No.61

NOVIEMBRE DE 2018

Documentos CEDE

ISSN 1657-7191 Edición electrónica.

Board Capital Diversity and Firm Value:
Evidence from Latin-America

Cristian Pinto-Gutiérrez
Carlos Pombo
Jairo Villamil-Díaz

CEDE
CENTRO DE ESTUDIOS SOBRE DESARROLLO ECONÓMICO

Universidad de
los Andes
Facultad de Economía

Serie Documentos Cede, 2018-61
ISSN 1657-7191 Edición electrónica.
Noviembre 2018

© 2018, Universidad de los Andes, Facultad de Economía,
CEDE. Calle 19A No. 1 – 37 Este, Bloque W.
Bogotá, D. C., Colombia Teléfonos: 3394949- 3394999,
extensiones 2400, 2049, 2467
infocede@uniandes.edu.co
<http://economia.uniandes.edu.co>

Impreso en Colombia – Printed in Colombia

La serie de Documentos de Trabajo CEDE se circula con propósitos de discusión y divulgación. Los artículos no han sido evaluados por pares ni sujetos a ningún tipo de evaluación formal por parte del equipo de trabajo del CEDE.

El contenido de la presente publicación se encuentra protegido por las normas internacionales y nacionales vigentes sobre propiedad intelectual, por tanto su utilización, reproducción, comunicación pública, transformación, distribución, alquiler, préstamo público e importación, total o parcial, en todo o en parte, en formato impreso, digital o en cualquier formato conocido o por conocer, se encuentran prohibidos, y sólo serán lícitos en la medida en que se cuente con la autorización previa y expresa por escrito del autor o titular. Las limitaciones y excepciones al Derecho de Autor, sólo serán aplicables en la medida en que se den dentro de los denominados Usos Honrados (Fair use), estén previa y expresamente establecidas, no causen un grave e injustificado perjuicio a los intereses legítimos del autor o titular, y no atenten contra la normal explotación de la obra.

Universidad de los Andes | Vigilada Mineducación
Reconocimiento como Universidad: Decreto 1297 del 30 de mayo de 1964. Reconocimiento personería jurídica: Resolución 28 del 23 de febrero de 1949 Minjusticia.

Board Capital Diversity and Firm Value: Evidence from Latin-America

Cristian Pinto-Gutiérrez¹

Carlos Pombo²

Jairo Villamil-Díaz³

Abstract

This paper analyzes the effects of diversity of boards of directors' human and relational capital on the performance of firms in Latin America. Using a large database of 442 firms in 6 countries (Argentina, Brazil, Chile, Colombia, Mexico, and Peru) from 2001 to 2012, we construct a Board Capital Diversity Index that includes educational backgrounds and work experiences for each board member. We find a positive relationship between board capital diversity and firm performance, as measured by Tobin's Q. In particular, we find that both human capital diversity (educational background) and relational capital diversity (experience in the private and public sector) increase the value of the company. Our results confirm the resource dependence theory, where the board, in addition to its monitoring role, is seen as a provider of resources.

JEL Codes: G32, G34

Keywords: Corporate Governance, Director Heterogeneity, Firm Performance, Emerging Markets.

¹ School of Business, University of Connecticut. 2100 Hillside Road, Unit 1041, Storrs, CT 06269-1041. Email: cristian.pinto-gutierrez@uconn.edu.

² School of Management, Finance Department, Universidad de los Andes, Colombia. *Corresponding Author*. Calle 21 # 1-20, Bogotá, Colombia. Email: cpombo@uniandes.edu.co.

³ School of Management, Finance Department, Universidad de los Andes Colombia; ONUDI. United Nations. Email: ja.villamil1472@uniandes.edu.co

Capital del Directorio y valoración corporativa: Evidencia de América Latina

Cristian Pinto-Gutiérrez

Carlos Pombo

Jairo Villamil-Díaz

Resumen

Este documento analiza los efectos de la diversidad de los directorios asociados capital humano y relacional de los directores con la valoración corporativa en América Latina. Utilizando una gran base de datos de 442 empresas en 6 países (Argentina, Brasil, Chile, Colombia, México y Perú) de 2001 a 2012, creamos un Índice de diversidad de capital del directorio que incluye antecedentes educativos y experiencia profesional para cada miembro de Junta. Encontramos una relación positiva entre la diversidad del capital del directorio y el desempeño de la empresa, medida por la Q de Tobin. En particular, los resultados señalan que tanto la diversidad explicada por capital humano (antecedentes educativos) como la diversidad del capital relacional (experiencia en el sector público y privado) tienen efecto marginal positivo en el valor de la firma. Nuestros resultados confirman la teoría de dependencia de los recursos, donde los directores, además de su función de monitoreo, son vistos como proveedores de recursos.

Códigos JEL: G32, G34

Palabras clave: Gobierno corporativo, heterogeneidad de directores, desempeño de la firma, mercados emergentes

1. Introduction

The relationship between board capital diversity and firm performance is a point of contention in prior literature. Several papers have examined the effect of board diversity on firm performance, often concluding that it had a positive impact. The arguments for this superior performance include improvements in the quality of the decision-making process due to access to more and not fully correlated information across board members (Adams et al., 2015; Arfken et al., 2004; Erhardt et al., 2003; Van der Walt et al., 2006).

The literature on corporate finance points out the enhancements in a board's independence that allow directors to improve its monitoring function (Adams & Ferreira, 2009).¹ Conversely, some studies show that gender diversity can also have adverse effects on firm performance because the gender quota imposed to security issuers does not imply the appointment of the best profiles from the market of directors (Ahern and Dittmar, 2012; Matsa and Miller, 2013). Extreme board diversity may also cause higher decision-making costs in boards, and increase the likelihood of conflicts and factions in teams.

This study relies on the concept of board capital, which is an organizational input. The concept is borrowed from the literature on organizational theory that dates from the work of Pfeffer (1972) and similar authors from the theory of dependence on resources -*Resource Based View*. It also comes more recently from the work of Hillman and co-authors (2000, 2003) that, from the same school, try to integrate a perspective of agency costs with that of dependence on resources.

This integrating view states that a crucial function of the board of directors is to provide and / or secure resources through links with the external environment. (Boyd, 1990, Pearce and Zahra, 1992). By having directors that serve to link the company with its external environment, a board

¹ For other proposed benefits of diverse boards, see Hillman (2015).

can reduce uncertainty. Directors also provide information, skills, access to suppliers, buyers, social groups and legitimacy ([Gales and Kesner, 1994](#)). The function of provision of resources by directors is theoretically different from their monitoring role. However, any director can play both roles simultaneously (Johnson et al., 1996).

The concept of board capital is the sum of two components: i) Human Capital and ii) Relational Capital. The first is associated with people's education variables while the second is related to their profile and professional experience. These attributes are intrinsic to people. They have been generated by ex-ante decisions that affect the original conditions so that ex-post show a competitive profile (capital level) in the directors' labor market. In a complementary way there are attributes of the directors as individuals that are exogenous in nature such as age, gender or nationality. Then the set of attributes associated with individual professional profiles and exogenous attributes are the sources of heterogeneity of directors. Greater director heterogeneity explains higher and lower diversity in a given directorate.

In this paper, we explore a sample of Latin American listed firms and, more specifically, where the issue of director heterogeneity and board capital becomes a central factor to improve directorate quality and internal corporate governance mechanisms within firms in countries ranked with low levels of investor protection. Outside investors see skilled boards as a sign of strong boards and firms with better governance. For instance, institutional investors have revealed preferences for governance issues such as equity ownership of management, use of equity based compensation, board independence, transparency regarding the holdings of large shareholders, and high free float ([McCahery et al., 2016](#)), as well as the quality of financial disclosure ([Bird and Karolyi, 2016](#)).

The demand for director heterogeneity comes from firms. The greatest demand for heterogeneity comes from companies with a greater degree of operational and managerial

complexity (Anderson et al., 2011), securities issuers, multinationals, multi-product firms, and firms affiliated with business groups. The sample of the 442 firms in the study includes companies with these characteristics: Latin American multinationals (e.g., America Móvil (MX), Cencosud (CL)), holding companies (e.g., Argos Group (COL), Carso Group (MX) and multi –product firms (e.g., EMBRAER (BR)). All firms were listed and some were cross-listed during the analyzed period.

Our conceptual² and empirical model includes variables of board structure such as size, turnover (turnover), and fraction of outside/independent directors. These variables in the model are included as moderating variables that facilitate / dissuade directors' monitoring, advising and providing resources to organizations. Less dependent directorates to firm management enhance the value of board capital.

There are two close studies from the perspective of corporate finance, that analyze the demand for director heterogeneity (Anderson et al., 2011) or the effect of demographic board diversity based on individual attributes - (Ararat et. al, 2015) on firm market performance (Tobin's Q). The first study, based on a sample of 615 industrial firms in the U.S., found that operationally complex firms (i.e., large, indebted, multiproduct firms with high fixed costs) require boards that are more heterogeneous. They found that an increase of 10% in the board heterogeneity index³ adjusted Tobin's Q will change by 7.8%. After controlling by firm operational complexity, this effect decreases to changes in value of about 3.2%.

The second is a country case study for Turkey that analyzes the indirect effect of a board's demographic diversity on firm performance based on a cross-section sample of 93 liquid firms

² Figure 1 in the appendix summarizes the conceptual framework on board capital, corporate governance and firm value relations.

³ The board heterogeneity index in Anderson et al., (2011) is a composite index constructed from six board heterogeneity director attributes: age, education, working experience, gender, ethnicity, board member experience.

belonging to Istanbul BIST-100 index for year 2007. The paper controls for ownership structures, where there is an observed wedge between ownership and control in publicly held firms with controlling owners (i.e., family related blockholders). The study finds evidence of a positive and non-linear relationship between board diversity index (BDI) and performance, mediated by the board's monitoring efforts. The marginal effect of board diversity on firm market to book ratio (MTB) is around 0.06 evaluated at the mean of the diversity index. This means that a 10% change in the demographic diversity index will increase MTB by 60 base points. If the diversity index value is greater than 0.25 standard deviation above the distribution mean, that effect turns out negative and firm value decreases.

This paper extends previous work on director heterogeneity and corporate governance in at least two ways. First, we broadly model board capital diversity as an organizational input that includes proxy variables to support the integrating agency provision of resources views of boards of directors. We consider several director heterogeneity sources that include director education skills, professional experience, demographic diversity, and construct a Board Capital Diversity Index (BCDI) composed by the aggregation of several diversity drivers, extending the idea of a board heterogeneity index. We extend Anderson et al.'s (2011) work by examining the effects of board heterogeneity in Latin America, a region where board capital becomes a signal for strong boards for outside investors within weak corporate governance regimes ([Dahya et al., 2008](#)).

Second, our approach differs from Ararat et al. (2015). On the one hand, their study focuses on only one emerging market based on a small cross-sectional sample of 97 observations. Such a limitation in the number of observations could cast some doubt on the robustness of their statistical tests since no causality analysis can be formally addressed. In contrast, we use a large panel of 4665 year-firm observations, from the six large equity markets in Latin America. On the other

hand, unlike Ararat et al. (2015), we estimate the effects of relational capital by calculating the impact of current and past work experience diversity on firm performance.

Our results show that several characteristics associated with the diversity of board capitals have a positive impact on firm performance. Our empirical analysis relates to the extent to which human capital (skills and knowledge), diversity and relational capital (work experiences and the network of links to private and public companies), and diversity improve firm performance. In particular, we find that diversifying the board with members holding law degrees and members with master's degrees in business administration (MBA) increases the value of the firm, as measured by Tobin's Q. We also find a positive relationship between Tobin's Q and the presence of some members with experience and networks of links to the public sector. This last result is consistent with prior studies that show that connections to public officials and politicians provide significant benefits to firms in developing countries that have higher levels of corruption ([Boubakri et al., 2012](#); [Chen et al., 2010](#); [Faccio et al 2010](#)), as is the case in many Latin American countries. Overall, the results are consistent with the intuition that directors use their skills, experience, expertise, and knowledge to perform not only manager-monitoring activities but also to provide advice and counsel to management ([Chen, 2008](#); [Hillman, 2005](#)).

The remainder of the paper is organized as follows. Section 2 explains the empirical design and method; Section 3 describes the dataset and the descriptive statistics; Section 4 discusses the empirical results and reports robustness checks. The last section provides concluding remarks.

2. Research Design

This section analyzes how board capital diversification affects firm performance. The estimating equation explicitly models the marginal effects of corporate board heterogeneity variables on firm

value, controlled by the set of firm characteristics and corporate governance variables that include board structure variables. The following equation shows the panel regression for this test:

$$Q_{it} = \beta_0 + \beta_k \text{BCDI}_{it} + \delta_k' \mathbf{DIV}_{it} + \gamma_k' \mathbf{BOARD}_{it} + \varphi_k' \mathbf{FIRM}_{it} + Y_i + I_i + C_i + \epsilon_{it}, \quad (1)$$

where Q_{it} is the performance variable Tobin's Q for firm i at year t . In line with prior empirical research on board diversity and firm performance, we used Tobin's Q as the primary measure of firm value. We define Tobin's Q as the ratio between the market value of equity plus book value of debt and book value of the preferred stock to book value of assets. BCDI stands for Board Capital Diversity Index, and represents the key variable of interest in this study. $\mathbf{DIV}$ is a vector that denotes traditional board diversity variables based on gender and foreign director ratios. $\mathbf{BOARD}$ is a vector representing board structure variables that include CEO-Chairman duality, board size, and board independence ratio. $\mathbf{FIRM}$ is the vector with the standard financial and firm idiosyncratic controls. The empirical model in Equation (1) allows for time ($Year_t$), industry (I_j), and country (C_j) fixed effects.

Board capital diversity index (BCDI) is calculated based on educational levels and previous work experience as the primary indicators. We rely on the Blau Index (1977) to measure diversity for each attribute and then create a composite board-level diversity index:

$$\text{Blau Index} = 1 - \sum_{i=1}^K P^2, \quad (2)$$

where P is the proportion of the board members in the i -th category for a given attribute, and k is the number of categories in a given attribute. According to the Blau Index formula, the higher the number of categories (i.e., the higher the diversity) in an attribute and the more evenly the subjects

are distributed to different groups, the lower the sum of the proportions, and hence, the greater the Blau index value. Because we make all our diversity factors have only two categories each, the only the maximum value their Blau indices can take is 50%. We finally form a composite Board Human Capital Diversity Index (BHDI) and a Board Relational Capital Diversity Index (BRDI) for each board by summing the standardized Blau values for each attribute. In particular, BHDI includes the Blau indices for the ratio of board members with undergraduate studies in business and law, other undergraduate degrees, master's degrees, Ph.D. degrees, and foreign studies. BRDI includes the Blau indices for the ratio of board members with experience as founders, CEO, and with experience in the public sector. Last, we generate a Board Capital Diversity Index (BCDI) defined as the sum of BHDI and BRDI.⁴ All variables are defined in Appendix A.

We introduce several control variables into our analysis to control for board and firm characteristics. To capture the extent to which larger boards are inherently more diverse, we include the natural log of board size. Further, because greater director independence from senior management potentially improves boards' monitoring and control activities and since independent boards may be more heterogeneous, we incorporate board independence into our analysis. Specifically, we use the number of independent directors divided by total board size. Our classification of independent directors follows that of [Ferris et al. \(2003\)](#), which is of nonemployee directors with no other relationship with the firm except their directorship. We also control for gender and nationally diversity proxies used previously by the corporate finance literature. To control for the effects of past performance on current performance and board structure, we use prior-year return on assets (ROA) calculated as income before interest, tax, depreciation, and amortization (EBITDA) divided by the book value of total assets. We also include the size,

⁴ Complete definitions of all variables are shown in Table A1 of the Appendix

leverage, and tangibility to control for financial constraints that may affect performance. The empirical model in Equation (1) allows for time ($year_t$), industry (I_j), and country (C_i) fixed effects.

3. Dataset and descriptive statistics

This study used a longitudinal database from 2001 to 2012 for 442 non-financial listed in Argentina, Brazil, Chile, Colombia, Mexico, and Peru, for a total of 4665 firm-year observations within the panel. Firms' director lists, appointment dates, and directors' biography information regarding education and professional backgrounds were collected from *Thomson's One*. Firms' financial variables were taken from *Thomson's DataStream*. Ownership data is from *Thomson's Worldscope*.⁵ Other primary sources include firm annual reports and local regulatory agencies' web pages.⁶ Some complementary information on corporate ownership was retrieved from *Economatica*

The central directors' variables used for this study are based on individual attributes such as education, professional experience, number of simultaneous appointments, firm relationship status (i.e., outsider and independent), age, gender, and nationality. We follow corporate director heterogeneity definitions commonly found in previously reviewed agency and resource-based studies on boards of directors. We begin by collecting the list of director names by firm and appointment dates that was retrieved from the Thomson One platform and complemented by personal biographies that were hand-collected, creating an unbalanced director-firm panel. For

⁵ Ownership information for Mexico and Argentina was also compiled using the U.S. Securities and Exchange Commission form 20F for cross-listed companies and, annual reports compiled by the Mexican stock exchange.

⁶ Superintendencia de Valores y Seguros (Chile), Superintendencia del Mercado de Valores (Perú), Comissão de Valores Mobiliários (Brazil), Superintendencia Financiera (Colombia). Comisión Nacional Bancaria y de Valores (México), and Comisión Nacional de Valores (Argentina).

many cases, directors' public curriculum information was limited, and impossible to trace back all individual educational and professional characteristics as a balanced panel. Further, all biographies and professional information for each person was recorded for 2012, which does not affect individual time-invariant characteristics such as gender or being a foreigner, but adds uncertainty for some time variant features such as professional experience in a given year.

To assemble the director-firm-year panel, we started with an initial set of the board-year panel that recorded the directorship for all members by the year they were appointed. Then, we kept a director in a particular year, if she was nominated for at least half of that year. It is important to keep this definition consistent with the information regarding the size of the board, especially when there is a turnover of a board member, because it could seem that more directors were participating in that year. We corroborated board conformation with the firm's annual reports.

The final working sample excluded financial institutions for their specifics on accounting risk-adjusted performance indicators; utility firms for their specific price cap and investment regulations; and health sector companies for their particular regulations on vertical integration, service quality, and customer affiliates. We also exclude low-volume traded stock firms, i.e., those ranked within the first quartile of stock turnovers, to exclude companies with illiquid stocks. Firms with incomplete information regarding board members' appointments and characteristics were also excluded. The final dataset is an unbalanced panel from 442 listed firms.⁷ The final sample also drops the outliers in the top and bottom 1% of each variable to minimize their influence. Table 1 presents summary statistics for the dependent, independent, and control variables included in the estimates of the main regressions.

⁷ Since we only include listed firms, our sample is biased towards the large and mostly market-driven subset of firms. Although our sample is comparable with other studies using listed companies, the results should be interpreted with the specificities of our sample in mind.

Table 1 shows that the average Tobin's Q is 1.23 while the average ROA is 13%. The average board size is 10 directors. Of those directors, on average, 13% are independent members, 25% consists of foreign nationals, and 7% are female directors. This last figure is far from the gender quota already established in Scandinavian countries of 25%. The CEO-Chairman duality occurs, on average, in 18% of the firm-year observations. CEO duality is regarded as a bad corporate practice that reduces the effectiveness of boards' monitoring efforts and might create conflicts of interests.

We also observe in the table that board members last in their positions a considerable time in Latin American firms, as implied by the low board turnover ratios. The table shows that the mean board turnover is only 7%, suggesting that it would take about 14 years ($=10/0.7$) to replace an entire board of 10 members. In fact, in many family-owned companies, director appointments can last 20 or more years because of their ties to the family. The statistics also show that 25% of board members have a business undergraduate degree, 10% have a law degree, 24% holds an MBA, 1% holds a Ph.D., and 1% have international studies. Meanwhile, 31% of directors have experience as CEOs, 4% have founded a company, and 3% have worked in the public sector.

The mean value of our board relational capital diversity index (BRDI) and board human capital diversity index (BHDI), calculated on the sum of Blau indices, is 0.41 and 0.72, respectively, while that of the composite board capital diversity index (BCDI) is 1.14. If the boards were fully diversified in each attribute, the maximum possible value for these indices would be 2.5, 1.5, and for 4 respectively, indicating low diversity in Latin-American's boards. **Table 2** reports the sample distribution for board capital diversity indices by country. Higher levels of board capital diversity are observed in Brazil, Mexico, and Peru.

Insert Table 1 about here

Insert Table 2 about here

4. Empirical Results

We analyzed the effects of board capital diversity on performance, first using a basic univariate analysis. **Table 3** presents the results of the univariate analysis for the relationship among the diversity variables under study and Tobin's Q. The sample is broken down by contrasting firms with "high" and "low" board capital diversity based on below and above median values for each diversity factor. The statistics show that, overall, firms with high board capital diversity in all categories perform better than firms in the low board capital diversity group. The differences for means (Panel A) and medians (Panel B) in Tobin's Q for all subgroups, except for that based on foreign degrees, are statistically significant at the 1 percent level.

Insert Table 3 about here

Next, we perform multivariable analyses for the relationship between board capital diversity on performance. **Table 4** displays the baseline pooled regressions and fixed effects results, testing the effects that board capital diversity has on firm performance. We begin with the effects of diversity regarding links to other organizations, measured by our board *relational capital diversity* index (BRDI), on firm performance. The regression equation in Col. 1 reports the results of BRDI when we control only for firm characteristics. The following regressions on the right in Col. 2 and 3, extend the set of controls by including the set of board structure variables such as board size, turnover, CEO - Chairman duality, among others. The next three regressions displayed in Col. 4 to Col. 6 perform the same exercise but consider the effect of the board human capital diversity index (BHDI), which is the one constructed using director education attributes. The last three columns present the regression with respect to composite overall board capital diversity index (BCDI).

Three main comments are worth highlighting. First, the regression coefficient for either human or relational capital diversity indices are positive and statistically significant. The size effect ranges from 0.08 to 0.132, meaning that a 10% increase in these diversity indices will increase Tobin's Q by an average of 100 base points. For the overall capital diversity index, the marginal effect is 0.093. These results suggest that directors with different professional backgrounds will bring a broader network of ties to other firms and the public sector, and thereby, promote shareholders' interests. The estimates related with the board human capital diversity index (BHDI) indicate that directors with higher analytical skills due to education levels perform better monitoring, and therefore increase the quality of investment projects and thus firm value.

Second, results show that BCDI is also consistently positive across all specifications that include a broad set of control variables. The results suggest that the skills and knowledge of directors are an essential component for boards to perform their monitoring and advising functions effectively. Overall, firms appear to have a better performance when they have a board with a more diverse human and relational capital attributes than otherwise.

Third, the set of controls related with board structure affects firm performance. This outcome is in accordance to previous studies on the value of independent directors or traditional exogenous attributes (i.e., gender or nationality) affect firm performance. Consistent with prior literature, we found a significantly positive effect of independent directors ([Choi et al., 2007](#)) and foreign directors ([Masulis et al., 2012](#)) on firm value. The marginal effects are, in both cases, non-trivial. A 10% change in the director independent ratio increases firm Q by 360 base points, and the same change in the foreign director ratio increases firm value by 300 base points. The results relating to female directors are opposite to the results found in studies of mandatory gender quotas based on the Norwegian case ([Ahern and Dittmar, 2012](#)) or on the monitoring role of female directors in

accounting quality in the UK (Garcia-Lara et al., 2017). The size effect is positive and statistically significant across regressions. A 10% change in the ratio of female directors raises firm Q by 6%. The female director ratio in the region is structurally lower showing, on average, 7% in contrast to the observed 36% in the U.S. and 22% in Europe. Thus, one might expect for small changes in gender board diversity to cause a greater marginal effect, as this would represent a structural change for many firms in appointing women as board directors for first time.⁸

Insert Table 4 about here.

The next step in the analysis examines the contribution of individual variables that form the board capital diversity index. **Table 5** shows the results of the panel-data regression of Tobin's Q on the individual elements of the board capital diversity index: proportions of members with a law, business, MBA, Ph.D., and foreign degrees; and the ratios of board members with experience as founders, CEOs, or in the public sectors. We perform this test while controlling for CEO duality, size of the board, board dependence, nationality and gender of board members, and the control variables. The results suggest that shareholders appear to place a higher value on board capital diversity arising from directors' law and MBA degrees, and from professional experience in the public sector. The rest of the board capital variables, except for that of Ph.D. degrees, are positively associated with the performance, but the effect is statistically insignificant.

Insert Table 5 about here.

4.3 Robustness Checks

This section evaluates the robustness tests of the above baseline regressions sorting the sample by

⁸ For more details on board statistics in the US across S&P 500 firms, see the Spencer Stuart Board Index (2017), and for European countries see Deloitte-GCCG-Women in the boardroom: A global perspective (2017). According to the Deloitte report, the fraction of female directors on average across the same 6 countries from Latin America in 2017 is 7.2%. We report an average of 7% from our dataset for 2013-2012 period.

CEO discretionary power, blockholder contestability, and firm size, and by testing whether the relationship between board diversity and Tobin's Q is driven by the above criteria.

The interactions between powerful CEOs and directors may influence the quality of board decisions (Dalton and Kesner, 1987; Kor, 2006). Previous literature has shown that a powerful CEO is more likely to engage in self-serving actions that decrease the value of shareholder wealth (Dunn, 2004). Therefore, the contribution of a board with diverse skills, experiences and knowledge, which protect shareholders' interests may be more important in companies where the power of the CEO is prevalent. Columns 1 and 2 of **Table 6** summarize the cross-sectional tests by CEO-Chairman duality status. The results indicate that the board capital diversity index is statistically significant for both of the subsamples, but the magnitude of the effect is stronger for the subsample of firms with a CEO that is also the chairman of the board ($\beta=0.133$ vs. $\beta=0.086$). Thus, director monitoring becomes more visible within firms with potential governance problems like the ones with high discretionally management power.

The second cross-test considers the role of blockholder contestability. Multiple shareholder ownership is the predominant ownership structure in Latin America (Pombo and Taborda, 2017). These structures have important implications for the corporate governance mechanism of companies, because of the issues of blockholder monitoring and the role of voting-blocks coalitions. The literature has measured these effects using a contestability indicator that captures the ability of relatively small investors to monitor the actions of firm managers and the largest shareholders. Moreover, prior evidence has shown that low contestability levels adversely affect firm performance. For instance, country case and cross-country studies have shown a robust effect of these variables on firm's Tobin's Q (Jara-Betin et al., 2008; Laeven and Levine, 2008). Also, the higher the probability of forming a controlling coalition, the higher cash flow diversion (or

tunneling), increasing agency costs, and lowering of firm value (Maury and Pajuste, 2006; De la Hoz and Pombo, 2016).

Therefore, the contributions of the directors' ability to use their skills, experience, expertise, and knowledge to perform monitoring activities and to advise are greater for firms with low ownership contestability. To define ownership contestability, we use the Herfindahl differences index that measures ownership power dispersions and capture the actual contest for corporate control that the largest blockholder faces when unable to control the company directly.

Columns 3 and 4 (**Table 6**) provide the regression results for the samples with low and high contestability firms, respectively. The results indicate that the coefficient for board capital diversity-index is statistically significant for both groups. The effect is significantly higher for the group with low contestability ($\beta=0.160$ vs. $\beta=0.083$). Again, this is consistent with the board capital given by director heterogeneity and diversified board has greater marginal impact on firm performance within firms with potentially lower governance levels.

The third cross test analyses the effect of firm size on the relationship between board capital diversity and performance. We state that a greater variety of skills and experiences and in particular a broader network of ties for other organizations will benefit small firms the most. For instance, entrepreneurs and startups approach venture capital and private equity firms because they need capital, but also because these investors add value by being deeply involved in managing the companies they invest in. The results in columns 5 and 6 (**Table 6**) indicate that the board capital diversity index is statistically significant for both of the subsamples, but the magnitude of the effect is significantly stronger for the subsample of small firms ($\beta=0.150$ vs. $\beta=0.096$).

Insert Table 6 about here.

A significant concern in the analysis of governance variables and firm performance is due to estimation biases due to reverse causality in which changes in board capital might be explained by past changes in firm performance. In this sense, good performing firms attract high quality directors so that the pool of candidates for firms to select a diverse, high-quality board is more extensive and thus, the causality is reversed. To address this issue, we follow Aggarwal et al. (2011) and study the relationship between changes in board capital diversity and changes in performance. If board capital diversity has a significant influence on performance as our results imply, then as board capital increases over time, we would expect to see corresponding increases in performance. This approach also eliminates the impact of time-invariant unobservable firm characteristics on performance.

Table 7 reports the results for regressions of changes in Tobin's Q as the dependent variable and lagged changes in the board capital diversity index (BCDI) as the primary explanatory variable. The dependent variable is the change in the Tobin's Q from period t-1 to t. The main explanatory variable is the change in the board capital diversity index (BCDI) from period t-2 to t-1. We express all other independent variables in terms of changes; they are lagged one period in relation to the Tobin's Q. Columns 1 and 3 show that the coefficients for the change in the board capital diversity index ($\Delta BCDI$) is positive and significant at the usual significance levels. These results suggest that the positive relationship we reported earlier between board capital diversity and performance retains the same sign and statistical significance after we control for potential reverse causality.

Insert Table 7 about here.

Table 8 displays the third robustness test of the baseline regressions. This test uses an alternative definition for the board capital diversity index to measure board capital diversity from

a principal components analysis based on the main director attributes associated on the eight Blau measures of human and relational capital diversity, and reduce the number of variables to three factors. Regression results show that two out of the three components show statistically significant effects on firm performance. For score factor index 1, the variance is explained by the director's professional experience and whether he or she has been a CEO or entrepreneur, a key element of director relational capital. Thus, a one standard deviation change in that index increases firm Q by 3.1%. Similarly, the score factor index 3 relies on educational variables related to business education and the presence of foreign directors. The size effect implies an increase of 2.2% in firm Q due to a 1 standard deviation change in this score factor index. The above regression coefficients are significant at the 5% and 1% levels.

Insert Table 8 about here.

Conclusions

This article examines how board capital diversity affects firm value and performance. The main findings show that board capital diversity is positively and significantly related to a firm Tobin's Q. This outcome is consistent with the hypothesis that if firms have a diverse board in terms knowledge and experience, their members will be more effective in their monitoring function. More importantly, a diverse board will also bring more resources to firms such as skills, knowledge, experience, reputation, and education levels that benefit shareholders. We also find that the contribution is especially important for firms that are small, that have a high ownership concentration (or low ownership contestability), and for firms with powerful CEOs.

Our findings indicate that diversity related to undergraduate and graduate studies, and connections to the public sector are those variables with significant effects on Tobin's Q. This evidence seems to suggest that boards with diversity regarding the number of lawyers and members

with MBA degrees provide more resources for the companies and improve their performance. We also observe that diversity concerning the presence of board members with CEO experience and firm founders are also significantly related to improved performance.

Robustness checks show that the results are robust. First, we used extensive control variables, including variables that have been used before as proxies for board diversity such as gender, nationality, and director independence. We also mitigated reverse causality problems by looking at whether the changes in Tobin's Q are explained by past changes in board capital indices. Finally, we used an alternative measure of board capital diversity by principal components factors. The baseline regression results hold with all these robustness checks.

Overall, the results in this study extend the empirical analysis on the role that board capital diversity plays in corporate governance in countries with low investor protection standards. More importantly, we shed light on the effects of board human and relational capital diversities as an additional determinant of firm performance, and the way in which the degree of board knowledge and experience diversity can improve firm performance.

Acknowledgements

We want to thank seminars participants at BALAS-2017 (UCHile); The CESA-Universidad Javeriana-Universidad de los Andes and Universidad del Rosario finance workshop (Bogotá). C. Pinto wants to thank Chinmoy Gosh at the Finance Department –U Connecticut for his visiting position while he was working on an early draft of this paper.

References

- Adams, R. B., & Ferreira, D. (2009). Women in the boardroom and their impact on governance and performance. *Journal of financial Economics* 94, 291-309.
- Adams, R. B., & J. de Haan, S. Terjesen, H. van Eas. (2015). Editorial board diversity: Moving the field forward. *Corporate Governance: An International Review* 23, 77-82.
- Aggarwal, R., Erel, I., Ferreira, M., & Matos, P. (2011). Does governance travel around the world? Evidence from institutional investors. *Journal of Financial Economics* 100, 154–181.
- Ahern K. and Dittmar A., (2012). The changing of the boards: The impact on firm valuation of mandated female board representation, *Quarterly Journal of Economics* 127, 137-197

- Anderson R., Reeb D., Upadhyay, & Zhao W., (2011). The economics of director heterogeneity, *Financial Management* 40, 5-38.
- Ararat, M., Aksu, M., & Tansel Cetin, A. (2015). How board diversity affects firm performance in emerging markets: Evidence on channels in controlled firms. *Corporate Governance: An International Review* 23, 83-103.
- Arfken, D., Bellar, S. L., Helms, M. M. (2004). The ultimate glass ceiling revisited: The presence of women on corporate boards. *Journal of Business Ethics* 50, 177-186.
- Blau, P.M. 1977. *Inequality and heterogeneity*. New York: Free Press.
- Boubakri N, Guedhami O, Mishra D, et al. (2012). Political connections and the cost of equity. *Journal of Corporate Finance* 18, 541–559.
- Boyd, B. 1990. Corporate linkages and organizational environment: A test of the resource dependence model, *Strategic Management Journal*, 11: 419-430.
- Bird, A., and Karolyi, S. (2016). Do Institutional Investors Demand Public Disclosure? The Review of Financial Studies, 29(12), 3245-3277
- Chen C, Ding Y and Kim C (2010). High-level politically-connected firms, corruption and analyst forecast accuracy around the world. *Journal of International Business Studies* 41, 1505–1524.
- Chen, D. (2008). The monitoring and advisory functions of corporate boards: Theory and evidence. Working Paper. SSRN.
- Choi, J., Park, W., & Yoo, S. (2007). The value of outside directors: Evidence from corporate governance reform in Korea. *Journal of Financial and Quantitative Analysis* 42, 941–962.
- Dahya, J., Dimitrov, O., & McConell, J. 2008. Dominant shareholders, corporate boards, and corporate value: A cross-country analysis. *Journal of Financial Economics* 87, 73–100.
- Dalton, D. R., & Kesner, I. F. (1987). Composition and CEO duality in boards of directors: An international comparison. *Journal of International Business Studies* 18, 33–42.
- Dalton, D. R., Daily, C. M., Ellstrand, A. E., & Johnson, J. L. (1998). Meta-analytic reviews of board composition, leadership structure, and financial performance. *Strategic Management Journal* 19, 269-290.
- De la Hoz, M. and C. Pombo. (2016). Institutional investor heterogeneity and firm valuation: Evidence from Latin America. *Emerging Markets Review* 26, 197-221.
- Dunn, P. (2004). The impact of insider power on fraudulent financial reporting. *Journal of Management Studies* 30, 397–412.
- Erhardt, N. L., Werbel, J. D., & Shrader, C. B. (2003). Board of director diversity and firm financial performance. *Corporate Governance: An International Review* 11, 102-111.
- Faccio M (2010) Differences between politically connected and non-connected firms: A cross-country analysis. *Financial Management* 39, 905–928.
- Ferreira, D. (2010). *Board diversity* in “Corporate governance: a synthesis of theory, research and practice”, Baker K., and Anderson R (eds), John Wiley & Sons
- Ferris, S., M. Jagannathan, and A.C. Pritchard (2003). Too busy to mind the business? Monitoring by directors with multiple board appointments. *Journal of Finance* 58, 1087-1111
- Gales L., and Kesner I., (1994), An analysis of board of director size and composition in bankrupt organizations, *Journal of Business Research* 30: 271-282

- Hermalin, B., & Weisbach, M. S. (1991). The effects of board composition and direct incentives on firm performance. *Financial Management* 20, 101–112.
- Hillman, A. J., Cannella, A. A., & Paetzold, R. L. (2000). The resource dependence role of corporate directors: Strategic adaptation of board composition in response to environmental change. *Journal of Management studies* 37, 235-256.
- Hillman, A. J., & Dalziel, T. (2003). Boards of directors and firm performance: Integrating agency and resource dependence perspectives. *Academy of Management Review* 28, 383-396.
- Hillman, A. J. (2015). Board diversity: Beginning to unpeel the onion. *Corporate Governance: An International Review* 23, 104-107.
- Hillman, A. J. (2005). Politicians on the board of directors: Do connections affect the bottom line? *Journal of Management* 31, 464-481.
- Jara-Bertin, M., F. López-Iturriaga, O. Lopez-de-Foronda. (2008). The contest to the control in European family firms: How other shareholders affect firm value. *Corporate Governance: An International Review* 16, 146 – 169.
- Johnson, J., Daily, C., and Ellstrand, A. (1996). Boards of directors: A review and research agenda. *Journal of Management*, 22: 409-438.
- Kor, Y. Y. (2006). Direct and interaction effects of top management team attributes and corporate governance on R&D investment strategy. *Strategic Management Journal* 27, 1081–1099.
- Laeven, L. and Levine, R. (2008). Complex ownership structure and corporate valuation. *Review of Financial Study* 21, 579-204
- McCahery, J. A., Z. Sautner, and L. T. Starks (2016) Behind the scenes: The corporate governance preferences of institutional investors. *The Journal of Finance*, 71 (6): 2905–2932
- Matsa, David A., Miller, Amalia R., 2013. A female style in corporate leadership? Evidence from quotas. *American Economic Journal: Applied Economics* 5, 136–169.
- Masulis R.W., Wang C., and Xie F., (2012). Globalizing the boardroom: The effects of foreign directors on corporate governance and firm performance, *Journal of Accounting and Economics* 53, 527-554
- Maury, B., and A. Pajuste. (2005). Multiple large shareholders and firm value. *Journal of Banking and Finance* 29, 1813-1834.
- Pfeffer, J. (1972). Size and composition of corporate boards of directors: The organization and its environment. *Administrative Science Quarterly*, 17: 218-228.
- Pfeffer, J., & Salancik, G. (1978). *The external control of organizations: A resource-dependence perspective*. New York: Harper & Row.
- Pombo C, and Taborda R., (2017) Stock liquidity and second blockholder as drivers of corporate value: Evidence from Latin America, *International Review of Economics and Finance*, 51: 214-234
- Van der Walt, N., Ingley, C., Shergill, G., and Townsend, A. (2006). Board configuration: Are diverse boards better boards, *Corporate Governance* 6, 129-147.
- Zahra, S., & Pearce, J. (1989). Boards of directors and corporate financial performance: A review and integrative model. *Journal of Management*, 15: 291-244.

Table 1. Summary Statistics

This table reports summary statistics for the dependent and independent variables used in this study. The sample is comprised of 442 companies listed in six stock Exchanges in Latin America from 2001-2014 (4,665 firm-year observations). Data is taken from Thomson's Data Stream, World Scope, Economatica, and firms' annual financial reports. All of the variables are defined in the appendix.

	<i># Obs.</i>	<i>Mean</i>	<i>Median</i>	<i>Min</i>	<i>Max</i>
<i>Firm Characteristics</i>					
Tobin's Q	4577	1.23	1.07	0.31	4.10
Tangibility	4530	0.40	0.39	0.00	0.91
Size	4568	6.08	6.05	2.08	10.44
Leverage	4548	0.48	0.48	0.03	0.96
L1.ROA	4138	0.13	0.11	-0.77	4.80
HI Difference	4144	0.21	0.12	0.00	1.00
Wedge	4552	1.39	1.31	0.77	1.99
<i>Board Characteristics</i>					
CEO - Chairman	4665	0.18	0.00	0.00	1.00
Ln(board Size)	4665	2.19	2.20	0.69	3.56
% Board Turnover	4665	0.07	0.00	0.00	1.00
% Independent	4665	0.13	0.00	0.00	1.00
% Foreigner	4665	0.25	0.18	0.00	1.00
% Female	4665	0.07	0.00	0.00	1.00
% Business Degree	4665	0.29	0.29	0.00	1.00
% Law Degree	4665	0.10	0.00	0.00	0.75
% MBA Degree	4665	0.24	0.14	0.00	1.00
% PhD Degree	4665	0.02	0.00	0.00	0.50
% Foreign Degree	4665	0.01	0.00	0.00	0.33
% CEO Experience	4665	0.31	0.29	0.00	1.00
% Founder Experience	4665	0.04	0.00	0.00	0.58
% Public Sector Experience	4665	0.03	0.00	0.00	0.73
<i>Board Diversity Indices</i>					
Blau Index Business Degree	4665	0.32	0.38	0.00	0.50
Blau Index Law Degree	4665	0.14	0.00	0.00	0.50
Blau Index MBA Degree	4665	0.21	0.22	0.00	0.50
Blau Index PhD Degree	4665	0.04	0.00	0.00	0.50
Blau Index Foreign Degree	4665	0.02	0.00	0.00	0.44
Blau Index CEO Experience	4665	0.30	0.38	0.00	0.50
Blau Index Founder Experience	4665	0.06	0.00	0.00	0.50
Blau Index Public Sector Experience	4665	0.05	0.00	0.00	0.50
BRDI	4665	0.41	0.44	0.00	1.28
BHDI	4665	0.72	0.74	0.00	1.88
BCDI	4665	1.14	1.16	0.00	2.72

Table 2. Summary Statistics for Board Capital Diversity Variables, by Country

This table reports mean values for board capital diversity indices categorized by country. Blau indices are based on Blau (1977). The sample is comprised of 442 companies listed in six stock Exchanges in Latin America from 2001-2014 (4,665 firm-year observations). Data is taken from Thomson's Data Stream, World Scope, Economatica, and firms' annual financial reports. All of the variables are defined in the appendix.

	<i>Argentina</i>	<i>Brazil</i>	<i>Chile</i>	<i>Colombia</i>	<i>Mexico</i>	<i>Peru</i>
Blau Index Business Degree	0.34	0.32	0.26	0.35	0.35	0.35
Blau Index Law Degree	0.12	0.16	0.08	0.10	0.22	0.16
Blau Index MBA Degree	0.20	0.26	0.18	0.12	0.10	0.30
Blau Index PhD Degree	0.01	0.05	0.04	0.06	0.04	0.02
Blau Index Foreign Degree	0.01	0.02	0.01	0.04	0.01	0.02
Blau Index CEO Experience	0.32	0.40	0.11	0.25	0.38	0.32
Blau Index Founder Experience	0.08	0.09	0.01	0.05	0.11	0.04
Blau Index Public Sector Experience	0.04	0.08	0.02	0.09	0.05	0.04
BRDI	0.44	0.57	0.15	0.39	0.54	0.40
BHDI	0.69	0.80	0.56	0.67	0.72	0.85
BCDI	1.13	1.37	0.71	1.06	1.26	1.25
Tobin's Q	1.16	1.24	1.30	1.09	1.29	1.14

Table 3. Univariate Results

This table provides the univariate results regarding the relationship between board capital diversity and performance. The sample is partitioned into low and high board capital diversity. Panel A presents the mean differences and t-tests for Tobin's Q differences. Panel B reports the median differences and Wilcoxon rank-sum test, which is also known as the Mann-Whitney two-sample statistic. ***, **, and * indicate that the coefficient is significantly different from zero at the 1%, 5%, and 10% levels, respectively.

Panel A: Mean Tobin's Q

	<i>Mean Tobin's Q</i>		<i>High-Low</i>
	<i>< Median (Low)</i>	<i>> Median (High)</i>	
Blau Index Business Degree	1.16	1.31	0.15***
Blau Index Law Degree	1.19	1.27	0.07***
Blau Index MBA Degree	1.17	1.30	0.13***
Blau Index PhD Degree	1.20	1.36	0.16***
Blau Index Foreign Degree	1.23	1.28	0.06*
Blau Index CEO Experience	1.19	1.28	0.08***
Blau Index Founder Experience	1.21	1.28	0.07***
Blau Index Public Sector Experience	1.21	1.32	0.12***
BRDI	1.14	1.32	0.18***
BHDI	1.19	1.28	0.09***
BCDI	1.15	1.31	0.16***

Panel B: Median Tobin's Q

	<i>Median Tobin's Q</i>		<i>High-Low</i>
	<i>< Median (Low)</i>	<i>> Median (High)</i>	
Blau Index Business Degree	1.02	1.13	0.11***
Blau Index Law Degree	1.06	1.09	0.03***
Blau Index MBA Degree	1.03	1.12	0.09***
Blau Index PhD Degree	1.05	1.18	0.13***
Blau Index Foreign Degree	1.07	1.09	0.02
Blau Index CEO Experience	1.04	1.10	0.06***
Blau Index Founder Experience	1.06	1.09	0.03***
Blau Index Public Sector Experience	1.05	1.13	0.08***
BRDI	1.01	1.13	0.12***
BHDI	1.04	1.10	0.06***
BCDI	1.02	1.12	0.1***

Table 4. The Effect of Board Capital on Performance

This table presents the parameter estimates from pooled ordinary least squares (OLS) regressions of the baseline model presented in Equation 1. The dependent variable in all specifications is *Tobin's Q*. Key independent variables include the board relational capital diversity index (BRDI), the board human capital diversity index (BHDI), and the total board capital diversity index (BCDI). All control variables are defined in Appendix A. Regressions also includes year, industry, and country fixed-effects. Variables defined as ratios are all Winsorized at the 1% and 99% levels. The t-values in parentheses are computed with robust standard errors. ***, **, and * indicate that the coefficient is significantly different from zero at the 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Tangibility	-0.255*** (5.57)	-0.255*** (5.55)	-0.269*** (6.09)	-0.253*** (5.50)	-0.247*** (5.35)	-0.259*** (5.85)	-0.247*** (5.37)	-0.243*** (5.27)	-0.257*** (5.80)
Size	0.043*** (5.65)	0.043*** (5.36)	0.041*** (5.26)	0.037*** (4.84)	0.038*** (4.82)	0.035*** (4.54)	0.036*** (4.65)	0.037*** (4.63)	0.034*** (4.43)
Leverage	0.032 (0.52)	0.032 (0.53)	0.013 (0.22)	0.016 (0.25)	0.018 (0.28)	-0.003 (0.06)	0.015 (0.24)	0.017 (0.28)	-0.003 (0.06)
L1. ROA	1.908*** (12.24)	1.918*** (12.20)	1.816*** (12.05)	1.886*** (12.18)	1.902*** (12.16)	1.798*** (12.01)	1.893*** (12.19)	1.906*** (12.17)	1.803*** (12.02)
Wedge	-0.101*** (2.98)	-0.101*** (2.98)	-0.100*** (3.01)	-0.114*** (3.33)	-0.113*** (3.33)	-0.114*** (3.42)	-0.112*** (3.31)	-0.112*** (3.29)	-0.112*** (3.35)
CEO-Chairman	...	0.053* (1.85)	0.043 (1.57)	...	0.064** (2.28)	0.055** (1.99)	...	0.056** (1.98)	0.046* (1.67)
ln (Board Size)	...	0.011 (0.45)	0.015 (0.63)	...	-0.008 (0.32)	-0.006 (0.23)	...	-0.004 (0.15)	0.000 (0.00)
Board Turnover	...	0.088 (1.36)	0.094 (1.47)	...	0.090 (1.40)	0.096 (1.51)	...	0.087 (1.36)	0.093 (1.47)
Ratio Independent	...	...	0.360*** (4.29)	...	...	0.373*** (4.49)	...	...	0.349*** (4.14)
Ratio Foreigner	...	...	0.300*** (6.47)	...	...	0.296*** (6.36)	...	...	0.301*** (6.47)
Ratio Female	...	...	0.590*** (5.73)	...	...	0.604*** (5.81)	...	...	0.605*** (5.84)
BRDI	0.098** (2.15)	0.085* (1.86)	0.080* (1.75)	...	...	...	...	...	...
BHDI	...	...	...	0.121*** (3.93)	0.124*** (3.93)	0.132*** (4.31)	...	...	...
BCDI	...	...	...	...	...	...	0.093*** (4.04)	0.091*** (3.93)	0.095*** (4.12)
Year Fixed-Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry Fixed-Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country Fixed-Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	3726	3726	3726	3726	3726	3726	3726	3726	3726
Adjusted R Squared	0.400	0.401	0.423	0.403	0.403	0.426	0.403	0.403	0.426

Table 5. The Effects of Board Capital Variables on Performance

This table presents the parameter estimates from pooled ordinary least squares (OLS) regressions of Tobin's Q on the individual elements of the board capital diversity index: Blau indices for the proportions of board directors with law, business, MBA, Ph.D., and foreign degrees; and the proportions of board members with experience as founders, CEOs, or in the public sectors. Key independent variables and all control variables are defined in Appendix A. Regressions also include year, industry, and country fixed-effects. Variables defined as ratios are all Winsorized at the 1% and 99% levels. The t-values in parentheses are computed with robust standard errors. ***, **, and * indicate that the coefficient is significantly different from zero at the 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Tangibility	-0.270*** (6.08)	-0.268*** (6.07)	-0.270*** (6.12)	-0.275*** (6.23)	-0.275*** (6.22)	-0.274*** (6.19)	-0.273*** (6.19)	-0.275*** (6.24)
Size	0.042*** (5.50)	0.042*** (5.59)	0.036*** (4.90)	0.044*** (5.63)	0.043*** (5.54)	0.043*** (5.63)	0.043*** (5.65)	0.038*** (4.74)
Leverage	0.015 (0.25)	0.012 (0.19)	0.000 (0.00)	0.021 (0.35)	0.018 (0.30)	0.017 (0.28)	0.018 (0.30)	0.011 (0.19)
L1. ROA	1.809*** (12.03)	1.828*** (12.15)	1.795*** (11.98)	1.819*** (12.05)	1.817*** (12.05)	1.815*** (12.06)	1.817*** (12.08)	1.804*** (11.88)
Wedge	-0.100*** (3.00)	-0.107*** (3.22)	-0.111*** (3.37)	-0.098*** (2.94)	-0.099*** (2.95)	-0.099*** (2.96)	-0.098*** (2.95)	-0.104*** (3.10)
CEO-Chairman	0.050* (1.83)	0.046* (1.72)	0.060** (2.20)	0.049* (1.80)	0.050* (1.83)	0.049* (1.75)	0.049* (1.75)	0.050* (1.83)
ln (Board Size)	0.012 (0.50)	0.011 (0.47)	-0.010 (0.39)	0.016 (0.66)	0.015 (0.63)	0.015 (0.61)	0.017 (0.67)	0.010 (0.43)
Board Turnover	0.096 (1.51)	0.097 (1.52)	0.095 (1.49)	0.096 (1.51)	0.096 (1.51)	0.096 (1.51)	0.095 (1.50)	0.091 (1.43)
Ratio Independent	0.379*** (4.55)	0.382*** (4.63)	0.373*** (4.49)	0.383*** (4.65)	0.386*** (4.66)	0.382*** (4.60)	0.381*** (4.54)	0.347*** (4.17)
Ratio Foreigner	0.292*** (6.25)	0.307*** (6.53)	0.301*** (6.47)	0.296*** (6.34)	0.296*** (6.35)	0.298*** (6.42)	0.295*** (6.23)	0.308*** (6.59)
Ratio Female	0.592*** (5.72)	0.602*** (5.86)	0.622*** (6.03)	0.586*** (5.69)	0.578*** (5.28)	0.586*** (5.67)	0.586*** (5.68)	0.591*** (5.74)
Blau Business Degree	0.063 (1.10)	...	...	...	...	...	...	...
Blau Law Degree	...	0.271*** (3.96)	...	...	...	...	...	...
Blau MBA Degree	...	...	0.304*** (4.82)	...	...	...	...	...
Blau Ph.D. Degree	...	...	...	-0.079 (0.73)	...	...	...	...
Blau Foreign Studies	...	...	...	...	0.053 (0.27)	...	...	...
Blau CEO Experience	...	...	...	...	...	0.038 (0.56)	...	...
Blau Founder	...	...	...	...	...	...	0.025 (0.27)	...
Blau Public Sector	...	...	...	...	...	...	...	0.309** (2.43)
Year Fixed-Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry Fixed-Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country Fixed-Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	3726	3726	3726	3726	3726	3726	3726	3726
Adjusted R Squared	0.423	0.425	0.427	0.422	0.422	0.422	0.422	0.424

Table 6. The Effect of Board Capital on Performance by Firm Size, Ownership Contestability, and CEO Power.

This table presents the parameter estimates from the pooled OLS regressions of the baseline model presented in Equation 1. The sample is separated into firms with CEO-Chairman duality and otherwise; “high” and “low” ownership contestability, by dividing firms into above and below-median values for Herfindahl ownership differences; and “small” and “large” firms, by dividing firms into above and below-median values for total assets. The dependent variable in all specifications is *Tobin’s Q*. The key independent variable is the total board capital diversity index (BCDI). Control variables are defined in Appendix A. Regressions include year, industry, and country fixed-effects. The t-values in parentheses are computed with robust standard errors. ***, **, and * indicate that the coefficient is significantly different from zero at the 1%, 5%, and 10% levels, respectively.

	CEO Power		Contestability		Firm Size	
	CEO-Chairman = 0	CEO-Chairman = 1	High	Low	Small	Large
	(1)	(2)	(4)	(5)	(7)	(8)
Tangibility	-0.251*** (5.06)	-0.430*** (3.13)	-0.342*** (4.95)	-0.264*** (3.78)	-0.149* (1.95)	-0.329*** (5.52)
Size	0.033*** (3.83)	0.023 (0.76)	0.028* (1.92)	0.024** (1.98)	0.009 (0.41)	0.021 (1.37)
Leverage	0.138** (2.16)	-0.596*** (3.33)	0.014 (0.13)	-0.056 (0.61)	0.056 (0.59)	0.063 (0.78)
L1. ROA	2.090*** (13.75)	0.568** (1.98)	1.505*** (6.08)	1.820*** (8.18)	1.280*** (6.26)	2.470*** (14.59)
Wedge	-0.124*** (3.28)	-0.083 (0.91)	-0.204*** (2.78)	-0.089* (1.69)	-0.187*** (3.60)	-0.091* (1.93)
CEO-Chairman	... ...	... ...	0.088** (2.16)	0.023 (0.48)	0.079* (1.70)	-0.002 (0.06)
ln (Board Size)	-0.018 (0.64)	0.115 (1.61)	0.037 (0.93)	0.032 (0.94)	0.024 (0.60)	-0.019 (0.58)
Board Turnover	0.107 (1.56)	-0.056 (0.36)	0.042 (0.43)	0.051 (0.55)	0.036 (0.43)	0.136 (1.49)
Ratio Independent	0.357*** (3.72)	0.352 (1.19)	0.471*** (3.31)	0.167 (1.29)	0.070 (0.51)	0.458*** (4.13)
Ratio Foreigner	0.245*** (4.73)	0.494*** (3.81)	0.226** (2.39)	0.408*** (6.54)	0.257*** (3.94)	0.293*** (4.15)
Ratio Female	0.638*** (5.85)	0.743 (1.58)	0.507*** (2.69)	0.754*** (5.11)	0.664*** (4.72)	0.738*** (3.29)
BCDI	0.086*** (3.47)	0.133* (1.81)	0.083* (1.82)	0.160*** (4.39)	0.150*** (3.87)	0.096*** (3.30)
Year Fixed-Effects	Yes	Yes	Yes	Yes	Yes	Yes
Industry Fixed-Effects	Yes	Yes	Yes	Yes	Yes	Yes
Country Fixed-Effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	3064	662	1633	1738	1774	1952
Adjusted R Squared	0.439	0.512	0.436	0.498	0.398	0.519

Table 7. Changes in Board Capital Diversity and Changes in Performance

This table shows estimates of regressions of changes in Tobin's Q on changes in the board capital diversity index (BCDI). The dependent variable in all specifications (yearly) changes Tobin's Q from t to t-1. Key independent variable includes (yearly) changes in the total board capital diversity index (BCDI) from t-2 to t-1. All explanatory variables are also yearly changes, lagged by one period. Refer to Appendix A for variable definitions. Regressions include year, industry, and country fixed-effects. The t-values in parentheses are computed with robust standard errors. ***, **, and * indicate that the coefficient is significantly different from zero at the 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)
LD.Tangibility	-0.248*** (2.72)	-0.244*** (2.69)	-0.246*** (2.71)
LD.Size	0.243*** (7.47)	0.245*** (7.50)	0.247*** (7.53)
LD.Leverage	-0.303*** (2.94)	-0.307*** (2.99)	-0.308*** (3.00)
LD.ROA	0.127 (1.19)	0.132 (1.23)	0.135 (1.26)
LD.Wedge	0.026 (0.46)	0.027 (0.49)	0.027 (0.49)
LD.CEO-Chairman	... ...	0.038 (0.79)	0.037 (0.76)
LD.ln (Board Size)	... ...	-0.084 (1.45)	-0.084 (1.46)
LD.Board Turnover	... ...	-0.013 (0.25)	-0.017 (0.32)
LD.Ratio Independent	... ...	... ...	-0.129 (0.71)
LD.Ratio Foreigner	... ...	... ...	0.056 (0.47)
LD.Ratio Female	... ...	... ...	-0.194 (0.85)
LD.BCDI	0.076* (1.70)	0.090* (1.95)	0.096** (2.07)
Year Fixed-Effects	Yes	Yes	Yes
Industry Fixed-Effects	Yes	Yes	Yes
Country Fixed-Effects	Yes	Yes	Yes
Observations	3238	3238	3238
Adjusted R Squared	0.0033	0.0039	0.0034

Table 8. Principal Component Analysis for the Effect of Board Capital Diversity on Performance

This table presents the parameter estimates from pooled ordinary least squares (OLS) regressions of Tobin's Q on the principal component of the Blau indices for the proportions of board directors with law, business, MBA, Ph.D., and foreign degrees; and the proportions of board members with experience as founders, CEOs, or in the public sectors. Panel A reports estimates of regressions of Tobin's Q on three components extracted from a principal components analysis. All control variables are defined in Appendix A. Regressions also include year, industry, and country fixed-effects. Variables defined as ratios are all winsorized at the 1% and 99% levels. The t-values in parentheses are computed with robust standard errors. ***, **, and * indicate that the coefficient is significantly different from zero at the 1%, 5%, and 10% levels, respectively. Panel B presents the eigenvalues for the varimax rotated components from the principal components analysis.

Panel A. OLS regressions

	(1)	(2)	(3)
Tangibility	-0.261*** (5.89)	-0.272*** (6.18)	-0.272*** (6.14)
Size	0.041*** (5.38)	0.040*** (4.96)	0.039*** (5.18)
Leverage	0.011 (0.17)	0.010 (0.16)	0.015 (0.24)
L1. ROA	1.824*** (12.13)	1.801*** (11.93)	1.818*** (12.07)
Wedge	-0.104*** (3.11)	-0.101*** (3.03)	-0.105*** (3.14)
CEO-Chairman	0.039 (1.41)	0.052* (1.89)	0.053* (1.94)
ln (Board Size)	0.015 (0.61)	0.011 (0.45)	0.006 (0.25)
Board Turnover	0.094 (1.47)	0.094 (1.49)	0.096 (1.52)
Ratio Independent	0.351*** (4.18)	0.371*** (4.45)	0.396*** (4.82)
Ratio Foreigner	0.300*** (6.43)	0.297*** (6.38)	0.296*** (6.36)
Ratio Female	0.606*** (5.89)	0.595*** (5.75)	0.554*** (5.22)
PC1	0.031*** (3.27)	...	...
PC2	...	0.015 (1.61)	...
PC3	...	...	0.022** (2.09)
Year Fixed-Effects	Yes	Yes	Yes
Industry Fixed-Effects	Yes	Yes	Yes
Country Fixed-Effects	Yes	Yes	Yes
Observations	3726	3726	3726
Adjusted R Squared	0.424	0.423	0.423

APPENDIX

Table A1 - Variable Definition

<i>Variable</i>	<i>Definition</i>
<i>Firm Characteristics</i>	
Tobin's Q	(Total Assets + Market Equity – Book Value of Equity) / Total Assets.
Tangibility	(Property, Plant, and Equipment) / Total Assets.
Size	Natural logarithm of total assets.
Leverage	(Short-term Interest Bearing Liabilities + Long-term Financial Debt) / Total Assets.
ROA	Income Before Extraordinary Items / Total Assets.
HI Difference	Herfindahl Index Differences. Calculated as the sum of squared differences between the
Wedge	(Shapley Value) / (Ownership of the largest shareholders).
<i>Board Characteristics</i>	
CEO - Chairman	Dummy variable that is equal to one if the CEO of the company is also the chairman of the
Ln(board Size)	Natural logarithm of total number of directors on the board.
% Board Turnover	Represents the number of board members that left the board that year.
% Independent	Percentage of independent directors on the board. Our classification of independent directors
% Foreigner	Percentage of foreign directors (or with foreign origin) on the board.
% Female	Percentage of female directors on the board.
% Business Degree	Percentage of directors on the board that hold business undergraduate degrees.
% Law Degree	Percentage of directors on the board that hold law undergraduate degrees.
% MBA Degree	Percentage of directors on the board that hold MBA degrees.
% PhD Degree	Percentage of directors on the board that hold Ph.D. degrees.
% Foreign Degree	Percentage of directors on the board that hold foreign degrees.
% CEO Experience	Percentage of directors on the board that are or were CEO of any firm (including the
% Founder Experience	Percentage of directors on the board that were founders of any firm or organization (including
% Public Sector Experience	Percentage of directors on the board that have or had public high profile position.
<i>Board Diversity Indices</i>	
Blau Index	Blau Index is based on Blau (1977).
Blau Index Business Degree	Blau index value for business degree diversity (business degree is 1, if the board member's undergraduate degree is in business; 0, otherwise)
Blau Index Law Degree	Blau index value for law degree diversity (law degree is 1, if the board member's undergraduate degree is in law; 0, otherwise)
Blau Index MBA Degree	Blau index value for MBA degree diversity (MBA degree is 1, if the board member hold an MBA degree; 0, otherwise)
Blau Index PhD Degree	Blau index value for Ph.D. degree diversity (Ph.D. degree is 1, if the board member holds a Ph.D. degree; 0, otherwise)
Blau Index Foreign Degree	Blau index value for foreign degree diversity (foreign degree is 1, if the board member earned a degree from a foreign country; 0, otherwise)
Blau Index CEO Experience	Blau index value for CEO experience diversity (CEO experience is 1, if the board member is or was CEO of any firm - including the corresponding firm -; 0, otherwise)
Blau Index Founder Experience	Blau index value for founder experience diversity (founder experience is 1, if the board member was a founder of any firm or organization - including the corresponding firm -; 0, otherwise)
Blau Index Public Sector Experience	Blau index value for public sector experience diversity (foreign degree is 1, if the board member has or had a high profile position in the public sector; 0, otherwise)
BRDI	Board Relational Capital Diversity Index BRDI= Blau Index CEO Experience + Blau Index Founder Experience + Blau Index Public Sector Experience
BHDI	Board Human Capital Diversity Index BHDI= Blau Index Business Degree + Blau Index Law Degree + Blau Index MBA Degree + Blau Index Ph.D. Degree + Blau Index Foreign Degree
BCDI	Board Capital Diversity Index BCDI = BRDI + BHCI

Figure A1 – Board capital input - corporate governance and firm value: Conceptual framework

Source: Adapted from Hillman and Daziel (2003)

... end of document ...