroups on the board. Its computation involves attaching Hofstede's four-dimensional scores to directors' nationalities, then clustering directors into cultural subgroups by using a clustering algorithm developed by Meyer and Glenz (2013). The software used for executing the algorithm provides a summary value of the strength of the cultural separation.
Marginalized directors	BoardEx and FAME	= A dummy indicator that takes a value of one if the percentage of unique-nationality directors (who do not share the same nationality with any other director on the board) is positive but below 25% of board members, and zero otherwise.
Low complexity	Worldscope	= A dummy indicator that takes a value of one if the total number of business and geographical segments in which the firm operates in a given year is below the sample median value of the total number of business and geographical segments for the same year, and zero otherwise.

Table 3 – Sample

Panel A: Sample Selection

	Firm-years	Unique Firms
Initial sample	24,805	2,795
Exclusion criteria		
(1) Belonging to the financial or real-estate sectors	(6,296)	(732)
(2) Domiciled outside the UK	(126)	(12)
(3) Missing age data for at least one board member	(48)	(3)
(4) Missing nationality data for at least one board member	(869)	(50)
(5) Having a board size of less than three directors	(173)	(8)
(6) Missing data of some required variables	(5,909)	(533)
Final sample	**11,384**	**1,457**

Panel B: Sample by Industry and Year

	ICB Industry Code									
Year	**(10)**	**(15)**	**(20)**	**(40)**	**(45)**	**(50)**	**(55)**	**(60)**	**(65)**	**Total**
1999	18	6	11	56	20	82	15	12	5	225
2000	36	7	21	78	24	109	19	14	5	313
2001	58	11	27	97	28	132	22	16	6	397
2002	61	14	29	113	30	139	26	20	6	438
2003	79	16	40	127	29	164	30	24	6	515
2004	95	23	46	146	31	181	36	27	7	592
2005	105	23	50	163	34	200	36	30	9	650
2006	123	27	60	171	35	206	38	33	12	705
2007	119	25	69	174	39	203	44	29	11	713
2008	113	23	62	168	39	202	45	34	14	700
2009	96	23	54	157	34	200	40	33	12	649
2010	97	15	47	156	37	188	44	35	14	633
2011	90	19	44	149	37	179	44	34	14	610
2012	88	23	42	143	39	175	46	41	13	610
2013	87	24	50	149	37	186	49	44	16	642
2014	94	21	52	144	35	190	46	34	16	632
2015	78	18	53	144	36	172	45	35	13	594
2016	74	19	53	151	38	160	47	27	13	582
2017	82	16	53	154	38	157	45	32	10	587
2018	85	13	60	158	34	160	42	32	13	597
Total	**1,678**	**366**	**923**	**2,798**	**674**	**3,385**	**759**	**586**	**215**	**11,384**

The ICB industry (codes) names are: **(10)** Technology; **(15)** Telecommunications; **(20)** Health Care; **(40)** Consumer Discretionary; **(45)** Consumer Staples; **(50)** Industrials; **(55)** Basic Materials; **(60)** Energy; **(65)** Utilities.

Panel C: Sample by Director Nationality and Year (Sorted by the Total Number of Directors per Nationality)

Nationality	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Total
British	1659	2232	2744	2932	3326	3707	4026	4189	4120	4044	3709	3633	3581	3487	3619	3598	3414	3312	3294	3308	67934
American	98	140	160	192	204	220	232	230	252	247	209	201	202	215	243	260	244	240	252	272	4313
Irish	14	16	18	25	33	37	39	49	46	57	50	53	48	47	50	59	52	51	57	63	864
French	24	24	30	39	38	38	41	44	43	38	36	37	49	42	49	53	55	48	43	46	817
Australian	17	15	27	31	34	37	37	41	50	51	48	55	46	43	33	43	41	34	35	34	752
Dutch	9	9	17	24	34	37	34	37	35	40	39	38	38	35	38	42	36	25	32	34	633
German	12	19	30	33	39	38	37	34	40	37	32	27	25	26	27	23	34	33	39	39	624
South African	12	18	36	35	21	27	24	28	31	31	28	24	30	35	38	38	40	36	42	41	615
Canadian	11	16	15	20	23	20	20	27	26	26	21	23	34	27	30	29	34	30	36	37	505
Swedish	14	18	23	20	17	24	26	27	29	21	23	25	21	20	20	22	21	22	23	24	440
Italian	6	4	5	6	9	8	12	5	5	7	6	12	17	20	20	16	18	22	24	20	242
Belgian	3	4	6	9	8	9	8	12	10	11	16	14	17	11	11	11	19	18	15	20	232
Swiss	3	3	6	6	8	8	7	7	9	14	12	12	14	15	19	17	14	11	10	14	209
New Zealander	0	2	5	8	14	9	10	5	13	11	15	17	12	15	13	12	9	10	8	11	199
Malaysian	10	9	5	6	9	8	9	8	8	11	10	10	8	11	16	11	10	7	8	8	182
Chinese	2	2	1	3	7	5	14	13	9	14	13	10	6	7	11	8	7	7	9	7	155
Indian	1	3	3	5	5	5	3	1	4	6	5	4	3	7	11	12	13	16	14	17	138
Singaporean	1	1	1	1	1	1	2	6	7	7	6	7	8	12	9	13	14	12	11	12	132
Norwegian	6	5	4	5	6	5	9	10	7	7	5	4	3	4	4	4	8	8	11	8	123
Danish	1	0	0	1	3	3	5	7	6	9	9	5	4	6	7	9	8	8	11	16	118
Chilean	4	3	3	3	4	4	7	7	7	7	6	6	5	6	6	7	4	4	12	12	117
Spanish	1	0	1	2	5	7	5	6	6	4	3	7	12	8	7	7	5	8	9	10	113
Israeli	0	0	0	0	0	3	2	4	10	7	8	8	12	12	8	7	7	9	7	6	110
Austrian	2	5	5	5	5	4	3	6	7	6	6	6	8	4	5	4	4	5	6	6	102
Russian	0	0	0	0	2	2	4	2	4	4	5	4	5	8	10	5	10	5	9	1	80
Greek	2	2	3	2	3	3	4	4	6	4	1	7	7	4	8	7	1	1	1	2	72
Portuguese	1	1	1	1	3	3	3	3	2	2	4	4	5	5	5	5	4	5	4	5	66
Kazakhstani	0	0	0	0	0	0	0	2	2	3	4	4	4	5	5	4	6	9	8	8	64
Jordanian	0	0	0	0	0	0	0	3	4	4	4	4	4	4	4	5	3	3	3	3	48
Argentine	0	0	0	0	1	1	1	1	2	2	0	1	1	2	2	3	5	4	4	5	35

Panel C – Continued

Nationality	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Total
Peruvian	0	0	0	0	0	0	0	0	4	3	0	4	4	3	3	3	3	3	2	0	32
Japanese	3	2	1	1	2	4	3	2	0	0	0	0	0	1	1	1	1	0	1	1	24
Pakistani	1	1	1	1	1	1	1	0	0	0	1	2	2	2	2	2	2	2	1	1	24
Brazilian	0	0	0	1	3	4	3	1	0	0	0	0	0	0	1	1	3	2	2	1	22
Icelander	0	0	0	0	0	0	0	0	0	2	1	1	2	0	2	3	3	1	1	6	22
Ukrainian	0	0	0	0	0	0	0	0	0	2	2	2	2	2	2	2	2	2	2	2	22
Zimbabwean	0	0	0	0	0	1	1	1	2	2	1	2	1	0	1	1	3	2	2	2	22
Egyptian	1	1	3	2	2	2	2	1	1	1	0	0	0	0	1	1	0	1	1	1	21
Finnish	0	1	1	1	1	0	0	2	2	1	2	0	0	1	3	1	1	1	1	1	20
Polish	1	0	0	0	0	1	0	1	1	0	0	0	0	1	1	1	4	4	2	3	20
Kenyan	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	2	2	2	2	2	17
Emirian	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	2	2	3	4	16
Ghanaian	1	1	1	1	1	0	0	0	1	1	0	1	1	1	1	1	1	1	1	1	16
Turkish	0	1	1	1	1	1	2	1	0	0	0	0	0	0	1	1	1	1	1	1	14
Colombian	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	0	1	12
Indonesian	0	0	0	0	0	0	0	0	0	0	1	1	1	5	3	0	0	0	0	1	12
Salvadoran	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	0	1	1	1	1	12
Taiwanese	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	2	2	1	3	11
Congolese	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	0	0	0	10
Zambian	0	0	0	0	0	0	0	0	0	0	0	0	2	2	2	2	0	0	0	0	8
Lithuanian	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	7
Paraguayan	0	0	0	0	0	0	0	0	0	0	1	0	1	1	1	1	1	1	0	0	7
Romanian	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	1	1	1	1	1	7
Bolivian	0	0	0	0	0	0	0	0	0	1	1	1	1	0	1	1	0	0	0	0	6
Georgian	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	2	6
Liechtensteiner	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	6
Nigerian	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	0	6
Slovak	1	2	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6
South Korean	0	0	0	0	0	0	0	1	1	1	1	1	1	0	0	0	0	0	0	0	6
Tanzanian	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	0	0	6

Panel C – Continued

Nationality	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Total
Mauritian	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	0	5
Mozambican	0	0	0	0	0	0	1	1	1	1	1	0	0	0	0	0	0	0	0	0	5
Trinidadian/ Tobagon	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	1	1	5
Belizean	0	0	0	0	0	0	0	0	0	0	1	1	1	1	0	0	0	0	0	0	4
Czech	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	2	4
Malian	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	4
Thai	0	0	0	0	0	0	0	1	1	1	1	0	0	0	0	0	0	0	0	0	4
Croatian	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	3
Luxembourger	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	3
Mexican	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
Moroccan	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
Lebanese	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
Saudi	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
Syrian	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1
Total	**1922**	**2561**	**3160**	**3426**	**3877**	**4290**	**4638**	**4833**	**4818**	**4752**	**4352**	**4283**	**4253**	**4170**	**4365**	**4377**	**4180**	**4042**	**4071**	**4130**	**80500**
Average *FDs*	**0.12**	**0.11**	**0.11**	**0.12**	**0.12**	**0.11**	**0.11**	**0.11**	**0.13**	**0.13**	**0.13**	**0.14**	**0.14**	**0.15**	**0.15**	**0.16**	**0.16**	**0.16**	**0.17**	**0.18**	**0.14**
Average *DDN*	**0.18**	**0.17**	**0.17**	**0.18**	**0.18**	**0.18**	**0.17**	**0.17**	**0.20**	**0.21**	**0.20**	**0.21**	**0.22**	**0.23**	**0.23**	**0.24**	**0.24**	**0.25**	**0.26**	**0.27**	**0.21**

Variable Definitions:

FDs = the proportion of foreign directors on the board.

Dissimilarity of director nationalities (*DDN*) = $1 - [\ \sum_{i=1}^{K} n_i(n_i - 1)\ \div\ n\ (n-1)\ ]$, where n_i is the number of directors in the ith nationality on the board and n is board size.

Panel D: Sample by Number of Foreign Directors and Number of Nationalities

Number of Foreign Directors	Number of Nationalities									Total
	1	2	3	4	5	6	7	8	9	
0	6225	0	0	0	0	0	0	0	0	6225
1	0	2309	0	0	0	0	0	0	0	2309
2	0	369	772	0	0	0	0	0	0	1141
3	3	120	262	246	0	0	0	0	0	631
4	9	60	141	116	68	0	0	0	0	394
5	1	17	73	73	44	25	0	0	0	233
6	0	5	28	66	54	16	1	0	0	170
7	0	5	20	30	33	18	4	1	0	111
8	0	6	13	30	16	16	2	2	0	85
9	0	0	3	8	20	2	3	0	0	36
10	0	0	0	7	4	8	2	1	0	22
11	0	0	2	4	1	4	2	1	1	15
12	0	0	0	1	2	1	2	1	0	7
13	0	0	0	0	0	0	1	0	1	2
15	0	0	0	0	2	0	0	0	1	3
Total	**6238**	**2891**	**1314**	**581**	**244**	**90**	**17**	**6**	**3**	**11384**

Table 4 – Descriptive Statistics

Variable	Obs.	Mean	Min.	Q1	Median	Q3	Max.	Std. Dev.
Board characteristics								
DDN	11384	0.210	0.000	0.000	0.000	0.400	1.000	0.265
Director ownership (in 000s)	11384	6310.903	0.500	215.775	744.250	2420.770	1388694.000	34328.640
Independent directors	11384	0.425	0.000	0.333	0.444	0.571	1.000	0.207
Director tenure	11384	5.799	0.100	3.500	5.086	7.350	26.600	3.330
Busy directors	11384	0.174	0.000	0.000	0.167	0.286	1.000	0.166
Retirement-age directors	11384	0.156	0.000	0.000	0.143	0.250	1.000	0.154
Female directors	11384	0.081	0.000	0.000	0.000	0.154	0.600	0.111
Board size	11384	7.071	3.000	5.000	7.000	8.000	23.000	2.358
CEO duality	11384	0.209	0.000	0.000	0.000	0.000	1.000	0.406
Foreign CEO	11384	0.130	0.000	0.000	0.000	0.000	1.000	0.336
Firm characteristics								
Tobin's Q	11384	1.919	0.518	1.074	1.443	2.139	10.539	1.550
Foreign sales	11384	0.392	0.000	0.013	0.320	0.721	1.000	0.359
Geographical segments	11384	3.120	1.000	2.000	3.000	4.000	10.000	1.928
Foreign ownership	11384	0.065	0.000	0.000	0.000	0.080	0.970	0.131
Institutional ownership	11384	0.084	0.000	0.000	0.050	0.140	0.850	0.108
Firm size	11384	11.836	7.246	10.267	11.660	13.301	17.416	2.208
Leverage	11384	0.125	0.000	0.000	0.072	0.205	0.672	0.150
Capital intensity	11384	0.236	0.002	0.048	0.156	0.355	0.894	0.232
Sales growth	11384	0.192	-0.696	-0.022	0.072	0.211	4.597	0.628
Stock return	11384	0.097	-0.849	-0.252	0.028	0.320	2.495	0.560
Prior measures of diversity								
FDs	11384	0.137	0.000	0.000	0.000	0.200	1.000	0.199
FNEDs	11384	0.090	0.000	0.000	0.000	0.143	1.000	0.150
Genetic diversity	11384	0.002	0.000	0.000	0.000	0.003	0.046	0.004
Cultural diversity	11384	0.871	0.000	0.000	0.000	1.236	7.843	1.403
Diversity-value moderators								
Strong faultlines	11384	0.088	0.000	0.000	0.000	0.000	1.000	0.284
Marginalized directors	11384	0.287	0.000	0.000	0.000	1.000	1.000	0.452
Low complexity	10711	0.451	0.000	0.000	0.000	1.000	1.000	0.498

All variables are defined in Table 2.

Table 5 – Firms with Diverse Boards vs Firms with Homogeneous Boards

Variable	Mean for *DIVERSE*	Mean for *HOMOGENEOUS*	Difference
Board characteristics			
DDN	0.465	0.000	0.465***
Director ownership (in 000s)	8056.452	4870.924	3185.528***
Independent directors	0.463	0.393	0.070***
Director tenure	5.360	6.161	-0.801***
Busy directors	0.215	0.139	0.076***
Retirement-age directors	0.171	0.144	0.027***
Female directors	0.094	0.071	0.023***
Board size	8.001	6.304	1.697***
CEO duality	0.184	0.229	-0.045***
Foreign CEO	0.287	0.000	0.287***
Firm characteristics			
Tobin's Q	1.993	1.858	0.135***
Foreign sales	0.556	0.258	0.298***
Geographical segments	3.699	2.643	1.056***
Foreign ownership	0.097	0.040	0.057***
Institutional ownership	0.082	0.085	-0.003
Firm size	12.583	11.221	1.362***
Leverage	0.142	0.112	0.030***
Capital intensity	0.246	0.228	0.019***
Sales growth	0.209	0.178	0.030**
Stock return	0.086	0.106	-0.020*
Prior measures of diversity			
FDs	0.300	0.002	0.298***
FNEDs	0.198	0.001	0.197***
Genetic diversity	0.004	0.000	0.004***
Cultural diversity	1.927	0.000	1.927***
Diversity-value moderators			
Strong faultlines	0.195	0.000	0.195***
Marginalized directors	0.635	0.000	0.635***
Low complexity	0.357	0.529	-0.172***

The above table presents the results of the difference of means tests between the characteristics of firms with diverse boards (*DIVERSE*) relative to the characteristics of those with homogeneous boards (*HOMOGENEOUS*). All variables are defined in Table 2. The number of observations for the *DIVERSE* (*HOMOGENEOUS*) set of firms is 5,146 (6,238), except for the last test that has 4,878 (5,833) observations.[53]

[53] When I set missing values for the number of business segments to a value of one, I obtain similar results (untabulated).

Table 6 – Correlations

Panel A: Diversity Variables

	DDN	*Cultural faultlines*	*FDs*	*FNEDs*	*Genetic diversity*	*Cultural diversity*
All Firms (n= 11384)						
DDN	1.00					
Cultural faultlines	0.84	1.00				
FDs	0.92	0.71	1.00			
FNEDs	0.83	0.63	0.90	1.00		
Genetic diversity	0.62	0.53	0.62	0.57	1.00	
Cultural diversity	0.84	0.64	0.79	0.72	0.66	1.00
Firms with at least one foreign board member (n= 5159)						
DDN	1.00					
Cultural faultlines	-0.30	1.00				
FDs	0.83	-0.26	1.00			
FNEDs	0.68	-0.21	0.81	1.00		
Genetic diversity	0.35	-0.09	0.38	0.34	1.00	
Cultural diversity	0.68	-0.26	0.58	0.50	0.47	1.00
Firms with at least two foreign board members (n= 2,850)						
DDN	1.00					
Cultural faultlines	-0.28	1.00				
FDs	0.65	-0.26	1.00			
FNEDs	0.53	-0.23	0.75	1.00		
Genetic diversity	0.29	-0.07	0.33	0.31	1.00	
Cultural diversity	0.61	-0.25	0.44	0.37	0.46	1.00

Variable Definitions:
DDN is the dissimilarity of director nationalities and is computed as $1 - [\sum_{i=1}^{K} n_i(n_i - 1) \div n(n-1)]$, where n_i is the no. of directors in the ith nationality on the board and n is board size; *Cultural faultlines* proxies for the strength of cultural separation between cultural subgroups on the board. It is based on four cultural dimensions: individualism, masculinity, power distance, and uncertainty avoidance (Hofstede, 2001); *FDs* is the proportion of foreign board members; *FNEDs* is the proportion of foreign non-executive board members; *Genetic diversity* is the standard deviation of genetic diversity scores, that are attached to directors' nationalities, on the board (Delis *et al.*, 2017); *Cultural diversity* proxies for cultural differences among board members and is also based the Hofstede's four cultural dimensions (Frijns *et al.*, 2016).

Panel B: Main Regression Variables

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
(1)	1.00																			
(2)	0.03	1.00																		
(3)	0.16	-0.04	1.00																	
(4)	-0.12	0.20	-0.08	1.00																
(5)	0.28	-0.01	0.30	-0.14	1.00															
(6)	0.12	0.03	0.04	0.25	-0.02	1.00														
(7)	0.11	0.06	0.28	-0.03	0.15	-0.02	1.00													
(8)	0.29	0.18	0.32	0.01	0.27	-0.01	0.20	1.00												
(9)	-0.05	0.13	-0.22	0.11	-0.11	0.05	-0.12	-0.08	1.00											
(10)	0.56	0.03	0.12	-0.09	0.18	0.07	0.07	0.16	-0.04	1.00										
(11)	0.03	0.23	-0.05	-0.04	-0.02	-0.04	0.03	-0.01	0.00	0.01	1.00									
(12)	0.45	-0.01	0.17	-0.01	0.19	0.13	0.02	0.12	-0.06	0.29	0.01	1.00								
(13)	0.28	0.00	0.22	0.05	0.18	0.09	0.06	0.19	-0.08	0.17	-0.02	0.63	1.00							
(14)	0.29	0.00	-0.04	-0.08	0.05	0.06	0.03	0.05	0.01	0.17	-0.01	0.11	0.03	1.00						
(15)	-0.05	-0.07	0.10	-0.06	0.04	-0.08	0.05	0.01	-0.10	-0.02	0.00	0.04	0.05	0.07	1.00					
(16)	0.30	0.18	0.52	0.02	0.42	0.02	0.30	0.68	-0.13	0.19	-0.20	0.18	0.24	0.05	0.02	1.00				
(17)	0.10	-0.04	0.19	-0.07	0.17	-0.02	0.10	0.24	-0.06	0.05	-0.06	0.02	0.02	0.01	0.01	0.40	1.00			
(18)	0.05	0.00	0.08	0.10	0.07	0.03	0.01	0.15	0.01	0.06	-0.15	-0.03	-0.12	0.08	-0.08	0.28	0.34	1.00		
(19)	0.04	0.06	-0.11	-0.18	0.00	-0.03	-0.06	-0.06	0.04	0.02	0.11	0.01	-0.09	0.03	0.00	-0.12	-0.06	-0.04	1.00	
(20)	-0.03	0.23	0.00	0.08	-0.02	0.01	0.00	0.01	0.00	-0.01	0.25	0.00	0.00	-0.01	-0.01	0.02	-0.04	-0.01	0.06	1.00

The above panel presents Pearson correlations between the main variables in the value model, Eq. (5). The variables are in the following order: **(1)** *DDN*; **(2)** *Ln(Director ownership)*; **(3)** *Independent directors*; **(4)** *Ln(Director tenure)*; **(5)** *Busy directors*; **(6)** *Retirement age directors*; **(7)** *Female directors*; **(8)** *Ln(Board size)*; **(9)** *CEO duality*; **(10)** *Foreign CEO*; **(11)** *Tobin's Q*; **(12)** *Foreign sales*; **(13)** *Ln(Geographical segments)*; **(14)** *Foreign ownership*; **(15)** *Institutional ownership*; **(16)** *Firm size*; **(17)** *Leverage*; **(18)** *Capital intensity*; **(19)** *Sales growth*; **(20)** *Stock return*. All variables are defined in Table 2. The number of observations is 11,384.

Table 7 – Determinants Model

	Expected Sign	Coefficient (t-statistic)
Intercept	?	-1.013***
		(-11.88)
Foreign sales$_{i,t-1}$	+	0.496***
		(13.30)
Ln(Geographical segments$_{i,t-1}$*)*	+	0.000
		(0.02)
Foreign ownership$_{i,t-1}$	+	0.591***
		(6.91)
Institutional ownership$_{i,t-1}$	+	-0.208**
		(-2.56)
Firm size$_{i,t-1}$	+	0.013
		(1.62)
Leverage$_{i,t-1}$	+	0.019
		(0.27)
Capital intensity$_{i,t-1}$	?	-0.066
		(-1.26)
Sales growth$_{i,t-1}$	+	0.007
		(0.79)
Stock return$_{i,t-1}$	?	-0.009
		(-1.07)
Ln(Director ownership$_{i,t}$*)*	?	-0.001
		(-0.23)
Independent directors$_{i,t}$	+	-0.101
		(-1.61)
Ln(Director tenure$_{i,t}$*)*	–	-0.105***
		(-5.39)
Busy directors$_{i,t}$	+	0.270***
		(4.70)
Retirement-age directors$_{i,t}$	?	0.190***
		(2.88)
Female directors$_{i,t}$	+	0.095
		(0.92)
Ln(Board size$_{i,t}$*)*	+	0.370***
		(8.84)
CEO duality$_{i,t}$	–	0.016
		(0.62)
Industry controls		Yes
Year controls		Yes
n		9374
Pseudo R^2		0.308

The dependent variable is board nationality diversity (*DDN*$_{i,t}$). *Foreign sales*$_{i,t-1}$ is the lagged proportion of sales generated from operations in foreign countries. *Ln(Geographical segments*$_{i,t-1}$*)* is the natural logarithm of the lagged number of geographical segments in which the firm operates. Other variables are defined in Table 2. The above model is estimated by using a two-limit Tobit specification. Below coefficient estimates are t-statistics, which are based on clustered standard errors to account for serial correlation. ***, **, * indicate significance at the 1%, 5%, and 10% level (two-tailed), respectively. Coefficient estimates of industry and year controls are suppressed for brevity.

Table 8 – Value Model

Panel A: OLS and 2SLS

	Expected Sign for Models (1) and (3)	OLS	2SLS	
			First Stage	Second Stage
		Tobin's $Q_{i,t}$	$DDN_{i,t}$	*Tobin's* $Q_{i,t}$
		Model (1)	**Model (2)**	**Model (3)**
Intercept	?	3.663***	-0.276***	4.056***
		(13.66)	(-8.16)	(12.48)
$DDN_{i,t}$	+	0.393**	-	-
		(2.51)		
Local diversity	-	-	0.393***	-
			(8.78)	
Instrumented $DDN_{i,t}$	+	-	-	2.244***
				(2.66)
Ln(Director ownership$_{i,t}$*)*	+	0.199***	-0.001	0.201***
		(12.17)	(-0.43)	(11.84)
Independent directors$_{i,t}$	+	0.793***	-0.052**	0.903***
		(4.55)	(-2.22)	(4.90)
Ln(Director tenure$_{i,t}$*)*	?	-0.116**	-0.025***	-0.062
		(-2.50)	(-3.94)	(-1.11)
Busy directors$_{i,t}$	?	0.639***	0.120***	0.383**
		(4.17)	(4.75)	(2.03)
Retirement-age directors$_{i,t}$	–	-0.296	0.075***	-0.456**
		(-1.63)	(2.93)	(-2.37)
Female directors$_{i,t}$	+	0.782***	0.009	0.714***
		(3.05)	(0.23)	(2.71)
Ln(Board size$_{i,t}$*)*	?	0.919***	0.098***	0.716***
		(7.78)	(6.03)	(5.15)
CEO duality$_{i,t}$	–	-0.110*	0.005	-0.124*
		(-1.68)	(0.56)	(-1.81)
Foreign CEO$_{i,t}$	+	0.008	0.281***	-0.546**
		(0.10)	(22.99)	(-2.05)
Foreign sales$_{i,t}$	+	0.127	0.172***	-0.217
		(1.12)	(10.48)	(-1.07)
Ln(Geographical segments$_{i,t}$*)*	?	-0.041	-0.006	-0.035
		(-0.82)	(-0.78)	(-0.67)
Foreign ownership$_{i,t}$	?	-0.023	0.310***	-0.635*
		(-0.12)	(8.57)	(-1.81)
Institutional ownership$_{i,t}$	?	-0.134	-0.143***	0.155
		(-0.65)	(-5.15)	(0.62)
Firm size$_{i,t}$	?	-0.360***	0.009***	-0.377***
		(-12.95)	(2.78)	(-12.91)
Leverage$_{i,t}$	+	0.953***	0.031	0.896***
		(3.46)	(1.06)	(3.21)
Capital intensity$_{i,t}$	–	-0.423***	-0.028	-0.334***
		(-3.61)	(-1.35)	(-2.59)
Sales growth$_{i,t}$	+	0.074**	0.004	0.065*
		(2.32)	(0.97)	(1.94)

Panel A – Continued

		Model (1)	Model (2)	Model (3)
Stock return$_{i,t}$	+	0.604***	-0.007**	0.618***
		(15.83)	(-2.15)	(15.63)
Industry controls		Yes	Yes	Yes
Year controls		Yes	Yes	Yes
n		11384	11384	11384
Adjusted R^2		0.260	0.513	0.210

Panel B: Controlling for Lagged Firm Value

	Expected Sign for Models (1) and (3)	OLS	2SLS	
			First Stage	Second Stage
		Tobin's $Q_{i,t}$	*$DDN_{i,t}$*	*Tobin's $Q_{i,t}$*
		Model (1)	Model (2)	Model (3)
Intercept	?	0.739***	-0.300***	0.882***
		(6.47)	(-7.86)	(6.38)
$DDN_{i,t}$	+	0.133**	-	-
		(2.37)		
Local diversity	-	-	0.384***	-
			(8.03)	
Instrumented $DDN_{i,t}$	+	-	-	0.714**
				(2.53)
Tobin's $Q_{i,t-1}$	+	0.748***	0.005	0.744***
		(44.94)	(1.59)	(44.86)
Ln(Director ownership$_{i,t}$)	+	0.018***	-0.002	0.019***
		(2.81)	(-0.82)	(2.94)
Independent directors$_{i,t}$	+	0.242***	-0.065**	0.285***
		(3.77)	(-2.50)	(4.08)
Ln(Director tenure$_{i,t}$)	?	-0.004	-0.026***	0.015
		(-0.18)	(-3.32)	(0.61)
Busy directors$_{i,t}$	?	0.184***	0.120***	0.105
		(3.42)	(4.46)	(1.57)
Retirement-age directors$_{i,t}$	–	-0.083	0.076***	-0.135**
		(-1.39)	(2.73)	(-2.04)
Female directors$_{i,t}$	+	0.192**	0.029	0.160*
		(2.09)	(0.69)	(1.65)
Ln(Board size$_{i,t}$)	?	0.197***	0.106***	0.129**
		(4.51)	(6.15)	(2.38)
CEO duality$_{i,t}$	–	0.013	0.009	0.007
		(0.59)	(0.81)	(0.31)
Foreign CEO$_{i,t}$	+	0.037	0.277***	-0.134
		(1.23)	(20.76)	(-1.53)
Foreign sales$_{i,t}$	+	0.026	0.173***	-0.082
		(0.69)	(9.64)	(-1.27)
Ln(Geographical segments$_{i,t}$)	?	0.005	-0.004	0.006
		(0.26)	(-0.45)	(0.28)
Foreign ownership$_{i,t}$	?	-0.111*	0.300***	-0.299***
		(-1.85)	(7.12)	(-2.66)

Panel B – Continued

		Model (1)	Model (2)	Model (3)
Institutional ownership$_{i,t}$	?	-0.007	-0.124***	0.072
		(-0.08)	(-4.06)	(0.79)
Firm size$_{i,t}$	?	-0.091***	0.010***	-0.097***
		(-8.36)	(2.83)	(-8.45)
Leverage$_{i,t}$	+	0.358***	0.028	0.342***
		(3.42)	(0.88)	(3.27)
Capital intensity$_{i,t}$	–	-0.013	-0.022	0.011
		(-0.33)	(-0.97)	(0.24)
Sales growth$_{i,t}$	+	-0.106***	0.007	-0.111***
		(-3.04)	(1.19)	(-3.18)
Stock return$_{i,t}$	+	0.820***	-0.009*	0.825***
		(22.52)	(-1.95)	(22.59)
Industry controls		Yes	Yes	Yes
Year controls		Yes	Yes	Yes
n		9374	9374	9374
Adjusted R^2		0.735	0.519	0.729

Panel C: Controlling for Two Lags of Firm Value

	Expected Sign for Models (1) and (3)	OLS	2SLS	
			First Stage	Second Stage
		Tobin's Q$_{i,t}$	*DDN$_{i,t}$*	*Tobin's Q$_{i,t}$*
		Model (1)	Model (2)	Model (3)
Intercept	?	0.484***	-0.306***	0.597***
		(4.31)	(-7.34)	(4.39)
DDN$_{i,t}$	+	0.151***	-	-
		(2.66)		
Local diversity	-	-	0.382***	-
			(7.55)	
Instrumented DDN$_{i,t}$	+	-	-	0.599**
				(2.30)
Tobin's Q$_{i,t-1}$	+	0.711***	0.004	0.708***
		(28.34)	(1.20)	(28.71)
Tobin's Q$_{i,t-2}$	+	0.081***	0.002	0.080***
		(4.04)	(0.97)	(3.99)
Ln(Director ownership$_{i,t}$)	+	0.017***	-0.002	0.018***
		(2.73)	(-0.58)	(2.79)
Independent directors$_{i,t}$	+	0.274***	-0.070**	0.310***
		(4.14)	(-2.41)	(4.27)
Ln(Director tenure$_{i,t}$)	?	-0.032	-0.031***	-0.015
		(-1.61)	(-3.12)	(-0.64)
Busy directors$_{i,t}$	?	0.103*	0.119***	0.042
		(1.84)	(4.15)	(0.63)
Retirement-age directors$_{i,t}$	–	-0.083	0.076**	-0.123**
		(-1.52)	(2.53)	(-2.09)
Female directors$_{i,t}$	+	0.189**	0.041	0.158*
		(2.05)	(0.92)	(1.65)

Panel C – Continued

		Model (1)	Model (2)	Model (3)
Ln(Board size$_{i,t}$)	?	0.171***	0.114***	0.114**
		(4.09)	(6.15)	(2.20)
CEO duality$_{i,t}$	–	0.023	0.010	0.019
		(1.05)	(0.81)	(0.82)
Foreign CEO$_{i,t}$	+	0.022	0.276***	-0.109
		(0.77)	(19.26)	(-1.37)
Foreign sales$_{i,t}$	+	-0.012	0.175***	-0.097
		(-0.30)	(8.93)	(-1.49)
Ln(Geographical segments$_{i,t}$)	?	0.005	-0.004	0.005
		(0.23)	(-0.45)	(0.25)
Foreign ownership$_{i,t}$	?	-0.130**	0.290***	-0.271***
		(-2.16)	(6.16)	(-2.63)
Institutional ownership$_{i,t}$	?	-0.048	-0.117***	0.011
		(-0.61)	(-3.52)	(0.12)
Firm size$_{i,t}$	?	-0.076***	0.009**	-0.080***
		(-6.91)	(2.49)	(-6.96)
Leverage$_{i,t}$	+	0.235**	0.030	0.222**
		(2.19)	(0.87)	(2.08)
Capital intensity$_{i,t}$	–	0.008	-0.020	0.026
		(0.22)	(-0.82)	(0.65)
Sales growth$_{i,t}$	+	-0.070**	0.003	-0.072**
		(-2.42)	(0.37)	(-2.46)
Stock return$_{i,t}$	+	0.777***	-0.005	0.779***
		(20.99)	(-0.98)	(21.16)
Industry controls		Yes	Yes	Yes
Year controls		Yes	Yes	Yes
n		7776	7776	7776
Adjusted R^2		0.761	0.527	0.757

The above table investigates the value of board nationality diversity to shareholders. The dependent variable is firm value (*Tobin's* $Q_{i,t}$) = (total assets + the market value of equity – the book value of equity)/total assets. I proxy for board nationality diversity by using $DDN_{i,t} = 1 - [\sum_{i=1}^{K} n_i(n_i - 1) \div n\,(n-1)]$, where n_i is the number of directors in the ith nationality on the board and n is board size. Other variables are defined in Table 2. The table consists of three panels. Models in Panel A do not control for firm value in previous years. I control for one and two lags of firm value in Panels B and C, respectively. In each panel, OLS, first-stage 2SLS, and second-stage 2SLS estimation results are presented in Models (1), (2), and (3), respectively. In 2SLS regressions, I allow $DDN_{i,t}$ to be endogenous and employ the average value of my endogenous variable for firms headquartered within the same postcode area as my instrumental variable (*Local diversity*). In each panel, the dependent variable is $DDN_{i,t}$ in Model (2) and *Tobin's* $Q_{i,t}$ in Models (1) and (3). Below coefficient estimates are robust *t*-statistics based on standard errors adjusted for heteroskedasticity (White, 1980) and clustered at the firm level (Petersen, 2009). ***, **, * indicate significance at the 1%, 5%, and 10% level (two-tailed), respectively. Coefficients of industry and year controls are suppressed for brevity.

Table 9 – Controlling for Prior Measures of Diversity

	Model (1)	Model (2)	Model (3)	Model (4)	Model (5)
Intercept	3.656***	3.643***	3.657***	3.649***	3.647***
	(13.62)	(13.58)	(13.64)	(13.66)	(13.65)
$DDN_{i,t}$	0.669**	0.525**	0.438***	0.791***	1.022***
	(2.40)	(2.56)	(2.68)	(3.31)	(3.15)
$FDs_{i,t}$	-0.445				-0.422
	(-1.20)				(-0.79)
$FNEDs_{i,t}$		-0.287			0.021
		(-0.91)			(0.05)
Genetic $diversity_{i,t}$			-5.603		3.856
			(-0.64)		(0.41)
Cultural $diversity_{i,t}$				-0.093**	-0.095**
				(-2.56)	(-2.54)
Ln(Director $ownership_{i,t}$)	0.200***	0.199***	0.199***	0.201***	0.202***
	(12.14)	(12.13)	(12.21)	(12.47)	(12.40)
Independent $directors_{i,t}$	0.788***	0.805***	0.793***	0.792***	0.786***
	(4.52)	(4.59)	(4.55)	(4.54)	(4.46)
Ln(Director $tenure_{i,t}$)	-0.119**	-0.117**	-0.116**	-0.116**	-0.119**
	(-2.55)	(-2.52)	(-2.50)	(-2.50)	(-2.55)
Busy $directors_{i,t}$	0.658***	0.657***	0.641***	0.642***	0.657***
	(4.32)	(4.30)	(4.17)	(4.19)	(4.29)
Retirement-age $directors_{i,t}$	-0.280	-0.283	-0.292	-0.293	-0.282
	(-1.55)	(-1.57)	(-1.60)	(-1.61)	(-1.56)
Female $directors_{i,t}$	0.782***	0.791***	0.784***	0.771***	0.768***
	(3.05)	(3.09)	(3.06)	(3.03)	(3.02)
Ln(Board $size_{i,t}$)	0.915***	0.920***	0.922***	0.914***	0.908***
	(7.76)	(7.81)	(7.79)	(7.84)	(7.86)
CEO $duality_{i,t}$	-0.107*	-0.112*	-0.109*	-0.117*	-0.115*
	(-1.65)	(-1.71)	(-1.67)	(-1.78)	(-1.75)
Foreign $CEO_{i,t}$	0.029	-0.009	0.004	0.011	0.035
	(0.36)	(-0.11)	(0.05)	(0.14)	(0.38)

Table 9 – Continued

	Model (1)	Model (2)	Model (3)	Model (4)	Model (5)
Foreign sales$_{i,t}$	0.137	0.125	0.127	0.111	0.120
	(1.21)	(1.11)	(1.13)	(0.98)	(1.07)
Ln(Geographical segments$_{i,t}$*)*	-0.044	-0.041	-0.040	-0.040	-0.043
	(-0.88)	(-0.81)	(-0.80)	(-0.80)	(-0.88)
Foreign ownership$_{i,t}$	0.033	0.011	-0.004	0.074	0.114
	(0.17)	(0.06)	(-0.02)	(0.37)	(0.55)
Institutional ownership$_{i,t}$	-0.155	-0.144	-0.140	-0.166	-0.182
	(-0.75)	(-0.70)	(-0.68)	(-0.82)	(-0.89)
Firm size$_{i,t}$	-0.360***	-0.359***	-0.360***	-0.359***	-0.359***
	(-12.95)	(-12.95)	(-12.96)	(-12.98)	(-12.97)
Leverage$_{i,t}$	0.957***	0.958***	0.951***	0.959***	0.964***
	(3.48)	(3.48)	(3.46)	(3.50)	(3.52)
Capital intensity$_{i,t}$	-0.416***	-0.422***	-0.418***	-0.414***	-0.410***
	(-3.55)	(-3.60)	(-3.59)	(-3.56)	(-3.55)
Sales growth$_{i,t}$	0.074**	0.074**	0.074**	0.074**	0.075**
	(2.33)	(2.32)	(2.31)	(2.33)	(2.34)
Stock return$_{i,t}$	0.602***	0.602***	0.604***	0.602***	0.601***
	(15.78)	(15.77)	(15.82)	(15.81)	(15.76)
Industry controls	Yes	Yes	Yes	Yes	Yes
Year controls	Yes	Yes	Yes	Yes	Yes
n	11384	11384	11384	11384	11384
Adjusted R^2	0.261	0.260	0.260	0.262	0.262

In the above table, I include prior measures of diversity as controls in the value model. The dependent variable is firm value (*Tobin's Q*$_{i,t}$). In Models (1) to (4), I control for *FDs*$_{i,t}$, *FNEDs*$_{i,t}$, *Genetic diversity*$_{i,t}$, and *Cultural diversity*$_{i,t}$, respectively. Model (5) reports the full model results. All variables are defined in Table 2. All models are estimated using OLS with robust *t*-statistics, which are based on standard errors adjusted for heteroskedasticity (White, 1980) and clustered at the firm level (Petersen, 2009). ***, **, * indicate significance at the 1%, 5%, and 10% level (two-tailed), respectively. Coefficients of industry/year controls are suppressed for brevity.

Table 10 – Moderation Model

	Model (1)	Model (2)	Model (3)	Model (4)
Intercept	3.716***	3.686***	3.383***	3.470***
	(13.69)	(13.79)	(11.65)	(11.73)
$DDN_{i,t}$	0.366**	0.362**	0.529***	0.470***
	(2.43)	(2.31)	(3.02)	(2.86)
Strong faultlines$_{i,t}$	0.246			0.233
	(1.20)			(1.07)
$DDN_{i,t}$ × Strong faultlines$_{i,t}$	-0.187			-0.147
	(-0.42)			(-0.33)
Marginalized directors$_{i,t}$		0.193		0.171
		(1.62)		(1.45)
$DDN_{i,t}$ × Marginalized directors$_{i,t}$		-0.297		-0.208
		(-1.09)		(-0.75)
Low complexity$_{i,t}$			0.246***	0.252***
			(3.51)	(3.58)
$DDN_{i,t}$ × Low complexity$_{i,t}$			-0.456***	-0.494***
			(-2.68)	(-2.95)
Ln(Director ownership$_{i,t}$)	0.199***	0.199***	0.195***	0.196***
	(12.21)	(12.18)	(11.75)	(11.81)
Independent directors$_{i,t}$	0.804***	0.787***	0.838***	0.843***
	(4.61)	(4.51)	(4.81)	(4.84)
Ln(Director tenure$_{i,t}$)	-0.117**	-0.115**	-0.097**	-0.097**
	(-2.51)	(-2.47)	(-2.04)	(-2.04)
Busy directors$_{i,t}$	0.637***	0.658***	0.575***	0.587***
	(4.14)	(4.28)	(3.70)	(3.77)
Retirement-age directors$_{i,t}$	-0.298	-0.289	-0.281	-0.279
	(-1.65)	(-1.59)	(-1.53)	(-1.52)
Female directors$_{i,t}$	0.784***	0.785***	0.773***	0.777***
	(3.07)	(3.07)	(2.93)	(2.97)
Ln(Board size$_{i,t}$)	0.886***	0.886***	0.911***	0.841***
	(7.55)	(7.38)	(7.43)	(6.87)
CEO duality$_{i,t}$	-0.113*	-0.109*	-0.122*	-0.125*
	(-1.74)	(-1.67)	(-1.83)	(-1.89)
Foreign CEO$_{i,t}$	0.004	0.029	0.016	0.027
	(0.05)	(0.37)	(0.20)	(0.33)
Foreign sales$_{i,t}$	0.123	0.121	0.162	0.152
	(1.09)	(1.07)	(1.43)	(1.34)
Ln(Geographical segments$_{i,t}$)	-0.040	-0.045	0.019	0.016
	(-0.80)	(-0.89)	(0.30)	(0.26)
Foreign ownership$_{i,t}$	-0.037	-0.001	-0.066	-0.060
	(-0.19)	(-0.00)	(-0.35)	(-0.32)
Institutional ownership$_{i,t}$	-0.135	-0.151	-0.104	-0.122
	(-0.66)	(-0.73)	(-0.49)	(-0.58)
Firm size$_{i,t}$	-0.360***	-0.358***	-0.354***	-0.353***
	(-12.95)	(-12.81)	(-12.09)	(-12.00)
Leverage$_{i,t}$	0.946***	0.959***	0.996***	0.994***
	(3.45)	(3.49)	(3.54)	(3.55)
Capital intensity$_{i,t}$	-0.420***	-0.425***	-0.420***	-0.417***
	(-3.60)	(-3.62)	(-3.49)	(-3.47)

Table 10 – Continued

	Model (1)	Model (2)	Model (3)	Model (4)
Sales growth$_{i,t}$	0.074**	0.073**	0.091***	0.091***
	(2.32)	(2.28)	(2.73)	(2.70)
Stock return$_{i,t}$	0.604***	0.603***	0.585***	0.584***
	(15.85)	(15.78)	(14.62)	(14.60)
Industry controls	Yes	Yes	Yes	Yes
Year controls	Yes	Yes	Yes	Yes
n	11384	11384	10711	10711
Adjusted R^2	0.261	0.261	0.258	0.259

The dependent variable is firm value (*Tobin's Q*$_{i,t}$). In Models (1) to (3), I investigate the roles of board cultural faultlines, marginalized board members, and firm complexity in moderating the relationship between board nationality diversity (*DDN*$_{i,t}$) and firm value. *Strong faultlines*$_{i,t}$ is an indicator that equals one if the strength of board cultural faultlines has a value of at least 0.9, and zero otherwise. *Marginalized directors*$_{i,t}$ is an indicator that equals one if the board has unique-nationality directors who represent less than 25% of board members, and zero otherwise. *Low complexity*$_{i,t}$ is an indicator that equals one if the total number of business and geographical segments in a given year is below its sample median for the same year, and zero otherwise. Other variables are defined in Table 2. Model (4) reports the full model results. All models are estimated using OLS with robust *t*-statistics, which are based on standard errors adjusted for heteroskedasticity (White, 1980) and clustered at the firm level (Petersen, 2009). ***, **, * indicate significance at the 1%, 5%, and 10% level (two-tailed), respectively. Coefficients of industry and year controls are suppressed for brevity.

APPENDIX A

Table A1 – An Illustration of Cultural Faultlines versus Cultural Diversity

	Board I				Board II			
Director ID:	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**
Director nationality:	**American**	**Australian**	**Russian**	**Ukrainian**	**British**	**Mexican**	**South Korean**	**Spanish**
Individualism	**91**	**90**	39	25	**89**	30	18	**51**
Masculinity	**62**	**61**	36	27	**66**	**69**	39	42
Power distance	40	36	**93**	**92**	35	**81**	**60**	57
Uncertainty avoidance	46	51	**95**	**95**	35	82	**85**	**86**

Suppose there are two equal-sized boards with the above data on directors' cultural backgrounds: individualism, masculinity, power distance, and uncertainty avoidance. In each board, there are four members, and the highest two scores per each cultural dimension are in bold. Both boards have very close cultural diversity scores of 2.83 and 2.54, respectively (Frijns *et al.*, 2016). Nevertheless, the strength of cultural faultline(s) on the first board (0.88) is more than double that on the second board (0.41). This is because the pattern (or structure) of cultural diversity in the former potentially creates a strong faultline that would split the board into two subgroups (directors A and B versus directors C and D), whereas the pattern in the latter does not suggest the existence of such a strong split.

APPENDIX B

An Example of Faultline Computation

Suppose a board is composed of four members (A, B, C, and D) with four different nationalities: American, Australian, Russian, and Ukrainian. To compute the strength of cultural faultline for this board, I employ the following three steps:

Step 1: Attaching Cultural Scores to Directors

In this step, four cultural scores are attached to each director based on their nationality. For example, Director A is assigned the scores of 91, 62, 40, and 46 for the cultural dimensions of individualism, masculinity, power distance, and uncertainty avoidance, respectively.

		Cultural Dimension			
Director ID	**Director Nationality**	**Individualism**	**Masculinity**	**Power distance**	**Uncertainty Avoidance**
A	**American**	91	62	40	46
B	**Australian**	90	61	36	51
C	**Russian**	39	36	93	95
D	**Ukrainian**	25	27	92	95

Step 2: Clustering

This step involves executing a hierarchical clustering algorithm (Ward, 1963) and an average linkage algorithm to identify a set of subgroups for each board (Meyer and Glenz, 2013). Initially, each director is assigned to a cluster, resulting in a solution with four clusters. Next, Director B moves into Cluster 1, resulting in a solution with 3 clusters. Finally, Director D moves into Cluster 3, resulting in a solution with 2 clusters. The final column shows the final clusters after putting them in sequence. The final clustering solution thus subdivides the board into two subgroups (clusters): Cluster 1 (Directors A and B) and Cluster 2 (Directors C and D). This solution is optimal because no further reassignment of a single director will further increase the average silhouette width (ASW).

Director ID	**Cluster Association 1**		**2**		**3**	**Final Clusters**
A	1		1		1	1
B	2	→	1		1	1
C	3		3		3	2
D	4		4	→	3	2

Step 3: Computing Faultline Strength

This step is simultaneously executed with Step 2 because Step 2 stops only when a clustering solution has a maximum ASW, which is my proxy for the strength of the cultural faultline. For the above board, the maximum ASW (i.e., *Cultural faultlines*) is 0.88062. This value is computed as follows:

First: Cultural Distances Within Clusters

Distance (A,B) = $\sqrt{(91-90)^2 + (62-61)^2 + (40-36)^2 + (46-51)^2}$ = 6.55744

Distance (C,D) = $\sqrt{(39-25)^2 + (36-27)^2 + (93-92)^2 + (95-95)^2}$ = 16.67333

Cluster 1	
	Director A
Director B	6.55744

Cluster 2	
	Director C
Director D	16.67333

Second: Cultural Distances Across Clusters

Distance (A,C) = $\sqrt{(91-39)^2 + (62-36)^2 + (40-93)^2 + (46-95)^2}$ = 92.68225

Distance (B,C) = $\sqrt{(90-39)^2 + (61-36)^2 + (36-93)^2 + (51-95)^2}$ = 91.71150

Distance (A,D) = $\sqrt{(91-25)^2 + (62-27)^2 + (40-92)^2 + (46-95)^2}$ = 103.37311

Distance (B,D) = $\sqrt{(90-25)^2 + (61-27)^2 + (36-92)^2 + (51-95)^2}$ = 102.23991

	Director A	**Director B**	**Average**
Director C	92.68225	91.71150	92.19688
Director D	103.37311	102.23991	102.80651
Average	98.02768	96.97571	

Third: Silhouette Width

Director (*i*)	a_i	b_i	**Max (a_i, b_i)**	**Silhouette Width (*i*)**
A	6.55744	98.02768	98.02768	0.93311
B	6.55744	96.97571	96.97571	0.93238
C	16.67333	92.19688	92.19688	0.81916
D	16.67333	102.80651	102.80651	0.83782
Average Silhouette Width (ASW)				**0.88062**

ESSAY 3

BOARD NATIONALITY DIVERSITY AND ACCOUNTING CONSERVATISM

ABSTRACT

I examine whether nationality diversity on the board and its audit committee affect accounting conservatism. The theory of groupthink predicts excessive risk-taking by members of cohesive homogeneous groups. If heterogeneous groups make more conservative decisions, I propose more diverse boards and audit committees may encourage greater conservatism in financial reporting. I test this proposition using a large sample of UK firms from 1999 to 2018. I employ a measure of group diversity that captures dissimilarities in directors' nationalities. I find the levels of nationality diversity on the board and the audit committee to be positively associated with conservatism. The association is stronger for firms with high diversity on both the board and its audit committee. The results hold after addressing potential endogeneity by using 2SLS regressions. My evidence suggests that demand for conservatism is higher among more nationality-diverse boards and audit committees.

JEL classification: G30; G38; M41.

Keywords: demographic diversity; audit committee; accounting conservatism.

Data availability: Data are available from the public sources cited in the text.

4.1. INTRODUCTION

Directors from different foreign countries have been mainly regarded as a homogeneous set of actors in the accounting literature (e.g., Masulis, Wang and Xie, 2012; Dong, Girardone and Kuo, 2017; Li and Wahid, 2018). I extend this literature by introducing the concept of board nationality diversity as uniqueness. A unique board (or audit committee) is one in which each member's nationality is unique from (or dissimilar to) the nationalities of other members. Adopting this concept of diversity, I examine the nationality compositions of the board and its audit committee in relation to conditional conservatism, which is defined as the requirement of *"… a higher degree of verification to recognize good news as gains than to recognize bad news as losses."* (Basu, 1997, p.7). This area has not yet been investigated in corporate governance research. I fill this gap.

Regulators have been calling for greater diversity on corporate boards, including diversity in ethnicity and nationality (Parker, 2017). One justification offered is that this reduces 'groupthink', which occurs when members of cohesive groups strive for within-group harmony and conformity rather than engaging in rigorous discussions of contentious issues (Janis, 1972). All-domestic groups are more likely to share a homogeneous cultural background and are therefore more cohesive and susceptible to groupthink than nationality-diverse groups. Since groupthink is associated with making excessively risky decisions (Janis, 1972; Bénabou, 2013), diverse boards are expected to adopt less risky financial policies. Empirical evidence in support of this argument is provided by Bernile, Bhagwat and Yonker (2018). If diverse groups have less appetite for taking on financial risk, I expect diverse boards and audit committees to demand more conservative financial reporting.

From a resource dependence perspective (Salancik and Pfeffer, 1978), nationality diversity on boards and audit committees could also bring valuable expertise and insights relevant to a firm's operations, especially for firms with complex and overseas operations (Anderson, Reeb, Upadhyay and Zhao, 2011; Estélyi and Nisar, 2016). These resources are then expected to improve the ability of the board and its audit committee to restrain aggressive (less conservative) financial reporting by management, in the presence of agency problems.

Conservative financial reporting results in deferred (timely) incorporation of probable gains (losses) in accounting income (Ball, Kothari and Nikolaev, 2013b). From an agency perspective, conservatism offsets managerial bias towards optimistic reporting of profits and net assets (Watts, 2003a). In cases of shareholder–management conflicts of interests, this bias stems from the adverse consequences of timely loss recognition on managers' personal wealth in terms of bonuses, tenure, prestige, and other aspects of their welfare (Ball, 2001). In cases of debtholder–shareholder conflicts, the deferral of loss recognition leads to higher profits and higher dividends to existing shareholders at the expense of debtholders. In cases of prospective shareholder–existing shareholder conflicts, avoiding timely loss recognition yields higher returns to existing shareholders at the expense of prospective shareholders. Therefore, I argue that, if nationality diversity improves the effectiveness of boards and audit committees, then they are likely to promote greater conservatism in financial reporting to facilitate efficient contracting between parties to the firm.

Based on the above, I ask the following question: does nationality diversity on the board and the audit committee affect conditional conservatism? To answer this question, I employ a sample of 6,469 firm-years of UK-domiciled non-financial firms that are listed on the London Stock Exchange over the period from 1999 to 2018. I use a UK sample because variations in directors' nationalities are relatively high in the UK compared to US samples (Frijns, Dodd and Cimerova, 2016). I measure nationality diversity on the board (the audit committee) by using dissimilarity of director nationalities (*DDN*) as a multi-categorical measure that captures all dissimilarities in directors' nationalities. Conditional conservatism is measured by Basu's (1997) asymmetric timeliness coefficient. To estimate this coefficient, I employ a modified Basu model that includes size, leverage, and market-to-book ratio as drivers of conservatism (Khan and Watts, 2009). I also re-estimate the model after adjusting for cash flow asymmetry (Collins, Hribar and Tian, 2014), sticky costs (Banker, Basu, Byzalov and Chen, 2016), and deprecation (Givoly and Hayn, 2000; Beaver and Ryan, 2005; Banker *et al.*, 2016). In addition, I estimate an extended model after adding other potential board-level determinants of conservatism, including the proportion of executive directors (Ahmed and Duellman, 2007), executives' ownership (LaFond and Roychowdhury, 2008), the proportion of female directors (Srinidhi, Tsui and Zhou, 2017), and the presence of strong cultural faultlines on the board.

My multivariate analyses reveal that higher nationality diversity on the board and the audit committee is associated with greater conservatism. The association is stronger for firms with high diversity on both the board and its audit committee. The results hold after addressing potential endogeneity by implementing instrumental variable tests using two-stage least squares (2SLS) regressions. The results are also robust to the use of fixed-effects models and the inclusion of a battery of board-level, firm-level, industry, and year controls. My findings suggest that foreign nationals who qualify for audit committee membership negatively impact its appetite for risk-taking in financial reporting. This effect is strengthened when nationality diversity on the audit committee is supported with a high level of nationality diversity on the board.

My study contributes to the literature on board composition and accounting conservatism in several ways. First, it refines the measurement of group nationality diversity by introducing a measure that accounts for the nationality composition of foreign directors, to capture the level of diversity. Second, it responds to calls for exploring group dynamics on specialized committees of the board (Adams, Hermalin and Weisbach, 2010 and Carcello, Hermanson, and Ye, 2011) by examining the impact of nationality diversity within the audit committee, which is responsible for monitoring the firm's financial reporting, on accounting conservatism. Third, it identifies a new source of variation in conservatism by providing robust evidence that nationality diversity on the board and its audit committee matters for conservatism in financial reporting. My findings may be of interest to regulators, firms, and investors.

This study is related to Makhlouf, Al-Sufy and Almubaudeen (2018), who find that annual variations in the proportion of foreign directors on Jordanian boards are positively associated with total accruals before depreciation, which is averaged over three years (Ahmed and Duellman, 2007). Unlike Makhlouf *et al*. (2018), my study relates annual variations in the levels of nationality diversity on the board and its audit committee to annual variations in conditional conservatism. My study is therefore different from Makhlouf *et al*. (2018) in many ways. First, it conceptualizes diversity as uniqueness and relates it to conditional conservatism. Second, it employs empirical proxies for diversity and conservatism that are measured annually and differ from those employed by Makhlouf *et al*. (2018). The annual measurement of both proxies avoids the confounding effect of large changes in board nationality diversity during the period over which conservatism is measured (LaFond and Roychowdhury, 2008). Third, it emphasises the role of nationality diversity on the audit committee as opposed to the board.

The study is also related to Masulis, Wang and Xie (2012), who find that independent directors domiciled outside the US are associated with a higher probability of intentional financial misreporting. This finding seems to run counter to my findings, which suggest that nationality diversity on the board and its audit committee is associated with higher conservatism in financial reporting. I argue that my results are mainly driven by audit committee diversity and the geographical location of the UK. First, foreign nationals who qualify for audit committee membership are likely to pay more attention to monitoring the financial reports. This is because the audit committee is charged with ultimate oversight of the financial reporting process (New York Stock Exchange and National Association of Securities Dealers, 1999). To qualify as a member of such a committee, a director should have a sufficient level of financial expertise to enable them to discharge their monitoring duties. Unlike the US case, foreign nationals on UK audit committees are expected to be more familiar with the accounting standards because of the widespread adoption of the international financial reporting standards (IFRS) worldwide since the year

2005. Second, the geographical location of the UK is more easily accessible to many foreign nationals than that of the US, which requires a longer time to cross the Atlantic Ocean. Empirical evidence in support of this argument is provided by Estélyi and Nisar (2016), who find that foreign nationals on UK boards are less likely to have a poor attendance record (below 75%) of board meetings. In contrast, Masulis *et al.* (2012) find the likelihood of missing the 75% board meeting attendance threshold to be higher among independent directors who are domiciled outside the US compared with their domestic (US-domiciled) counterparts.

The remainder of the study is organised as follows. Section 4.2 provides information on the institutional and regulatory background to the diversity debate in the UK. Section 4.3 discusses prior literature and develops the hypotheses to be tested. In Section 4.4, I detail the research design adopted in this study, with the results of my main analyses then presented in Section 4.5. A summary and my conclusions are presented in Section 4.6.

4.2. INSTITUTIONAL BACKGROUND TO BOARD DIVERSITY IN THE UK

The board of directors is regarded as an essential pillar of a firm's governance system. The composition of the board and its committees has therefore been under intense scrutiny by regulators. Recommendations for best practice in relation to board structure in the UK are contained in the Corporate Governance Codes, which are updated every few years, informed at times by reports from business leaders.

The Higgs Review of the Role and Effectiveness of Non-Executive Directors is one such report (Higgs, 2003). Research commissioned by the review committee chairman, Derek Higgs, revealed that only 6% of UK non-executive directors were female, and only 7% were non-British. These findings motivated the UK regulator[54] to commission the Dean of London Business School, Laura Tyson, to prepare a report on 'The Recruitment and Development of Non-Executive Directors' (Tyson, 2003). In it, Tyson argues that,

> *"Diversity in the background, skills, and experiences of NEDs enhances board effectiveness by bringing a wider range of perspectives and knowledge to bear on issues of company performance, strategy and risk."* [p.1]

She talks about diversity in relation to *"background, experience, age, gender, ethnicity and nationality"*. In listing the four broad responsibilities of non-executive directors, Tyson includes: the provision of advice and direction relating to company strategy; monitoring the executives in their implementation of the strategy; monitoring legal and ethical performance; and monitoring *"the veracity and adequacy of the financial and other company information provided to investors and other stakeholders."* [p.4]

After discussing the benefits of diversity within boards, she acknowledges the problems which may accompany it:

> *"Despite these advantages of diversity to group performance, research also suggests that diversity can lead to lower cohesion, less trust and higher turnover within groups unless members are encouraged and trained to trust one another and work together.*

[54] At the time, this was the Department for Trade and Industry, the DTI.

This finding is true across different kinds of diversity including age, gender, racial/ethnic background and tenure within a group." [p.7]

Both Higgs (2003) and Tyson (2003) discuss the benefits of increasing ethnic diversity on boards, an issue which is addressed more thoroughly in the Parker Report (Parker, 2017). This report acknowledges that board diversity is a multi-dimensional concept, where *"… the term "diversity" is not solely limited to gender, but also includes many aspects of the human condition."* [p.25]

The report then makes the business case for ethnic diversity, citing positive benefits such as the reduction of groupthink, increasing the board's ability to deal with a more diverse range of stakeholders, access to a global talent pool, and improved understanding of cultural sensitivities in a global supply chain. The same benefits apply to nationality diversity, which is regarded in the report as a potential source for ethnic-diverse candidates with valuable expertise:

> *"[there are not enough capable and qualified candidates] … such assumptions are outdated and do not reflect a full appreciation of the breadth and depth of expertise available in candidates from a minority ethnic background, not only amongst UK citizens, but also from non-UK nationals."* [p.39]

Although the benefits of ethnic diversity and nationality diversity may overlap, the two constructs are different. In a second report by Sir Parker, firms are encouraged not to use director nationality (among other constructs) as a proxy for director ethnicity in their annual reports; rather they are recommended to distinguish clearly between these constructs (Parker, 2020).

Later, I will make the case that looking at the colour of board members' faces or their names is a noisy way to capture the diversity of background, but it is important to note that this aspect of diversity is seen as an area for development within the UK corporate governance agenda.

These shifts in attitude to the composition of UK boards, and evidence of changes in practice, have sparked a stream of literature which attempts to quantify the determinants and consequences of board diversity in various ways. I review some of this literature in the following section.

4.3. Literature Review and Hypothesis Development

Earlier research has documented that the independence and expertise of the board and its audit committee are important determinants of accounting conservatism (Beekes, Pope and Young, 2004; Ahmed and Duellman, 2007; García Lara, García Osma and Penalva, 2009; Krishnan and Visvanathan, 2008). Nationality diversity can influence both the independence and the expertise of boards and audit committees.

First, board independence is regarded as a key to board effectiveness (Weisbach, 1988; Byrd and Hickman, 1992; Beasley, 1996; Hermalin and Weisbach, 1998). The literature on the determinants of board nationality diversity has revealed that foreign nationals tend to have weak ties with domestic management and pay more attention to the interests of foreign shareholders. For example, Oxelheim, Gregorič, Randøy and Thomsen (2013) find that foreign nationals on Nordic boards are primarily driven by foreign ownership, suggesting that foreign directors are appointed to the board to meet the monitoring needs of foreign investors. Estélyi and

Nisar (2016) also find that UK firms with higher foreign ownership are more likely to hire foreign board members. Further evidence corroborating this finding is provided by Miletkov, Poulsen and Wintoki (2017) using a sample of 62,066 firm-years from eighty countries. From an agency perspective, if foreign directors attribute their board appointment to foreign shareholders, then their membership on the board is likely to enhance its independence. I argue that this likelihood is higher for foreign directors who qualify for membership of the audit committee, which is specifically tasked with monitoring the firm's financial reporting.

In addition, earlier research has documented evidence supporting the premise that board diversity mitigates groupthink (Abbott, Parker and Presley, 2012; Lai, Srinidhi, Gul and Tsui, 2017; Chen, Leung and Goergen, 2017; Bernile *et al*., 2018). Groupthink is associated with an ex-ante dissent-aversion and an ex-post denial of bad news, leading to excessively risky decisions by group members (Bénabou, 2013). It has been cited in relation to the collapse of Enron (O'Connor, 2003) and the Volkswagen emissions scandal (Glebovskiy, 2019). Since harmful groupthink is most problematic in homogeneous groups (Bernile *et al*., 2018), nationality-diverse boards and audit committees are then less prone to groupthink than their homogeneous counterparts.

In sum, nationality diversity could strengthen the independence of the board and its audit committee, leading to effective monitoring of the financial reporting process. Improved monitoring should then be reflected in the firm's financial reports.

Second, the quality of financial reporting is also affected by the mix of expertise on the board and its audit committee. This incudes directors' financial background (Xie, Davidson, and DaDalt, 2003), accounting expertise (Krishnan and Visvanathan, 2008), finance expertise (Dhaliwal, Naiker and Navissi, 2010), and industry expertise (Cohen, Hoitash, Krishnamoorthy and Wright, 2014). From a resource dependence perspective, increasing board diversity provides access to extra skills, experience, and knowledge, which improves the board's ability to make effective decisions (Salancik and Pfeffer, 1978; Singh, 2007). Similarly, it may be argued that diversity expands the set of resources at the audit committee's disposal, leading to better oversight of the financial reporting process.

In my second essay, I find that the level of board nationality diversity depends on the magnitude of a firm's foreign activities. Foreign nationals may bring valuable expertise and insights relevant to these activities (Estélyi and Nisar, 2016) and other complex operations of the firm (Anderson *et al*., 2011). Therefore, I expect the expertise and knowledge brought by foreign nationals to complement those of domestic directors, to make better-informed operating and financial decisions for firms with overseas and complex operations. The knowledge of foreign directors could be particularly crucial when CEO entrenchment is a threat to corporate governance. This argument is supported by the model developed by Baldenius, Melumad and Meng (2014), who demonstrate that shareholders sometimes choose a more advising-heavy board to better serve corporate governance purposes. This happens in cases of severe agency problems in which CEOs entrench themselves by strategically exacerbating project complexity causing substantial difficulties in the flow of information to the board.

Under conservative financial reporting, the disclosed accounting value of net assets is prevented from exceeding, or even reaching, its underlying economic value. Watts (2003a) offers four explanations for the historical prevalence of conservatism in accounting: contracting (including debt and compensation contracts), litigation, taxation, and regulation. After providing a review of the evidence available at the time, Watts (2003b) concludes that the strong body of evidence that accounting is conservative is largely consistent with contracting and litigation explanations. Further evidence of the association between conservatism and litigation risk is provided by Ball, Kothari and Robin (2000) who find that, among the common law countries in their sample, the UK has the least conservative financial reporting, in part due to litigation being less common in the UK relative to other countries. Therefore, contracting is potentially the primary explanation for conservatism in the UK setting.

According to the contracting explanation, conservatism is demanded by capital providers (shareholders and debtholders) to mitigate agency problems emanating from shareholder–management conflicts and debtholder–shareholder conflicts (Ball, 2001; Watts, 2003a; Ball and Shivakumar, 2005). This is because conservatism prevents the disclosed accounting value of net assets from reaching its underlying economic value, thereby constraining management's opportunistic payments to themselves and shareholders (Watts, 2003a). Conservatism is thus a means to efficient contracting between parties to the firm.

Recognizing the above role of conservatism and its benefits to their reputational capital, effective boards are likely to encourage greater conservatism in financial reporting. This proposition can be decomposed into three main points. First, effective boards may proactively elicit timely bad news from management to mitigate agency costs between shareholders and management (Armstrong, Guay, and Weber, 2010). Conservatism is therefore predicted to lower the firm's cost of equity capital, and evidence supporting this prediction is documented by García Lara, García Osma and Penalva (2011). Second, effective boards may also demand conservatism to reduce agency costs between debtholders and shareholders. This point suggests that shareholders accrue indirect benefits from conservatism by lowering the cost of debt. Empirical evidence in line with this argument is provided by Ahmed, Billings, Morton and Stanford-Harris (2002) and Zhan (2008). Third, effective boards could create a demand for conservative financial reporting to preserve their reputational capital. Using board independence as a proxy for board effectiveness, Beekes *et al*. (2004) find that UK firms with higher board independence are more conservative in their financial reporting. Ahmed and Duellman (2007) provide US evidence to corroborate the earlier UK finding. Their results show a negative association between the percentage of inside board members and conservatism. Including the proportion of executive board members, García Lara *et al*. (2009) develop a composite proxy for the strength of a firm's governance system. Using a US sample, the authors then find that their composite measure is positively associated with conservatism in financial reporting.

Recent work has begun to relate other dimensions of board composition to board effectiveness. For example, board gender diversity is found to be positively associated with various aspects of financial reporting quality, including the frequency of voluntary disclosure of "other" events in 8-K reports of large firms (Gul, Srinidhi and Ng, 2011), the quality of accruals (Srinidhi, Gul and Tsui, 2011), a lower likelihood of financial restatement (Abbott *et al.*, 2012), the accuracy of analysts' earnings forecasts (Gul, Hutchinson and Lai, 2013), audit quality (Lai *et al.*, 2017), and conservatism in financial reporting (Srinidhi *et al.*, 2017).

Based on the above review of the literature, nationality diversity strengthens the independence of the board (Oxelheim *et al.*, 2013; Estélyi and Nisar, 2016; Miletkov *et al.*, 2017). In addition, the theory of groupthink predicts excessive risk-taking by members of cohesive homogeneous groups (Janis, 1972), suggesting that diverse boards adopt less risky financial policies. For example, Bernile *et al.* (2018) find that higher diversity on boards is associated with less reliance on debt financing. Diverse boards are also more likely to distribute free cash flow as dividend payouts, thereby mitigating agency costs (Bernile *et al.*, 2018; Chen *et al.*, 2017). Accordingly, nationality-diverse boards and audit committees are expected to demand more conservative financial reporting. Furthermore, these boards and audit committees will have access to international expertise and networks (Masulis *et al.*, 2012; Estélyi and Nisar, 2016) that are expected to enhance corporate governance over firms with overseas subsidiaries or complex operations (Estélyi and Nisar, 2016; Anderson *et al.*, 2011; Baldenius *et al.*, 2014). To sum up, I extend the literature by arguing that nationality diversity improves the independence and the expertise of boards and audit committees who will then demand greater conservatism in financial reporting. This reasoning leads to the following hypothesis:

Hypothesis: *Nationality diversity on the board and the audit committee will be positively associated with conditional conservatism.*

The next section details my research design.

4.4. RESEARCH DESIGN

This section describes my measures of board nationality diversity, audit committee nationality diversity, and conservatism. It also specifies my empirical models, data sources and sample selection criteria.

4.4.1. MEASUREMENT OF NATIONALITY DIVERSITY

I measure board nationality diversity using dissimilarity of director nationalities within the board (*BDDDN*), which is given by the following formula (Simpson, 1949; Rae and Taylor, 1970):

$$BDDDN = 1 - \frac{\sum_{i=1}^{K} n_i(n_i - 1)}{n\,(n-1)} \tag{1}$$

where: n_i is the number of board members in the ith nationality; n is board size. It captures national-origin dissimilarities and reaches its maximum when each director comes from a different country. It also satisfies nine desirable properties for a measure of diversity as uniqueness in a multi-categorical attribute like nationality (see Section 3.3 in my second essay). By analogy, audit committee nationality diversity is measured using *ACDDN*, which is computed following Equation (1), but after replacing board members with audit committee members and board size with audit committee size.

Note that I measure nationality as opposed to ethnicity. This is for two main reasons. First, a lack of available data has forced authors of studies including ethnicity (e.g., Brammer, Millington and Pavelin, 2007; Guest, 2019) to resort to looking at photographs of board members to determine their ethnic status. This could be subjective and imperfect. For example, a white Turkish national with a strong accent would not be classed as ethnic (or 'other') whereas a person born and educated in Oxford but of Asian parentage would be classed as 'other'. Other authors have used board member names as a surrogate to retain valuable observations (e.g., Bernile *et al.*, 2018). This also presents problems as names can reflect the spousal or parental heritage, rather than that of the board member. Therefore, I use the stated nationality of each director to denote whether they are different from the base case, this being of British nationality.

4.4.2. *Measurement of Conservatism*

Ball and Shivakumar (2005) and Beaver and Ryan (2005) distinguish between conditional and unconditional conservatism. Beaver and Ryan (2005, p. 269) state: *"Under unconditional conservatism, the book value of net assets is understated due to predetermined aspects of the accounting process. Under conditional conservatism, book value is written down under sufficiently adverse circumstances, but not up under favorable circumstances."* Examples of the former include accelerated depreciation and expensing research and development costs as incurred. Examples of the latter include impairment recognition for long-lived assets and valuing inventory at the lower of cost or market. Unlike unconditional conservatism, conditional conservatism carries new information, which makes it an important concept in financial reporting (Ball, Kothari and Nikolaev, 2013a).

I measure conditional conservatism by using Basu's (1997) asymmetric timeliness coefficient, which captures the incremental timeliness of incorporating bad news over good news in earnings (i.e., asymmetric timeliness of earnings). Following prior research (e.g., Banker *et al.*, 2016; Srinidhi *et al.*, 2017; LaFond and Roychowdhury, 2008), I employ several models to capture the Basu coefficient. I specify these models below.

4.4.3. Empirical Models

Khan and Watts (2009) have extended Basu's (1997) model by including size, leverage, and market-to-book ratio as drivers of conservatism. I extend their work by adding nationality diversity on the board and its audit committee as another potential determinant of conservatism. Therefore, I start by specifying a modified Basu model as follows:

$$
\begin{aligned}
X_{it} = {} & (\beta_{01} + \beta_{02}ND_{it} + \beta_{03}SIZE_{it} + \beta_{04}LEV_{it} + \beta_{05}MTB_{it}) \\
& + DR_{it}\,(\beta_{11} + \beta_{12}ND_{it} + \beta_{13}SIZE_{it} + \beta_{14}LEV_{it} + \beta_{15}MTB_{it}) \\
& + RET_{it}\,(\beta_{21} + \beta_{22}ND_{it} + \beta_{23}SIZE_{it} + \beta_{24}LEV_{it} + \beta_{25}MTB_{it}) \\
& + DR_{it}RET_{it}(\beta_{31} + \beta_{32}ND_{it} + \beta_{33}SIZE_{it} + \beta_{34}LEV_{it} + \beta_{35}MTB_{it}) \\
& + \sum_{d=1}^{D-1} \delta_{1d}\, IND_d + \sum_{t=1}^{T-1} \lambda_{1t}\, YEAR_t + \varepsilon_{it}
\end{aligned}
$$

(2)

where: X_{it} is defined as one of the following: (i) $EARN_{it}$ = net income before extraordinary items divided by opening market value of equity (Khan and Watts, 2009), (ii) ACC_{it} = net income before extraordinary items – operating cash flows (*CFO*), scaled by lagged market value of equity (Collins *et al*., 2014), or (iii) $ACCDEP_{it}$ = net income before extraordinary items – CFO + depreciation expense, scaled by lagged market value of equity (Givoly and Hayn, 2000; Beaver and Ryan, 2005; Banker *et al*., 2016); RET_{it} is the compound stock returns for the 12-month period ending at the fiscal-year end; DR_{it} is a dummy indicator, for negative returns, that takes a value of one if *RET* is negative, and zero otherwise; ND_{it} is nationality diversity, which is defined as one of the following: board nationality diversity ($BDDDN_{it}$), audit committee nationality diversity ($ACDDN_{it}$), or a dummy indicator for the presence of high nationality diversity levels on both the board and its audit committee ($HIDDN_{it}$). $HIDDN_{it}$ is equal to one if both *BDDDN* and *ACDDN* in a given year are above their sample median for the same year, and zero otherwise; $SIZE_{it}$ is the natural logarithm of the market value of equity; LEV_{it} is short-term plus long-term debt, scaled by the market value of equity; MTB_{it} is the market value of equity divided by the book value of equity; *d* denotes a specific industry and *D* is the number of industries in my sample; IND_d is a set of industry controls; *t* denotes a specific year, and *T* is the sample period; $YEAR_t$ is a set of year controls; ε_{it} is an error term.

In this model, it is expected that, due to the availability of public information about firms, returns lead earnings, that is, stock returns reflect information in a timelier way than earnings. Where accounting conservatism is present, bad news, already reflected in stock prices, will be more quickly reflected in earnings, leading to a stronger association between earnings and stock prices in 'bad news' firms compared to 'good news' firms. In the original Basu's (1997) model, conditional conservatism then manifest itself in a significantly positive slope coefficient on the interaction between 'bad news' and stock returns (*DR*RET*). This coefficient is therefore my measure of conditional conservatism.

To test whether a specific variable (*V*) is a determinant of conditional conservatism, this variable should be interacted with *DR*, *RET*, and their interaction (*DR*RET*) in a Basu-type reverse regression of earnings on returns. If the estimation of the resultant regression model reveals a significant coefficient on the three-way interaction (*DR*RET*V*) then variable (*V*) is a determinant of conditional conservatism.

Khan and Watts (2009) propose that maturity and better information environments (*SIZE*), debtholder demands for conservatism (*LEV*), and growth options (*MTB*) are key drivers of conservatism. In particular, the authors expect the coefficients on the interaction terms of *SIZE*, *LEV*, and *MTB* with *DR*RET* to be negative (β_{33}), positive (β_{34}), and positive (β_{35}), respectively.

I extend earlier work by examining a new potential source of variation in conservatism, which is nationality diversity on the board and its audit committee. My hypothesis predicts a positive association of nationality diversity (*ND*) with conditional conservatism. A positive coefficient is therefore expected on the three-way interaction: *DR*RET*ND* (β_{32}).

Banker *et al.* (2016) point out that cost asymmetry in response to sales changes could bias conservatism estimates of the standard asymmetric timeliness models. This asymmetry exists because costs rise more in response to sales increases than they fall for sales decreases. Following Banker *et al.* (2016), I apply the sticky cost adjustment to my modified Basu model, as follows:

$$
\begin{aligned}
X_{it} = (\beta_{01} + \beta_{02}ND_{it} + \beta_{03}SIZE_{it} + \beta_{04}LEV_{it} + \beta_{05}MTB_{it}) \\
+ DR_{it}\,(\beta_{11} + \beta_{12}ND_{it} + \beta_{13}SIZE_{it} + \beta_{14}LEV_{it} + \beta_{15}MTB_{it}) \\
+ RET_{it}\,(\beta_{21} + \beta_{22}ND_{it} + \beta_{23}SIZE_{it} + \beta_{24}LEV_{it} + \beta_{25}MTB_{it}) \\
+ DR_{it}RET_{it}(\beta_{31} + \beta_{32}ND_{it} + \beta_{33}SIZE_{it} + \beta_{34}LEV_{it} + \beta_{35}MTB_{it}) \\
+ DS_{it}\,(\beta_{41} + \beta_{42}ND_{it} + \beta_{43}SIZE_{it} + \beta_{44}LEV_{it} + \beta_{45}MTB_{it}) \\
+ \Delta SALES_{it}\,(\beta_{51} + \beta_{52}ND_{it} + \beta_{53}SIZE_{it} + \beta_{54}LEV_{it} + \beta_{55}MTB_{it}) \\
+ DS_{it}\Delta SALES_{it}(\beta_{61} + \beta_{62}ND_{it} + \beta_{63}SIZE_{it} + \beta_{64}LEV_{it} + \beta_{65}MTB_{it}) \\
+ \sum_{d=1}^{D-1} \delta_{1d}\, IND_d + \sum_{t=1}^{T-1} \lambda_{1t}\, YEAR_t + \eta_{i,t}
\end{aligned}
\tag{3}
$$

where: $\Delta SALES_{it}$ is the sales change in year t scaled by the lagged market value of equity; DS_{it} is a dummy indicator, for a decrease in sales, that takes a value of one if $\Delta SALES$ is negative, and zero otherwise; $\eta_{i,t}$ is an error term.

To account for the industry- and year-specific variations in conservatism, I allow Basu coefficients to vary by industry and year. Specifically, I interact industry/year controls with the three fundamental terms in the Basu model: *DR*, *RET*, and the interaction between them (*DR*RET*), as follows:

$$
\begin{aligned}
X_{it} = {} & (\beta_{01} + \beta_{02}ND_{it} + \beta_{03}SIZE_{it} + \beta_{04}LEV_{it} + \beta_{05}MTB_{it}) \\
& + DR_{it}\,(\beta_{11} + \beta_{12}ND_{it} + \beta_{13}SIZE_{it} + \beta_{14}LEV_{it} + \beta_{15}MTB_{it}) \\
& + RET_{it}\,(\beta_{21} + \beta_{22}ND_{it} + \beta_{23}SIZE_{it} + \beta_{24}LEV_{it} + \beta_{25}MTB_{it}) \\
& + DR_{it}RET_{it}(\beta_{31} + \beta_{32}ND_{it} + \beta_{33}SIZE_{it} + \beta_{34}LEV_{it} + \beta_{35}MTB_{it}) \\
& + DS_{it}\,(\beta_{41} + \beta_{42}ND_{it} + \beta_{43}SIZE_{it} + \beta_{44}LEV_{it} + \beta_{45}MTB_{it}) \\
& + \Delta SALES_{it}\,(\beta_{51} + \beta_{52}ND_{it} + \beta_{53}SIZE_{it} + \beta_{54}LEV_{it} + \beta_{55}MTB_{it}) \\
& + DS_{it}\Delta SALES_{it}(\beta_{61} + \beta_{62}ND_{it} + \beta_{63}SIZE_{it} + \beta_{64}LEV_{it} + \beta_{65}MTB_{it}) \\
& + \sum_{d=1}^{D-1} IND_d(\delta_{1d} + \delta_{2d}DR_{it} + \delta_{3d}RET_{it} + \delta_{4d}DR_{it}RET_{it}) \\
& + \sum_{t=1}^{T-1} YEAR_t(\lambda_{1t} + \lambda_{2t}DR_{it} + \lambda_{3t}RET_{it} + \lambda_{4t}DR_{it}RET_{it}) + \Upsilon_{it}
\end{aligned}
\tag{4}
$$

where: Υ_{it} is an error term.

Given that my empirical model is a partial econometric model which includes a constant term to capture the effects of potential unobservable omitted variables, my OLS estimates will be unbiased only if the unobservable omitted variables are uncorrelated with one or more of my independent variables. OLS-based conservatism estimates are therefore biased if time-invariant firm-specific characteristics that relate to both earnings and returns are not controlled for (Ball *et al.*, 2013b). To address this concern, I specify the below fixed-effects model.

$$
\begin{aligned}
X_{it} = (&\beta_{01} + \beta_{02}ND_{it} + \beta_{03}SIZE_{it} + \beta_{04}LEV_{it} + \beta_{05}MTB_{it}) \\
&+ DR_{it}\,(\beta_{11} + \beta_{12}ND_{it} + \beta_{13}SIZE_{it} + \beta_{14}LEV_{it} + \beta_{15}MTB_{it}) \\
&+ RET_{it}\,(\beta_{21} + \beta_{22}ND_{it} + \beta_{23}SIZE_{it} + \beta_{24}LEV_{it} + \beta_{25}MTB_{it}) \\
&+ DR_{it}RET_{it}(\beta_{31} + \beta_{32}ND_{it} + \beta_{33}SIZE_{it} + \beta_{34}LEV_{it} + \beta_{35}MTB_{it}) \\
&+ DS_{it}\,(\beta_{41} + \beta_{42}ND_{it} + \beta_{43}SIZE_{it} + \beta_{44}LEV_{it} + \beta_{45}MTB_{it}) \\
&+ \Delta SALES_{it}\,(\beta_{51} + \beta_{52}ND_{it} + \beta_{53}SIZE_{it} + \beta_{54}LEV_{it} + \beta_{55}MTB_{it}) \\
&+ DS_{it}\Delta SALES_{it}(\beta_{61} + \beta_{62}ND_{it} + \beta_{63}SIZE_{it} + \beta_{64}LEV_{it} + \beta_{65}MTB_{it}) \\
&+ \sum_{t=1}^{T-1} YEAR_t(\lambda_{1t} + \lambda_{2t}DR_{it} + \lambda_{3t}RET_{it} + \lambda_{4t}DR_{it}RET_{it}) + \sum_{i=1}^{I-1} \mu_i\, FE_i + \alpha_{it}
\end{aligned}
\tag{5}
$$

where: i denotes a specific firm, and I is the number of unique firms in the sample; FE_i is a set of firm controls; α_{it} is an error term.

Lastly, I incorporate other board-level characteristics that are deemed important in explaining firm-level variations in conservatism, including the proportion of executive board members (*BDEXD*; Ahmed and Duellman, 2007), executives' ownership (*BDEXOWN*; LaFond and Roychowdhury, 2008), and the proportion of female directors (*BDFEM*; Srinidhi *et al.*, 2017). I also add an indicator for the presence of strong cultural faultlines on the board (*STROFAU*). Because 75% of audit committees in my sample have four or fewer members, subgroups within audit committees are unlikely. For this reason, I do not include an indicator of the presence of strong cultural faultlines on the audit committee. My extended model is therefore specified as follows:

$$
\begin{aligned}
X_{it} = (&\beta_{01} + \beta_{02}ND_{it} + \beta_{03}SIZE_{it} + \beta_{04}LEV_{it} + \beta_{05}MTB_{it} + \beta_{06}BDEXD_{it} \\
&+ \beta_{07}BDEXOWN_{it} + \beta_{08}BDFEM_{it} + \beta_{09}STROFAU_{it}) \\
&+ DR_{it}\,(\beta_{11} + \beta_{12}ACND_{it} + \beta_{13}SIZE_{it} + \beta_{14}LEV_{it} + \beta_{15}MTB_{it} \\
&+ \beta_{16}BDEXD_{it} + \beta_{17}BDEXOWN_{it} + \beta_{18}BDFEM_{it} + \beta_{19}STROFAU_{it}) \\
&+ RET_{it}\,(\beta_{21} + \beta_{22}ACND_{it} + \beta_{23}SIZE_{it} + \beta_{24}LEV_{it} + \beta_{25}MTB_{it} \\
&+ \beta_{26}BDEXD_{it} + \beta_{27}BDEXOWN_{it} + \beta_{28}BDFEM_{it} + \beta_{29}STROFAU_{it}) \\
&+ DR_{it}RET_{it}(\beta_{31} + \beta_{32}ACND_{it} + \beta_{33}SIZE_{it} + \beta_{34}LEV_{it} + \beta_{35}MTB_{it} \\
&+ \beta_{36}BDEXD_{it} + \beta_{37}BDEXOWN_{it} + \beta_{38}BDFEM_{it} + \beta_{39}STROFAU_{it}) \\
&+ DS_{it}\,(\beta_{41} + \beta_{42}ACND_{it} + \beta_{43}SIZE_{it} + \beta_{44}LEV_{it} + \beta_{45}MTB_{it} \\
&+ \beta_{46}BDEXD_{it} + \beta_{47}BDEXOWN_{it} + \beta_{48}BDFEM_{it} + \beta_{49}STROFAU_{it}) \\
&+ \Delta SALES_{it}\,(\beta_{51} + \beta_{52}ACND_{it} + \beta_{53}SIZE_{it} + \beta_{54}LEV_{it} + \beta_{55}MTB_{it} \\
&+ \beta_{56}BDEXD_{it} + \beta_{57}BDEXOWN_{it} + \beta_{58}BDFEM_{it} + \beta_{59}STROFAU_{it}) \\
&+ DS_{it}\Delta SALES_{it}(\beta_{61} + \beta_{62}ACND_{it} + \beta_{63}SIZE_{it} + \beta_{64}LEV_{it} + \beta_{65}MTB_{it} \\
&+ \beta_{66}BDEXD_{it} + \beta_{67}BDEXOWN_{it} + \beta_{68}BDFEM_{it} + \beta_{69}STROFAU_{it}) \\
&+ \sum_{d=1}^{D-1} \delta_{1d}\, IND_d + \sum_{t=1}^{T-1} \lambda_{1t}\, YEAR_t + \nu_{it}
\end{aligned} \tag{6}
$$

where: ν_{it} is an error term. A full definition of each variable is provided in Table 1.

[Table 1 about here]

4.4.4. DATA AND SAMPLE

My dataset comprises UK-domiciled non-financial firms that are listed on the London Stock Exchange over the period from 1999 to 2018. The dataset is obtained by merging available board data from the BoardEx database with their respective financial data from the Worldscope database, excluding unlisted firms and those with missing industry classification benchmark (ICB) code. Because a firm's annual report date on BoardEx database is reported at the beginning of the month in which its fiscal year ends, I require any difference in corporate annual reporting date between BoardEx data and Worldscope data to be less than or equal to one month. This involves correcting for Worldscope mid-January rule,[55] then dropping firm-years with a reporting year that is more than seven days above or below 365.

The resultant sample consists of 24,318 firm-year observations for 2,764 unique firms. Panel A of Table 2 shows that some observations are then excluded due to one of the following reasons: (1) belonging to the financial sector—ICB industry code = 8000; (2) domiciled outside the UK; (3) missing age data for at least one board member; (4) missing nationality data for at least one board member; (5) having a board size of fewer than three directors; (6) having an audit committee size of fewer than three directors; (7) having a negative book value of equity; (8) having a share price of less than 1 pound;[56] (9) missing returns for at least one month of the year; (10) missing data of some required variables. The final sample consists of 6,469 firm-years from 992 unique firms. It includes 52,362 board director-years, with 23,723 audit committee

[55] This rule stipulates a cut-off date of 15 January of each year as the basis for classifying non-US firms' financial data into years on the Worldscope platform (Worldscope, 2013, p. 41). Accordingly, if a firm's fiscal year ends before mid-January in year *t*, its financial data will be classified by Worldscope as belonging to year *t-1*. However, this firm's board data will still be classified by BoardEx as belonging to year *t*.

[56] Exclusion Criteria (7) and (8) are employed following Khan and Watts (2009).

director-years, 98% of whom are non-executives. Panel B of Table 2 provides a breakdown of the final sample by industry and across years.

[Table 2 about here]

The next section details my analyses of this sample.

4.5. ANALYSIS

Descriptive statistics for the sample are presented in Table 3. Continuous variables are winsorized at their 1st and 99th percentiles to reduce the influence of outliers. Nationality diversity on the average (median) board has a value of 0.239 (0.200), *BDDDN*. More than 50% of audit committees have no foreign board members. The median of audit committee nationality diversity (*ACDDN*) is therefore zero, but it has an average value of 0.235. Both variables (*BDDDN* and *ACDDN*) occupy a tidy range of variation from a minimum value of zero, indicating a homogeneous group, to a maximum value of one, indicating that each director comes from a different country. About one-third of sample firms have high levels of nationality diversity on both the board and its audit committee (*HIDDN*). Executive directors represent almost 40% of the average board (*BDEXD*). The natural logarithm of mean equity ownership by executive board members (*BDEXOWN*) has an average (median) of 6.941 (7.118). Women comprise 9.5% of the average board (*BDFEM*). Boards with strong cultural faultlines (*STROFAU*) represent 11.4% of the sample. The average and median board has approximately eight members (*BDSIZE*), whereas average (median) audit committee size (*ACSIZE*) is 3.667 (3).

Turning to firm characteristics, average earnings (*EARN*), accruals (*ACC*), and accruals before depreciation (*ACCBDEP*) are 4%, −5.9%, and −0.3% of the opening market value of equity, respectively. Sample average (median) annual stock returns (*RET*) are 19.1% (13.5%). Slightly more than a third of sample firms suffer negative annual stock returns (*DR*). The natural logarithm of the market value of equity (*SIZE*) for the average firm is 13.027. Average (median) debt to equity ratios (*LEV*) for the sample are 0.29 (0.17) and firms have an average (median) market to book ratio (*MTB*) of 3.77 (2.42). The average (median) sample firm experiences annual sales growth (*ΔSALES*) equivalent to 10.3% (5.2%) of opening market value of equity, though 24.3% of firms suffer an annual decline in sales (*DS*).

[Table 3 about here]

In Table 4, I report descriptive statistics relating to nationality diversity on boards and audit committees over time. Despite some decreases in years 2004 and 2010, the average proportion of foreign directors on the board (*BDFDs*) has an overall upward trend over my sample period, growing from 0.10 in 1999 to almost double (0.19) in 2018. Likewise, we can see a similar pattern for the average proportion of foreign directors on the audit committee (*ACFDs*). Turning to my measures of nationality diversity, we can see that the biggest increase (by 14.9%) in board nationality diversity (*BDDDN*) is in the year 2007, while the biggest increase (by 16.3%) in *BDFDs* takes place in the year 2003. This difference is because my measure (*BDDDN*) accounts for dissimilarities in foreign directors' nationalities, whereas the *BDFDs* regards foreign nationals as a homogeneous set of directors. By comparing the annual averages for audit committee nationality diversity (*ACDDN*) with those for

ACFDs, both have the biggest increase in the year 2003, but they are different in terms of the year of the biggest decline: 2010 (by 4.8%) and 2004 (by 5.2%), respectively. This provides further empirical support that my measure of nationality diversity as uniqueness is different from the conventional measure of the proportion of foreign directors.

[Table 4 about here]

Before moving on to conduct multivariate tests of my hypothesis, I report Pearson correlations in Table 5. Of note are the high correlations between my measures of nationality diversity on the board (*BDDDN*), the audit committee (*ACDDN*), and both of them (*HIDDN*): 0.80 (*BDDDN* and *ACDDN*), 0.77 (*BDDDN* and *HIDDN*), and 0.92 (*ACDDN* and *HIDDN*). This does not introduce a multicollinearity problem to my multivariate tests because each of these measures is included separately in my empirical models. None of the other correlations is high enough to introduce issues of multicollinearity in my main tests, which are reported below.

[Table 5 about here]

4.5.1. Main Tests

Table 6 reports the results of the first tests of my hypothesis, which predicts positive associations of board/audit committee nationality diversity with conditional conservatism. The results in this table are estimations of my modified Basu model, Eq. (2), using earnings (*EARN*) as the dependent variable. As described in Subsection 4.4.3, my coefficient of interest is β_{32} (*DR*RET*ND*). If this coefficient is positive and significant, it will indicate that nationality diversity (*ND*) is strongly associated with conservatism in the way predicted by my hypothesis. In Models (1)–(2) , (3)–(4), and (5)–(6), I define *ND* as board nationality diversity (*BDDDN*), audit committee nationality diversity (*ACDDN*), and a dummy indicator for the presence of high nationality diversity levels on both the board and its audit committee (*HIDDN*), respectively.

[Table 6 about here]

Model (1) shows OLS estimation results of the modified Basu model. I find a significant positive coefficient on the interaction term of interest: *DR*RET*BDDDN*, suggesting a positive association between board nationality diversity (*BDDDN*) and conservatism. Consistent with Khan and Watts (2009), coefficient estimates on the interactions of *DR*RET* with firm size (*SIZE*), leverage (*LEV*), and market-to-book ratio (*MTB*) have the expected signs, but only firm size (*SIZE*) is significant at the 1% level.

In Models (3) and (5), I also find significant positive coefficients on the interaction terms of interest: *DR*RET*ACDDN* and *DR*RET*HIDDN*, respectively. By comparing these results with those reported in Model (1), we can see that audit committee nationality diversity (*ACDDN*) is more strongly associated with conservatism, in the sense of having a higher *t*-statistic, compared to board nationality diversity (*BDDDN*): coefficient = 0.148 and *t*-stat. = 2.38 versus coefficient = 0.160 and *t*-stat. = 2.06, respectively. The association is even stronger for firms with high nationality diversity levels on both the board and its audit committee (*HIDDN*), coefficient = 0.109 and *t*-stat. = 2.52. Coefficient estimates on control variables are generally in line with those reported in Model (1).

A potential interpretation of the above OLS results is that nationality diversity on the board and the audit committee encourage greater conservatism in financial reporting by enhancing board/audit committee independence and expanding their resource pool. A major concern with this interpretation is the potential endogenous nature of the relationships between board/audit committee nationality diversity and conservatism. In particular, the endogeneity problem occurs when foreign directors are not randomly distributed among firms, and their representation on boards and audit committees is indirectly related to conservative financial reporting. To mitigate this concern, I allow *BDDDN*, *ACDDN*, and *HIDDN* to be endogenous and implement instrumental variable tests using 2SLS regressions.

I employ the average values of *BDDDN*, *ACDDN* and their interaction (*BDDDN**ACDDN*) for firms headquartered within the same postcode area as instrumental variables for *BDDDN*, *ACDDN* and *HIDDN*, respectively. These instruments are motivated by the role of a firm's headquarters location in attracting foreign directors (Masulis *et al.*, 2012 and Frijns *et al.*, 2016). My instruments (*LOCALBDs*, *LOCALACs*, and *LOCALBDACs*)[57] are thus likely to be correlated with the nationality diversity measures (*BDDDN*, *ACDDN*, and *HIDDN*), but unlikely to have a direct association with conservatism.

Tests for the relevance of my instruments indicate that they are correlated with the endogenous regressors,[58] and the correlations are not weak.[59] The first stage results

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[57] See Table 1 for a detailed definition of each instrument.

[58] In all 2SLS estimations, the p-value of the Kleibergen-Paap-LM statistic is 0.0000, rejecting the null hypothesis that first-stage models are under-identified.

[59] In all 2SLS estimations, first stage results reveal that the Kleibergen-Paap Wald F statistic on the excluded instruments is greater than the threshold value of 10 (Staigler and Stock, 1997): 32.229,

(untabulated) show strong positive associations between the endogenous regressors and their respective instruments (the p-values are consistently equal to 0.000), confirming my expectations.

Second stage results are reported in Models (2), (4), and (6). In Model (2), I find a positive and significant coefficient on the interaction term of interest: *DR*RET*INSTBDDDN*, where *INSTBDDDN* refers to instrumented *BDDDN* (coeff. = 0.362 and *t*-stat. = 1.97). In Models (4) and (6), the interaction terms of interest are *DR*RET*INSTACDDN* (where *INSTACDDN* refers to instrumented *ACDDN*) and *DR*RET*INSTHIDDN* (where *INSTHIDDN* refers to instrumented *HIDDN*), respectively. The former has a marginally significant coefficient (coeff. = 0.274 and *t*-stat. = 1.95), whilst the latter has a significant coefficient (coeff. = 0.251 and *t*-stat. = 2.12). The 2SLS results thus confirm that nationality diversity on the board and the audit committee impact accounting conservatism, and the impact is greater for firms with high diversity levels on both the board and the audit committee. Overall, both OLS and 2SLS results support my hypothesis and suggest that firms with greater nationality diversity on the board and its audit committee are significantly more conservative in their financial reporting when compared to firms with less diverse boards/audit committees.

29.492, and 22.029 for Models (2), (4), and (6), respectively. Also, the value of Cragg-Donald F-statistic is consistently greater than the Stock-Yogo critical value of 24.58 (Stock and Yogo, 2005): 171.262, 145.416, and 96.980 for Models (2), (4), and (6), respectively. Both statistics indicate that my instruments are not weak.

4.5.2. Robustness Tests

Collins *et al*. (2014) decompose the Basu asymmetric timeliness of earnings into accrual asymmetry and cash flow asymmetry. The authors then posit that cash flow asymmetry, which is unlikely to manifest conditional conservatism, could bias the Basu asymmetric timeliness of earnings. To adjust for this potential bias, operating cash flows (*CFO*) should be excluded from earnings. I implement this adjustment and report the results in Table 7, where the accrual component of earnings (*ACC*) is the dependent variable. In Models (1) to (3), I am interested in the interaction terms of *DR*RET* with board nationality diversity (*BDDDN*), audit committee nationality diversity (*ACDDN*), and the presence of high nationality diversity levels on the board and its audit committee (*HIDDN*), respectively. I find the coefficients on these terms to have bigger magnitude and stronger significance than those reported in Models (1), (3), and (5) of Table 6: coeff. = 0.188; *t*-stat. = 2.47, coeff. = 0.184; *t*-stat. = 3.02, and coeff. = 0.119; *t*-stat. = 2.68 versus coeff. = 0.160; *t*-stat. = 2.06, coeff. = 0.148; *t*-stat. = 2.38, and coeff. = 0.109; *t*-stat. = 2.52, respectively. The results after adjusting for cash flow asymmetry thus provide further support to my hypothesis.

[Table 7 about here]

Banker *et al*. (2016) propose another adjustment to account for the confounding effect of sticky costs on conditional conservatism. I incorporate this adjustment in Eq. (3), which is then estimated in Table 8 using two alternative definitions for the dependent variable: earnings (*EARN*) and the accrual component of earnings (*ACC*). In support of my hypothesis, the results on the interaction terms of interest are generally consistent with those reported without the sticky cost adjustment.

[Table 8 about here]

Next, I execute further tests of my hypothesis after allowing the three fundamental terms in the Basu model (*DR*, *RET*, and *DR*RET*) to vary by industry and year, Eq. (4), to account for the industry- and year-specific variations in conservatism. Table 9 reports the results of these tests. The results are again consistent with those reported earlier, except for the interaction of *DR*RET* with board nationality diversity (*BDDDN*), which still has a positive, albeit insignificant, coefficient in Model (1). These results lend support to the idea that audit committee nationality diversity (*ACDDN*) is more important than board nationality diversity (*BDDDN*) in explaining variations in conservatism.

[Table 9 about here]

My subsequent set of tests pays regard to the potential influence of time-invariant firm-specific characteristics, that relate to both earnings and returns, on OLS-based conservatism estimates. In particular, the estimates will be biased if these characteristics are not controlled for (Ball *et al*., 2013b). To address this concern, I estimate a fixed-effects model, Eq. (5), that controls for these characteristics, thereby mitigating concerns about the problem of correlated-omitted-variables. Table 10 reports the results, which are in line with those reported in Table 9. Together, the results in both tables are supportive of my hypothesis.

[Table 10 about here]

After that, I augment the modified Basu model with controls for other potential board-level determinants of conservatism, including the proportion of executive directors (Ahmed and Duellman, 2007), executives' ownership (LaFond and

Roychowdhury, 2008), the proportion of female directors (Srinidhi *et al.*, 2017), and the presence of strong cultural faultlines on the board. Table 11 presents the results of estimating this extended model, Eq. (6). I find positive and significant coefficients on the interaction terms of interest, except for the interaction of *DR*RET* with board nationality diversity (*BDDDN*), which has a marginally significant coefficient in Model (1). Coefficient estimates on control variables are generally consistent with expectations.[60]

Finally, I re-estimate the models from Equations (2) to (6) after adjusting for depreciation, which is unlikely to reflect conditional conservatism (Givoly and Hayn, 2000; Beaver and Ryan, 2005; Banker *et al.*, 2016). The results across all model specifications are consistent with those obtained using the accrual component of earnings (*ACC*) as the dependent variable (see Appendix A).

Overall, the results of the robustness tests strongly support my hypothesis: there is a stronger positive association between earnings and returns in bad news firms (i.e., greater reporting conservatism) where the board and its audit committee are more diverse with respect to the nationality of their members.

[Table 11 about here]

The next section summarises my study and its findings.

[60] When I re-estimate the models in Table 11 after dropping missing values for *BDEXOWN* (291 observations), I obtain similar results (untabulated).

4.6. Summary and Conclusions

I examine nationality diversity on the board and its audit committee in relation to conservatism in financial reporting. I propose that nationality diversity enhances the effectiveness of boards and audit committees because: (i) directors from different foreign countries tend to have weak ties with each other and with domestic management, (ii) nationality diversity mitigates harmful groupthink, which is associated with excessively risky decisions being made by cohesive, often homogeneous, sets of people, and (iii) nationality diversity brings valuable expertise and insights relevant to a firm's operations, especially for firms with complex and overseas operations. Effective boards and audit committees are then expected to demand greater conservatism in financial reporting to preserve their reputational capital, mitigate agency costs between shareholders and management, and reduce the cost of debt.

To test my proposition, I employ a large sample of UK firms, where there is substantial heterogeneity in directors' nationalities. My diversity measure accounts for the nationality composition of foreign directors to capture the level of diversity. I find that nationality diversity on both the board and the audit committee is positively associated with conditional conservatism, measured by Basu's (1997) asymmetric timeliness coefficient. The results hold after mitigating sources of endogeneity, including self-selection bias and omitted-variable bias by using 2SLS and fixed-effects regressions. The results are also robust to several model specifications that mitigate possible sources of bias in the Basu model and to a battery of board-level, firm-level, industry, and year controls.

My findings suggest that foreign nationals who qualify for audit committee membership negatively impact its appetite for risk-taking in financial reporting. This effect is strengthened when nationality diversity on the audit committee is supported with a high level of nationality diversity on the board. These findings could be of interest to regulators, firms, and investors.

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Table 1 – Variable Definitions and Data Sources

Panel A: Board Characteristics

Variable	Source	Definitions
Nationality diversity		
BDDDN	BoardEx and FAME	$= 1 - \left[\sum_{i=1}^{K} n_i(n_i - 1) \div n\,(n-1)\right]$, where: n_i is the number of directors in the ith nationality on the board, and n is board size (Simpson, 1949; Rae and Taylor, 1970).
ACDDN	BoardEx and FAME	$= 1 - \left[\sum_{i=1}^{K} n_i(n_i - 1) \div n\,(n-1)\right]$, where: n_i is the number of directors in the ith nationality on the audit committee, and n is audit committee size (Simpson, 1949; Rae and Taylor, 1970).
HIDDN	BoardEx and FAME	=A dummy indicator, for the presence of high nationality diversity levels on both the board and its audit committee, that equals one if both *BDDDN* and *ACDDN* in a given year are above their sample median for the same year, and zero otherwise.
Instrumental variables		
LOCALBDs	BoardEx and FAME	= The average value of *BDDDN* for firms headquartered within the same postcode area.
LOCALACs	BoardEx and FAME	= The average value of *ACDDN* for firms headquartered within the same postcode area.
LOCALBDACs	BoardEx and FAME	= The average value of the interaction between *BDDDN* and *ACDDN* for firms headquartered within the same postcode area.
Other board characteristics		
BDEXD	BoardEx	= The proportion of executive directors on the board.
BDEXOWN	BoardEx	=The natural logarithm of one plus mean equity ownership by executive board members at year-end. Missing values (291 observations) are set to zero.
BDFEM	BoardEx	= The proportion of female directors on the board.
STROFAU	BoardEx and FAME	= A dummy indicator, for strong faultlines, that takes a value of one if the strength of board cultural faultlines has a value of at least 0.9, and zero otherwise. The strength of board cultural faultlines (*Cultural faultlines*) is a proxy for the strength of cultural separation between cultural subgroups on the board. Its computation involves attaching Hofstede's four-dimensional scores to directors' nationalities, then clustering directors into cultural subgroups by using a clustering algorithm developed by Meyer and Glenz (2013). The software used for executing the algorithm provides a summary value of the strength of the cultural separation.
BDSIZE	BoardEx	= The number of directors on the board.
ACSIZE	BoardEx	= The number of directors on the audit committee.

Panel B: Firm Characteristics

Variable	Source	Definitions
Basu (1997)		
EARN	Worldscope	= Net income before extraordinary items scaled by the opening market value of equity.
RET	Datastream	= Compound stock returns for 12 months ending at the fiscal-year end.
DR	Datastream	= A dummy indicator, for negative returns, that takes a value of one if *RET* is negative, and zero otherwise.
Khan and Watts (2009)		
SIZE	Worldscope	= The natural logarithm of the market value of equity.
LEV	Worldscope	= Short-term plus long-term debt, scaled by the market value of equity.
MTB	Worldscope	= The market value of equity divided by the book value of equity.
Banker et al. (2016)		
Δ*SALES*	Worldscope	= Sales change scaled by the lagged market value of equity.
DS	Worldscope	= A dummy indicator, for a decrease in sales, that takes a value of one if Δ*SALES* is negative, and zero otherwise.
Accruals-based Models		
ACC	Worldscope	= Net income before extraordinary items minus cash flows from operations (*CFO*), scaled by the lagged market value of equity. It is referred to as the accrual component of earnings (Collins *et al*., 2014).
ACCBDEP	Worldscope	= Net income before extraordinary items minus cash flows from operations (*CFO*) plus depreciation expense, scaled by the lagged market value of equity. It is referred to as accruals before depreciation (Givoly and Hayn, 2000; Beaver and Ryan, 2005; Banker *et al*., 2016).

Table 2 – Sample

Panel A: Sample Selection

	Firm-years	Unique Firms
Initial sample	24,318	2,764
Exclusion criteria		
(1) Belonging to the financial sector	(6,195)	(718)
(2) Domiciled outside the UK	(119)	(12)
(3) Missing age data for at least one board member	(40)	(3)
(4) Missing nationality data for at least one board member	(892)	(50)
(5) Having a board size of less than three directors	(166)	(9)
(6) Having an audit committee size of less than three directors	(5,888)	(378)
(7) Having a negative book value of equity	(493)	(36)
(8) Having a share price of less than 1 pound	(3,737)	(502)
(9) Missing returns for at least one month of the year	(242)	(52)
(10) Missing data of some required variables	(77)	(12)
Final sample	**6,469**	**992**

Panel B: Sample by Industry and Year

	ICB Industry Code									
Year	**(0001)**	**(1000)**	**(2000)**	**(3000)**	**(4000)**	**(5000)**	**(6000)**	**(7000)**	**(9000)**	**Total**
1999	7	11	69	26	12	38	3	7	15	188
2000	8	13	91	30	20	57	3	7	24	253
2001	9	13	103	41	24	72	7	9	24	302
2002	8	13	98	42	22	86	2	8	16	295
2003	14	16	102	45	27	85	3	9	23	324
2004	20	21	122	53	27	102	7	10	32	394
2005	23	22	129	47	27	99	6	11	35	399
2006	25	24	140	46	27	85	6	13	31	397
2007	28	26	134	45	29	90	9	11	29	401
2008	19	18	102	37	24	70	7	11	18	306
2009	18	13	94	32	23	68	5	11	24	288
2010	19	22	100	38	19	67	4	10	24	303
2011	18	30	100	36	16	58	7	9	23	297
2012	18	30	104	38	16	59	7	9	27	308
2013	22	26	113	38	20	75	7	8	30	339
2014	13	25	125	42	23	75	8	9	33	353
2015	12	21	117	44	27	77	9	10	30	347
2016	8	26	117	46	25	83	9	9	37	360
2017	10	25	113	49	25	85	6	8	38	359
2018	5	17	80	37	16	64	5	7	25	256
Total	**304**	**412**	**2,153**	**812**	**449**	**1,495**	**120**	**186**	**538**	**6,469**

The ICB industry (codes) names are: **(0001)** Oil and gas; **(1000)** Basic materials; **(2000)** Industrials; **(3000)** Consumer goods; **(4000)** Health care; **(5000)** Consumer services; **(6000)** Telecommunications; **(7000)** Utilities; **(9000)** Technology.

Table 3 – Descriptive Statistics

Variable	Obs.	Mean	Min.	Q1	Median	Q3	Max.	Std. Dev.
Nationality diversity								
BDDDN	6469	0.239	0.000	0.000	0.200	0.417	1.000	0.265
ACDDN	6469	0.235	0.000	0.000	0.000	0.500	1.000	0.323
HIDDN	6469	0.343	0.000	0.000	0.000	1.000	1.000	0.475
Other board characteristics								
BDEXD	6469	0.399	0.000	0.300	0.400	0.500	1.000	0.132
BDEXOWN	6469	6.941	0.000	5.719	7.118	8.444	14.903	2.495
BDFEM	6469	0.095	0.000	0.000	0.077	0.167	0.571	0.111
STROFAU	6469	0.114	0.000	0.000	0.000	0.000	1.000	0.318
BDSIZE	6469	8.094	3.000	6.000	8.000	9.000	23.000	2.318
ACSIZE	6469	3.667	3.000	3.000	3.000	4.000	10.000	0.882
Firm characteristics								
EARN	6469	0.040	-0.960	0.026	0.059	0.088	0.616	0.123
ACC	6469	-0.059	-1.158	-0.083	-0.035	-0.005	0.467	0.131
ACCBDEP	6466	-0.003	-0.867	-0.023	0.002	0.027	0.570	0.109
RET	6469	0.191	-0.884	-0.107	0.135	0.394	5.679	0.510
DR	6469	0.353	0.000	0.000	0.000	1.000	1.000	0.478
SIZE	6469	13.027	7.740	11.687	12.955	14.266	18.324	1.928
LEV	6469	0.290	0.000	0.031	0.167	0.376	6.669	0.441
MTB	6469	3.773	0.318	1.459	2.420	4.083	98.526	5.189
ΔSALES	6469	0.103	-2.903	0.000	0.052	0.158	2.695	0.343
DS	6469	0.243	0.000	0.000	0.000	0.000	1.000	0.429

All variables are defined in Table 1.

Table 4 – Nationality Diversity Across Years

	Board of Directors		Audit Committee	
Year	***BDFDs***	***BDDDN***	***ACFDs***	***ACDDN***
1999	0.103	0.168	0.091	0.151
2000	0.107	0.173	0.097	0.162
2001	0.112	0.183	0.101	0.165
2002	0.112	0.182	0.103	0.169
2003	0.130	0.209	0.127	0.203
2004	0.123	0.201	0.120	0.201
2005	0.124	0.200	0.117	0.193
2006	0.131	0.208	0.123	0.204
2007	0.151	0.239	0.144	0.240
2008	0.166	0.249	0.159	0.249
2009	0.171	0.257	0.167	0.257
2010	0.164	0.251	0.159	0.245
2011	0.175	0.267	0.168	0.262
2012	0.180	0.276	0.171	0.270
2013	0.183	0.275	0.170	0.271
2014	0.183	0.276	0.170	0.276
2015	0.184	0.277	0.172	0.269
2016	0.186	0.283	0.178	0.282
2017	0.191	0.288	0.189	0.294
2018	0.193	0.301	0.188	0.289
Average	**0.154**	**0.239**	**0.147**	**0.235**

BDFDs (*ACFDs*) is the proportion of foreign directors on the board (the audit committee). *BDDDN* (*ACDDN*) is nationality diversity on the board (the audit committee).

Table 5 – Correlations

	(1)	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*	*(9)*	*(10)*	*(11)*	*(12)*	*(13)*	*(14)*	*(15)*	*(16)*	*(17)*	*(18)*	*(19)*
(1) *BDDDN*	1.00																		
(2) *ACDDN*	0.80	1.00																	
(3) *HIDDN*	0.77	0.92	1.00																
(4) *BDEXD*	-0.37	-0.29	-0.29	1.00															
(5) *BDEXOWN*	0.02	0.01	0.00	0.09	1.00														
(6) *BDFEM*	0.16	0.16	0.13	-0.32	0.05	1.00													
(7) *STROFAU*	0.30	0.21	0.24	-0.11	0.04	0.04	1.00												
(8) *BDSIZE*	0.34	0.24	0.25	-0.08	0.13	0.14	0.33	1.00											
(9) *ACSIZE*	0.25	0.22	0.28	-0.28	0.02	0.19	0.18	0.47	1.00										
(10) *EARN*	-0.09	-0.08	-0.08	0.06	0.15	0.03	-0.02	0.10	0.05	1.00									
(11) *ACC*	-0.06	-0.06	-0.07	0.07	0.11	0.02	-0.01	0.01	-0.02	0.48	1.00								
(12) *ACCBDEP*	-0.08	-0.07	-0.08	0.09	0.05	-0.01	-0.02	0.00	-0.02	0.54	0.89	1.00							
(13) *RET*	-0.03	-0.03	-0.02	0.05	0.11	-0.05	-0.01	-0.05	-0.05	0.21	-0.04	0.05	1.00						
(14) *DR*	0.01	0.01	0.01	-0.02	-0.12	0.00	0.00	-0.01	-0.01	-0.23	-0.03	-0.09	-0.63	1.00					
(15) *SIZE*	0.40	0.29	0.29	-0.37	0.26	0.35	0.27	0.64	0.42	0.21	0.06	0.02	0.04	-0.12	1.00				
(16) *LEV*	-0.03	-0.01	0.00	-0.05	-0.13	0.01	0.00	0.10	0.05	-0.12	-0.29	-0.15	-0.17	0.15	0.03	1.00			
(17) *MTB*	0.04	0.03	0.03	-0.04	0.12	0.07	0.02	0.04	0.00	-0.05	0.06	-0.02	0.15	-0.10	0.14	-0.13	1.00		
(18) *ΔSALES*	-0.08	-0.07	-0.07	0.12	0.05	-0.07	-0.03	-0.01	-0.05	0.17	0.04	0.09	0.15	-0.09	-0.08	-0.02	-0.02	1.00	
(19) *DS*	0.05	0.05	0.05	-0.08	-0.11	0.02	0.02	0.00	0.05	-0.14	-0.13	-0.11	-0.10	0.11	-0.03	0.08	-0.05	-0.46	1.00

The above table presents Pearson correlations between the main variables in my models. The variables are defined in Table 1. The number of observations is 6,469, except for correlations involving *ACCBDEP* where the number of observations is 6,466.

Table 6 – Board Diversity, Audit Committee Diversity, and Conservatism

		Board of Directors		Audit Committee		Both	
	Expected Sign	OLS Model (1)	2SLS (2nd Stage) Model (2)	OLS Model (3)	2SLS (2nd Stage) Model (4)	OLS Model (5)	2SLS (2nd Stage) Model (6)
Intercept		-0.060*	-0.092**	-0.037	-0.062*	-0.035	-0.074*
		(-1.86)	(-2.33)	(-1.20)	(-1.69)	(-1.17)	(-1.91)
BDDDN		-0.055***					
		(-4.00)					
INSTBDDDN			-0.112***				
			(-3.05)				
ACDDN				-0.019*			
				(-1.94)			
INSTACDDN					-0.067**		
					(-2.08)		
HIDDN						-0.012*	
						(-1.83)	
INSTHIDDN							-0.065**
							(-2.52)
SIZE		0.009***	0.013***	0.006***	0.009***	0.006***	0.011***
		(3.67)	(3.73)	(2.90)	(3.09)	(2.89)	(3.31)
LEV		-0.025	-0.025	-0.025	-0.025	-0.025	-0.025
		(-1.24)	(-1.22)	(-1.22)	(-1.21)	(-1.21)	(-1.19)
MTB		-0.002***	-0.002***	-0.002***	-0.002***	-0.002***	-0.002***
		(-3.53)	(-3.31)	(-3.45)	(-3.46)	(-3.40)	(-3.32)
DR		0.046	0.040	0.039	0.039	0.034	0.043
		(0.96)	(0.73)	(0.85)	(0.77)	(0.76)	(0.81)
*DR*BDDDN*		0.030					
		(1.22)					
*DR*INSTBDDDN*			0.051				
			(0.98)				

Table 6 – Continued

		Board of Directors		Audit Committee		Both	
	Expected Sign	OLS Model (1)	2SLS (2nd Stage) Model (2)	OLS Model (3)	2SLS (2nd Stage) Model (4)	OLS Model (5)	2SLS (2nd Stage) Model (6)
*DR*ACDDN*				0.018			
				(0.96)			
*DR*INSTACDDN*					0.042		
					(1.06)		
*DR*HIDDN*						0.009	
						(0.73)	
*DR*INSTHIDDN*							0.049
							(1.54)
*DR*SIZE*		-0.005	-0.005	-0.005	-0.005	-0.004	-0.006
		(-1.34)	(-1.06)	(-1.25)	(-1.18)	(-1.14)	(-1.31)
*DR*LEV*		0.002	0.002	0.002	0.002	0.002	0.002
		(0.08)	(0.08)	(0.08)	(0.08)	(0.06)	(0.09)
*DR*MTB*		0.001	0.001	0.001	0.001	0.001	0.001
		(1.05)	(1.17)	(0.97)	(1.02)	(0.98)	(1.11)
RET		-0.050	-0.059	-0.067	-0.061	-0.066	-0.053
		(-0.89)	(-0.80)	(-1.19)	(-0.86)	(-1.18)	(-0.73)
*RET*BDDDN*		-0.008					
		(-0.29)					
*RET*INSTBDDDN*			-0.032				
			(-0.40)				
*RET*ACDDN*				-0.023			
				(-1.06)			
*RET*INSTACDDN*					-0.020		
					(-0.34)		

Table 6 – Continued

		Board of Directors		Audit Committee		Both	
	Expected Sign	OLS Model (1)	2SLS (2nd Stage) Model (2)	OLS Model (3)	2SLS (2nd Stage) Model (4)	OLS Model (5)	2SLS (2nd Stage) Model (6)
*RET*HIDDN*						-0.017	
						(-1.07)	
*RET*INSTHIDDN*							-0.012
							(-0.25)
*RET*SIZE*		0.006	0.007	0.008*	0.007	0.008*	0.007
		(1.36)	(1.08)	(1.75)	(1.15)	(1.75)	(1.00)
*RET*LEV*		0.004	0.008	0.005	0.008	0.004	0.008
		(0.16)	(0.29)	(0.18)	(0.29)	(0.16)	(0.29)
*RET*MTB*		-0.002**	-0.002**	-0.002**	-0.002**	-0.002**	-0.002**
		(-2.41)	(-2.24)	(-2.29)	(-2.18)	(-2.26)	(-2.11)
*DR*RET*		1.006***	0.946***	1.043***	0.983***	1.033***	0.947***
		(6.52)	(5.75)	(6.90)	(6.38)	(6.88)	(6.08)
DR*RET*BDDDN	+	**0.160****					
		(2.06)					
DR*RET*INSTBDDDN	+		**0.362****				
			(1.97)				
DR*RET*ACDDN	+			**0.148****			
				(2.38)			
DR*RET*INSTACDDN	+				**0.274***		
					(1.95)		
DR*RET*HIDDN	+					**0.109****	
						(2.52)	
DR*RET*INSTHIDDN	+						**0.251****
							(2.12)
DR*RET*SIZE	–	**-0.077*****	**-0.077*****	**-0.079*****	**-0.078*****	**-0.079*****	**-0.077*****
		(-6.19)	**(-5.17)**	**(-6.54)**	**(-5.86)**	**(-6.53)**	**(-5.67)**

Table 6 – Continued

	Expected Sign	Board of Directors		Audit Committee		Both	
		OLS	2SLS (2nd Stage)	OLS	2SLS (2nd Stage)	OLS	2SLS (2nd Stage)
		Model (1)	**Model (2)**	**Model (3)**	**Model (4)**	**Model (5)**	**Model (6)**
DR*RET*LEV	+	**0.019**	**0.019**	**0.017**	**0.015**	**0.017**	**0.015**
		(0.50)	**(0.50)**	**(0.44)**	**(0.41)**	**(0.43)**	**(0.38)**
DR*RET*MTB	+	**0.004**	**0.005**	**0.004**	**0.004**	**0.004**	**0.005**
		(1.12)	**(1.42)**	**(0.98)**	**(1.08)**	**(1.03)**	**(1.24)**
Industry controls		Yes	Yes	Yes	Yes	Yes	Yes
Year controls		Yes	Yes	Yes	Yes	Yes	Yes
n		6469	6469	6469	6469	6469	6469
Adjusted R^2		0.230	0.210	0.224	0.208	0.225	0.189

The above table investigates nationality diversity on the board of directors (BD) and its audit committee (AC) in relation to financial reporting conservatism. Nationality Diversity is measured using the dissimilarity of director nationalities ($BDDDN/ACDDN$) $= 1 - [\sum_{i=1}^{K} n_i(n_i - 1) \div n(n-1)]$, where n_i is the number of directors in the ith nationality on the BD/AC and n is BD/AC size. In addition, I proxy for the presence of high nationality diversity levels on both the board and its audit committee using an indicator (*HIDDN*) that equals one if both *BDDDN* and *ACDDN* in a given year are above their sample median for the same year, and zero otherwise. Conservatism is captured by the Basu's (1997) asymmetric timeliness of earnings. The dependent variable (*EARN*) is net income before extraordinary items, scaled by opening market value of equity. *INSTBDDDN*, *INSTACDDN*, and *INSTHIDDN* refer to instrumented *BDDDN*, *ACDDN*, and *HIDDN*, respectively. Other variables are defined in Table 1. Models (1) and (2) examine the relationship between board nationality diversity (BDDDN) and conservatism using OLS and 2SLS, respectively. Similarly, Models (3) and (4) investigate the relationship between audit committee nationality diversity (ACDDN) and conservatism using OLS and 2SLS, respectively. Lastly, Models (5) and (6) examine the relationship between the presence of high nationality diversity levels on both the board and its audit committee (HIDDN) and conservatism using OLS and 2SLS, respectively. Below coefficient estimates are robust t-statistics based on standard errors adjusted for heteroskedasticity (White, 1980) and clustered at the firm level (Petersen, 2009). ***, **, * indicate significance at the 1%, 5%, and 10% level (two-tailed), respectively. Coefficients of industry and year controls are suppressed for brevity.

Table 7 – Adjusting for Cash Flow Asymmetry

	Expected Sign	Board of Directors Model (1)	Audit Committee Model (2)	Both Model (3)
Intercept		-0.097***	-0.093***	-0.093***
		(-3.41)	(-3.26)	(-3.31)
BDDDN		-0.030**		
		(-2.13)		
ACDDN			-0.023**	
			(-2.17)	
HIDDN				-0.018**
				(-2.40)
SIZE		0.007***	0.007***	0.007***
		(3.32)	(3.09)	(3.20)
LEV		-0.079***	-0.079***	-0.079***
		(-3.00)	(-3.00)	(-2.99)
MTB		-0.001	-0.001	-0.001
		(-1.25)	(-1.50)	(-1.48)
DR		0.114***	0.119***	0.116***
		(2.83)	(3.00)	(2.91)
*DR*BDDDN*		0.027		
		(1.43)		
*DR*ACDDN*			0.046***	
			(2.88)	
*DR*HIDDN*				0.027**
				(2.39)
*DR*SIZE*		-0.011***	-0.011***	-0.011***
		(-3.23)	(-3.53)	(-3.40)
*DR*LEV*		0.008	0.009	0.008
		(0.25)	(0.27)	(0.24)
*DR*MTB*		0.003**	0.003***	0.003***
		(2.58)	(2.66)	(2.64)
RET		0.036	0.052	0.054
		(0.59)	(0.82)	(0.87)
*RET*BDDDN*		-0.048		
		(-1.64)		
*RET*ACDDN*			-0.017	
			(-0.74)	
*RET*HIDDN*				-0.012
				(-0.73)
*RET*SIZE*		-0.005	-0.007	-0.007
		(-0.92)	(-1.24)	(-1.29)
*RET*LEV*		-0.073	-0.073	-0.074
		(-1.45)	(-1.46)	(-1.46)
*RET*MTB*		0.001**	0.002***	0.002***
		(2.28)	(2.70)	(2.70)

Table 7 – Continued

	Expected Sign	Board of Directors Model (1)	Audit Committee Model (2)	Both Model (3)
*DR*RET*		0.393***	0.385***	0.373**
		(2.70)	(2.61)	(2.52)
DR*RET*BDDDN	+	**0.188****		
		(2.47)		
DR*RET*ACDDN	+		**0.184*****	
			(3.02)	
DR*RET*HIDDN	+			**0.119*****
				(2.68)
DR*RET*SIZE	−	**-0.030*****	**-0.030****	**-0.028****
		(-2.60)	**(-2.49)**	**(-2.38)**
DR*RET*LEV	+	**0.070**	**0.069**	**0.069**
		(1.12)	**(1.14)**	**(1.12)**
DR*RET*MTB	+	**0.004**	**0.004**	**0.004**
		(1.07)	**(0.97)**	**(0.99)**
Industry controls		Yes	Yes	Yes
Year controls		Yes	Yes	Yes
n		6469	6469	6469
Adjusted R^2		0.162	0.160	0.161

The above table is a re-estimation of the OLS models in Table 6 using the accrual component of earnings (*ACC*) as the dependent variable. *ACC* is defined as net income before extraordinary items minus *CFO*, scaled by the lagged market value of equity. Models (1) to (3) examines the impacts on conservatism of board nationality diversity (*BDDDN*), audit committee nationality diversity (*ACDDN*), and the presence of high nationality diversity levels on the board and its audit committee (*HIDDN*), respectively. Other variables are defined in Table 1. Below coefficient estimates are robust t-statistics based on standard errors adjusted for heteroskedasticity (White, 1980) and clustered at the firm level (Petersen, 2009). ***, **, * indicate significance at the 1%, 5%, and 10% level (two-tailed), respectively. Coefficients of industry/year controls are suppressed for brevity.

Table 8 – Adjusting for Cost Stickiness

	Expected Sign	Board of Directors		Audit Committee		Both	
		EARN	*ACC*	*EARN*	*ACC*	*EARN*	*ACC*
		Model (1)	**Model (2)**	**Model (3)**	**Model (4)**	**Model (5)**	**Model (6)**
Intercept		-0.045	-0.045	-0.023	-0.042	-0.020	-0.044
		(-1.32)	(-1.42)	(-0.70)	(-1.35)	(-0.64)	(-1.42)
BDDDN		-0.047***	-0.024				
		(-3.16)	(-1.59)				
ACDDN				-0.011	-0.015		
				(-1.02)	(-1.33)		
HIDDN						-0.006	-0.013*
						(-0.80)	(-1.72)
SIZE		0.007***	0.003	0.005**	0.003	0.004*	0.003
		(2.77)	(1.48)	(1.99)	(1.32)	(1.94)	(1.44)
LEV		-0.003	-0.054***	-0.004	-0.056***	-0.004	-0.055***
		(-0.23)	(-2.69)	(-0.27)	(-2.71)	(-0.27)	(-2.70)
MTB		-0.001**	-0.001	-0.001**	-0.001	-0.001**	-0.001
		(-2.38)	(-0.95)	(-2.40)	(-1.15)	(-2.34)	(-1.11)
DR		0.057	0.121***	0.050	0.123***	0.047	0.120***
		(1.17)	(2.97)	(1.09)	(3.09)	(1.02)	(3.01)
*DR*BDDDN*		0.035	0.037*				
		(1.40)	(1.90)				
*DR*ACDDN*				0.021	0.045***		
				(1.08)	(2.97)		
*DR*HIDDN*						0.011	0.027**
						(0.89)	(2.44)
*DR*SIZE*		-0.006	-0.011***	-0.005	-0.011***	-0.005	-0.011***
		(-1.51)	(-3.36)	(-1.45)	(-3.62)	(-1.36)	(-3.51)
*DR*LEV*		-0.000	0.004	0.001	0.006	-0.000	0.005
		(-0.02)	(0.15)	(0.04)	(0.23)	(-0.00)	(0.20)

Table 8 – Continued

	Expected Sign	Board of Directors		Audit Committee		Both	
		EARN	*ACC*	*EARN*	*ACC*	*EARN*	*ACC*
		Model (1)	**Model (2)**	**Model (3)**	**Model (4)**	**Model (5)**	**Model (6)**
*DR*MTB*		0.001	0.003***	0.001	0.003***	0.001	0.003***
		(0.73)	(2.64)	(0.71)	(2.75)	(0.73)	(2.72)
RET		-0.066	0.048	-0.079	0.060	-0.076	0.063
		(-1.18)	(0.76)	(-1.39)	(0.93)	(-1.34)	(1.00)
*RET*BDDDN*		0.000	-0.025				
		(0.00)	(-0.83)				
*RET*ACDDN*				-0.026	-0.024		
				(-1.19)	(-1.07)		
*RET*HIDDN*						-0.017	-0.015
						(-1.07)	(-0.94)
*RET*SIZE*		0.007	-0.005	0.008*	-0.007	0.008*	-0.007
		(1.56)	(-1.01)	(1.84)	(-1.24)	(1.79)	(-1.33)
*RET*LEV*		0.023	-0.060	0.024	-0.059	0.023	-0.060
		(0.91)	(-1.30)	(0.92)	(-1.26)	(0.88)	(-1.27)
*RET*MTB*		-0.001**	0.001**	-0.001**	0.002***	-0.001**	0.002***
		(-2.50)	(2.08)	(-2.22)	(2.61)	(-2.21)	(2.61)
*DR*RET*		1.011***	0.398***	1.047***	0.388***	1.035***	0.376***
		(6.51)	(2.81)	(6.88)	(2.72)	(6.86)	(2.62)
DR*RET*BDDDN	+	**0.149****	**0.173****				
		(1.96)	**(2.39)**				
DR*RET*ACDDN	+			**0.156****	**0.202*****		
				(2.49)	**(3.36)**		
DR*RET*HIDDN	+					**0.115*****	**0.129*****
						(2.64)	**(2.97)**
DR*RET*SIZE	−	**-0.077*****	**-0.032*****	**-0.080*****	**-0.031*****	**-0.079*****	**-0.030*****
		(-6.17)	**(-2.80)**	**(-6.52)**	**(-2.73)**	**(-6.50)**	**(-2.59)**
DR*RET*LEV	+	**0.008**	**0.069**	**0.006**	**0.067**	**0.005**	**0.067**
		(0.20)	**(1.16)**	**(0.15)**	**(1.13)**	**(0.14)**	**(1.12)**

Table 8 – Continued

	Expected Sign	Board of Directors		Audit Committee		Both	
		EARN	*ACC*	*EARN*	*ACC*	*EARN*	*ACC*
		Model (1)	**Model (2)**	**Model (3)**	**Model (4)**	**Model (5)**	**Model (6)**
DR*RET*MTB	+	**0.003**	**0.005**	**0.003**	**0.004**	**0.003**	**0.005**
		(0.94)	**(1.32)**	**(0.81)**	**(1.21)**	**(0.86)**	**(1.22)**
DS		-0.081**	-0.107***	-0.078**	-0.101***	-0.080**	-0.101***
		(-2.04)	(-3.38)	(-2.04)	(-3.46)	(-2.08)	(-3.45)
*DS*BDDDN*		-0.012	0.017				
		(-0.63)	(0.91)				
*DS*ACDDN*				-0.015	-0.000		
				(-1.04)	(-0.02)		
*DS*HIDDN*						-0.010	0.004
						(-1.05)	(0.39)
*DS*SIZE*		0.006*	0.006**	0.006*	0.006***	0.006**	0.006***
		(1.85)	(2.44)	(1.96)	(2.77)	(2.01)	(2.74)
*DS*LEV*		-0.012	-0.010	-0.013	-0.013	-0.012	-0.012
		(-1.00)	(-0.63)	(-1.02)	(-0.78)	(-0.99)	(-0.77)
*DS*MTB*		-0.000	0.001	-0.000	0.001	-0.000	0.001
		(-0.12)	(1.30)	(-0.29)	(0.90)	(-0.38)	(0.83)
ΔSALES		0.017	-0.126	0.007	-0.123	-0.001	-0.122
		(0.21)	(-1.44)	(0.09)	(-1.40)	(-0.01)	(-1.38)
*ΔSALES*BDDDN*		0.004	-0.061				
		(0.08)	(-1.12)				
*ΔSALES*ACDDN*				0.002	-0.030		
				(0.05)	(-0.74)		
*ΔSALES*HIDDN*						-0.008	-0.019
						(-0.30)	(-0.68)
*ΔSALES*SIZE*		0.002	0.009	0.003	0.008	0.004	0.008
		(0.30)	(1.27)	(0.48)	(1.20)	(0.61)	(1.17)

Table 8 – Continued

	Expected Sign	Board of Directors		Audit Committee		Both	
		EARN	*ACC*	*EARN*	*ACC*	*EARN*	*ACC*
		Model (1)	**Model (2)**	**Model (3)**	**Model (4)**	**Model (5)**	**Model (6)**
*ΔSALES*LEV*		-0.018	-0.013	-0.019	-0.012	-0.017	-0.014
		(-0.77)	(-0.39)	(-0.75)	(-0.34)	(-0.68)	(-0.38)
*ΔSALES*MTB*		-0.003	-0.003	-0.003*	-0.003	-0.003*	-0.003
		(-1.61)	(-0.85)	(-1.74)	(-0.98)	(-1.70)	(-0.99)
*DS*ΔSALES*		-0.069	-0.152	-0.087	-0.153	-0.074	-0.155
		(-0.34)	(-0.82)	(-0.43)	(-0.81)	(-0.37)	(-0.82)
*DS*ΔSALES*BDDDN*		0.200*	0.308***				
		(1.86)	(2.80)				
*DS*ΔSALES*ACDDN*				0.065	0.025		
				(0.81)	(0.28)		
*DS*ΔSALES*HIDDN*						0.055	0.021
						(1.09)	(0.35)
*DS*ΔSALES*SIZE*		-0.003	0.013	0.001	0.019	-0.000	0.019
		(-0.20)	(0.81)	(0.07)	(1.20)	(-0.01)	(1.19)
*DS*ΔSALES*LEV*		0.143***	0.098**	0.131***	0.077*	0.131***	0.079*
		(4.58)	(2.27)	(4.11)	(1.70)	(4.09)	(1.74)
*DS*ΔSALES*MTB*		0.013*	0.003	0.011	0.001	0.011	0.001
		(1.85)	(0.38)	(1.48)	(0.10)	(1.50)	(0.11)
Industry controls		Yes	Yes	Yes	Yes	Yes	Yes
Year controls		Yes	Yes	Yes	Yes	Yes	Yes
n		6469	6469	6469	6469	6469	6469
Adjusted R^2		0.267	0.195	0.258	0.190	0.259	0.190

In the above table, all models are OLS estimations of Eq. (3). Model 1 (Model 2) investigates the impact of board nationality diversity, *BDDDN*, on conservatism using *EARN* (*ACC*) as the dependent variable. I re-estimate the first two models in Models 3 and 4 and Models 5 and 6 after replacing *BDDDN* with audit committee nationality diversity (*ACDDN*) and an indicator for the presence of high nationality diversity levels on the board and its audit committee (*HIDDN*), respectively. All variables are defined in Table 1. Below coefficient estimates are robust t-statistics based on standard errors adjusted for heteroskedasticity (White, 1980) and clustered at the firm level (Petersen, 2009). ***, **, * indicate significance at the 1%, 5%, and 10% level (two-tailed), respectively. Coefficients of industry and year controls are suppressed for brevity.

Table 9 – Controlling for Variations in Conservatism by Industry and Year

		Board of Directors		Audit Committee		Both	
	Expected Sign	*EARN*	*ACC*	*EARN*	*ACC*	*EARN*	*ACC*
		Model (1)	**Model (2)**	**Model (3)**	**Model (4)**	**Model (5)**	**Model (6)**
Intercept		-0.018	-0.034	-0.003	-0.038	0.000	-0.038
		(-0.48)	(-1.02)	(-0.09)	(-1.14)	(0.01)	(-1.15)
BDDDN		-0.042***	-0.016				
		(-3.00)	(-1.18)				
ACDDN				-0.006	-0.011		
				(-0.58)	(-1.02)		
HIDDN						-0.003	-0.011
						(-0.38)	(-1.49)
SIZE		0.008***	0.003	0.005**	0.003	0.005**	0.003
		(2.95)	(1.39)	(2.18)	(1.28)	(2.12)	(1.40)
LEV		-0.003	-0.056***	-0.006	-0.059***	-0.006	-0.059***
		(-0.19)	(-2.63)	(-0.35)	(-2.69)	(-0.34)	(-2.66)
MTB		-0.001***	-0.000	-0.001***	-0.000	-0.001***	-0.000
		(-2.71)	(-0.45)	(-2.61)	(-0.51)	(-2.60)	(-0.51)
DR		0.093*	0.139***	0.092*	0.146***	0.088*	0.143***
		(1.80)	(3.04)	(1.86)	(3.25)	(1.77)	(3.17)
*DR*BDDDN*		0.027	0.025				
		(1.13)	(1.29)				
*DR*ACDDN*				0.013	0.041**		
				(0.68)	(2.56)		
*DR*HIDDN*						0.007	0.024**
						(0.58)	(2.13)
*DR*SIZE*		-0.007*	-0.012***	-0.007*	-0.013***	-0.006*	-0.012***
		(-1.85)	(-3.53)	(-1.81)	(-3.90)	(-1.75)	(-3.79)
*DR*LEV*		0.000	0.000	0.003	0.004	0.002	0.003
		(0.00)	(0.01)	(0.15)	(0.12)	(0.11)	(0.10)

Table 9 – Continued

	Expected Sign	Board of Directors		Audit Committee		Both	
		EARN	*ACC*	*EARN*	*ACC*	*EARN*	*ACC*
		Model (1)	**Model (2)**	**Model (3)**	**Model (4)**	**Model (5)**	**Model (6)**
*DR*MTB*		0.001	0.002**	0.001	0.002**	0.001	0.002**
		(0.87)	(2.28)	(0.84)	(2.36)	(0.88)	(2.36)
RET		-0.078	0.078	-0.075	0.099	-0.075	0.100
		(-1.23)	(1.19)	(-1.16)	(1.49)	(-1.16)	(1.52)
*RET*BDDDN*		-0.016	-0.050**				
		(-0.67)	(-2.02)				
*RET*ACDDN*				-0.039*	-0.037*		
				(-1.86)	(-1.82)		
*RET*HIDDN*						-0.026*	-0.024*
						(-1.80)	(-1.73)
*RET*SIZE*		0.002	-0.007	0.003	-0.008*	0.003	-0.009*
		(0.45)	(-1.35)	(0.63)	(-1.67)	(0.59)	(-1.75)
*RET*LEV*		0.013	-0.049	0.016	-0.047	0.015	-0.048
		(0.47)	(-1.03)	(0.57)	(-0.96)	(0.53)	(-0.98)
*RET*MTB*		-0.001	0.001	-0.001	0.001	-0.001	0.001
		(-0.87)	(1.25)	(-0.84)	(1.46)	(-0.78)	(1.54)
*DR*RET*		1.080***	0.562***	1.114***	0.551***	1.099***	0.535***
		(6.30)	(3.47)	(6.62)	(3.37)	(6.56)	(3.25)
DR*RET*BDDDN	+	**0.106**	**0.160****				
		(1.40)	**(2.18)**				
DR*RET*ACDDN	+			**0.133****	**0.206*****		
				(2.16)	**(3.27)**		
DR*RET*HIDDN	+					**0.105****	**0.132*****
						(2.44)	**(2.94)**
DR*RET*SIZE	−	**-0.073*****	**-0.035*****	**-0.076*****	**-0.035*****	**-0.076*****	**-0.033*****
		(-5.82)	**(-3.02)**	**(-6.14)**	**(-3.03)**	**(-6.16)**	**(-2.91)**
DR*RET*LEV	+	**0.025**	**0.045**	**0.021**	**0.042**	**0.022**	**0.043**
		(0.62)	**(0.74)**	**(0.53)**	**(0.70)**	**(0.53)**	**(0.71)**

Table 9 – Continued

	Expected Sign	Board of Directors		Audit Committee		Both	
		EARN	*ACC*	*EARN*	*ACC*	*EARN*	*ACC*
		Model (1)	**Model (2)**	**Model (3)**	**Model (4)**	**Model (5)**	**Model (6)**
DR*RET*MTB	+	**0.002**	**0.005**	**0.002**	**0.005**	**0.002**	**0.005**
		(0.65)	**(1.62)**	**(0.57)**	**(1.61)**	**(0.63)**	**(1.60)**
DS		-0.089**	-0.109***	-0.083**	-0.103***	-0.085**	-0.103***
		(-2.26)	(-3.40)	(-2.18)	(-3.47)	(-2.22)	(-3.45)
*DS*BDDDN*		-0.011	0.015				
		(-0.60)	(0.84)				
*DS*ACDDN*				-0.012	0.000		
				(-0.83)	(0.01)		
*DS*HIDDN*						-0.009	0.004
						(-0.96)	(0.44)
*DS*SIZE*		0.006**	0.006**	0.006**	0.006***	0.006**	0.006***
		(2.07)	(2.47)	(2.10)	(2.79)	(2.16)	(2.74)
*DS*LEV*		-0.005	-0.007	-0.006	-0.009	-0.005	-0.009
		(-0.42)	(-0.46)	(-0.46)	(-0.60)	(-0.43)	(-0.60)
*DS*MTB*		-0.000	0.001	-0.001	0.001	-0.001	0.000
		(-0.46)	(1.05)	(-0.67)	(0.68)	(-0.74)	(0.62)
ΔSALES		-0.008	-0.141	-0.019	-0.137	-0.028	-0.135
		(-0.10)	(-1.59)	(-0.26)	(-1.55)	(-0.38)	(-1.52)
*ΔSALES*BDDDN*		0.004	-0.062				
		(0.08)	(-1.17)				
*ΔSALES*ACDDN*				0.000	-0.031		
				(0.01)	(-0.76)		
*ΔSALES*HIDDN*						-0.010	-0.018
						(-0.41)	(-0.65)
*ΔSALES*SIZE*		0.004	0.010	0.005	0.010	0.006	0.009
		(0.58)	(1.44)	(0.81)	(1.37)	(0.96)	(1.33)

Table 9 – Continued

	Expected Sign	Board of Directors		Audit Committee		Both	
		EARN	*ACC*	*EARN*	*ACC*	*EARN*	*ACC*
		Model (1)	**Model (2)**	**Model (3)**	**Model (4)**	**Model (5)**	**Model (6)**
*ΔSALES*LEV*		-0.013	-0.014	-0.014	-0.012	-0.012	-0.014
		(-0.55)	(-0.41)	(-0.54)	(-0.35)	(-0.46)	(-0.40)
*ΔSALES*MTB*		-0.003	-0.003	-0.003*	-0.003	-0.003*	-0.003
		(-1.53)	(-0.82)	(-1.71)	(-0.99)	(-1.67)	(-1.02)
*DS*ΔSALES*		-0.123	-0.164	-0.133	-0.158	-0.119	-0.161
		(-0.62)	(-0.87)	(-0.65)	(-0.83)	(-0.58)	(-0.84)
*DS*ΔSALES*BDDDN*		0.253**	0.326***				
		(2.47)	(2.91)				
*DS*ΔSALES*ACDDN*				0.077	0.035		
				(0.95)	(0.39)		
*DS*ΔSALES*HIDDN*						0.064	0.027
						(1.26)	(0.44)
*DS*ΔSALES*SIZE*		0.001	0.013	0.006	0.019	0.004	0.019
		(0.06)	(0.83)	(0.36)	(1.18)	(0.26)	(1.17)
*DS*ΔSALES*LEV*		0.141***	0.103**	0.127***	0.081*	0.125***	0.083*
		(4.50)	(2.42)	(3.94)	(1.82)	(3.90)	(1.87)
*DS*ΔSALES*MTB*		0.012*	0.003	0.010	0.001	0.010	0.001
		(1.68)	(0.36)	(1.26)	(0.09)	(1.28)	(0.11)
Industry controls		Yes	Yes	Yes	Yes	Yes	Yes
Year controls		Yes	Yes	Yes	Yes	Yes	Yes
Interactions of industry /year controls with *DR*, *RET*, and *DR*RET*		Yes	Yes	Yes	Yes	Yes	Yes
n		6469	6469	6469	6469	6469	6469
Adjusted R^2		0.297	0.206	0.287	0.200	0.289	0.201

The above table is a re-estimation of the models in Table 8 after adding interactions of industry and year controls with the fundamental terms in the Basu model: *DR*, *RET*, and *DR*RET*. All variables are defined in Table 1. Standard errors are adjusted for heteroskedasticity and clustered at the firm level. ***, **, * indicate significance at the 1%, 5%, and 10% level (two-tailed), respectively. Coefficients involving industry or year controls are suppressed for brevity.

Table 10 – Fixed-effects Model

	Expected Sign	Board of Directors		Audit Committee		Both	
		EARN	*ACC*	*EARN*	*ACC*	*EARN*	*ACC*
		Model (1)	**Model (2)**	**Model (3)**	**Model (4)**	**Model (5)**	**Model (6)**
Intercept		-0.014	-0.349***	-0.018	-0.359***	-0.021	-0.362***
		(-0.22)	(-4.68)	(-0.29)	(-4.85)	(-0.32)	(-4.89)
BDDDN		-0.010	0.002				
		(-0.69)	(0.14)				
ACDDN				0.017	0.002		
				(1.54)	(0.18)		
HIDDN						0.011	-0.002
						(1.56)	(-0.23)
SIZE		0.008	0.029***	0.007	0.030***	0.008	0.030***
		(1.51)	(5.08)	(1.49)	(5.23)	(1.55)	(5.31)
LEV		-0.046**	-0.086***	-0.048**	-0.089***	-0.048**	-0.089***
		(-2.01)	(-3.60)	(-2.09)	(-3.63)	(-2.07)	(-3.62)
MTB		-0.001**	-0.001	-0.001**	-0.001	-0.001**	-0.001
		(-2.10)	(-1.01)	(-2.13)	(-1.06)	(-2.13)	(-1.04)
DR		0.043	0.135***	0.042	0.137***	0.041	0.136***
		(0.98)	(3.06)	(0.99)	(3.18)	(0.98)	(3.16)
*DR*BDDDN*		0.003	0.025				
		(0.17)	(1.33)				
*DR*ACDDN*				-0.007	0.026*		
				(-0.42)	(1.75)		
*DR*HIDDN*						-0.005	0.015
						(-0.42)	(1.43)
*DR*SIZE*		-0.004	-0.010***	-0.004	-0.010***	-0.004	-0.010***
		(-1.29)	(-3.08)	(-1.27)	(-3.29)	(-1.26)	(-3.23)
*DR*LEV*		0.019	0.025	0.021	0.028	0.020	0.027
		(0.85)	(0.99)	(0.93)	(1.05)	(0.88)	(1.02)

Table 10 – Continued

	Expected Sign	Board of Directors		Audit Committee		Both	
		EARN	*ACC*	*EARN*	*ACC*	*EARN*	*ACC*
		Model (1)	**Model (2)**	**Model (3)**	**Model (4)**	**Model (5)**	**Model (6)**
*DR*MTB*		0.002*	0.002**	0.002*	0.002**	0.002*	0.002**
		(1.78)	(2.17)	(1.87)	(2.19)	(1.89)	(2.19)
RET		0.016	-0.023	0.024	-0.001	0.028	0.004
		(0.32)	(-0.39)	(0.47)	(-0.02)	(0.55)	(0.07)
*RET*BDDDN*		-0.038	-0.035				
		(-1.56)	(-1.21)				
*RET*ACDDN*				-0.054***	-0.031		
				(-2.67)	(-1.47)		
*RET*HIDDN*						-0.031**	-0.014
						(-2.19)	(-0.97)
*RET*SIZE*		0.000	0.000	0.001	-0.001	-0.000	-0.002
		(0.12)	(0.05)	(0.13)	(-0.30)	(-0.01)	(-0.45)
*RET*LEV*		0.035	-0.023	0.038	-0.021	0.037	-0.022
		(1.33)	(-0.51)	(1.43)	(-0.45)	(1.36)	(-0.47)
*RET*MTB*		-0.000	0.001	-0.000	0.001	-0.000	0.001
		(-0.86)	(1.16)	(-0.58)	(1.50)	(-0.56)	(1.50)
*DR*RET*		0.166	0.503***	0.153	0.466***	0.142	0.447***
		(0.96)	(3.19)	(0.90)	(2.95)	(0.83)	(2.82)
DR*RET*BDDDN	+	**0.092**	**0.187****				
		(1.12)	**(2.31)**				
DR*RET*ACDDN	+			**0.127****	**0.200*****		
				(2.01)	**(3.37)**		
DR*RET*HIDDN	+					**0.089****	**0.114*****
						(2.03)	**(2.69)**
DR*RET*SIZE	−	**-0.019**	**-0.034*****	**-0.019**	**-0.032*****	**-0.018**	**-0.030*****
		(-1.41)	**(-3.04)**	**(-1.49)**	**(-2.90)**	**(-1.44)**	**(-2.74)**
DR*RET*LEV	+	**0.002**	**0.029**	**-0.001**	**0.025**	**-0.000**	**0.026**
		(0.06)	**(0.50)**	**(-0.03)**	**(0.44)**	**(-0.01)**	**(0.44)**

Table 10 – Continued

	Expected Sign	Board of Directors		Audit Committee		Both	
		EARN	*ACC*	*EARN*	*ACC*	*EARN*	*ACC*
		Model (1)	**Model (2)**	**Model (3)**	**Model (4)**	**Model (5)**	**Model (6)**
DR*RET*MTB	+	**0.006**	**0.007**	**0.006**	**0.007**	**0.006**	**0.007**
		(1.20)	**(1.59)**	**(1.22)**	**(1.56)**	**(1.24)**	**(1.55)**
DS		-0.067*	-0.101***	-0.062*	-0.098***	-0.063*	-0.099***
		(-1.92)	(-3.22)	(-1.83)	(-3.31)	(-1.85)	(-3.34)
*DS*BDDDN*		-0.013	0.018				
		(-0.71)	(1.01)				
*DS*ACDDN*				-0.011	0.007		
				(-0.81)	(0.51)		
*DS*HIDDN*						-0.007	0.006
						(-0.73)	(0.65)
*DS*SIZE*		0.005	0.007***	0.004*	0.007***	0.004*	0.007***
		(1.61)	(2.67)	(1.65)	(3.04)	(1.66)	(3.06)
*DS*LEV*		-0.003	-0.016	-0.003	-0.017	-0.003	-0.017
		(-0.20)	(-1.14)	(-0.25)	(-1.25)	(-0.22)	(-1.24)
*DS*MTB*		0.001	0.000	0.000	0.000	0.000	0.000
		(0.57)	(0.46)	(0.27)	(0.19)	(0.23)	(0.19)
Δ*SALES*		0.019	-0.081	0.006	-0.088	-0.002	-0.089
		(0.23)	(-0.91)	(0.08)	(-1.01)	(-0.02)	(-1.01)
Δ*SALES*BDDDN*		-0.003	-0.040				
		(-0.05)	(-0.68)				
Δ*SALES*ACDDN*				-0.009	-0.026		
				(-0.25)	(-0.60)		
Δ*SALES*HIDDN*						-0.016	-0.019
						(-0.65)	(-0.65)
Δ*SALES*SIZE*		0.001	0.005	0.002	0.006	0.003	0.006
		(0.16)	(0.76)	(0.33)	(0.84)	(0.46)	(0.85)

Table 10 – Continued

	Expected Sign	Board of Directors		Audit Committee		Both	
		EARN	*ACC*	*EARN*	*ACC*	*EARN*	*ACC*
		Model (1)	**Model (2)**	**Model (3)**	**Model (4)**	**Model (5)**	**Model (6)**
*ΔSALES*LEV*		-0.017	-0.032	-0.017	-0.029	-0.015	-0.030
		(-0.62)	(-0.95)	(-0.62)	(-0.82)	(-0.54)	(-0.87)
*ΔSALES*MTB*		-0.002	-0.003	-0.002	-0.003	-0.002	-0.003
		(-0.87)	(-0.84)	(-0.96)	(-0.91)	(-0.93)	(-0.91)
*DS*ΔSALES*		-0.082	-0.213	-0.095	-0.200	-0.085	-0.199
		(-0.39)	(-1.08)	(-0.43)	(-0.97)	(-0.38)	(-0.96)
*DS*ΔSALES*BDDDN*		0.245**	0.259**				
		(2.29)	(2.29)				
*DS*ΔSALES*ACDDN*				0.097	0.051		
				(1.14)	(0.57)		
*DS*ΔSALES*HIDDN*						0.082	0.042
						(1.53)	(0.70)
*DS*ΔSALES*SIZE*		-0.001	0.020	0.004	0.024	0.003	0.023
		(-0.06)	(1.22)	(0.23)	(1.41)	(0.15)	(1.37)
*DS*ΔSALES*LEV*		0.137***	0.110**	0.124***	0.092*	0.121***	0.094*
		(3.53)	(2.08)	(3.21)	(1.68)	(3.20)	(1.76)
*DS*ΔSALES*MTB*		0.011	-0.001	0.008	-0.003	0.008	-0.003
		(1.50)	(-0.19)	(1.06)	(-0.44)	(1.08)	(-0.43)
Firm fixed effects		Yes	Yes	Yes	Yes	Yes	Yes
Year controls		Yes	Yes	Yes	Yes	Yes	Yes
Interactions of year controls with *DR*, *RET*, and *DR*RET*		Yes	Yes	Yes	Yes	Yes	Yes
n		6469	6469	6469	6469	6469	6469
Adjusted R^2		0.181	0.208	0.176	0.206	0.177	0.205

In the above table, I run the models from Table 8 after replacing industry controls with firm-specific fixed effects. The models still include year controls and their interactions with *DR*, *RET*, and *DR*RET*. All variables are defined in Table 1. Standard errors are adjusted for heteroskedasticity and clustered at the firm level. ***, **, * indicate significance at the 1%, 5%, and 10% level (two-tailed), respectively. Coefficients involving firm/year controls are suppressed for brevity.

Table 11 – Controlling for Other Board Characteristics

	Expected Sign	Board of Directors		Audit Committee		Both	
		EARN	*ACC*	*EARN*	*ACC*	*EARN*	*ACC*
		Model (1)	**Model (2)**	**Model (3)**	**Model (4)**	**Model (5)**	**Model (6)**
Intercept		-0.103**	-0.076*	-0.094**	-0.076*	-0.093**	-0.075*
		(-2.42)	(-1.91)	(-2.24)	(-1.92)	(-2.21)	(-1.90)
BDDDN		-0.036**	-0.016				
		(-2.41)	(-1.11)				
ACDDN				-0.005	-0.011		
				(-0.49)	(-0.93)		
HIDDN						-0.001	-0.009
						(-0.15)	(-1.15)
SIZE		0.007***	0.004	0.006**	0.004	0.006**	0.004
		(2.80)	(1.46)	(2.26)	(1.42)	(2.24)	(1.45)
LEV		0.002	-0.052**	0.003	-0.054**	0.002	-0.054**
		(0.15)	(-2.47)	(0.16)	(-2.52)	(0.15)	(-2.52)
MTB		-0.001**	-0.000	-0.001**	-0.000	-0.001**	-0.000
		(-2.27)	(-0.54)	(-2.38)	(-0.64)	(-2.33)	(-0.60)
BDEXD		0.067**	0.011	0.075***	0.012	0.075***	0.009
		(2.26)	(0.37)	(2.61)	(0.37)	(2.60)	(0.29)
BDEXOWN		0.003**	0.002	0.003**	0.002	0.003**	0.002
		(2.05)	(1.09)	(2.32)	(1.10)	(2.30)	(1.07)
BDFEM		0.003	-0.017	0.003	-0.017	0.002	-0.018
		(0.08)	(-0.52)	(0.09)	(-0.54)	(0.05)	(-0.56)
STROFAU		0.007	-0.019*	0.003	-0.021**	0.002	-0.021**
		(0.69)	(-1.83)	(0.25)	(-2.11)	(0.17)	(-2.10)
DR		0.072	0.125**	0.069	0.124**	0.068	0.123**
		(1.18)	(2.54)	(1.11)	(2.54)	(1.12)	(2.50)
*DR*BDDDN*		0.027	0.038*				
		(1.11)	(1.96)				

Table 11 – Continued

	Expected Sign	Board of Directors		Audit Committee		Both	
		EARN	*ACC*	*EARN*	*ACC*	*EARN*	*ACC*
		Model (1)	**Model (2)**	**Model (3)**	**Model (4)**	**Model (5)**	**Model (6)**
*DR*ACDDN*				0.014	0.045***		
				(0.77)	(2.84)		
*DR*HIDDN*						0.006	0.027**
						(0.51)	(2.39)
*DR*SIZE*		-0.004	-0.012***	-0.003	-0.013***	-0.003	-0.012***
		(-0.97)	(-3.49)	(-0.88)	(-3.67)	(-0.85)	(-3.61)
*DR*LEV*		-0.003	0.010	-0.002	0.012	-0.003	0.011
		(-0.17)	(0.37)	(-0.11)	(0.44)	(-0.15)	(0.41)
*DR*MTB*		0.001	0.002**	0.001	0.002**	0.001	0.002**
		(0.85)	(2.29)	(0.88)	(2.37)	(0.88)	(2.34)
*DR*BDEXD*		-0.037	0.005	-0.036	0.011	-0.038	0.009
		(-0.88)	(0.12)	(-0.84)	(0.25)	(-0.89)	(0.20)
*DR*BDEXOWN*		-0.003	0.001	-0.003*	0.001	-0.003*	0.001
		(-1.58)	(0.33)	(-1.69)	(0.32)	(-1.68)	(0.33)
*DR*BDFEM*		-0.024	0.044	-0.027	0.045	-0.024	0.048
		(-0.55)	(1.03)	(-0.60)	(1.05)	(-0.53)	(1.13)
*DR*STROFAU*		-0.008	0.004	-0.005	0.004	-0.004	0.004
		(-0.58)	(0.25)	(-0.33)	(0.28)	(-0.29)	(0.25)
RET		0.009	0.013	0.000	0.015	0.004	0.017
		(0.15)	(0.19)	(0.01)	(0.21)	(0.06)	(0.24)
*RET*BDDDN*		-0.021	-0.020				
		(-0.71)	(-0.65)				
*RET*ACDDN*				-0.039*	-0.018		
				(-1.86)	(-0.78)		
*RET*HIDDN*						-0.027*	-0.012
						(-1.66)	(-0.74)

Table 11 – Continued

	Expected Sign	Board of Directors		Audit Committee		Both	
		EARN	*ACC*	*EARN*	*ACC*	*EARN*	*ACC*
		Model (1)	**Model (2)**	**Model (3)**	**Model (4)**	**Model (5)**	**Model (6)**
*RET*SIZE*		0.009**	-0.004	0.010**	-0.005	0.010**	-0.005
		(2.08)	(-0.74)	(2.32)	(-0.90)	(2.27)	(-0.95)
*RET*LEV*		0.011	-0.053	0.012	-0.052	0.011	-0.053
		(0.41)	(-1.12)	(0.44)	(-1.10)	(0.41)	(-1.11)
*RET*MTB*		-0.002***	0.001	-0.002***	0.001	-0.002***	0.001
		(-3.08)	(1.27)	(-2.84)	(1.60)	(-2.84)	(1.59)
*RET*BDEXD*		-0.124**	0.080	-0.119**	0.094*	-0.117**	0.095*
		(-2.43)	(1.53)	(-2.49)	(1.73)	(-2.44)	(1.78)
*RET*BDEXOWN*		-0.005***	-0.002	-0.005***	-0.002	-0.006***	-0.003
		(-2.61)	(-0.75)	(-3.03)	(-0.83)	(-3.00)	(-0.85)
*RET*BDFEM*		-0.055	-0.057	-0.054	-0.049	-0.051	-0.047
		(-0.62)	(-0.81)	(-0.62)	(-0.70)	(-0.58)	(-0.66)
*RET*STROFAU*		-0.036	0.022	-0.034	0.021	-0.032	0.022
		(-1.43)	(0.94)	(-1.43)	(0.95)	(-1.35)	(1.00)
*DR*RET*		0.973***	0.432**	0.992***	0.419**	0.978***	0.411**
		(4.96)	(2.50)	(5.12)	(2.39)	(5.08)	(2.33)
DR*RET*BDDDN	+	**0.136***	**0.168****				
		(1.81)	**(2.23)**				
DR*RET*ACDDN	+			**0.144****	**0.195*****		
				(2.33)	**(3.10)**		
DR*RET*HIDDN	+					**0.107****	**0.129*****
						(2.48)	**(2.80)**
DR*RET*SIZE	−	**-0.066*****	**-0.032*****	**-0.068*****	**-0.031*****	**-0.067*****	**-0.031****
		(-5.10)	**(-2.73)**	**(-5.28)**	**(-2.61)**	**(-5.24)**	**(-2.53)**
DR*RET*LEV	+	**0.022**	**0.067**	**0.021**	**0.066**	**0.020**	**0.066**
		(0.54)	**(1.10)**	**(0.53)**	**(1.09)**	**(0.51)**	**(1.08)**
DR*RET*MTB	+	**0.006**	**0.006**	**0.005**	**0.006**	**0.005**	**0.006**
		(1.47)	**(1.52)**	**(1.37)**	**(1.46)**	**(1.40)**	**(1.48)**

Table 11 – Continued

	Expected Sign	Board of Directors		Audit Committee		Both	
		EARN	*ACC*	*EARN*	*ACC*	*EARN*	*ACC*
		Model (1)	**Model (2)**	**Model (3)**	**Model (4)**	**Model (5)**	**Model (6)**
DR*RET*BDEXD	–	**-0.053**	**-0.086**	**-0.048**	**-0.084**	**-0.041**	**-0.086**
		(-0.36)	**(-0.52)**	**(-0.31)**	**(-0.49)**	**(-0.27)**	**(-0.50)**
DR*RET*BDEXOWN	–	**-0.013****	**-0.002**	**-0.012****	**-0.002**	**-0.012***	**-0.002**
		(-2.03)	**(-0.21)**	**(-1.98)**	**(-0.20)**	**(-1.96)**	**(-0.21)**
DR*RET*BDFEM	+	**-0.103**	**0.212**	**-0.133**	**0.184**	**-0.125**	**0.192**
		(-0.57)	**(1.25)**	**(-0.72)**	**(1.11)**	**(-0.68)**	**(1.16)**
DR*RET*STROFAU	–	**0.016**	**-0.039**	**0.022**	**-0.039**	**0.016**	**-0.043**
		(0.26)	**(-0.65)**	**(0.36)**	**(-0.64)**	**(0.26)**	**(-0.70)**
DS		-0.072	-0.102**	-0.068	-0.094**	-0.068	-0.095**
		(-1.49)	(-2.49)	(-1.40)	(-2.36)	(-1.39)	(-2.37)
*DS*BDDDN*		-0.011	0.014				
		(-0.58)	(0.71)				
*DS*ACDDN*				-0.009	-0.000		
				(-0.63)	(-0.02)		
*DS*HIDDN*						-0.006	0.003
						(-0.62)	(0.35)
*DS*SIZE*		0.005*	0.006**	0.005*	0.006**	0.005*	0.006**
		(1.70)	(2.09)	(1.74)	(2.19)	(1.74)	(2.16)
*DS*LEV*		-0.011	-0.015	-0.011	-0.016	-0.011	-0.016
		(-0.94)	(-0.91)	(-0.95)	(-1.00)	(-0.92)	(-0.99)
*DS*MTB*		0.000	0.001	-0.000	0.001	-0.000	0.001
		(0.19)	(1.54)	(-0.00)	(1.14)	(-0.06)	(1.08)
*DS*BDEXD*		-0.003	0.010	-0.004	0.008	-0.005	0.009
		(-0.07)	(0.24)	(-0.09)	(0.19)	(-0.13)	(0.22)
*DS*BDEXOWN*		-0.000	-0.001	-0.001	-0.001	-0.001	-0.001
		(-0.11)	(-0.43)	(-0.31)	(-0.47)	(-0.26)	(-0.45)
*DS*BDFEM*		-0.002	0.029	0.004	0.040	0.003	0.040
		(-0.05)	(0.79)	(0.10)	(1.10)	(0.09)	(1.09)

Table 11 – Continued

	Expected Sign	Board of Directors		Audit Committee		Both	
		EARN	*ACC*	*EARN*	*ACC*	*EARN*	*ACC*
		Model (1)	**Model (2)**	**Model (3)**	**Model (4)**	**Model (5)**	**Model (6)**
*DS*STROFAU*		-0.004	0.006	-0.003	0.012	-0.002	0.011
		(-0.33)	(0.52)	(-0.23)	(1.02)	(-0.18)	(0.96)
ΔSALES		0.020	-0.201*	0.018	-0.191*	0.015	-0.192*
		(0.19)	(-1.86)	(0.18)	(-1.78)	(0.14)	(-1.79)
*ΔSALES*BDDDN*		0.037	-0.086*				
		(0.69)	(-1.77)				
*ΔSALES*ACDDN*				0.027	-0.049		
				(0.88)	(-1.35)		
*ΔSALES*HIDDN*						0.010	-0.036
						(0.44)	(-1.36)
*ΔSALES*SIZE*		-0.002	0.009	-0.001	0.007	-0.000	0.008
		(-0.24)	(1.12)	(-0.13)	(0.97)	(-0.04)	(1.00)
*ΔSALES*LEV*		-0.011	-0.028	-0.013	-0.025	-0.012	-0.026
		(-0.43)	(-0.90)	(-0.51)	(-0.74)	(-0.46)	(-0.79)
*ΔSALES*MTB*		-0.002	-0.003	-0.003	-0.003	-0.003	-0.003
		(-1.11)	(-0.82)	(-1.26)	(-0.95)	(-1.23)	(-0.93)
*ΔSALES*BDEXD*		0.007	0.126	-0.004	0.118	-0.007	0.116
		(0.09)	(1.24)	(-0.04)	(1.14)	(-0.08)	(1.13)
*ΔSALES*BDEXOWN*		0.004	0.002	0.004	0.003	0.004	0.003
		(1.21)	(0.43)	(1.19)	(0.56)	(1.16)	(0.55)
*ΔSALES*BDFEM*		0.053	0.082	0.056	0.081	0.058	0.079
		(0.61)	(0.79)	(0.64)	(0.79)	(0.66)	(0.76)
*ΔSALES*STROFAU*		-0.059	0.109***	-0.059	0.105***	-0.054	0.111***
		(-1.31)	(3.64)	(-1.34)	(3.26)	(-1.21)	(3.44)
*DS*ΔSALES*		0.027	0.020	0.001	0.016	0.011	0.017
		(0.12)	(0.08)	(0.00)	(0.07)	(0.05)	(0.08)

Table 11 – Continued

	Expected Sign	Board of Directors		Audit Committee		Both	
		EARN	*ACC*	*EARN*	*ACC*	*EARN*	*ACC*
		Model (1)	**Model (2)**	**Model (3)**	**Model (4)**	**Model (5)**	**Model (6)**
*DS*ΔSALES*BDDDN*		0.147	0.318***				
		(1.42)	(2.84)				
*DS*ΔSALES*ACDDN*				0.052	0.038		
				(0.73)	(0.48)		
*DS*ΔSALES*HIDDN*						0.041	0.032
						(0.88)	(0.59)
*DS*ΔSALES*SIZE*		0.003	0.011	0.010	0.018	0.008	0.017
		(0.22)	(0.61)	(0.62)	(1.03)	(0.52)	(1.01)
*DS*ΔSALES*LEV*		0.136***	0.112***	0.131***	0.092**	0.130***	0.094**
		(4.21)	(2.83)	(4.01)	(2.19)	(3.99)	(2.24)
*DS*ΔSALES*MTB*		0.011	0.003	0.009	0.000	0.009	0.000
		(1.63)	(0.36)	(1.28)	(0.06)	(1.31)	(0.06)
*DS*ΔSALES*BDEXD*		-0.119	-0.205	-0.128	-0.201	-0.125	-0.200
		(-0.53)	(-0.95)	(-0.56)	(-0.96)	(-0.55)	(-0.96)
*DS*ΔSALES*BDEXOWN*		-0.021***	-0.009	-0.025***	-0.012	-0.024***	-0.012
		(-2.59)	(-0.82)	(-2.96)	(-1.22)	(-2.86)	(-1.22)
*DS*ΔSALES*BDFEM*		-0.014	-0.122	0.044	-0.028	0.049	-0.028
		(-0.06)	(-0.55)	(0.17)	(-0.13)	(0.19)	(-0.13)
*DS*ΔSALES*STROFAU*		0.093	-0.065	0.107	0.000	0.098	-0.007
		(1.07)	(-0.72)	(1.33)	(0.00)	(1.22)	(-0.08)
Industry controls		Yes	Yes	Yes	Yes	Yes	Yes
Year controls		Yes	Yes	Yes	Yes	Yes	Yes
n		6469	6469	6469	6469	6469	6469
Adjusted R^2		0.283	0.204	0.278	0.200	0.278	0.200

The above table incorporates controls for the proportion of executive directors (*BDEXD*), executives' ownership (*BDEXOWN*), the proportion of female directors (*BDFEM*), and an indicator for the presence of strong cultural faultlines on the board (*STROFAU*). All variables are defined in Table 1. Standard errors are adjusted for heteroskedasticity and clustered at the firm level. ***, **, * indicate significance at the 1%, 5%, and 10% level (two-tailed), respectively. Coefficients of industry and year controls are suppressed for brevity.

APPENDIX A

Table A1 – Adjusting for Depreciation

Panel A: Modified Basu Model with and without Adjustment for Sticky Costs

		Board of Directors		Audit Committee		Both	
	Expected Sign	Unadjusted	Adjusted	Unadjusted	Adjusted	Unadjusted	Adjusted
		Model (1)	Model (2)	Model (3)	Model (4)	Model (5)	Model (6)
Intercept		-0.001	0.029	0.001	0.030	-0.001	0.027
		(-0.03)	(1.01)	(0.05)	(1.08)	(-0.05)	(0.98)
BDDDN		-0.015	-0.015				
		(-1.39)	(-1.25)				
ACDDN				-0.012	-0.009		
				(-1.41)	(-1.02)		
HIDDN						-0.011*	-0.010*
						(-1.93)	(-1.68)
SIZE		0.002	-0.000	0.002	-0.001	0.002	-0.000
		(1.04)	(-0.18)	(0.95)	(-0.28)	(1.12)	(-0.09)
LEV		-0.007	0.016	-0.007	0.015	-0.006	0.015
		(-0.33)	(1.01)	(-0.34)	(0.91)	(-0.33)	(0.93)
MTB		-0.001***	-0.001**	-0.001***	-0.001***	-0.001***	-0.001***
		(-3.72)	(-2.58)	(-3.93)	(-2.81)	(-3.92)	(-2.78)
DR		0.095**	0.102***	0.100***	0.106***	0.097***	0.104***
		(2.57)	(2.70)	(2.76)	(2.89)	(2.68)	(2.82)
*DR*BDDDN*		0.024	0.030*				
		(1.43)	(1.80)				
*DR*ACDDN*				0.037***	0.038***		
				(2.75)	(2.91)		
*DR*HIDDN*						0.020**	0.020**
						(2.08)	(2.16)
*DR*SIZE*		-0.009***	-0.009***	-0.009***	-0.010***	-0.009***	-0.009***
		(-2.88)	(-3.01)	(-3.20)	(-3.35)	(-3.07)	(-3.22)

Panel A – Continued

	Expected Sign	Board of Directors		Audit Committee		Both	
		Unadjusted	Adjusted	Unadjusted	Adjusted	Unadjusted	Adjusted
		Model (1)	Model (2)	Model (3)	Model (4)	Model (5)	Model (6)
*DR*LEV*		-0.003	-0.003	-0.002	-0.001	-0.003	-0.002
		(-0.11)	(-0.17)	(-0.08)	(-0.04)	(-0.11)	(-0.08)
*DR*MTB*		0.002***	0.002***	0.002***	0.002***	0.002***	0.002***
		(2.81)	(2.69)	(2.87)	(2.79)	(2.85)	(2.77)
RET		0.052	0.052	0.065	0.065	0.070	0.071
		(0.96)	(0.94)	(1.18)	(1.18)	(1.30)	(1.31)
*RET*BDDDN*		-0.041*	-0.027				
		(-1.91)	(-1.18)				
*RET*ACDDN*				-0.017	-0.021		
				(-0.93)	(-1.25)		
*RET*HIDDN*						-0.008	-0.010
						(-0.64)	(-0.87)
*RET*SIZE*		-0.004	-0.004	-0.005	-0.005	-0.006	-0.006
		(-0.83)	(-0.80)	(-1.16)	(-1.13)	(-1.30)	(-1.29)
*RET*LEV*		-0.042	-0.027	-0.042	-0.026	-0.043	-0.027
		(-1.39)	(-0.98)	(-1.40)	(-0.92)	(-1.42)	(-0.95)
*RET*MTB*		0.001	0.000	0.001	0.001	0.001	0.001
		(1.07)	(0.94)	(1.52)	(1.56)	(1.53)	(1.58)
*DR*RET*		0.406***	0.421***	0.396***	0.409***	0.382***	0.394***
		(3.10)	(3.25)	(3.02)	(3.16)	(2.89)	(3.03)
DR*RET*BDDDN	+	**0.193*****	**0.181*****				
		(3.05)	**(2.88)**				
DR*RET*ACDDN	+			**0.174*****	**0.187*****		
				(3.44)	**(3.69)**		
DR*RET*HIDDN	+					**0.099*****	**0.107*****
						(2.69)	**(2.91)**
DR*RET*SIZE	–	**-0.033*****	**-0.034*****	**-0.031*****	**-0.033*****	**-0.030*****	**-0.031*****
		(-3.10)	**(-3.30)**	**(-2.97)**	**(-3.20)**	**(-2.77)**	**(-2.99)**

Panel A – Continued

	Expected Sign	Board of Directors		Audit Committee		Both	
		Unadjusted	Adjusted	Unadjusted	Adjusted	Unadjusted	Adjusted
		Model (1)	Model (2)	Model (3)	Model (4)	Model (5)	Model (6)
DR*RET*LEV	+	**0.094****	**0.088****	**0.094****	**0.087****	**0.093****	**0.087****
		(2.33)	**(2.13)**	**(2.34)**	**(2.10)**	**(2.31)**	**(2.09)**
DR*RET*MTB	+	**0.004**	**0.004**	**0.003**	**0.004**	**0.004**	**0.004**
		(1.07)	**(1.18)**	**(0.95)**	**(1.05)**	**(0.96)**	**(1.06)**
DS			-0.082***		-0.079***		-0.079***
			(-2.82)		(-2.86)		(-2.87)
*DS*BDDDN*			0.018				
			(1.09)				
*DS*ACDDN*					0.002		
					(0.20)		
*DS*HIDDN*							0.005
							(0.63)
*DS*SIZE*			0.005**		0.005**		0.005**
			(2.23)		(2.57)		(2.54)
*DS*LEV*			-0.021**		-0.024**		-0.024**
			(-2.00)		(-2.19)		(-2.18)
*DS*MTB*			0.001		0.001		0.001
			(1.06)		(0.70)		(0.65)
ΔSALES			-0.074		-0.079		-0.076
			(-1.01)		(-1.10)		(-1.05)
*ΔSALES*BDDDN*			-0.003				
			(-0.08)				
*ΔSALES*ACDDN*					0.002		
					(0.06)		
*ΔSALES*HIDDN*							0.005
							(0.21)

Panel A – Continued

	Expected Sign	Board of Directors		Audit Committee		Both	
		Unadjusted	Adjusted	Unadjusted	Adjusted	Unadjusted	Adjusted
		Model (1)	Model (2)	Model (3)	Model (4)	Model (5)	Model (6)
*ΔSALES*SIZE*			0.006		0.006		0.006
			(1.04)		(1.16)		(1.11)
*ΔSALES*LEV*			-0.011		-0.011		-0.012
			(-0.44)		(-0.42)		(-0.47)
*ΔSALES*MTB*			-0.002		-0.002		-0.002
			(-0.86)		(-0.97)		(-0.97)
*DS*ΔSALES*			-0.169		-0.176		-0.182
			(-1.09)		(-1.11)		(-1.14)
*DS*ΔSALES*BDDDN*			0.236***				
			(2.59)				
*DS*ΔSALES*ACDDN*					0.018		
					(0.25)		
*DS*ΔSALES*HIDDN*							0.016
							(0.33)
*DS*ΔSALES*SIZE*			0.010		0.016		0.016
			(0.78)		(1.22)		(1.22)
*DS*ΔSALES*LEV*			0.099***		0.082**		0.084**
			(3.06)		(2.38)		(2.45)
*DS*ΔSALES*MTB*			0.004		0.003		0.003
			(0.81)		(0.41)		(0.44)
Industry controls		Yes	Yes	Yes	Yes	Yes	Yes
Year controls		Yes	Yes	Yes	Yes	Yes	Yes
n		6466	6466	6466	6466	6466	6466
Adjusted R^2		0.084	0.115	0.083	0.109	0.083	0.109

Panel B: Controlling for Variations in Conservatism by Industry/Year and Time-invariant Firm-specific Characteristics

		Board of Directors		Audit Committee		Both	
	Expected Sign	OLS	FE	OLS	FE	OLS	FE
		Model (1)	Model (2)	Model (3)	Model (4)	Model (5)	Model (6)
Intercept		0.051*	-0.110*	0.047	-0.120**	0.046	-0.123**
		(1.68)	(-1.94)	(1.59)	(-2.12)	(1.58)	(-2.17)
BDDDN		-0.011	0.002				
		(-0.98)	(0.15)				
ACDDN				-0.007	-0.003		
				(-0.81)	(-0.32)		
HIDDN						-0.009	-0.006
						(-1.54)	(-0.86)
SIZE		-0.000	0.012***	-0.001	0.013***	-0.000	0.014***
		(-0.23)	(2.84)	(-0.34)	(3.03)	(-0.17)	(3.12)
LEV		0.017	-0.027	0.014	-0.030	0.015	-0.030
		(0.98)	(-1.41)	(0.82)	(-1.51)	(0.85)	(-1.51)
MTB		-0.001**	-0.001**	-0.001**	-0.001**	-0.001**	-0.001**
		(-2.22)	(-2.13)	(-2.31)	(-2.18)	(-2.33)	(-2.15)
DR		0.134***	0.133***	0.141***	0.137***	0.138***	0.136***
		(3.30)	(3.23)	(3.58)	(3.39)	(3.49)	(3.37)
*DR*BDDDN*		0.020	0.023				
		(1.16)	(1.39)				
*DR*ACDDN*				0.033**	0.029**		
				(2.48)	(2.12)		
*DR*HIDDN*						0.017*	0.017*
						(1.80)	(1.75)
*DR*SIZE*		-0.010***	-0.009***	-0.011***	-0.010***	-0.011***	-0.009***
		(-3.34)	(-3.05)	(-3.77)	(-3.32)	(-3.64)	(-3.25)
*DR*LEV*		-0.011	0.008	-0.008	0.010	-0.009	0.009
		(-0.51)	(0.39)	(-0.36)	(0.51)	(-0.38)	(0.45)

Panel B – Continued

	Expected Sign	Board of Directors		Audit Committee		Both	
		OLS	FE	OLS	FE	OLS	FE
		Model (1)	Model (2)	Model (3)	Model (4)	Model (5)	Model (6)
*DR*MTB*		0.002**	0.002*	0.002***	0.002*	0.002***	0.002*
		(2.53)	(1.69)	(2.60)	(1.71)	(2.61)	(1.71)
RET		0.051	0.002	0.071	0.020	0.073	0.027
		(0.88)	(0.04)	(1.22)	(0.40)	(1.26)	(0.55)
*RET*BDDDN*		-0.043**	-0.026				
		(-2.14)	(-1.16)				
*RET*ACDDN*				-0.031*	-0.026		
				(-1.86)	(-1.52)		
*RET*HIDDN*						-0.017	-0.009
						(-1.50)	(-0.78)
*RET*SIZE*		-0.005	-0.000	-0.006	-0.001	-0.007	-0.002
		(-1.10)	(-0.04)	(-1.45)	(-0.37)	(-1.58)	(-0.60)
*RET*LEV*		-0.022	-0.003	-0.020	-0.000	-0.022	-0.002
		(-0.73)	(-0.10)	(-0.66)	(-0.01)	(-0.69)	(-0.06)
*RET*MTB*		0.000	0.000	0.001	0.000	0.001	0.000
		(0.69)	(0.36)	(0.89)	(0.68)	(0.97)	(0.66)
*DR*RET*		0.613***	0.561***	0.602***	0.530***	0.585***	0.507***
		(4.08)	(3.62)	(4.00)	(3.43)	(3.86)	(3.27)
DR*RET*BDDDN	+	**0.144****	**0.176****				
		(2.32)	**(2.38)**				
DR*RET*ACDDN	+			**0.174*****	**0.199*****		
				(3.46)	**(3.69)**		
DR*RET*HIDDN	+					**0.098*****	**0.111*****
						(2.75)	**(2.98)**
DR*RET*SIZE	−	**-0.038*****	**-0.037*****	**-0.038*****	**-0.036*****	**-0.036*****	**-0.034*****
		(-3.60)	**(-3.34)**	**(-3.60)**	**(-3.29)**	**(-3.41)**	**(-3.11)**
DR*RET*LEV	+	**0.070**	**0.053**	**0.068**	**0.050**	**0.069**	**0.050**
		(1.64)	**(1.21)**	**(1.59)**	**(1.12)**	**(1.60)**	**(1.12)**

Panel B – Continued

	Expected Sign	Board of Directors		Audit Committee		Both	
		OLS	FE	OLS	FE	OLS	FE
		Model (1)	Model (2)	Model (3)	Model (4)	Model (5)	Model (6)
DR*RET*MTB	+	**0.004**	**0.004**	**0.004**	**0.004**	**0.004**	**0.004**
		(1.32)	**(0.97)**	**(1.29)**	**(0.95)**	**(1.27)**	**(0.96)**
DS		-0.087***	-0.095***	-0.083***	-0.091***	-0.083***	-0.092***
		(-2.96)	(-3.13)	(-2.97)	(-3.10)	(-2.95)	(-3.15)
*DS*BDDDN*		0.018	0.016				
		(1.09)	(0.93)				
*DS*ACDDN*				0.003	0.006		
				(0.24)	(0.45)		
*DS*HIDDN*						0.006	0.005
						(0.66)	(0.62)
*DS*SIZE*		0.005**	0.006***	0.006***	0.006***	0.006***	0.006***
		(2.35)	(2.61)	(2.66)	(2.84)	(2.61)	(2.89)
*DS*LEV*		-0.018*	-0.005	-0.020*	-0.006	-0.020*	-0.006
		(-1.72)	(-0.46)	(-1.90)	(-0.60)	(-1.90)	(-0.57)
*DS*MTB*		0.001	0.001	0.000	0.000	0.000	0.000
		(0.92)	(0.58)	(0.57)	(0.30)	(0.53)	(0.29)
Δ*SALES*		-0.089	-0.077	-0.093	-0.088	-0.090	-0.091
		(-1.21)	(-0.98)	(-1.31)	(-1.15)	(-1.26)	(-1.19)
Δ*SALES*BDDDN*		-0.002	-0.012				
		(-0.05)	(-0.25)				
Δ*SALES*ACDDN*				0.002	-0.008		
				(0.07)	(-0.25)		
Δ*SALES*HIDDN*						0.006	-0.010
						(0.25)	(-0.45)
Δ*SALES*SIZE*		0.007	0.006	0.008	0.007	0.007	0.007
		(1.24)	(0.94)	(1.38)	(1.11)	(1.32)	(1.18)
Δ*SALES*LEV*		-0.011	-0.026	-0.011	-0.024	-0.012	-0.024
		(-0.45)	(-0.94)	(-0.42)	(-0.81)	(-0.47)	(-0.81)

Panel B – Continued

	Expected Sign	Board of Directors		Audit Committee		Both	
		OLS	FE	OLS	FE	OLS	FE
		Model (1)	Model (2)	Model (3)	Model (4)	Model (5)	Model (6)
*ΔSALES*MTB*		-0.002	-0.002	-0.002	-0.002	-0.002	-0.002
		(-0.86)	(-0.77)	(-1.01)	(-0.81)	(-1.04)	(-0.80)
*DS*ΔSALES*		-0.183	-0.193	-0.182	-0.181	-0.187	-0.177
		(-1.17)	(-1.09)	(-1.13)	(-0.95)	(-1.16)	(-0.93)
*DS*ΔSALES*BDDDN*		0.261***	0.243**				
		(2.78)	(2.50)				
*DS*ΔSALES*ACDDN*				0.029	0.047		
				(0.40)	(0.57)		
*DS*ΔSALES*HIDDN*						0.023	0.043
						(0.45)	(0.78)
*DS*ΔSALES*SIZE*		0.011	0.015	0.016	0.018	0.016	0.018
		(0.81)	(1.01)	(1.21)	(1.21)	(1.21)	(1.16)
*DS*ΔSALES*LEV*		0.104***	0.126***	0.086**	0.109***	0.088***	0.109***
		(3.27)	(3.43)	(2.54)	(2.79)	(2.62)	(2.84)
*DS*ΔSALES*MTB*		0.005	0.000	0.003	-0.002	0.003	-0.002
		(0.83)	(0.07)	(0.44)	(-0.27)	(0.48)	(-0.26)
Firm fixed effects		No	Yes	No	Yes	No	Yes
Year controls		Yes	Yes	Yes	Yes	Yes	Yes
Industry controls		Yes	No	Yes	No	Yes	No
Interactions of year controls with *DR*, *RET*, and *DR*RET*		Yes	Yes	Yes	Yes	Yes	Yes
Interactions of industry controls with *DR*, *RET*, and *DR*RET*		Yes	No	Yes	No	Yes	No
n		6466	6466	6466	6466	6466	6466
Adjusted R^2		0.125	0.121	0.118	0.118	0.119	0.117

Panel C: Controlling for Other Board Characteristics

	Expected Sign	Board of Directors Model (1)	Audit Committee Model (2)	Both Model (3)
Intercept		-0.001	0.000	0.001
		(-0.01)	(0.01)	(0.02)
BDDDN		-0.007		
		(-0.57)		
ACDDN			-0.004	
			(-0.43)	
HIDDN				-0.005
				(-0.94)
SIZE		-0.000	-0.000	0.000
		(-0.02)	(-0.01)	(0.07)
LEV		0.019	0.017	0.017
		(1.11)	(1.01)	(1.01)
MTB		-0.001**	-0.001**	-0.001**
		(-2.03)	(-2.20)	(-2.16)
BDEXD		0.019	0.016	0.013
		(0.75)	(0.62)	(0.51)
BDEXOWN		0.001	0.001	0.001
		(0.96)	(1.03)	(0.99)
BDFEM		-0.010	-0.012	-0.012
		(-0.35)	(-0.43)	(-0.44)
STROFAU		-0.017*	-0.019**	-0.018**
		(-1.91)	(-2.11)	(-2.09)
DR		0.117***	0.117***	0.117***
		(2.66)	(2.65)	(2.66)
*DR*BDDDN*		0.027		
		(1.59)		
*DR*ACDDN*			0.036***	
			(2.65)	
*DR*HIDDN*				0.018*
				(1.92)
*DR*SIZE*		-0.010***	-0.010***	-0.010***
		(-3.05)	(-3.28)	(-3.22)
*DR*LEV*		-0.001	0.002	0.001
		(-0.03)	(0.09)	(0.05)
*DR*MTB*		0.002**	0.002**	0.002**
		(2.36)	(2.46)	(2.43)
*DR*BDEXD*		-0.013	-0.004	-0.007
		(-0.35)	(-0.10)	(-0.20)
*DR*BDEXOWN*		-0.000	-0.000	-0.000
		(-0.14)	(-0.17)	(-0.16)
*DR*BDFEM*		0.030	0.029	0.032
		(0.79)	(0.76)	(0.83)
*DR*STROFAU*		0.006	0.006	0.007
		(0.43)	(0.44)	(0.50)
RET		0.054	0.055	0.058
		(0.88)	(0.91)	(0.96)

Panel C – Continued

	Expected Sign	Board of Directors Model (1)	Audit Committee Model (2)	Both Model (3)
*RET*BDDDN*		-0.032		
		(-1.38)		
*RET*ACDDN*			-0.024	
			(-1.36)	
*RET*HIDDN*				-0.014
				(-1.14)
*RET*SIZE*		-0.002	-0.003	-0.004
		(-0.54)	(-0.79)	(-0.90)
*RET*LEV*		-0.027	-0.025	-0.026
		(-0.89)	(-0.84)	(-0.86)
*RET*MTB*		0.000	0.000	0.000
		(0.23)	(0.64)	(0.64)
*RET*BDEXD*		0.032	0.051	0.054
		(0.73)	(1.13)	(1.21)
*RET*BDEXOWN*		-0.004*	-0.004*	-0.004*
		(-1.78)	(-1.95)	(-1.94)
*RET*BDFEM*		-0.004	0.004	0.006
		(-0.06)	(0.06)	(0.10)
*RET*STROFAU*		0.024	0.023	0.024
		(1.15)	(1.14)	(1.17)
*DR*RET*		0.441***	0.431***	0.427***
		(2.77)	(2.69)	(2.65)
DR*RET*BDDDN	+	**0.182*** **		
		(2.86)		
DR*RET*ACDDN	+		**0.186*** **	
			(3.63)	
DR*RET*HIDDN	+			**0.109*** **
				(2.92)
DR*RET*SIZE	–	**-0.035*** **	**-0.034*** **	**-0.033*** **
		(-3.17)	**(-3.02)**	**(-2.89)**
DR*RET*LEV	+	**0.090** **	**0.089** **	**0.088** **
		(2.09)	**(2.08)**	**(2.05)**
DR*RET*MTB	+	**0.005**	**0.005**	**0.005**
		(1.38)	**(1.29)**	**(1.29)**
DR*RET*BDEXD	–	**-0.067**	**-0.072**	**-0.083**
		(-0.52)	**(-0.55)**	**(-0.63)**
DR*RET*BDEXOWN	–	**0.000**	**0.000**	**0.000**
		(0.04)	**(0.04)**	**(0.01)**
DR*RET*BDFEM	+	**0.102**	**0.072**	**0.078**
		(0.68)	**(0.47)**	**(0.51)**
DR*RET*STROFAU	–	**-0.030**	**-0.027**	**-0.026**
		(-0.56)	**(-0.49)**	**(-0.48)**
DS		-0.069*	-0.064*	-0.065*
		(-1.82)	(-1.69)	(-1.72)
*DS*BDDDN*		0.015		
		(0.87)		

Panel C – Continued

	Expected Sign	Board of Directors Model (1)	Audit Committee Model (2)	Both Model (3)
*DS*ACDDN*			0.003	
			(0.20)	
*DS*HIDDN*				0.005
				(0.63)
*DS*SIZE*		0.005**	0.006**	0.005**
		(2.13)	(2.28)	(2.26)
*DS*LEV*		-0.025**	-0.027**	-0.026**
		(-2.24)	(-2.36)	(-2.34)
*DS*MTB*		0.001	0.001	0.001
		(1.39)	(1.00)	(0.97)
*DS*BDEXD*		-0.011	-0.014	-0.013
		(-0.31)	(-0.39)	(-0.35)
*DS*BDEXOWN*		-0.002	-0.002	-0.002
		(-0.90)	(-1.01)	(-0.99)
*DS*BDFEM*		0.007	0.018	0.017
		(0.23)	(0.57)	(0.55)
*DS*STROFAU*		-0.001	0.003	0.002
		(-0.13)	(0.28)	(0.16)
ΔSALES		-0.143*	-0.140*	-0.140*
		(-1.70)	(-1.68)	(-1.67)
*ΔSALES*BDDDN*		-0.023		
		(-0.62)		
*ΔSALES*ACDDN*			-0.016	
			(-0.61)	
*ΔSALES*HIDDN*				-0.010
				(-0.51)
*ΔSALES*SIZE*		0.006	0.006	0.006
		(0.99)	(1.03)	(1.03)
*ΔSALES*LEV*		-0.023	-0.021	-0.022
		(-0.87)	(-0.78)	(-0.82)
*ΔSALES*MTB*		-0.002	-0.002	-0.002
		(-0.77)	(-0.89)	(-0.89)
*ΔSALES*BDEXD*		0.109	0.099	0.099
		(1.45)	(1.32)	(1.31)
*ΔSALES*BDEXOWN*		0.002	0.003	0.003
		(0.54)	(0.58)	(0.58)
*ΔSALES*BDFEM*		0.036	0.038	0.036
		(0.41)	(0.44)	(0.41)
*ΔSALES*STROFAU*		0.091***	0.091***	0.093***
		(2.93)	(2.95)	(2.98)
*DS*ΔSALES*		0.059	0.049	0.047
		(0.31)	(0.26)	(0.25)
*DS*ΔSALES*BDDDN*		0.250***		
		(2.60)		
*DS*ΔSALES*ACDDN*			0.041	
			(0.60)	

Panel C – Continued

	Expected Sign	Board of Directors Model (1)	Audit Committee Model (2)	Both Model (3)
*DS*ΔSALES*HIDDN*				0.032
				(0.70)
*DS*ΔSALES*SIZE*		0.006	0.013	0.013
		(0.45)	(0.96)	(0.95)
*DS*ΔSALES*LEV*		0.109***	0.093***	0.095***
		(3.33)	(2.73)	(2.79)
*DS*ΔSALES*MTB*		0.005	0.003	0.003
		(0.91)	(0.48)	(0.50)
*DS*ΔSALES*BDEXD*		-0.273	-0.276	-0.277
		(-1.48)	(-1.51)	(-1.50)
*DS*ΔSALES*BDEXOWN*		-0.011	-0.014	-0.014
		(-1.14)	(-1.59)	(-1.59)
*DS*ΔSALES*BDFEM*		-0.057	0.026	0.028
		(-0.30)	(0.14)	(0.15)
*DS*ΔSALES*STROFAU*		-0.085	-0.036	-0.043
		(-0.97)	(-0.45)	(-0.54)
Industry controls		Yes	Yes	Yes
Year controls		Yes	Yes	Yes
n		6466	6466	6466
Adjusted R^2		0.122	0.117	0.117

The above table re-estimates Equations (1) to (5) after using accruals before depreciation (*ACCBDEP*) as the dependent variable. *ACCBDEP* is the accrual component of earnings (*ACC*) plus depreciation expense, scaled by the lagged market value of equity. Other variables are defined in Table 1. Standard errors are adjusted for heteroskedasticity and clustered at the firm level. ***, **, * indicate significance at the 1%, 5%, and 10% level (two-tailed), respectively. Coefficients involving firm/industry/year controls are suppressed for brevity.

Conclusion

5.1. Summary and Overview

Drawing on various theories, conscious and subconscious differences in mentality and behaviour have been attributed to diversity among board members (Chen *et al*., 2017; Lai *et al*., 2017; Van Peteghem *et al*., 2018; Riordan and Wayne, 2008). Understanding the upside and the downside of diversity is then a key to board effectiveness. Less clear is how available empirical proxies map onto different theoretical constructs of diversity. The first essay of this thesis contributes to filling this gap. In particular, it distinguishes between three constructs of diversity: case-based asymmetry, balanced diversity, and unique diversity. It then presents three sets of criteria to assess how well available empirical proxies map onto these constructs. The assessment reveals that these constructs are best captured by using the proportion of case directors, proportional balance (excluding null categories/ combinations), and dissimilarity proportion, respectively.

The second essay examines the demand side and the outcome side of diversity, after accounting for the nationality composition of non-domestic (foreign) directors. This composition can play a vital role in shaping board dynamics as it determines three elements of diversity: (i) the level of board nationality diversity, (ii) the strength of cultural subgrouping along faultlines, and (iii) the possible presence of marginalized foreign minorities. These elements have not yet been directly investigated in the literature on the antecedents and consequences of board nationality diversity. To fill this gap, this essay begins by distinguishing the first element, which is deemed helpful to the operation of corporate boards, and the other two elements, which are mechanisms through which board cultural separation may reduce the value of diversity to shareholders. Each of these elements is then measured separately. Using a large UK sample, the empirical findings indicate that the level of board nationality diversity is driven by the magnitude of foreign activities (measured by the proportion of foreign sales), rather than the number of geographical regions in which a firm operates. The findings also suggest that higher diversity is associated with higher firm value, after addressing potential endogeneity by implementing an instrumental variable approach using 2SLS regressions. In addition, no statistically significant role is found for the presence of strong board cultural faultlines or marginalized foreign directors in moderating the relationship between board nationality diversity and firm value. Yet, this relationship is mitigated by levels of operational complexity, suggesting that board nationality diversity contributes to firm value only under certain circumstances.

The final essay investigates the nationality compositions of the board and its audit committee in relation to conditional conservatism. This area has not been investigated in accounting and governance research to date. This essay fills this gap. It draws on the theories of groupthink and resource dependence to propose that nationality-diverse boards and audit committees are more likely to demand higher conservatism in financial reporting compared to their homogeneous (all-domestic) counterparts. Employing a sample of UK firms with at least three audit committee members, I find that higher nationality diversity on the board and the audit committee is associated with greater conservatism. The association is stronger for firms with high diversity on both the board and its audit committee. The results hold after addressing potential endogeneity by using 2SLS and fixed effects regressions. The findings suggest that foreign nationals who qualify for audit committee membership negatively impact its appetite for risk-taking in financial reporting. This effect is strengthened when nationality diversity on the audit committee is supported with a high level of nationality diversity on the board.

5.2. IMPLICATIONS

This thesis has a set of implications for academic research on board diversity. First, it suggests that both the positive and the negative aspects of board diversity should be accounted for simultaneously. Second, it reviews a set of theoretical and empirical constructs of diversity that could be applied to diversity within other workgroups (e.g., top management teams and audit teams). Third, it cautions against the use of empirical proxies that do not map onto the theoretical construct under investigation. Fourth, it introduces geographical proximity between firms' headquarters as a potential driver for similar corporate governance practices.

The thesis also has some practical implications. First, it directs companies' attention to unique boards as diverse boards with potentially no faultlines nor marginalized members. This could help companies in the design of their optimal board diversity structures. Second, the thesis shows that board nationality diversity creates value for shareholders only when firms are complex. This could help investors in developing a better understanding of the shareholder-value implications of board nationality diversity. Third, it identifies a new source of variation in conditional conservatism. This suggests that regulators could advocate higher levels of nationality diversity on corporate boards to achieve greater conservatism in financial reporting, thereby facilitating efficient contracting between market participants (including shareholders, debtholders, and managers).

This study could therefore be of interest to academics, companies, investors, and regulators.

5.3. LIMITATIONS AND SUGGESTIONS FOR FUTURE RESEARCH

As with all studies, this study has limitations. First, the empirical tests emphasise two main constructs of board diversity: uniqueness and separation. Other constructs of diversity, such as disparity, are not tested empirically in this thesis. Also, the comparisons between available empirical proxies for each diversity construct are mainly theoretical, except for those between our proxy for board nationality diversity as uniqueness and prior measures of board nationality diversity. Future research may explore these points further. Second, while the results survive a battery of robustness checks to mitigate sources of endogeneity (including self-selection bias and omitted-variable bias), endogeneity concerns cannot be completely ruled out. Third, boards with strong faultlines are not common in my samples. A possible reason for this is that most firms with nationality-diverse boards are actively avoiding the creation of such strong faultlines on their boards to get the most out of diversity. Fourth, the empirical tests have been conducted employing UK samples. While the results should be reasonably generalisable to many other countries, future research might consider the use of other samples.

5.4. Final Remarks

This study is a further step toward a better understanding of the theoretical and empirical constructs of board diversity. It introduces new theoretical and empirical constructs to board diversity research in accounting and finance, opening the door for a more rigid investigation of the pros and cons of diversity practices on the board and its specialized committees.

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