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Corporate governance, institutions, markets, and social factors

Nawaf Almaskati*, Ron Bird, Yue Lu

University of Waikato, New Zealand



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ABSTRACT

We use a comprehensive set of country-level social and institutional measures to study the relationship between country-level factors and firm-level governance. We also examine the roles of the country's financial development status and the firm's external financing needs in influencing the firm's governance framework. Using a sample of 43 countries and 3301 firms, we find that country-level factors explain a large part of the variation in firm-level governance across countries. We also find evidence that the relationship between country-level factors and firm-level mechanisms is best represented as a moderating relationship. The results also indicate the presence of a complementary relationship, albeit sometimes insignificant, between firm-level governance and all the country-level variables included in our study. When accounting for the effect of a country's financial development status and a firm's external financing needs, we find evidence of a positive relationship between firm-level governance and firm returns and value for firms with high financing needs which operate in countries with high financial development.

1. Introduction

The level of protection provided to a firm's investors and other stakeholders is impacted by both external (country-level) and internal (firm-level) governance mechanisms. The interaction between these two sets of mechanisms can influence the selection process of the firm's directors and executives, the structure of its board, its compensation scheme and any other incentives alignment mechanisms, and the protections given to its creditors and minority shareholders. As a result, these mechanisms have a major impact on the daily operations of a firm and its value (Daily et al., 2003; Shleifer and Vishny, 1997; Walsh and Seward, 1990).

There are many direct benefits that a firm can extract from the adoption of good governance practices with one of them being to have better access to capital markets leading to improved terms of financing. This benefit will differ *across countries* for reasons such as that good governance brings less benefits to firms operating in less developed markets due to the limited financing expected from the capital markets (Aggarwal et al., 2010; Doidge et al., 2007). They will also be greater for firms that require more frequent access to external funding opportunities (Aggarwal et al., 2010; Doidge et al., 2007).

Agency theory highlights that the adoption of firm-level mechanisms is a costly investment that the firm undertakes to protect the rights of its shareholders (Aggarwal et al., 2010; Jensen and Meckling, 1976). As a result, the differences in the benefits and the costs of adopting good governance practices across countries as well as the possibility that firm-level mechanisms are not complete substitutes for country-level mechanisms, could explain to a large extent the observed differences in governance practices across countries (Aggarwal et al., 2010; Doidge et al., 2007). There appears to be no clear consensus on the nature or the form of the relationship between country-level factors and firm-level mechanisms (Schiehl and Martins, 2016). While several studies report that firm-level governance complements country-level factors (Aggarwal et al., 2010; Anderson and Gupta, 2009; Doidge et al., 2007),

* Corresponding author.

E-mail address: nawafmask@hotmail.com (N. Almaskati).

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another group of studies find that firm-level governance substitutes for country-level mechanisms (Chen et al., 2009; Chou et al., 2011; Klapper and Love, 2004; Renders et al., 2010; Tian and Twite, 2011).

This paper studies the role played by country-level factors in determining the characteristics of the corporate governance framework in each country. It also examines whether firm-level corporate governance mechanisms act as substitutes or complements to these country-level factors with special attention to the role of financial development and firm-level financing needs in influencing the firm's governance framework. To our knowledge this is the first study that examines the different causal-relationship models used in the literature in order to answer the question of how to best represent the relationship between country-level factors and firm-level governance mechanisms and their joint-effect on firm value and performance. Furthermore, our study differs from previous studies in the field through employing a wide range of publicly available indices as country-level factors to explain cross country variation in firm-level governance. The study also addresses several pitfalls and methodological issues with prior studies by focusing on outcome-based external governance indicators and through employing the hierarchical linear modeling (HLM) approach and the Generalized Method of Moments (GMM) technique to account for the nested nature of the data and for potential endogeneity issues, respectively (see Aguilera et al., 2015; Essen et al., 2013; Schiehl and Martins, 2016). Overall, the study contributes to the ongoing debate on the nature of the relationship between country-level and firm-level factors and the effect of such relationship on firm value and performance.

We find that country-level factors explain a large part of the variation in firm-level governance across countries. We also find strong evidence to suggest that models which assume that country-level mechanisms act as moderators of the relationship between firm-level governance and firm performance provide the best fit of the relationship between these two groups. Moreover, we find that in contrast to several prior studies (e.g. Chen et al., 2009; Chou et al., 2011; Klapper and Love, 2004), our findings support the proposition that firm-level and country-level governance are complementary. Furthermore, we find that stronger firm-level governance is associated with higher firm value for firms with high financing needs and which operate in countries with high financial development. This supports the argument that a firm's governance framework is highly dependent on the financial development status of the country in which it operates as well as its need for external financing. Lastly, we find that our main findings hold even after controlling for endogeneity.

The remainder of this study is organized as follows. Section 2 provides a summary of relevant prior studies and outlines the main research questions. Section 3 describes the sample and methodology used. Sections 4–6 present the results of our analysis and a battery of robustness tests while section 7 concludes.

2. Literature review and research questions

The majority of studies on governance have attempted to explain the different results and observations using the agency theory framework (Aguilera et al., 2015; Schiehl and Martins, 2016)¹. Agency theory highlights the possibility that the managers of a corporate may use every opportunity to maximize their self-interest, which normally comes at the expense of the real owners of the corporate (Jensen and Meckling, 1976). Therefore, in the absence of an effective governance framework, internal or external, managers may, for example, undertake some value destroying investments, forgo some value-creating ones, or even manipulate financial results, as part of their pursuit of their self-interests. Put differently, agency theory suggests that from the owners' perspective, firms can perform better and operate more efficiently when these agency issues are addressed using the appropriate mechanisms.

Before the influential works of La Porta et al. (1997, 1998), most of the studies in corporate governance have focused on examining corporate governance practices in firms within one country. More specifically, research on corporate governance has historically focused on internal governance mechanisms, such as: ownership, board structure, and compensation (Aguilera et al., 2015; Essen et al., 2013; Schiehl and Martins, 2016). As a result of this focus, our understanding of the role played by the country-level (external) mechanisms in influencing the firm's governance characteristics, whether directly or indirectly, is still fairly limited (Aguilera et al., 2015).

Many recent studies have focused on examining the effectiveness of the different internal and external mechanisms through measuring their effect on a firm's value, performance and/or overall decision-making process. However, an agreement on the nature of the relationship between the internal and the external mechanisms and their joint influence on a firm's performance or value does not seem to arise in literature (see Aggarwal et al., 2010; Aguilera et al., 2015; Schiehl and Martins, 2016). Schiehl and Martins (2016) classify the causal-relationship models used in previous studies into four main categories: additive (e.g., Aggarwal et al., 2011), intervening (e.g., García-Castro et al., 2013), independent (e.g., Durnev and Kim, 2005; Essen et al., 2013), and moderating (e.g., Chua et al., 2007). While additive models treat country-level mechanisms as control variables, intervening models assume that these mechanisms have significant influence on firm-level mechanisms which in turn has a direct influence on a firm's performance. Independent models, on the other hand, assume that both mechanisms, external and internal, exert a significant influence on a firm's performance with the magnitude of the influence of each mechanism being dependent on the other. The last category of models, moderating models, assume that country-level mechanisms do not affect a firm's performance directly, but rather act as moderators of the effect of firm-level mechanisms on it. This study contributes to this debate through re-examining the validity of the different causal-relationship models identified by Schiehl and Martins (2016).

The current body of literature suffers from several gaps in coverage. Schiehl and Martins (2016) point out that for many

¹ For a detailed review of the different theoretical frameworks employed in governance research refer to Aguilera et al (2015).

countries, mainly emerging ones, there is little empirical evidence on the role of external governance mechanisms in influencing the firm's governance framework. [Aguilera et al. \(2015\)](#) highlights the scarcity of studies examining the interactions between the different external governance mechanisms. [Schiehll and Martins \(2016\)](#) and [Kaufmann et al. \(2011\)](#) report that one of the deficiencies of the past literature is the lack of a clear distinction between rules-based and outcome-based indicators of external governance. While the rules-based indicators measure whether there are adequate rules to protect investors, outcome-based indicators reflect the actual outcome of these rules. They point out that a finer distinction between these two indicator groups in empirical research will most likely improve the reliability of our models and enhance our understanding of the nature of the relationship between internal and external mechanisms.

There are a number of methodological issues relating to the past research. [Aguilera et al. \(2015\)](#) and [Schiehll and Martins \(2016\)](#) raise concerns about the usual treatment of governance mechanisms as exogenous variables while evidence from the literature suggests the potential presence of unobservable heterogeneity and simultaneity². [Essen et al. \(2013\)](#) also raise concerns about the reliance on ordinary least squares (OLS) regressions to analyze the relationship between internal and external governance mechanisms and firm performance. They point out that due to the fact the firms are nested within countries, the standard assumption of observation independence is most likely to be violated. This happens because firms within one country are generally more similar than firms from different countries. A violation of the independence assumption causes the standard errors of the model parameters to be too small which in turn leads to erroneous conclusions about the statistical significance of such parameters.

2.1. Research questions

2.1.1. Cross-country differences and firm-level governance

Two recent reviews by [Aguilera et al. \(2015\)](#) and [Schiehll and Martins \(2016\)](#) classify the different external governance mechanisms studied in the literature into six main categories: legal system, media, stakeholder activism, corporate control, external auditing, and rating organizations. With regards to the legal system, the results of [La Porta et al. \(1998\)](#) show that common law countries (e.g. the US and the UK) tend to provide far better investor protection than French-civil-law countries (e.g. France and Italy). Their results also show that the level of investor protection provided by German-civil-law (e.g. Germany and Japan) and Scandinavian (e.g. Denmark and Sweden) countries fall in the middle between these two extremes. This suggests that a shareholder or a creditor would enjoy different levels of protection depending on the jurisdiction in which he or she operates rather than the particular security he or she holds (see also, [Denis and McConnell, 2003](#); [Wurgler, 2000](#)). Besides that, [La Porta et al. \(2000\)](#) argue that using measures of investor protection is a better way to explain differences in corporate governance practices across different jurisdictions than applying the usual market-versus-bank centric argument (see also, [Anderson and Gupta, 2009](#)).

In emerging markets, [Klapper and Love \(2004\)](#) report that countries with weaker legal systems have lower average firm-level governance scores. They also report that governance scores are significantly and positively correlated with measures of value and performance and more significantly so in countries with weaker legal systems. This suggests that the absence of sufficient protection by the legal system gives rise to the role of governance practices as another source of protection. Klapper and Love further argue that although firms may be able to significantly improve shareholders' rights and protection of minority investors by adopting stronger governance mechanisms, these mechanisms cannot fully replace the role of the country's legal system in protecting investors' interests (see also, [Chen et al., 2009](#); [Dojige et al., 2007](#); [Morey et al., 2009](#); [Renders et al., 2010](#)). Based on prior findings in the literature, our first research question is:

1a. Do differences in the origins of law and the strength of law enforcement contribute to explaining variation in corporate governance characteristics across countries?

Although the media's role as an important external corporate governance mechanism has only been recognized recently in the literature, media in its different forms have long been a major provider of information for investors as well as an important source of scrutiny for the actions of managers and directors. Through analyzing and spreading information about the firm and its actions, media outlets help educate and guide investors and other market players in order to arrive at more informed decisions ([Bebchuk and Neeman, 2010](#)). Additionally, the scrutiny provided by the public coverage of the actions of the firm's managers and directors and the monitoring role played by investigative journalism add another layer of control over the decision-making process within the firm ([Lauterbach and Pajuste, 2016](#); [Wang and Ye, 2015](#); [Zhang and Su, 2015](#)).

[Bebchuk and Neeman \(2010\)](#) argue that investor protection is more likely to be higher in economies where media is active due to media's role in exposing rent extraction attempts by insiders. Empirically, [Miller \(2006\)](#) report that the press plays a major role by distributing information from different sources (analysts, auditors, and law cases) and by undertaking original investigations. He reported that the press was involved in the early detection of accounting fraud in almost one-third of the cases he studied (see also: [Aguilera et al., 2015](#); [Core et al., 2008](#); [Dyck et al., 2008](#); [Liu and McConnell, 2013](#); [Wiesenfeld et al., 2008](#)). Furthermore, [Bednar et al. \(2012\)](#) show evidence that in some cases negative media coverage of a firm indicates to its managers the need for a strategy shift. They also show that negative coverage is more likely to lead to a change when the firm has a weak performance or as the number of outsiders on the board increases. Moreover, media coverage can also promote corporate governance enhancements. For example, [Joe et al. \(2009\)](#) document that boards that were classified as bad in a media outlet ranking, were subject to major improvements in their structures following the publication of the ranking. The results also show that individual investors responded

² Heterogeneity arises when unobservable factors affect both the dependent and the independent variables, whereas simultaneity arises when the independent variables are a function of the dependent variable or its expected value.

to the publication of the ranking by putting a downward pressure on the prices of the firms with bad boards. Hence, our next question is:

1b. Do differences in media's freedom and strength contribute to explaining variation in corporate governance characteristics across countries?

Moreover, the effectiveness and structure of firm-level corporate governance mechanisms and country-level investor protection are also highly influenced by the social characteristics and the cultural values prevailing in a country. [Bebchuk and Neeman \(2010\)](#) theorize that investor protection is more likely to be higher in economies where investors are more educated financially due to their active role in forcing public officials to undertake decisions that increase such protection. They also argue that public officials in economies where a large proportion of the voters hold shares in public firms, directly or indirectly, will try to improve investors' protection out of fear of losing these votes if they fail to do so. To this effect, the influence that the general population have on the appointment of public officials and the threat they pose to ineffective ones determine to a large extent the degree of investor protection offered in the different regulations.

Empirically, [Licht et al. \(2005\)](#) document that in comparison to legal families (e.g. civil or common law), prevailing cultural values and norms explain a larger portion of cross-country variations in corporate governance and investor protection. They also show evidence that cultural values persist in spite of any legal reforms, suggesting that culture may influence or even hinder reforms which in turn impacts national corporate governance practices. This confirms the important role played by social institutions and values in shaping corporate governance practices in a country (see also: [Boytsun et al., 2011](#); [Estrin and Prevezer, 2011](#); [Djankov et al., 2003](#); [Licht et al., 2007](#)). In the same vein, [Stulz and Williamson \(2003\)](#) present a strong evidence that cultural differences such as language and prevailing religion play a significant role in explaining the cross-country variations in investor protection. For instance, the results show that when compared to Protestant countries, Catholic countries have significantly weaker creditor and shareholder rights. Furthermore, the results also show that higher openness to international trade reduces the influence of religion on protection of creditors (see also [La Porta et al., 1999](#)). On this basis, our next question is:

1c. Do differences in social or cultural characteristics contribute to explaining variation in corporate governance characteristics across countries?

Furthermore, to ensure their survival, firms operating in competitive environments are more likely to only appoint and keep highly trained and well-performing managers who are also expected to run the firms as efficient as possible. As a result, corporate governance problems are expected to be less acute in firms operating in competitive environments (see [Claessens and Yurtoglu, 2013](#)). For instance, [Baggs and De Bettignies \(2007\)](#) report that competition for market and product share puts more pressure on the managers to improve quality and operate more efficiently. They also show that in firms with more serious agency issues the competition effect reduces the marginal cost needed to provide managerial incentives. Moreover, [Giroud and Mueller \(2010\)](#) show that firms in non-competitive industries see a drop in their operating performance upon the passage of a law that reduces hostile takeover threats, whereas firms in competitive industries see no change to their performance. The results also show increases in overhead costs, wages, and input costs following the passage of the law, which are exclusive to firms operating in non-competitive industries only. Giroud and Mueller argue that this supports the argument that competition prevents managerial slack, and thus firms operating in competitive industries are less likely to suffer from the increase in the likelihood of slackness brought by the reduction in takeover threats (see also [Baggs and De Bettignies, 2007](#); [DeFond and Park, 1999](#); [Fee and Hadlock, 2000](#); [Giroud and Mueller, 2010](#)). Hence, the next research question is:

1d. Do differences in market competition and efficiency levels contribute to explaining variation in corporate governance characteristics across countries?

2.1.2. The relationship between firm-level and country-level governance

With regards to the nature of the relationship between firm-level and country level factors, several studies report that firm-level governance complements country-level factors ([Aggarwal et al., 2010](#); [Anderson and Gupta, 2009](#); [Doidge et al., 2007](#)), while another group of studies find that firm-level governance substitutes for country-level mechanisms ([Chen et al., 2009](#); [Chou et al., 2011](#); [Klapper and Love, 2004](#); [Renders et al., 2010](#); [Tian and Twite, 2011](#)). One would expect firms operating in countries with strong country-level mechanisms to invest less (more) in firm-level governance than firms in countries with weak country-level mechanisms if the two mechanisms are substitutes (complements).

One should account for the fact that strong country-level governance may also lead to more developed markets and thus, as discussed earlier, more benefits to the firm from adopting good governance practices. Whereas weak country-level governance is more likely to create less developed markets and as a result lead to less benefits from improving firm-level governance. This would lead to the observance of a complementary relationship between country-level and firm-level mechanisms. However, in the case that some of the more developed markets are associated with lower country-level protections, then one would expect firms to invest more in firm-level governance in order to gain preferential access to its capital markets. In this case, country-level and firm-level factors would be substitutes.

The institutional theory framework suggests the presence of a complementary relationship between firm-level and country-level mechanisms based on the assumption that firm-level governance is influenced by the prevailing national institutions and social systems ([Aguilera et al., 2015](#); [Schiehl and Martins, 2016](#)). In contrast, the focus of agency theory on the costs and benefits of improving governance at the firm-level provides no direct support for either substitution or complementarity. Agency theory suggests that the relationship between firm-level and country-level governance mechanisms may depend on contextual factors and characteristics, such as financial development or firms' external financing needs ([Aggarwal et al., 2010](#); [Aguilera et al., 2015](#)).

[Schiehl and Martins \(2016\)](#) classify the different relationship models used in previous studies into four main categories:

intervening, moderating, additive, and independent. The first two categories assume that country-level factors have no direct influence on firm performance. Models classified under the intervening category assume that country-level factors influence firm-level mechanisms which then affect firm performance, while moderating models assume that country-level mechanisms act as moderators of the relationship between firm-level governance and firm performance. The last two categories, additive and independent, assume the existence of a direct relationship between both firm-level and country-level variables and firm performance. However, the difference between these two categories is that the additive models assume that the effect of either mechanism on firm performance do not depend on the other, while the independent models assumes the opposite. Therefore, our next closely related research questions are

2a. Which causal-relationship model best represents the relationship between country-level factors and firm-level governance mechanisms?

2b. Are country-level factors and firm-level governance mechanisms complements or substitutes?

2.1.3. The role of financial development and capital dependency

As discussed earlier, one of the main benefits to a firm from adopting better governance practices is having a better access to capital markets along with improved terms of financing (Aggarwal et al., 2010). This comes as a result of the role played by corporate governance mechanisms in controlling agency issues and reducing information asymmetry which provides better protection for the firm's capital providers (Bhojraj and Sengupta, 2003; Shleifer and Vishny, 1997). However, these benefits differ across countries based on the financing that a firm expects to secure from its domestic market, which in turn depends on how developed the country's financial system is. Furthermore, a firm with higher external financing needs is more likely to see higher value from adopting better governance practices in the form of reduced funding costs and better financing conditions, which would result in a better financial performance and value (Bhojraj and Sengupta, 2003; Doidge et al., 2007; Shleifer and Vishny, 1997). Additionally, the improved access to external financing reduces the likelihood of having to forego value-creating investment opportunities due to the lack of suitable financing. Therefore, it can be argued that a firm's gain from adopting a more stringent governance framework depends both on the financial development status of the country in which the firm operates and its reliance on external sources to fund its operations (Doidge et al., 2007). Consequently, our last two research questions are:

3. Does the status of a country's financial development play a major role in determining the relationship between firm-level governance and firm value or return?

4. Does the firm's external financing need play a major role in determining the relationship between firm-level governance and firm value or return?

3. Data and methodology

To conduct our comparative analysis, we extract data for the years 2010 to 2017 from various sources. We source our accounting and market data (i.e. sales, total assets, total debt, book value and market value of equity, net income, short-term assets) from DataStream for all firms with governance data in ASSET4 for the selected period. We extract corporate governance data from ASSET4 which is part of the DataStream package to construct our own corporate governance index. We also use the corporate governance score calculated by DataStream as an alternative proxy for a firm's quality of governance. We only include a firm if it has at least half of the attributes covered by our governance index (explained later) to reduce any potential bias in the final governance scores due to the limited number of attributes used. To ensure that our sample reflects corporate governance practices in each country, a country would be included in our sample only if the total market capitalization of firms with adequate data is equal to or above 50% of its total market capitalization³. This gives us a final sample of 3301 firms in 43 countries and territories representing different regions around the world (see Table 1). Table 1 provides more information about the countries covered in our study (e.g. legal family, predominant religion, average governance index, financial development index and income group), and the number of firms in each country. Our sample is dominated by countries with high income and civil law systems, while most of the countries in our sample have Christianity as the predominant religion.

We source the data needed to construct our country-level indices (i.e. the rule of law, media freedom, social and cultural development, and market competition) from different public sources such as the World Economic Forum, World Justice Project and Freedom House. We explain the construction of these variables in Appendix B. We winsorize the different variables at 90% to reduce the effect of extreme or wrong observations on our results.

3.1. Governance index

We construct a firm-level additive index of governance (GOVI) using a collection of the most cited individual measures of governance. Many studies in the literature rely on additive governance indices to measure the overall governance quality of a firm (e.g. Aggarwal et al., 2010; Anderson and Gupta, 2009; Brown and Caylor, 2006). The need for constructing a governance index arises from the fact that there is no individual variable that can be used to measure the overall governance quality of a firm, thus some type of scoring system is needed to be able to rank and compare the governance framework of each firm. Following Aggarwal et al. (2010) and Brown and Caylor (2006), we use the most recent governance thresholds provided by the Institutional Shareholder

³ Market capitalization figures are sourced from the World Federation of Exchanges as of end of 2017.

Table 1

Sample Characteristics. The table shows the main characteristics of the countries covered in this study. The legal family indicator is based on the origin of the legal system in the country, whereas the predominant religion classification reflects the most followed religion in it based on the CIA World Factbook. The governance index column shows the average governance score for all the firms in our sample within the particular country (for 2017). The financial development index is based on the 2017 financial development score provided by the Global Competitiveness Index (GCI) report. The number of firms column shows the total number of firms in the country that have been included in our sample. The income group is based on the World Bank's 2017 classification of countries and territories.

| Country | Legal family | Predominant religion | Governance index | Financial Development index | No. of firms | Income group |
|----------------------|--------------|----------------------|------------------|-----------------------------|--------------|---------------------|
| Australia | Common | Christianity | 72.96 | 1.31 | 346 | High income |
| Austria | Civil | Christianity | 59.39 | -0.75 | 16 | High income |
| Belgium | Civil | Christianity | 63.36 | 0.43 | 25 | High income |
| Brazil | Civil | Christianity | 52.84 | -1.12 | 85 | Upper-middle income |
| Canada | Common | Christianity | 80.84 | 2.63 | 297 | High income |
| Chile | Civil | Christianity | 51.36 | 0.82 | 22 | High income |
| China | Civil | Buddhism | 61.36 | -1.19 | 92 | Upper-middle income |
| Czech Republic | Civil | Christianity | 50.40 | -0.25 | 9 | High income |
| Denmark | Civil | Christianity | 73.87 | -0.34 | 26 | High income |
| Finland | Civil | Christianity | 72.65 | 3.00 | 25 | High income |
| France | Civil | Christianity | 50.81 | 0.61 | 100 | High income |
| Germany | Civil | Christianity | 67.70 | 0.82 | 90 | High income |
| Greece | Civil | Christianity | 55.05 | -5.85 | 18 | High income |
| Hong Kong | Common | Buddhism | 59.21 | 3.55 | 165 | High income |
| Hungary | Civil | Christianity | 51.34 | -3.87 | 9 | High income |
| India | Common | Hinduism | 49.41 | -1.80 | 95 | Lower-middle income |
| Indonesia | Civil | Islam | 51.32 | -0.54 | 36 | Lower-middle income |
| Ireland | Common | Christianity | 83.50 | -2.26 | 15 | High income |
| Israel | Common | Judaism | 61.53 | -0.07 | 16 | High income |
| Italy | Civil | Christianity | 65.13 | -3.97 | 46 | High income |
| Japan | Civil | Shinto | 40.40 | 1.24 | 411 | High income |
| Malaysia | Common | Islam | 65.02 | 2.36 | 52 | Upper-middle income |
| Mexico | Civil | Christianity | 49.35 | -2.37 | 33 | Upper-middle income |
| Morocco | Civil | Islam | 27.98 | -1.65 | 7 | Lower-middle income |
| Netherlands | Civil | Christianity | 75.25 | 0.79 | 34 | High income |
| New Zealand | Common | Christianity | 70.10 | 2.66 | 44 | High income |
| Norway | Civil | Christianity | 68.19 | 3.02 | 26 | High income |
| Philippines | Civil | Christianity | 60.01 | -0.41 | 26 | Lower-middle income |
| Poland | Civil | Christianity | 51.28 | -1.64 | 30 | High income |
| Portugal | Civil | Christianity | 58.67 | -3.00 | 10 | High income |
| Qatar | Civil | Islam | 57.96 | 3.69 | 13 | High income |
| Russia | Civil | Christianity | 58.27 | -3.30 | 35 | High income |
| Singapore | Common | Buddhism | 63.55 | 3.45 | 46 | High income |
| South Africa | Common | Christianity | 61.78 | 2.13 | 121 | Upper-middle income |
| South Korea | Civil | Christianity | 44.45 | -3.49 | 111 | High income |
| Spain | Civil | Christianity | 62.75 | -2.81 | 48 | High income |
| Sweden | Civil | Christianity | 58.30 | 1.77 | 61 | High income |
| Switzerland | Civil | Christianity | 59.43 | 2.51 | 66 | High income |
| Taiwan | Civil | Buddhism | 53.24 | 1.84 | 134 | High income |
| Thailand | Common | Buddhism | 58.88 | 0.32 | 33 | Upper-middle income |
| Turkey | Civil | Islam | 50.59 | -1.46 | 25 | Upper-middle income |
| United Arab Emirates | Civil | Islam | 45.77 | 2.00 | 13 | High income |
| United Kingdom | Common | Christianity | 78.78 | 1.20 | 389 | High income |
| Average | | | 59.40 | 0.00 | 77 | |
| Median | | | 59.21 | 0.32 | 35 | |

Services (ISS) Governance QuickScore 3.0 to construct our index. Basically, a firm gains 1 point if its governance attribute meets the threshold suggested by ISS's guideline or 0 otherwise⁴. We cover a total of 36 governance attributes which represent the different variables covered by both DataStream's ASSET4 database and ISS's QuickScore. Details of these attributes are provided in Appendix A. The final value of our index is the percentage of scores achieved versus the potential score that could have been achieved (100%). When an attribute is missing from the database for a particular firm, its score is taken out of the total potential score, so that the final score of such a firm does not get affected by missing attributes.

3.2. Main regression models

3.2.1. Cross-country differences and firm-level governance

We use four main groups of models to answer the set of questions addressed in our study. First, in order to examine the

⁴ Thresholds for the different governance measures are provided in the appendix.

relationship between firm-level governance and country-level factors (research question 1a to 1d), we run the following regression using industry and year dummies⁵ :

$$\text{GOVI}_{i,t} = \beta_0 + \beta_1 \text{RLAW}_{i,t} + \beta_2 \text{LORG}_{i,t} + \beta_3 \text{MEDI}_{i,t} + \beta_4 \text{CHRN}_{i,t} + \beta_5 \text{ISLM}_{i,t} + \beta_6 \text{SOCL}_{i,t} + \beta_7 \text{COMP}_{i,t} + \text{Control Variables (SIZE}_{i,t}/\text{LEVG}_{i,t}/\text{GROW}_{i,t}/\text{LGPC}_{i,t})} + \varepsilon_{i,t} \quad (1)$$

Where RLAW, MEDI, SOCL and COMP, are indices that measure: the rule of law, media freedom, social and cultural development, and market competition, respectively. LORG is a dummy variable which takes the value 1 if the country's legal system is based on common law or 0 if it is based on civil law, while CHRN and ISLM are dummy variables which take the value 1 if the country's predominant religion is Christianity or Islam, respectively, or 0 otherwise. The sources and construction of the different independent variables are explained in Appendix B.

As highlighted earlier, due to the fact the firms are nested within countries, the standard assumption of observation independence is most likely to be violated. This happens because firms within one country are generally more similar than firms from different countries. Therefore, we employ the hierarchical linear modeling (HLM) approach to capture the nested nature of the data and avoid potential problems with our conclusions due to the violation of the independence assumption (Essen et al., 2013)⁶. Our HLM regressions are based on two hierarchical levels (firm and country), each of which has its own regression equation. Level 1 regression includes firm and country level variables, whereas Level 2 includes country-level variables only. In contrast to the usual OLS approach, this approach allows us to vary the Level 1 intercept and slopes across countries. Following Aggarwal et al. (2010), Klapper and Love (2004), and others, we include several control variables in the regression to account for potential variations in the governance characteristics of a firm due to firm-specific attributes⁷⁻⁸. These variables are:

- **Firm size (SIZE):** is the log of total assets. As highlighted by Klapper and Love (2004), size plays an important role in determining the governance characteristics of the firm. A larger firm may have greater agency problems indicating the need to impose stricter governance mechanisms. At the same time, a small firm may have greater financing needs and thus may need to improve its governance profile in order to be able to attract external financing.
- **Leverage (LEVG):** is the ratio of the total book value of short- and long-term debt to total assets. Leverage levels have been found in many studies to be highly related to the level of agency issues in the firm. Jensen (1986) and Stulz (1990), among others, have documented that higher leverage levels reduce agency issues by reducing the amount of free cash available to managers as well as imposing more financial constraints on their daily operations. One can also argue that leverage adds a new layer of monitoring of managers' actions by the creditors. Thus, under some conditions leverage can be viewed as an important determinant of the firm's governance profile.
- **Growth opportunities (GROW):** is the average growth rate in sales for the last three years. A firm with high growth opportunities will have a higher need for external financing and thus may find it beneficial to improve its governance characteristics and overall protection of shareholder rights in order to improve its access to external sources as well as reduce its cost of doing so (Himmelberg et al., 1999; Klapper and Love, 2004).

We also add a country-level control variable, Log of GNP per capita (LGPC), to control for differences in the state of economic development across countries (Aggarwal et al., 2010; Klapper and Love, 2004). We source this data from the World Bank WDI Database for all countries in our sample.

3.2.2. The relationship between firm-level and country-level governance

Next, since the focus of this study is on outcome-based (i.e. RLAW, MEDI, SOCL, and COMP) rather than rules-based (LORG, CHRN, and ISLM) country-level indicators, we only include the former indicators in our next three models⁹. This focus stems from the argument that outcome-based variables provide a better gauge of the effectiveness of the protections and governance mechanisms in place as opposed to the rules-based variables which only measure the presence of such protections (Kaufmann et al., 2011; Schiehl and Martins, 2016). The second set of research questions is addressed using a second set of regressions which examines the nature of the relationship between firm value/return and firm-level governance when considering the effect of country-level factors. We run the following regressions using industry and year dummies:

$$\text{Return or Value Measure}_{i,t} = \beta_0 + \beta_1 \text{GOVI}_{i,t} + \beta_2 \text{RLAW}_{i,t} + \beta_3 \text{MEDI}_{i,t} + \beta_4 \text{SOCL}_{i,t} + \beta_5 \text{COMP}_{i,t} + \beta_6 (\text{GOVI}_{i,t} \times \text{RLAW}_{i,t}) + \beta_7 (\text{GOVI}_{i,t} \times \text{MEDI}_{i,t}) + \beta_8 (\text{GOVI}_{i,t} \times \text{SOCL}_{i,t}) + \beta_9 (\text{GOVI}_{i,t} \times \text{COMP}_{i,t}) + \text{Control Variables (SIZE}_{i,t}/\text{LEVG}_{i,t}/\text{GROW}_{i,t}/$$

⁵ We analyze individual Variance Inflation Factor (VIF) scores for any signs of multicollinearity in our models. We also report mean VIF scores for all of our regressions.

⁶ For the other models we rely on country clustered standard errors to address our concerns about violation of the independence assumption.

⁷ We omit some of the control variables used in earlier studies (e.g. Aggarwal et al., 2010; Klapper and Love, 2004) such as: PPE/Sales, because they were found to be insignificant in these studies. We also believe that the industry dummies will capture many of the differences that those omitted control variables were designed to capture.

⁸ The sensitivity of the results of the analysis to the choice and definition of these different control variables will be tested for robustness in a later section.

⁹ As explained earlier, the rules-based indicators measure whether there are adequate rules to protect investors, while outcome-based indicators reflect the actual outcome of these rules (see Kaufmann et al., 2011; Schiehl and Martins, 2016)

$$LGPC_{i,t}) + \varepsilon_{i,t} \quad (2a)$$

$$\text{Return or Value Measure}_{i,t} = \beta_0 + \beta_1 GOVI_{i,t} + \beta_2 RLAW_{i,t} + \beta_3 MEDI_{i,t} + \beta_4 SOCL_{i,t} + \beta_5 COMP_{i,t} + \text{Control Variables (SIZE}_{i,t}/LEVG_{i,t}/GROW_{i,t}/ LGPC_{i,t}) + \varepsilon_{i,t} \quad (2b)$$

$$\text{Return or Value Measure}_{i,t} = \beta_0 + \beta_1 GOVI_{i,t} + \beta_2 (GOVI_{i,t} \times RLAW_{i,t}) + \beta_3 (GOVI_{i,t} \times MEDI_{i,t}) + \beta_4 (GOVI_{i,t} \times SOCL_{i,t}) + \beta_5 (GOVI_{i,t} \times COMP_{i,t}) + \text{Control Variables (SIZE}_{i,t}/LEVG_{i,t}/GROW_{i,t}/ LGPC_{i,t}) + \varepsilon_{i,t} \quad (2c)$$

The different models represent the different causal-relationship models used in past studies as outlined by Schiehl and Martins (2016). *Model 2a* represents the independent models where all the factors as well as the interaction between these factors have been included in the model. *Model 2b* represents the second group of models (i.e. the additive models), where the effect of both factors, firm and country, on firm return/value is assumed to be independent of each other, which explains dropping the interaction variables. Lastly, *Model 2c* represents the moderating models, where country-level factors moderate the relationship between firm-level mechanisms and firm value/return. We use a battery of model selection tests (explained later) to find the most suitable form to explain the relationship between country-level factors and firm-level governance mechanisms and their joint effect on firm value/return. We also use the Granger causality test and structural equation modelling to investigate the validity of the intervening models in explaining the relationship under consideration.

Moreover, we construct a country-level governance score (COGI) based on the first principal component scores (explains 87% of the variation) from a principal component analysis that includes the individual country-level factors (i.e. RLAW, MEDI, SOCL, or COMP). This allows us to significantly reduce the number of variables needed in our next regressions. Our new set of regressions is:

$$\text{Return or Value Measure}_{i,t} = \beta_0 + \beta_1 GOVI_{i,t} + \beta_2 COGI_{i,t} + \beta_3 (GOVI_{i,t} \times COGI_{i,t}) + \text{Control Variables (SIZE}_{i,t}/LEVG_{i,t}/GROW_{i,t}/ LGPC_{i,t}) + \varepsilon_{i,t} \quad (3a)$$

$$\text{Return or Value Measure}_{i,t} = \beta_0 + \beta_1 GOVI_{i,t} + COGI_{i,t} + \text{Control Variables (SIZE}_{i,t}/LEVG_{i,t}/GROW_{i,t}/ LGPC_{i,t}) + \varepsilon_{i,t} \quad (3b)$$

$$\text{Return or Value Measure}_{i,t} = \beta_0 + \beta_1 GOVI_{i,t} + \beta_2 (GOVI_{i,t} \times COGI_{i,t}) + \text{Control Variables (SIZE}_{i,t}/LEVG_{i,t}/GROW_{i,t}/ LGPC_{i,t}) + \varepsilon_{i,t} \quad (3c)$$

Both the sign and significance of the interaction between the governance index and the country variables (e.g. $GOVI_{i,t} \times RLAW_{i,t}$) in the above models would indicate whether the particular country-level factor or index and firm-level governance are complements (positive sign) or substitutes (negative sign). A positive (negative) sign indicates that improving firm-level governance in a country with strong country-level mechanism is beneficial (detrimental) to firm value/performance.

3.2.3. The role of financial development and capital dependency

Our next set of regressions is used to answer our third and fourth research questions through examining the relationship between firm return or value measures and firm-level governance when considering both the country's state of financial development and the firm's external financing needs. We run the following regression using industry and year dummies assuming a moderating causal-relationship:

$$\text{Return or Value Measure}_{i,t} = \beta_0 + \beta_1 GOVI_{i,t} + \beta_2 (GOVI_{i,t} \times D_{COGI}) + \beta_3 (GOVI_{i,t} \times D_{FIND}) + \beta_4 (GOVI_{i,t} \times D_{EXCD}) + \text{Control Variables (SIZE}_{i,t}/LEVG_{i,t}/GROW_{i,t}/ LGPC_{i,t}) + \varepsilon_{i,t} \quad (4)$$

Where the dummy variables (D_{COGI} and D_{FIND}) take the value 1 if the score of the country on the index is above the median value for all countries in the sample or 0 otherwise. The financial development score (FIND) is calculated using PCA based on the scores of the 8th pillar (financial market development) of the GCI report (discussed earlier)¹⁰. D_{EXCD} is a dummy variable for the firm's External Capital Dependence (EXCD) and takes the value 1 (high dependence on external financing) if the external capital dependence ratio (capital expenditure minus cash-flow from operations divided by capital expenditure) for a particular firm is above the median value for all firms in the sample or 0 otherwise.

Compared to model (3c), the additional independent variable ($GOVI_{i,t} \times D_{FIND}$) is added to investigate the effect of improving firm-level governance in a country with high financial development on firm value/performance. While, the independent variable ($GOVI_{i,t} \times D_{EXCD}$) is added to examine the effect of improving firm-level governance in a firm with high financing needs on firm value/performance.

4. Results and discussion

Panel A in *Table 2* provides descriptive statistics for the country-level factors included in our analysis after splitting the sample into two groups based on the average governance score of the firms operating in each country. It is clear from an analysis of the statistics reported in the table that countries with high average governance scores have significantly higher scores in the different

¹⁰ This pillar scores financial development around the world based on factors such as: affordability and availability of financial services; financing through local equity market; ease of access to loans; venture capital availability; soundness of banks; regulation of securities exchanges.

Table 2

Descriptive Statistics. Panels A and B present the mean and median differences in the different country-level variables after splitting the sample into two groups based on average governance score and financial development score, respectively. Panel C presents overall statistics for the full sample. The test for the equality of means uses Welch's t-test, while the test for the equality of medians uses Wilcoxon's rank-sum test. The p-values are reported in the parentheses. *Significant at the 10% level. **Significant at the 5% level. ***Significant at the 1% level.

| Panel A: Mean and Median comparisons based on the Governance index scores (2017) | | | | | | |
|--|-----------|--------|-----------|--------|------------------|------------------|
| | Upper 50% | | Lower 50% | | Difference | |
| | Mean | Median | Mean | Median | Mean | Median |
| Rule of Law (RLAW) | 1.164 | 2.147 | -1.111 | -0.446 | 2.275*** (0.003) | 2.593*** (0.002) |
| Freedom of Media (MEDI) | 0.617 | 1.064 | -0.579 | -0.234 | 1.185** (0.019) | 1.298*** (0.007) |
| Social and Cultural index (SOCL) | 0.754 | 1.327 | -0.720 | -0.394 | 1.473*** (0.003) | 1.720*** (0.002) |
| Market Competitiveness (COMP) | 0.811 | 1.381 | -0.774 | -1.299 | 1.584*** (0.004) | 2.679** (0.012) |
| Financial Development Score (FIND) | 0.691 | 0.819 | -0.660 | -0.832 | 1.350* (0.059) | 1.651* (0.065) |

| Panel B: Mean and Median comparisons based on the Financial Development score (2017) | | | | | | |
|--|-----------|--------|-----------|--------|------------------|------------------|
| | Upper 50% | | Lower 50% | | Difference | |
| | Mean | Median | Mean | Median | Mean | Median |
| Rule of Law (RLAW) | 1.468 | 2.131 | -1.401 | -2.011 | 2.869*** (0.000) | 4.142*** (0.000) |
| Freedom of Media (MEDI) | 0.490 | 0.904 | -0.468 | -0.234 | 0.958* (0.060) | 1.138** (0.022) |
| Social and Cultural index (SOCL) | 1.018 | 1.397 | -0.971 | -0.808 | 1.989*** (0.000) | 2.205*** (0.000) |
| Market competitiveness (COMP) | 1.340 | 1.657 | -1.279 | -1.767 | 2.619*** (0.000) | 3.424*** (0.000) |
| Governance index (GOVI) | 62.697 | 63.356 | 56.243 | 56.659 | 6.454* (0.053) | 6.697** (0.035) |

| Panel C: Overall characteristics (full sample) | | | | | | |
|--|--------|--------|----------------|---------|---------|--|
| | Mean | Median | Std. Deviation | Minimum | Maximum | |
| Rule of Law (RLAW) | 0.000 | 0.397 | 2.581 | -5.096 | 3.760 | |
| Freedom of Media (MEDI) | 0.000 | 0.456 | 1.668 | -3.780 | 2.057 | |
| Social and Cultural index (SOCL) | 0.000 | 0.326 | 1.629 | -4.229 | 2.441 | |
| Market Competitiveness (COMP) | 0.000 | 0.079 | 1.815 | -3.551 | 3.443 | |
| Financial Development Score (FIND) | 0.000 | 0.120 | 2.319 | -5.852 | 4.307 | |
| Governance index (GOVI) | 56.817 | 56.667 | 14.958 | 15.789 | 93.333 | |
| Firm size (SIZE) | 15.396 | 15.332 | 1.511 | 13.088 | 17.894 | |
| Leverage (LEVG) | 0.241 | 0.223 | 0.184 | 0.000 | 0.821 | |
| Growth opportunities (GROW) | 0.068 | 0.056 | 0.108 | -0.095 | 0.266 | |
| External capital dependency (EXCD) | -3.073 | -0.978 | 4.744 | -14.443 | 0.750 | |

country-level factors. This indicates the presence of a positive link between each of these factors and firm-level governance. Although with a lesser degree of significance, the analysis also indicates that high governance countries tend to have more developed financial markets. This is in line with our earlier discussion of the effect that the financial markets development levels have on the firms' governance framework. This is also confirmed by examining the different results from *Panel B* of *Table 2* which show that countries with higher financial development scores also have a higher score on each of the country-level factors as well as the average governance scores.

4.1. Explaining the cross-country differences in firm-level governance

Table 3 shows the results of regressing the firm-level governance index on the different country-level variables and firm-level control variables. The R^2 reported in each of the first four columns when we regress the governance index on each of the country variables is much greater than the (unreported) R^2 of 0.037 for the basic regression that only includes the control variables which indicates the significant role played by the country variables in explaining the governance framework at the firm-level. For example, when we include the rule of law index and the legal origin as independent variables the R^2 (within countries) value improves by five times compared to the basic regression. We observe similar results when we include our media freedom index as well as our social and cultural index and predominant religion dummies. This is largely in line with the findings of *La Porta et al. (2000)* and *Stulz and Williamson (2003)*, who found that the legal and cultural factors, respectively, are more powerful than economic and financial factors in explaining cross-country differences in the governance practices. Furthermore, although with a lesser magnitude, R^2 scores are also higher for the regression including our market competition index.

In column five we report a regression which includes all of the country-level measures as explanatory variables. The R^2 (within and between countries) is now significantly higher compared to that of regressions reported in the first four columns, all of the country variables are positive and all but ISLM are significant. The lower AIC scores also suggest that the regression containing all of the country-level measures provides a better fit to the data after accounting for the higher complexity of this regression (i.e. more

Table 3

HLM Analysis of Firm-level Governance and Country-level Factors. The table presents the results of five hierarchical linear modeling (HLM) regressions using industry and year dummies with the Governance index (GOVI) measure as the dependent variable. GOVI is a firm-level additive index of governance constructed using a collection of individual measures of governance (see text for details). The Rule of Law Index (RLAW) is a score of the country's legal system and its law enforcement power. The legal system origin (LORG) is a dummy variable which takes the value 1 if the country's legal system is based on common law or 0 if it is based on civil law. Media (MEDI) is a score that assesses the degree of media freedom in a particular country. The Social and Cultural index (SOCL) assesses the characteristics of the education and health systems as well as training and technological readiness in a country. Christianity (CHRN) and Islam (ISLM) are dummy variables which take the value 1 if the country's predominant religion is Christianity and Islam, respectively, or 0 otherwise. The Market Competitiveness index (COMP) measures the efficiency of the goods and labor markets as well as innovation and business sophistication in a particular country. Countries with better or more positive conditions will score higher in the respective index. The control variables (SIZE/LEVG/GROW/LGPC) are explained in the text. The z-Statistics reported in the parentheses are based on country clustered standard errors. *Significant at the 10% level. **Significant at the 5% level. ***Significant at the 1% level. The Mean Variance Inflation Factor (VIF) is a measure of the severity of multicollinearity in a regression. "L1" and "L2" denote level 1 and level 2 predictors in the HLM analysis, respectively. The Akaike information criterion (AIC) measures the relative quality of a model compared to other models, through considering the tradeoff between the model's complexity and its goodness of fit.

| | 1 | 2 | 3 | 4 | 5 |
|------------------------------------|-------------------|------------------|-------------------|------------------|-------------------|
| Intercept | 6.447 (0.100) | 5.750 (0.050) | 1.389 (0.480) | 0.727 (0.240) | 0.816 (0.180) |
| RLAW (L2) | 1.199* (1.860) | | | | 0.507* (1.920) |
| LORG (L2) | 12.058*** (7.640) | | | | 14.647*** (3.880) |
| MEDI (L2) | | 4.025*** (3.590) | | | 2.874** (2.020) |
| SOCL (L2) | | | 0.505*** (2.620) | | 0.318* (1.650) |
| CHRN (L2) | | | 11.679*** (5.920) | | 13.212** (2.30) |
| ISLM (L2) | | | 1.577 (1.090) | | 1.759 (1.620) |
| COMP (L2) | | | | 1.326** (2.530) | 1.025* (1.920) |
| SIZE (L1) | 0.694*** (4.380) | 0.693*** (4.390) | 0.693*** (4.390) | 0.693*** (4.380) | 0.696*** (4.40) |
| LEVG (L1) | -0.273 (-0.410) | -0.289 (-0.430) | -0.275 (-0.410) | -0.268 (-0.400) | -0.278 (-0.410) |
| GROW (L1) | -0.000 (-0.800) | -0.000 (-0.750) | -0.000 (-0.800) | -0.000 (-0.800) | -0.000 (-0.760) |
| LGPC (L2) | 4.068* (1.800) | 4.446*** (2.880) | 4.621*** (3.400) | 5.094** (2.440) | 3.216** (2.310) |
| R ² (within countries) | 0.208 | 0.166 | 0.164 | 0.077 | 0.348 |
| R ² (between countries) | 0.389 | 0.303 | 0.299 | 0.121 | 0.676 |
| AIC score | 96,493 | 96,491 | 96,501 | 96,507 | 96,473 |
| Mean VIF | 2.45 | 2.53 | 2.36 | 2.54 | 3.72 |
| No. of Firms (Firm-year) | 3301 (25,352) | 3301 (25,352) | 3301 (25,352) | 3301 (25,352) | 3301 (25,352) |
| No. of Countries | 43 | 43 | 43 | 43 | 43 |

independent variables) than the regressions reported in the first four columns.

The positive sign of the rule of law index suggests that more effective law enforcement and judicial systems are likely to be associated with better firm-level governance (Doidge et al., 2007). Furthermore, our results show that countries with common law origins tend to be associated with better firm-level governance when compared to those with civil law origins. This finding is in agreement with the findings of La Porta et al. (1997, 1998, 2000) and others, who argue that countries with common law origins tend to have the strongest investor protection frameworks which in turn influence firm-level protections by imposing higher governance requirements. This influence also manifests through the fact that common law countries tend to have more developed markets which incentivizes the firm to adopt a more stringent governance framework in order to secure a more favorable access to these markets¹¹.

With regards to the role of media in influencing governance quality, the results of our regression show the presence of a positive link between the strength and effectiveness of media and the strength of firm-level governance. It can be argued that an active and a free media sector does not only help monitor and rectify governance shortfalls, but also act as an independent watchdog that forces firms to adopt a more stringent governance framework. The media influences the governance quality of a firm through reporting governance violations and shortfalls to the public (e.g. Bednar et al., 2012; Joe et al., 2009). The publicity generated by negative media coverage threatens the reputations of the firm and its managers and directors causing them to react quickly and ensures that proper controls are put in place in order to avoid future coverage (Bednar, 2012; Core et al., 2008; Dyck et al., 2008).

The results of the regression also show a positive relationship between our social and cultural index and governance at firm level. This is consistent with a better educated individual being more involved and astute when investing in the capital markets and so putting more pressure on firms to improve their governance framework (Bebchuk and Neeman, 2010). Additionally, technological advances help create a more informed pool of investors by improving the availability of information to the different stakeholders, which in turn increases the pressure on the firms to improve their image by adopting a more stringent governance framework.

Contrary to the findings of Stulz and Williamson (2003), the results of our regression suggest the presence of a positive association between firm-level governance and Christianity and Islam as predominant religions when compared to other religions and beliefs, albeit the dummy variable representing Islam is insignificant in this case. One possible explanation for this relationship is that the prescriptive nature of these two religions compared to other beliefs might contribute to the establishment of a minimum benchmark of accepted business and governance practices, which in turn influences the firm-level governance practices. Another possible

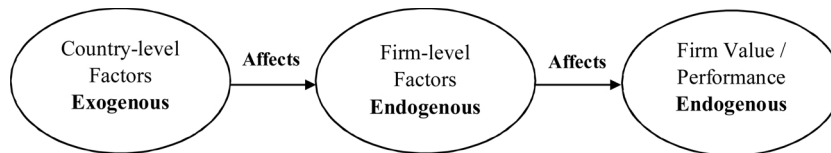
¹¹ We intend to revisit this claim in our next set of regressions.

explanation for this result could be related to the fact that our sample is dominated by Christian and Islamic high to middle income countries with more developed financial markets, which could lead to observing a higher association between firm-level governance and the religion dummy (see La Porta et al., 1999).

With regards to market competitiveness, the results confirm the existence of a positive association between our market competitiveness index which measures the efficiency of the goods and labor markets as well as innovation and business sophistication, and firm level governance. In other words, countries with more efficient and competitive domestic markets tend to have higher governance quality at the firm level. This observation is expected given the fact that highly competitive environments force firms to continuously improve their governance and internal controls to be able to survive (see Claessens and Yurtoglu, 2013). This is also in agreement with prior studies that reported higher CEO turnover and more focus on efficiency and performance in competitive environments (Baggs and De Bettignies, 2007; DeFond and Park, 1999; Fee and Hadlock, 2000).

4.2. The relationship between firm-level and country-level governance

Table 4 shows the results from our sets of regressions (Models 2a-2c and 3a-3c) intended to examine the most suitable causal-relationship model to represent the relationship between country-level factors and firm-level governance mechanisms. The regressions reported in Panel A include the individual country variables, while the regressions reported in Panel B include the country-level index only. First of all, the results of the Likelihood-ratio test for nested models suggest that both the additive and the moderating models provide better fit than the independent models. Furthermore, the Davidson-MacKinnon J test for non-nested models confirms that the moderating models provide a better fit than both the independent and the additive models. This is also confirmed by the fact that the moderating models have the lowest AIC scores in each group of regressions, which suggests that these models provide a better fit to the data after accounting for the differences in complexity¹². With regards to the last group of causal-relationship models, the intervening models, we find no evidence to support the hypothesis that country-level factors affect firm-level governance and then firm value/performance. More specifically, we do not find a significant result using the granger causality test routine to suggest that country-level factors granger-causes firm-level factors¹³. We also fail to find any support for the intervening models using the structural equation modelling routine specified below.



Overall, the results of our different model selection tests confirm that the moderating models provide a better fit and representation of the relationship between country-level and firm-level governance mechanisms and their joint effect on firm value/performance. Furthermore, we can infer from the positive signs of the interaction between the firm governance index and the country variable (e.g. $GOVI_{i,t} \times RLAW_{i,t}$) in the moderating models that a firm extracts more benefits from adopting a stronger governance framework when operating in a country with stronger country-level mechanisms. This indicates the presence of a complementary relationship between firm-level governance and all the country-level factors included in our regressions. This observation is consistent with the findings of several prior studies (e.g. Aggarwal et al., 2010; Anderson and Gupta, 2009; Doidge et al., 2007), but equally at variance with a number of other studies that found that firm-level governance substitutes, rather than complements, country-level mechanisms (Chen et al., 2009; Klapper and Love, 2004; Renders et al., 2010). Our results remain essentially the same when we use Return on Assets (ROA) as a dependent variable instead of Return on Equity (ROE).

Our finding of complementarity could also be related to the fact that many of the countries with the highest scores on the country-level indicators are also those with the most advanced financial markets (e.g. United Kingdom, Hong Kong, Australia, Germany, France, Japan). Combining this with our previous observation that firms would benefit most from stronger governance in countries with strong financial institutions, suggests an incentive for firms to institute strong internal governance even in countries with strong mechanisms. Our observation of complementarity can also be justified under the institutional theory framework, which views firm-level governance as a result of the prevailing national institutions and social systems (Aguilera et al., 2015; Schiehl and Martins, 2016). The theory assumes that a firm's external environment determines its adoption of the various governance practices. Overall, our observations regarding the moderating effect of country-level factors as well as the complementarity of firm-level and country-level factors call for a further examination of the specific factors that entice a firm to alter its investment in firm-level governance under different scenarios. We examine two of these factors in the next section.

5. The role of financial development and capital dependency

One of main benefits to a firm from adopting better governance practices is having a better access to capital markets along with

¹² The AIC is an approximately unbiased estimate of the Kullback-Liebler Information Criterion (KLIC) used to measure divergence between models.

¹³ We test the causality up to the fourth lag of the independent variables and find no significant evidence of granger-causality in our sample.

Table 4

Multivariate Regressions of Return and Value Measures on the Firm-level Governance index and Country-level variables. The table presents the results of six ordinary least squares regressions using industry and year dummies with two measures of return and value: Return on Equity (ROE) and Tobin's Q, as the dependent variables. Panel A presents the regressions with the individual country-level variables, while Panel B presents the regressions with the country level index. ROE is net income divided by equity. Tobin's Q is calculated as the sum of the book value of preferred equity, book value of long-term debt, short-term debt minus short-term marketable securities, and market value of equity divided by the book value of total assets. This method of calculating Tobin's Q was found by [Chung and Pruitt \(1994\)](#) to have a very high correlation with the results of the original Tobin's Q. GOVI is a firm-level additive index of governance constructed using a collection of individual measures of governance (see text for details). COGI is a country-level governance index (explained in the text). The Rule of Law Index (RLAW) is a score of the country's legal system and its law enforcement power. Media (MEDI) is a score that assesses the degree of media freedom in a particular country. The Social and Cultural index (SOCL) assesses the characteristics of the education and health systems as well as training and technological readiness in a country. The Market Competitiveness index (COMP) measures the efficiency of the goods and labor markets as well as innovation and business sophistication in a particular country. The control variables (SIZE/LEVG/GROW/LGPC) are explained in the text. The t-Statistics reported in the parentheses are based on country clustered standard errors. *Significant at the 10% level. **Significant at the 5% level. ***Significant at the 1% level. The Akaike information criterion (AIC) measures the relative quality of a model compared to other models, through considering the tradeoff between the model's complexity and its goodness of fit. The Likelihood-ratio and the Davidson-MacKinnon J tests are model selection tests used for nested and non-nested models, respectively. The Likelihood-ratio test compares the additive/moderating models to the independent model. The Davidson-MacKinnon J test compares each model to the other two alternatives. In both cases, rejecting the null hypothesis (significant results) would result in selecting the alternative model. For both tests, we report the test statistics value and the significance level.

| Panel A: Regressions with the Individual Country-level Factors | | | | | | |
|--|---------------------------------|--------------------|--------------------|---------------------------------------|-------------------|--------------------|
| Model Category | With ROE as Dependent Variables | | | With Tobin's Q as Dependent Variables | | |
| | Independent (I) | Additive (A) | Moderating (M) | Independent (I) | Additive (A) | Moderating (M) |
| Intercept | 0.861*** (3.090) | 0.821** (2.610) | 0.869 (1.620) | 0.208** (2.590) | 0.167* (1.910) | 0.217* (1.700) |
| GOVI | 0.266* (1.880) | 0.503*** (2.770) | 0.308** (2.460) | 0.046** (2.300) | 0.093* (1.790) | 0.051** (2.210) |
| RLAW | 0.600** (2.250) | 0.267 (0.650) | | 0.431 (1.220) | 0.132 (1.120) | |
| MEDI | 0.192 (1.190) | 0.372 (0.800) | | 0.508** (2.100) | 0.031 (0.060) | |
| SOCL | 0.421 (1.520) | 0.139 (0.270) | | 0.359 (1.450) | 0.830 (0.680) | |
| COMP | 0.343 (0.210) | 0.140*** (2.770) | | 0.374 (1.230) | 0.279* (1.860) | |
| GOVI*RLAW | 0.984** (2.120) | | 0.015*** (3.160) | 0.092 (1.260) | | 0.021** (2.170) |
| GOVI*MEDI | 0.318 (1.090) | | 0.042* (1.910) | 0.104** (2.090) | | 0.008 (0.900) |
| GOVI*SOCL | 0.705 (1.510) | | 0.049*** (3.050) | 0.063 (1.210) | | 0.016* (1.820) |
| GOVI*COMP | 0.303 (1.180) | | 0.241** (2.550) | 0.113 (1.550) | | 0.052* (1.960) |
| SIZE | 0.129 (1.070) | 0.130 (1.080) | 0.130 (1.080) | -0.351*** (-4.020) | 0.350*** (-4.120) | -0.348*** (-4.060) |
| LEVG | 0.736* (1.980) | 0.733* (1.980) | 0.734* (1.980) | 0.935 (0.340) | 0.829 (0.300) | 0.806 (0.300) |
| GROW | 0.000 (1.500) | 0.000 (1.450) | 0.000 (1.480) | 0.000 (0.780) | 0.000 (0.610) | 0.000 (0.650) |
| LGPC | -0.904** (-2.580) | -0.990*** (-2.820) | -0.938*** (-3.310) | -0.914* (-1.780) | -0.946 (-1.530) | -0.987* (-1.890) |
| Adjusted R-squared | 0.150 | 0.148 | 0.149 | 0.124 | 0.102 | 0.113 |
| AIC score | 172,380 | 172,377 | 172,375 | 121,036 | 121,049 | 121,027 |
| Likelihood-ratio test | | 3.330 | 1.470 | | 2.280 | 1.560 |
| Davidson-MacKinnon J test | | | | | | |
| H_A : Independent | | 1.310 | 1.210 | | 1.040 | 1.110 |
| H_A : Additive | 10.470*** | | -0.190 | 3.370*** | | -0.820 |
| H_A : Moderating | 10.470*** | 3.320*** | | 3.370*** | 1.820* | |
| No. of Firms (Firm-year) | 3301 (25,352) | 3301 (25,352) | 3301 (25,352) | 3301 (25,352) | 3301 (25,352) | 3301 (25,352) |
| No. of Countries | 43 | 43 | 43 | 43 | 43 | 43 |

| Panel B: Regressions with the Country-level Index | | | | | | |
|---|---------------------------------|-------------------|-------------------|---------------------------------------|--------------------|--------------------|
| Model Category | With ROE as Dependent Variables | | | With Tobin's Q as Dependent Variables | | |
| | Independent (I) | Additive (A) | Moderating (M) | Independent (I) | Additive (A) | Moderating (M) |
| Intercept | 0.699** (2.400) | 0.635* (1.830) | 0.702* (1.840) | 0.172** (2.440) | 0.116* (1.880) | 0.164 (1.590) |
| GOVI | 0.329* (1.820) | 0.458** (2.490) | 0.293** (2.360) | 0.025** (2.070) | 0.087** (2.580) | 0.059** (2.170) |
| COGI | 0.258 (0.130) | 0.106* (1.880) | | 0.600** (2.260) | 0.105 (0.990) | |
| GOVI*COGI | 0.151* (1.870) | | 0.194** (2.300) | 0.132* (1.740) | | 0.032** (2.030) |
| SIZE | 0.160 (1.320) | 0.159 (1.300) | 0.160 (1.310) | -0.292*** (-2.960) | -0.302*** (-3.010) | -0.294*** (-2.970) |
| LEVG | 0.737* (1.990) | 0.737* (1.990) | 0.737* (1.990) | 0.958 (0.340) | 0.939 (0.340) | 0.908 (0.330) |
| GROW | 0.000 (1.560) | 0.000 (1.540) | 0.000 (1.570) | 0.000 (0.650) | 0.000 (0.560) | 0.000 (0.570) |
| LGPC | -0.827** (-2.180) | -0.826** (-2.150) | -0.810** (-2.720) | -0.974 (-1.610) | -0.972 (-1.400) | -0.135* (-1.750) |
| Adjusted R-squared | 0.138 | 0.138 | 0.138 | 0.091 | 0.083 | 0.086 |
| AIC score | 172,386 | 172,384 | 172,384 | 121,066 | 121,070 | 121,061 |
| Likelihood-ratio test | | 0.300 | 0.030 | | 1.120 | 0.980 |

(continued on next page)

Table 4 (continued)

| Panel B: Regressions with the Country-level Index | | | | | | |
|---|---------------------------------|---------------|----------------|---------------------------------------|---------------|----------------|
| Model Category | With ROE as Dependent Variables | | | With Tobin's Q as Dependent Variables | | |
| | Independent (I) | Additive (A) | Moderating (M) | Independent (I) | Additive (A) | Moderating (M) |
| Davidson-MacKinnon J test | | | | | | |
| H_A : Independent | | 0.550 | 0.869 | | 1.210 | 0.990 |
| H_A : Additive | 10.490*** | | -0.160 | 3.400*** | | -0.930 |
| H_A : Moderating | 10.490*** | 2.030** | | 3.400*** | 3.340*** | |
| No. of Firms (Firm-year) | 3301 (25,352) | 3301 (25,352) | 3301 (25,352) | 3301 (25,352) | 3301 (25,352) | 3301 (25,352) |
| No. of Countries | 43 | 43 | 43 | 43 | 43 | 43 |

improved terms of financing. As discussed earlier, this suggests that the benefits will be related to the firm's ability to access capital which will depend on the extent of the development of the country's capital market. However, it can be also argued that a firm's gain from adopting a more stringent governance framework does not only rely on the financial development status of the country it operates in, but also depends on its external financing requirements. In other words, the higher the firm's need for external financing the more likely it will adopt a stronger governance framework to benefit from the reduced funding costs and the improved access to funding sources, which will result in a better financial performance. Put together, a firm with high external financing needs is most likely to adopt a high governance framework to gain favorable access to the capital markets if it is operating in a country with high financial development than otherwise. Similarly, a firm with low needs for external financing is more likely to adopt a low governance framework if it is operating in a country with low financial development. An additional dimension can be added to the analysis to capture the difference for firms operating in countries with stronger and weaker country-level governance mechanism.

To test the validity of our argument, we run *Model 4* with dummies for the level of the country governance mechanism (D_{COGI}), the level of financial development (D_{FIND}), and the extent of demand for external funds (D_{EXCD}):

$$\text{Return or Value Measure}_{i,t} = \beta_0 + \beta_1 \text{GOVI}_{i,t} + \beta_2 (\text{GOVI}_{i,t} \times D_{COGI}) + \beta_3 (\text{GOVI}_{i,t} \times D_{FIND}) + \beta_4 (\text{GOVI}_{i,t} \times D_{EXCD}) + \text{Control Variables (SIZE}_{i,t}/\text{LEV}_{i,t}/\text{GROW}_{i,t}/\text{LGPC}_{i,t}) + \varepsilon_{i,t}$$

The coefficient of the governance index (β_1) represents the effect of governance on firm value or return when the firm operates in a country with low country score and low financial development while also having low external financing needs. The contribution of governance to firm value or return when the firm operates with combinations of high and low country governance, financial development, and needs to tap external funding are as set out in Fig. 1.

The results of our regressions reported in *Panel A* of Table 5 show that firms with low external financing needs and which reside in a country with low country governance mechanisms and low financial development would still enjoy both higher returns and value driven by the internal governance mechanisms that they have put in place. However, the positive and significant coefficients associated with each of the cross products terms show that the positive impact internal governance has on firm return and value are enhanced by strong country governance, a well-developed capital market and a strong need to raise funds externally. We report the results of the different coefficient combinations in Fig. 1 along with the relevant Wald test results (as reported in *Panel B* of Table 5). The reported results show that the strongest and most significant positive impact on firm performance and value occurs for firms with high external funding needs resident in a country with a developed capital market and strong country governance. Finally, our results suggest that it is external financial needs that have the greatest impact on the relationship between internal governance mechanisms and firm performance whereas it is the extent of the development of the capital market that has the greatest impact on the relationship between internal governance and firm value.

We also re-run our analysis after splitting the sample into two subsamples based on the level of financial development (D_{FIND}) and using continuous rather than dummy measures of firm-level governance (GOVI), country governance mechanisms (COGI) and external financing needs (EXCD). The regression model we run for each subsample is:

$$\text{Return or Value Measure}_{i,t} = \beta_0 + \beta_1 \text{GOVI}_{i,t} + \beta_2 \text{COGI}_{i,t} + \beta_3 \text{EXCD}_{i,t} + \beta_4 (\text{GOVI}_{i,t} \times \text{EXCD}_{i,t}) + \text{Control Variables (SIZE}_{i,t}/\text{LEV}_{i,t}/\text{GROW}_{i,t}/\text{LGPC}_{i,t}) + \varepsilon_{i,t}$$

The results from Table 6 confirm to a large extent our previous observations. More specifically, while the interaction variable between firm-level governance and external financing needs is positive in all regressions, it is only significant in the regressions done on the subsample with high financial development. This means that firms with higher external financing needs and which operate in highly developed financial markets reap significantly higher benefits from adopting stronger firm-level governance compared to other firms in the same market. This is not the case for firms operating in less developed markets. This conclusion is further supported by results of the Wald test. Overall, this confirms our earlier arguments and lends support to prior findings in the literature on the collective role of the country' financial development and the firm's external financing needs in influencing its governance framework (see Aggarwal et al., 2010; Doidge et al., 2007)¹⁴.

¹⁴ Results remain essentially the same when we re-run model 4 excluding the country variables.

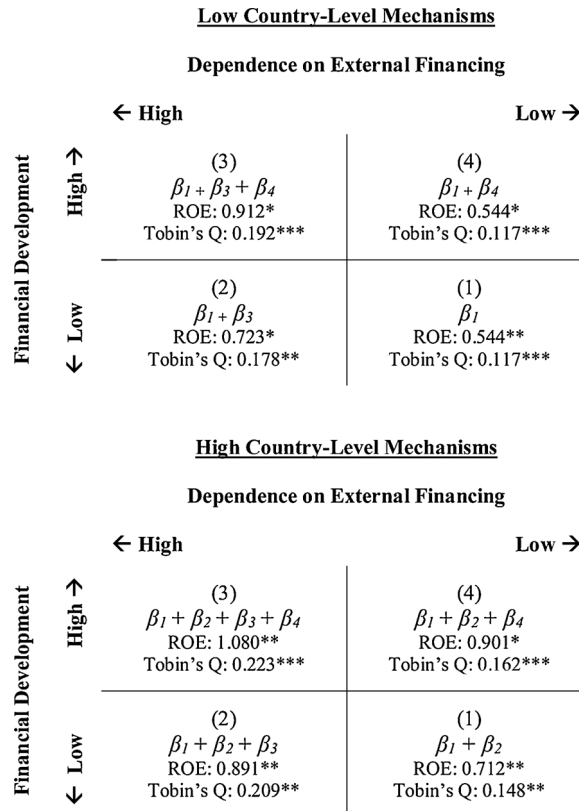


Fig. 1. The Financial Development, Capital Dependency, Firm Governance Nexus.

6. Robustness tests

We realize that our conclusions may be susceptible to the way we build our proxy of firm-level governance quality, therefore we test the robustness of our results by using the corporate governance score calculated by DataStream (GOVS) as an alternative proxy for a firm’s quality of internal governance^{15 16}. While the construction methods of both governance indices are not very dissimilar, the method followed to construct our own index allows us to largely reduce the effect of missing data and over/under representation of firms, through measuring each firm’s governance score as a standalone while adjusting for missing variables. Moreover, although no signs of multicollinearity were found using the standard statistical tests, we address any remaining concerns on the existence of such problem by re-running our analysis using the country-level governance (COGI) score introduced earlier. The results from Table 7 confirm that our earlier findings are not affected by our governance index (*Regression 1*). They also confirm (*Regressions 2-4*) that our conclusions remain essentially the same with an overall measure of country-level factors that accounts for potential multicollinearity issues in our previous models.

Renders et al. (2010) note several issues such as the observance of insignificant or incorrect results when econometric issues such as endogeneity are not properly controlled for in similar studies (see also Aguilera et al., 2015; Schiehl and Martins, 2016). Following Wintoki et al. (2012) and others, we use the dynamic-panel Generalized Methods of Moments (GMM) estimator introduced by Arellano and Bover (1995) and Blundell and Bond (1998) and follow a three steps estimation process. First of all, the regression models (models 1 and 2a) are modified to include the first lag of the dependent variable as an independent variable. Second, we take the first-difference of the variables to account for any unobserved heterogeneity. Lastly, we use the dynamic panel GMM estimator to estimate the final model while using the lagged values of the explanatory variables as instruments for the current values of the same variables to account for possible simultaneity and reverse causality (Hoechle et al., 2012). This setup allows us to treat all explanatory variables as endogenous variables while adding the years’ dummy variables as the only exogenous variables. The results from re-estimating model 3c are reported in Table 8¹⁷. The results convey similar results to ones reported earlier with higher significance in

¹⁵ The governance score provided by DataStream is a standardized score (Z-score) that compares the firm’s overall governance framework to all other firms in the database.

¹⁶ We re-run all models but report the results for Model 1 only as all results remain essentially the same.

¹⁷ Unreported results for Models 2c and 4 confirm similar findings, with regressions using Tobin’s Q as the dependent variable showing more significant results.

Table 5

Multivariate Regressions of Return and Value Measures on the Firm-level Governance index, Country-level mechanisms, the Financial Development index and the External Capital Dependency measure. The table presents the results of two ordinary least squares regressions using industry and year dummies with two measures of return and value: Return on Equity (ROE) and Tobin's Q, as the dependent variables. The dummy variables (DCOGI, DFIND, and DEXCD) take the value 1 if the score of the country/firm on the index is above the median value for all countries/firms in the sample or 0 otherwise. COGI is a country-level governance index (explained in the text). GOVI is a firm-level additive index of governance constructed using a collection of individual measures of governance (see text for details). All other variables are explained in the text. The t-Statistics reported in the parentheses are based on country clustered standard errors. The reported Wald test results in Panel B test the null hypothesis that the coefficients are simultaneously equal to zero. *Significant at the 10% level. **Significant at the 5% level. ***Significant at the 1% level. The Mean Variance Inflation Factor (VIF) is a measure of the severity of multicollinearity in a regression.

| Panel A: Regression Results | | |
|--|-----------------|--------------------|
| | ROE | Tobin's Q |
| Intercept | 0.460 (1.290) | 0.104* (1.690) |
| GOVI | 0.544** (2.220) | 0.117*** (2.980) |
| GOVI*DCOGI | 0.168* (1.720) | 0.031* (1.810) |
| GOVI*DFIND | 0.179* (1.830) | 0.061** (2.170) |
| GOVI*DEXCD | 0.189** (2.250) | 0.014 (1.140) |
| SIZE | 0.1110 (0.820) | -0.442*** (-3.860) |
| LEVG | 0.696 (1.510) | 0.649 (0.210) |
| GROW | 0.000 (1.650) | 0.000 (0.610) |
| LGPC | -0.525 (-1.450) | -0.660 (-1.160) |
| Adjusted R-squared | 0.156 | 0.138 |
| Mean VIF | 2.73 | 2.73 |
| No. of Firms (Firm-year) | 3301 (25,352) | 3301 (25,352) |
| No. of Countries | 43 | 43 |
| Panel B: Wald Tests | | |
| a. $B_{GOVI} = B_{GOVI*DCOGI} = 0$ | 4.000** | 4.830** |
| b. $B_{GOVI} = B_{GOVI*DFIND} = 0$ | 2.700* | 4.600** |
| c. $B_{GOVI} = B_{GOVI*DFIND} = B_{GOVI*DCOGI} = 0$ | 3.610** | 3.760** |
| d. $B_{GOVI} = B_{GOVI*DEXCD} = 0$ | 2.820* | 12.390*** |
| e. $B_{GOVI} = B_{GOVI*DEXCD} = B_{GOVI*DCOGI} = 0$ | 2.720* | 11.000*** |
| f. $B_{GOVI} = B_{GOVI*DFIND} = B_{GOVI*DEXCD} = 0$ | 2.750* | 10.370*** |
| g. $B_{GOVI} = B_{GOVI*DFIND} = B_{GOVI*DEXCD} = B_{GOVI*DCOGI} = 0$ | 2.770** | 8.760*** |

Table 6

Multivariate Regressions of Return and Value Measures on the Firm-level Governance index, Country-level mechanisms and the External Capital Dependency measure. The table presents the results of four ordinary least squares regressions using industry and year dummies with two measures of return and value: Return on Equity (ROE) and Tobin's Q, as the dependent variables. The main sample is divided into two subsamples, high and low, based on the median score of the financial development index (FIND). GOVI is a firm-level additive index of governance constructed using a collection of individual measures of governance (see text for details). COGI is a country-level governance index (explained in the text). EXCD is a measure of the firm's need for external financing (explained in the text). All other variables are explained in the text. The t-Statistics reported in the parentheses are based on country clustered standard errors. The reported Wald test results test the null hypothesis that the coefficients are simultaneously equal to zero. *Significant at the 10% level. **Significant at the 5% level. ***Significant at the 1% level. The Mean Variance Inflation Factor (VIF) is a measure of the severity of multicollinearity in a regression.

| Subsample | Low Financial Development | | High Financial Development | |
|---|---------------------------|--------------------|----------------------------|--------------------|
| | ROE | Tobin's Q | ROE | Tobin's Q |
| Intercept | 13.260*** (2.810) | 7.435*** (5.510) | 9.275 (0.670) | 5.665 (1.160) |
| GOVI | 0.637** (2.080) | 0.139*** (3.650) | 0.710** (2.460) | 0.170** (2.180) |
| COGI | 0.281*** (2.820) | 0.130*** (2.920) | 0.212** (2.180) | 0.189 (1.430) |
| EXCD | -0.098 (-1.070) | 0.000 (0.790) | -0.002 (-1.120) | 0.000* (2.130) |
| GOVI*EXCD | 0.001 (1.080) | 0.000 (0.910) | 0.000* (2.020) | 0.000** (2.170) |
| SIZE | 0.520 (0.310) | -0.565*** (-4.910) | 0.344*** (3.610) | -0.254*** (-3.500) |
| LEVG | 0.661 (1.520) | 0.381 (1.010) | 0.809 (1.370) | 0.355 (1.660) |
| GROW | 0.000 (1.560) | 0.000 (0.920) | 0.006*** (6.750) | 0.000** (2.180) |
| LGPC | -0.142*** (-2.830) | -0.347*** (-5.260) | -0.411 (-0.890) | -0.489* (-2.160) |
| Wald Test $B_{GOVI} = B_{EXCD} = B_{GOVI*EXCD} = 0$ | 1.680 | 2.030 | 4.850** | 3.490** |
| Adjusted R-squared | 0.176 | 0.186 | 0.199 | 0.201 |
| Mean VIF | 2.33 | 2.53 | 2.41 | 2.58 |
| No. of Firms (Firm-year) | 1781 (13,690) | 1781 (13,690) | 1520 (11,662) | 1520 (11,662) |
| No. of Countries | 29 | 29 | 14 | 14 |

Table 7

Robustness Test: Multivariate Regressions Using Alternative Firm-level and Country-level Governance Measures. The table presents the results of four ordinary least squares regressions using industry and year dummies with different dependent variables. GOVI is a firm-level additive index of governance constructed using a collection of individual measures of governance (see text for details). GOVS is a standardized governance score provided by DataStream that compares the firm's overall governance framework to all other firms in the database. COGI is a country-level governance index (explained in the text). The Rule of Law Index (RLAW) is a score of the country's legal system and its law enforcement power. The legal system origin (LORG) is a dummy variable which takes the value 1 if the country's legal system is based on common law or 0 if it is based on civil law. Media (MEDI) is a score that assesses the degree of media freedom in a particular country. The Social and Cultural index (SOCL) assesses the characteristics of the education and health systems as well as training and technological readiness in a country. The Market Competitiveness index (COMP) measures the efficiency of the goods and labor markets as well as innovation and business sophistication in a particular country. All other variables are explained in the text. The t-Statistics reported in the parentheses are based on country clustered standard errors. *Significant at the 10% level. **Significant at the 5% level. ***Significant at the 1% level. The Mean Variance Inflation Factor (VIF) is a measure of the severity of multicollinearity in a regression.

| | GOVS (1) | GOVI (2) | ROE (3) | Tobin's Q (4) |
|--------------------------|---------------------|-------------------|-----------------|--------------------|
| Intercept | -44.452*** (-3.910) | 42.025*** (7.700) | -0.957 (-1.120) | 3.340*** (3.360) |
| GOVS | | | 0.237** (2.170) | 0.035* (1.930) |
| COGI | | 3.622*** (4.140) | | |
| GOVS*COGI | | | 0.029* (1.790) | 0.006* (1.830) |
| RLAW | 3.829* (1.830) | | | |
| LORG | 28.856*** (8.910) | | | |
| MEDI | 1.801* (1.740) | | | |
| SOCL | 3.825* (1.910) | | | |
| CHRN | 27.388*** (7.470) | | | |
| ISLM | 9.515 (1.510) | | | |
| COMP | 2.218 (1.590) | | | |
| SIZE | 3.379*** (5.090) | -0.055 (-0.170) | 0.166 (1.400) | -0.275*** (-2.850) |
| LEVG | -2.048 (-1.200) | 2.338 (1.450) | 0.715* (1.970) | 0.744 (0.270) |
| GROW | -0.000** (-2.040) | -0.000 (-0.980) | 0.000 (1.420) | 0.000 (0.480) |
| LGPC | 7.540 (0.950) | 1.121 (0.758) | -0.110 (-1.300) | -0.090 (-0.310) |
| Adjusted R-squared | 0.424 | 0.217 | 0.137 | 0.080 |
| Mean VIF | 3.72 | 2.54 | 2.63 | 2.63 |
| No. of Firms (Firm-year) | 3301 (25,352) | 3301 (25,352) | 3301 (25,352) | 3301 (25,352) |
| No. of Countries | 43 | 43 | 43 | 43 |

Table 8

Robustness Test: Test for Endogeneity using Dynamic Panel GMM Models. The table presents the results of two different regressions with different dependent variables. COGI is a country-level governance index (explained in the text). GOVI is a firm-level additive index of governance constructed using a collection of individual measures of governance (see text for details). Details of the Dynamic Panel GMM procedure can be found in the text. Arellano-Bond test is a test for first-order autocorrelation in the first-differenced errors with the null hypothesis of zero autocorrelation (*p-value* is reported). Hansen test of over-identification tests the null hypothesis that all instruments are valid (*p-value* is reported). The t-statistics are reported in the parentheses. *Significant at the 10% level. **Significant at the 5% level. ***Significant at the 1% level.

| | ROE | Tobin's Q |
|--------------------------------|-------------------|--------------------|
| Intercept | 0.474 (0.090) | -0.074*** (-2.650) |
| Dependent variable (One Lag) | 0.966*** (22.790) | 0.960*** (62.000) |
| GOVI | 0.264* (1.760) | 0.009** (2.110) |
| GOVI*COGI | 0.102** (2.222) | 0.027** (2.330) |
| SIZE | 0.2341 (0.090) | -0.003** (-2.590) |
| LEVG | 0.8173 (0.540) | 0.003** (2.520) |
| GROW | 0.274 (0.540) | 0.000*** (2.610) |
| LGPC | -0.259 (-0.550) | -0.002 (-0.371) |
| Arellano-Bond first order test | 0.229 | 0.396 |
| Hansen Test | 0.593 | 0.330 |
| No. of Firms (Firm-year) | 3301 (25,352) | 3301 (25,352) |
| No. of Countries | 43 | 43 |

the model using Tobin's Q as a dependent variable. Our results remain essentially the same when we use Return on Assets (ROA) or Earnings Per Share (EPS) as dependent variables.

7. Conclusion

This study investigates whether differences in some country-level characteristics can explain the differences in the corporate governance practices across countries. The study also analyzes the nature of the relationship between the mechanisms of corporate

governance and the institutions, markets, and socio-political variables across countries. We find that country-level factors such as rule of law, media freedom, social and cultural development, and market competition, explain a significant part of the variation in firm-level governance across countries (Claessens and Yurtoglu, 2013; Core et al., 2008; La Porta et al., 2000; Stulz and Williamson, 2003). Furthermore, we find that the relationship between country-level factors and firm-level mechanisms is best represented using a moderating model where country-level factors act as moderators of the relationship between firm-level mechanisms and firm value/return. Also, consistent with the findings of Aggarwal et al. (2010); Anderson and Gupta (2009) and others, the results from our regressions indicate the presence of a complementary relationship between firm-level governance and all the country-level variables included in our study. Under the framework of the agency theory, this complementary relationship can be explained through the argument that a firm may not find it beneficial to improve its governance framework in an environment with weak institutions and country-level protections because it expects no gains from doing so (Jensen and Meckling, 1976). Support for our observation also comes from the institutional theory framework, which views firm-level governance as a result of the prevailing national institutions and social systems (Aguilera et al., 2015; Schiehl and Martins, 2016).

When accounting for the effect of financial development, the results suggest that the adoption of stronger firm-level governance framework is associated with higher value or return when the firm operates in a highly developed financial market. This confirms our argument that a high state of financial development will encourage firms to adopt even more stringent governance frameworks to improve their access to the domestic capital markets. We also find evidence of stronger firm-level governance in firms with high financing needs supporting the argument that a firm's governance framework is highly dependent not only on the financial development status of the country in which it operates but also on its needs for external financing (Aggarwal et al., 2010; Doidge et al., 2007). A firm that expects to be able to secure its financing needs from the capital markets is more likely to adopt a stronger firm-level governance in order to improve the terms of its financing.

The results of this study contribute to the global debate on the best governance practices and the role of country characteristics in determining the optimal set of mechanisms. Our finding regarding the form of the relationship between the country-level factors and firm-level mechanisms constitutes an important addition to the existing debate on the nature of the relationship between these two governance groups. The results also inform future decision-making process with regards to improving corporate governance practices and increasing investor protection. Future research can focus on examining the changes in the relationship between firm-level governance and country-level factors over time, which was not possible in this study due to the limited availability of historical governance data in the database used. This will also permit a closer examination of the effect that structural changes in country-level factors leave on firm-level governance.

Appendix A

Corporate Governance thresholds provided by the ISS Governance QuickScore 3.0

Attributes

Board Structure and Policies

- 1 Average attendance of board meetings is at least 75%
- 2 Board is controlled by more than 50% independent outside directors
- 3 Board size is not less than 6 but not greater than 15
- 4 Board has a policy on diversity
- 5 No former CEO on the board
- 6 Chairman and CEO are separated
- 7 Compensation committee is composed of independent directors only
- 8 Nominating committee is composed of independent directors only
- 9 Audit committee is composed of independent directors only
- 10 Governance committee or similar committee exists
- 11 Average number of other corporate affiliations for the board member not greater than four
- 12 Governance guidelines are publicly disclosed
- 13 No staggered board (frequently elected board)
- 14 Majority vote requirement to amend charter/bylaws (no rights to vote or supermajority required)
- 15 No limitations on shareholders' right to remove board members (i.e. only for cause, supermajority vote required, etc.)
- 16 Board has the authority to hire its own advisors
- 17 Performance of the board is reviewed regularly
- 18 Cumulative voting rights for shareholders
- 19 A succession plan for executives is in place
- 20 Policy on limit of the number of years of board membership

Anti-takeover Provisions

- 21 Single class, common
- 22 Majority vote requirement to approve significant company transitions such as mergers and acquisitions (no rights to vote or supermajority required)
- 23 The company does not have a golden parachute or other similar clauses (compensation plan for accelerated pay-out)
- 24 No limitations on shareholders' rights to call special meetings
- 25 Company has no poison pill provisions
- 26 The company has less than five anti-takeover devices in place
- 27 The company does not have unlimited authorized capital or a blank check
- 28 The company is not owned by a reference shareholder who has the majority of the voting rights, veto power or golden share

| | |
|-----------------------------------|--|
| 29 | The company permits actions to be taken without meeting by written consent |
| Compensation and Ownership | |
| 30 | CEO compensation is linked to total shareholder return |
| 31 | The company's statutes or by-laws require that stock-options are only granted with a vote at a shareholder meeting |
| 32 | The company has a policy for performance-oriented compensation that attracts and retain the senior executives and board members |
| 33 | The most recently granted stocks/options vest in a three-year period at a minimum |
| 34 | The company's shareholders have the right to vote on executive compensation |
| 35 | The remuneration of management and directors is partly linked to objectives or targets which are more than two years forward looking |
| 36 | Percentage of shares held by all insiders and 5% owners is less than 50% |

Appendix B

Country-level measures

We include a number of country-level variables in our regression models which are selected based on our research questions as well as prior findings in the literature on the role played by these variables in explaining variations in firm-level governance across countries. We explain the construction of these variables in the next few sub-sections.

-Legal system and law enforcement¹⁸

As a measure of the differences in the degree of law enforcement around the world, we use the Rule of Law Index (RLAW) published by the World Justice Project on an annual basis. RLAW relies on more than 100,000 expert and household surveys to gauge how the rule of law is felt in everyday life in more than 100 countries around the world. The survey covers 44 indicators under eight primary rule of law categories, which are: constraints on government powers, absence of corruption, open government, fundamental rights, order and security, regulatory enforcement, civil justice, and criminal justice. We use principal component analysis (PCA) to estimate the overall scores of the different countries in our sample using their scores in each of the eight categories. Using this approach allows us to capture as much as possible of the differences in the various categories while maintaining the brevity of our final model¹⁹. It also simplifies the interpretation of the results of our regressions. Countries with better or more positive conditions will score higher in this index. We also use the legal system origin (LORG) classification provided in La Porta et al. (1998) to classify the legal systems of the countries included in our sample into two main categories: civil or common. Some of the countries covered in our study are not included in La Porta et al.'s original list, thus we classify these countries ourselves using the same classification logic followed in La Porta et al. (1998).

-Media

We use the Freedom of the Press annual report published by Freedom House to measure the strength of media's monitoring role in everyday life and the degree of independence enjoyed by journalists in a particular country. Freedom of the Press is an annual report published since 1980 to assess the degree of media (print, broadcast, and digital) freedom in 199 countries and territories around the world. A group of external analysts, expert advisers, and regional specialists, produce the scores seen in the report using a combination of on-the-ground research and information from variety of sources. The overall score of any country is the sum of its scores in three primary categories, which are: laws and regulations that influence media content, political pressures and controls on media content (including harassment or violence against journalists or facilities, censorship, self-censorship...etc.), and economic influences over media content. We use PCA to estimate the overall scores of the different countries in our sample using their scores in each of the three categories and we name the estimated variable: *MEDI*. Countries with better or more positive conditions will score higher in this index.

-Social norms and cultural characteristics

The World Economic Forum publishes the Global Competitiveness Index (GCI) report on an annual basis using its Executive Opinion Survey (EOS) of more than 14,000 business leaders from 140 countries in addition to data collected from reports published by several international organizations such as: the World Bank Group, the International Monetary Fund, the United Nations Educational, Scientific and Cultural Organization, and the World Health Organization. The report analyses and rates a country's competitiveness based on 12 main pillars: 1) institutions, 2) infrastructure, 3) macroeconomic environment, 4) health and primary education, 5) higher education and training, 6) goods market efficiency, 7) labor market efficiency, 8) financial market development, 9) technological readiness, 10) market size, 11) business sophistication, and 12) innovation. The overall scores are calculated based on three sub-indices: basic requirements, efficiency enhancers, and innovation and sophistication factors, for which the weights of the

¹⁸ We do not include a variable related to the type of financial systems in our study. La Porta et al. (2000) argue that the legal approach is more powerful in explaining differences in corporate governance practices than the usual argument between bank-centered and market-centered financial systems. La Porta et al. (1997) also highlight that the differences in the financial systems can be traced back to differences in the legal systems.

¹⁹ For all indices included in this study, the first principal explains more than 80% of the variation observed in the scores.

overall score are determined based on the economy's stage of development (factor-driven, efficiency-driven, or innovation driven). In order to estimate our overall social and cultural index (SOCL), we use PCA and the scores of the different countries in our sample in each of the following relevant pillars: health and primary education, higher education and training, and technological readiness. Countries with better or more positive conditions will score higher in this index. Furthermore, following [Stulz and Williamson \(2003\)](#) and others, we add dummy variables (1 or 0) to capture differences in the prevailing religions in the countries in our sample. Our religion dummy variables reflect three main categories: Christianity (*CHRN*), Islam (*ISLM*), and Shinto/Buddhism/Hinduism (*SBHD*)^{20 21}.

-Competition and market conditions

We use data from the GCI report (discussed earlier) to build our market competitiveness index (COMP). Specifically, we use PCA and the scores of the following relevant pillars: goods market efficiency, labor market efficiency, market size, business sophistication, and innovation. Countries with better or more positive conditions will score higher in this index. This index is intended to measure the level of overall competitiveness and to capture differences in the market conditions and practices among the countries included in our sample.

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²⁰ We obtain data on the prevailing religion from the CIA World Factbook.

²¹ Shinto is the ethnic religion of the Japanese people.

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