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Three Essays on Corporate Governance and Firm Risk-Taking & Performance Outcomes

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The undersigned, Kwabena Aboah Addo, in his capacity of doctoral candidate for Ph.D. degree in Management granted by the Università Ca'Foscari Venezia certifies that the research exposed in this dissertation is original and that it has not be used to pursue or attain any other academic degree at any other academic institution, being it foreign or Italian.

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ABSTRACT

The recent global financial crisis has drawn the attention of corporate stakeholders including scholars to re-examine the role of corporate governance practices across entities. Specifically, policymakers questioned the extent to which bank corporate governance practices and the failure of the boards to monitor executives may have led to excessive risk-taking and consequently financial instability. On this account, this thesis set out to investigate the role of Governance configurations in determining the outcomes pertaining to contemporary issues in the corporate world: performance and risk-taking considerations.

A careful review of the extant research addressing the relationships between bank board governance mechanisms and performance in the context of the agency theory demonstrates little consistency in results. Specifically, neither board size, independence, female directorships, board leadership structure nor monitoring exerted by institutional owners has been consistently linked to bank performance. In an attempt to resolve the prevailing inconsistencies, Chapter 1 of this thesis theorize an institutionally embedded agency viewpoint to undertake a meta-analysis of 47 empirical studies of bank board composition and their relationship to performance. Aside from our results providing aggregate evidence of a systematic association between board independence, female directorship and bank performance, the theoretical upshot of our analysis is provocative. That is, agency theory alone cannot fully capture the dynamics of bank performance, and that it must be integrated with an institution-based view. Consequently, the study concludes congruence between its findings and the recent crusade by governance scholars (Rediker &Seth, 1995; Oh et al., 2016) to assess organizational outcomes on the rubric of governance mechanism bundles. Hence, as a recommendation for future studies and foundational to our methodological and theoretical designs in the subsequent chapters, we focus on the bundles of governance mechanisms to aids our deeper understanding of the corporate governance effect on bank-risk taking and corporate tax management practices.

The second essay focuses on the bundling effects of internal and external governance mechanism on a critical subject for which banks were considered pivotal during the crisis: systemic risk. Using a sample of large European banks from 2000 to 2016, this chapter analyzes how monitoring by institutional investors complements or substitutes various board-level governance mechanisms in determining a bank's systemic risk taking. The findings largely show that external (institutional ownership) and internal (board level) governance mechanisms complement each other to determine systemic risk among sample domestic systemically important banks. Our results are robust to other econometric specification of systemic risk and additional controls. The most important implication of this chapter is the support for the concept of "equifinality", which informs practitioners of the strategic flexibility in terms of configuring their corporate governance structures to attain similar levels of systemic risk.

The essay in Chapter 3 is motivated by the view of Hanlon and Heitzman (2010) that describes corporate tax avoidance as a risk-taking activity with returns commensurate with the aggressiveness of the strategy. Based on this premise, I investigate if the prevailing governance mechanisms determine the roles of CSR committee either as an ethical or risk management structure. We test our conjecture using a global cross-industry sample of firms for the years 2002-2015. By integrating the agency with the legitimacy and corporate culture theories, I show that the CSR committee is mostly a risk management tool for firm legitimization. This consequently facilitates the balancing of stakeholder interests to subtly emphasizes a new role of the board of directors opined by the stakeholder theory.

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Kwabena Aboah Addo

DEDICATION

To Uncle Ben (†), Akosua Asabea (†), Vince and the unborn.

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List & Meanings of Acronyms

HOMA – Hedges-Olkin-type Meta-Analysis

MARA – Meta-Analytic Regression Analysis

ES–Effect Size

BoD – Board of Directors

RDT – Resource Dependency Theory

SYS-GMM – System Generalized Moments of Methods

TBTF – Too Big to Fail

SRISK – A traditional measure of systemic risk

AR – Absorption Ratio

D-SIBs – Domestic Systemically Important Banks

MES – Marginal Expected Shortfall

CoVaR – Conditional Value at Risk

2SLS – Two-Stage Least Square Regression

CG – Corporate Governance

CEO – Chief Executive Officer

FSB – Financial Stability Board

BCBS – Basel Commission for Banking Supervision

VIF – Variance Inflation Factor

OLS – Ordinary Least Square

CETR– Cash Effective Tax Rate

GETR – GAAP Effective Tax Rate

CSR – Corporate Social Responsibility

GVKEY – Global Company Key

ISO – International Organization for Standardization

CHAPTER 1

An Institution-Based View of Corporate Governance and Bank Performance: A Meta-Analytic Test

An Institution-Based View of Corporate Governance and Bank Performance: A Meta-Analytic Test

Abstract

A careful review of extant research addressing the relationships between bank board governance mechanisms and bank performance in the context of the agency theory demonstrates little consistency in results. Specifically, neither board size, independence, female directorships, board leadership structure nor monitoring exerted by institutional owners has been consistently linked to bank performance. In response to these findings, we employ an institutionally embedded agency theoretical viewpoint to undertake a meta-analysis (i.e. HOMA and MARA) of 47 empirical studies of bank board composition (N = 35,852) and their relationship to performance.

Aside from our results providing aggregate evidence of a systematic association between board independence and female directorship and bank performance, they support our theorization that country-level institutions–i.e. extent of investor protection, national culture, and legal system–significantly moderate the governance mechanism and bank performance relationships. By integrating the agency and institutional theories, this study provides a novel and empirically validated theoretical underpinnings which illuminates understanding on the dynamics behind the governance and bank performance relations.

Keywords: Board of directors, Bank Performance, Meta-analysis, National institutions,

Agency theory, Institutional theory.

1.1 Introduction

The past decade has seen burgeoned interest in bank corporate governance by academics, practitioners and policy makers (De Haan and Vlahu, 2016) particularly on the role that the board of directors has played in the 2008-2009 global financial crisis. Much of the discussion focuses on the question of whether corporate governance mechanisms can be justified in terms of their contribution to bank performance and risk-taking (Leaven and Levin, 2009; Pathan, 2009; Griffiths et al., 2009). According to the influential agency-theoretical view (Jensen and Meckling, 1972; Jensen and Murphy, 2010), an important function of the board of directors (BoD hereafter) is to align the interests of executives with those of shareholders through its monitoring and advisory roles. This bonding of interests disciplines managers to make value-enhancing decisions that equally benefit shareholders and executives. Although some scholars have made invasive findings in this direction, there still remains an inconclusive/fragmented consensus about the nature of relationships. Specifically, De Haan and Vlahu, (2016) concluded that neither board composition nor board leadership structure has been consistently linked to firm financial performance. Against this backdrop, a partial aim of this study is to fill this gap by using a meta-analytic assessment (i.e. HOMA) to aggregate the results of existing BoD–bank performance studies to establish a consensus on what the relationships between governance mechanisms and bank performance are.

Narrowing the discussion down, a stylized fact that has emerged from two prior meta-analyses relating to corporate governance mechanisms and firm performance is that there are significant associations between entity performance and board level governance mechanisms (see Dalton et al., 1998; Dalton et al., 1999). Yet both prior meta-analyses were limited in terms of their focus and their primary quest to provide a consistent estimate of the associational strength of the relationship between various elements of board-level corporate governance mechanisms and performance (Dalton et al., 1998;1999). For instance, while Dalton et al,

(1999) reported an average association between firm performance and board size of 0.16 to implying that extant variation in board membership explains the variability in firm performance, Dalton et al, (1998) found no aggregate effect between board composition and firm performance". What is striking about these studies is not so much their estimated mean effect, but their finding that the underlying effect size distribution is very heterogeneous (e.g. Dalton et al., 1999: p. 677). This heterogeneity we contend may partly result from the inherent country-specific factors which these studies failed to account for. Therefore, researchers have concluded that, as much as these board-level mechanisms are clearly important in explaining the bank performance, the field has nearly exhausted their explanatory potential which distracts research attention away from investigating other possible influences, especially those deriving from country-level institutions (van Essen et al. 2012; Bruce, Buck, & Main, 2005; Peng & Khoury, 2008; Barkema & Gomez-Mejia,1998). Garcia-Meca and Sanchez-Ballesta (2009) further demonstrated that prevailing inconsistencies in the reported results of similar focal relationships may be an indication of the possibilities of missing aspects of the relationship, which moderation analysis as an empirical strategy could help account for. Therefore, a substantial gap still remains in our understanding of the country-level moderating factors that determine the strength of the performance – BoD mechanism relationship. Our study attempts to fill this gap by using a Meta-Analytic Regression Analysis (MARA) procedure which moderates our focal relationships with national institutional variables. Ultimately, the key questions which our study based on this empirical design seeks to explore are as follows: what is the aggregate relationship between bank level governance mechanisms and performance? And what are the national institutional factors that may moderate these focal relationships?

To answer our research questions and subsequently fill the gaps outlined above, the multivariate meta-analytical techniques this study adopts is designed specifically to model our focal relationships and such country-level moderating factors on 47 bank board-performance empirical studies (n = 35,852). Our empirical operationalizations of the latter thus concentrate

on shareholder protection (Klapper & Love, 2004), dimensions of culture (Hofstede,1984), governance effectiveness, the legal system (Shleifer & Vishny, 1997), ease of doing business, level of corporate transparency and the level of financial development.

This study makes several contributions to the existing stream of literature. First, to our knowledge, this is the first study to offer a comprehensive meta-analytic synthesis of the bank board governance-performance literature. By studying the banking niche, the findings of this study will not only enhance a deeper understanding on the performance effects of governance mechanisms owing to its peculiarities but will also bring us a step closer to resolving the mixed findings reported by existing meta-analysis studies which have mainly relied on samples from several industries (see Dalton et al., 1998;1999). Second, our study adds a methodological extension to the emerging tradition of meta-analyzing macro research (van Essen et al., 2012; Combs et al, 2011). As an extension, we use bivariate correlations in addition to partial correlations as effect sizes, thereby allowing us to incorporate studies from diverse disciplines such as finance and economics, in which bivariate effect size information is not commonly reported (Rost & Osterloh, 2009). This limits bias resulting from omitted variables in the multivariate estimation of the focal relationship (Doucouliagos & Ulubasoglu, 2008). Third, Schiell, Ahmadjian and Filatotchev (2014) directed future research to improve understanding of the governance effect on organizational outcomes in the context of national/regional governance characteristics. By virtue of investigating the moderating effects of national institutions on the governance mechanism and bank performance relationship, this study offers a relevant response to their call. Finally, our meta-analysis goes beyond the aim of research synthesis towards theory extension (Eden, 2002). Thus, theoretically we integrate agency and institutional theories (Carney, Gedajlovic, Heugens, van Essen, & van Oosterhout, 2011; Heugens, van Essen, & van Oosterhout, 2009; Peng, Sun, Pinkham, & Chen, 2009; Shi, Magnan, & Kim, 2012) to provide the bank board governance-performance literature with novel and empirically validated theoretical underpinnings. More specifically, in the quest to

illuminate understanding in the observed international differences in the performance effect of similar governance mechanisms, this study based on its findings and recommendations demonstrates that decisions pertaining to what the optimal board of director composition is must take account of the prevailing national institutions in order to be fruitful.

The rest of the paper is organized as follows. The second section reviews the relevant literature and states the empirical propositions. The third section describes the data, variables and the meta-analytic procedures, while the fourth section presents the results and discussion of our empirical tests. The fifth section concludes by discussing various implications of the findings and offers directions for future research.

1.2 Theory and Literature Review

1.2.1 Corporate Governance and Bank Performance

Modern firms operate in a business model where the ownership is separated from the management (Berle and Means, 1932). This separation of ownership and control gives rise to misalignment of objectives between managers and owners. This misalignment gives birth to an agency problem. To overcome agency problem, corporate governance structures are put into place to 1. Manage and control the opportunistic behaviour and 2. Align the diverging interests of managers and shareholders. Accordingly, the classical and dominant framework for analyzing the performance effects of BoD is provided by the Agency theory (Fama and Jensen, 1983). This theory assumes that the widely publicized model of separating ownership from management effectuates misaligned interests between owners (principals) and managers (agents). As such, managers are placed in a better position because of their discretionary powers, privy to sensitive information and strategic oversight (Crossland & Hambrick,2011). However, improving performance requires effort and oversight by owners, which is usually associated with disutility for managers. Specifically, shareholders pay a huge amount of agency

cost in the form of putting in place a vigilant board of governors to serve as an immediate defense against managerial opportunism through its monitoring and advisory roles (Hermalin & Weisbach, 2001). Evidence of the propositions of the agency theory and its counter-findings entrench the bank literature. Adams and Mehran (2012) show that the agency problem vis-à-vis the complexity of bank operation is limited by the existence of the BoD by virtue of its size, which positively relates to bank performance. Also, Dunn (2012)'s study on a sample of Canadian financial institutions concluded on a performance-enhancing effect of female directors. Finally, Pathan (2009), Aebi et al. (2012) and Wang et al. (2012) showed a significant and negative relationship between board independence and diverse bank performance measures.

In spite of its popularity, there are problems associated with agency theory, especially when it is used to study the governance mechanisms and performance relationship in the international context. Since the seminal agency theoretic view was proposed in the context of US corporate set-up (Berle and Means, 1932), certain stylized facts/characteristics about the US economy have seeped into the foundations of the agency theory models that do not necessarily hold in an international setting. First, the agency theoretic lens assumes that the entities analyzed under the model operate under the Anglo-American ownership control structure (market system) which is characterized by dispersed ownership (Rajan and Zingales, 1995). Yet because markets outside the USA may be characterized by high concentrated ownership (bank system), the predicted performance sensitivity of BoD mechanisms may not be found in international studies. Second, agency theory implicitly assumes the presence of well-functioning national institutions for the effectuation of contracts (La Porta et al., 2002; Djankov et al, 2008). Moreover, when formal institutions are underdeveloped, the focal BoD mechanism–performance relationship may weaken, because even well-designed contracts are vulnerable to ex-post haggling and defection in the absence of well-functioning enforcement mechanisms (van Essen et al., 2012). Third, Peng and Khoury (2008) argue that agency theory overlooks

the moderating potential of informal institutions such as national culture on the governance mechanism and performance linkages. Because the agency relation relies on a nexus of contracts mainly reliant on the formal legal underpinnings, it might underestimate the magnitude of the impact of informal institutions on the focal relationship. We, therefore, expect the agency theory alone to be ill-equipped for modelling the focal relationship in an international context and contend its complementation with an institutional theory to account for the moderating effects of institutional factors on national contracting practices.

1.2.2 The moderating role of national institutional: Institutional Theoretic View

Institutional theorists have asserted that the institutional environment can strongly influence the development of formal structures in an organization (Meyer and Rowan, 1977). Accordingly, it follows that the magnitude of the performance effect of bank board governance mechanisms is conditioned by country-level national institutional characteristics. The authors further account that institutional factors limit the set of feasible governance mechanisms to choose from and suppress the true variance of the relationship between performance and BoD when studied in any single national context. Consequentially, the true variability of the governance mechanism–performance relationship becomes revealing only when these relationships are studied in the international context (Peng et al., 2009). Van Essen et al., (2012) modelled institutional factors as moderators to explain cross-country differences in the corporate governance and firm performance relationship, because they determine the strength of the focal relationship in any particular national context. Also, Yoshikawa, Zhu, and Wang (2014) developed a conceptual model that posits a bundling effect between national governance institutions and prevailing ownership structure which determines the predominant role the board of directors plays within the firm. Although North (1990:3) broadly define institutions as "humanly devised constraints that structure human interaction", they are classified either as

formal or Informal "rules of the game" that socially constrain contracting practices between the BoD and managers (Greif, 2006; North, 1990). We discuss these below.

1.2.2.1 Formal Institutions

Goodin (1996) describes formal institutions as deliberately devised constraints to human action, usually created and enforced by the state, which functions by sanctioning actions by attaching rewards or punishments to alternative courses of behavior. The formal institutions that matter most to the bank performance–BoD relationship are those that directly promote the interests of owners and those that indirectly limits managerial opportunism. These include investor protection laws, disclosure laws related to corporate insiders and the effectiveness of the country's legal systems (Klapper and Love, 2004; La Porta et al., 2000; Leuz, et al, 2003; Kaufmann et al., 2009). In this regard, prior studies have demonstrated the effect of formal institutions on a broad range of corporate governance phenomena. For example, Filatotchev, Jackson, and Nakajima (2014) illustrate how performance effects of corporate boards, ownership concentration, and executive incentives may differ according to the country-specific legal system. Also, Vanacker, Heughebaert, and Manigart (2014) demonstrated that although venture capitalists are effective monitors and also bring good corporate governance practices to a firm, they are only able to play this role in an environment of strong shareholder protection. The authors explained that, since investor protection laws facilitate greater insider disclosure, accountability and easy lawsuit procedures against insiders, they limit corporate wealth appropriation actions such as tunneling, empire building and the consumption of perquisites accruing to powerful executives who enjoy both informational and decision-making advantages over independent directors and minority shareholders.

1.2.2.2 Informal institutions

Informal institutions propagate spontaneously in response to repeatedly encountered social or economic problems, are maintained through continuous re-enactment in behavior rather than

through formal rules or decrees and are self-enforcing because the long-term value of complying with their prescriptions is larger than the short-run gain from breach for all parties participating in them (Klein, 1985; Stiglitz, 2000). Deephouse and Suchman (2008) describe informal institutions as broad in nature because they derive their regulatory potential mainly from the manipulation of immaterial resources such as reputation, legitimacy, and status. Immediate examples of these are national cultures (Hofstede, 1984; Greif, 2006b) and corporate governance codes (Augilera & Cuervo-Cazurra,2004)[1]. Dwelling on our main focus, national culture, which has been defined as the values, beliefs and assumptions learned in early childhood that distinguish one group of people from another (Beck and Moore 1985: Hofstede 1991). National culture is embedded deeply in everyday life and is relatively impervious to change. The predictive accuracy of the culture variables provides strong support for the argument that norms embedded in a society's culture affect organizational structure, at least at the board level which in turn shape the performance outcomes of firms. In this regards, Li & Harrison, (2008), empirically showed that entities based in high power distance, individualistic and masculinity societies are more likely to have a single leader as both board chair and CEO, which according to agency theory promotes managerial opportunism which may attenuate performance. They, however reported an opposite effect for firms operating in a high uncertainty avoidance culture. Also, firms based in societies that value higher levels of individual freedom tend to have smaller boards which facilitate quicker decision making and performance.

On these accounts, we conjecture both formal and informal country-level institutions to affect the relationship between bank performance and board level governance mechanisms.

[1] Abbott & Snidal (2000) explain that similar to "soft law" in general, corporate governance codes tend to be drafted by committees lacking formal legislative powers, hence classifying them as informal institutions.

1.2.3 Research Questions

In summary, our review of the literature on corporate governance mechanisms and bank performance informs that scholars need to develop a holistic and institutionally embedded theoretical understanding of corporate governance to analyze the organizational outcomes of various governance practices. The contribution of this perspective is to go beyond a more universalistic approach, which has applied the agency theory in different institutional jurisdictions. Furthermore, the findings based on the reported correlation coefficients of our sample and reviewed literature have been inconclusive (positive, negative, or insignificant results for the similar relationships). Finally, the research design and techniques have been typically diverse and inconsistent (e.g., controlling for endogeneity, use of single country against an international sample and the control for peculiar banking characteristics such as regulations). In our effort to synthesize and further advance this literature, our study takes an explorative approach to address two research questions. The first concerns the aggregate relationship between various aspects of bank board governance mechanisms and performance and the second proceeds to explore the moderating factors that could help explain the mixed results reported by earlier studies. Hence, we address the following specific research questions:

Research Question 1: What is the aggregate relationship between bank level governance mechanisms and performance?

Research Question 2: What are the national institutional factors that may moderate these focal relationships?

1.3 Methodology

1.3.1 Sample

To address our research questions, we conducted a meta-analytical study that followed recently established guidelines for developing rigorous meta-analytic research in management

(Buckley, Devinney, & Tang, 2013; Marano et al., 2016). We used several search techniques to identify the highest number of relevant studies which investigated the effect of bank board governance mechanisms and performance. As a first step, we read a well-cited bank review article (see De Haan and Vlahu, 2016) and two prior meta-analyses (i.e. Dalton et al., 1998; Dalton et al., 1999) which directed us to some seminal papers. At this stage, the scope of our definition for bank performance focused mainly accounting and market-based measures. For instance, ROA, Q-ratio, EVA etc. Hunter and Schmidt (1990)'s account that meta-analysis aims aggregating empirical results across diverse studies, measures and geographic settings. Also, Gentry and Chen (2010), Hoskisson et al, (1994), and Dess and Robinson Jr., (1984) show that, accounting based measure are positively related to both market and economic indicators of entity performance. Hence, a synthesized inference drawn from these diverse measures (i.e. accounting and market) of bank performance could be considered reliable and generalizable.

Next, through extensive searches of prominent electronic databases such as JSTOR, Google Scholar, SSRN, Wiley and Elsevier using the following query terms "bank boards", "bank corporate governance", "bank performance", "bank risk-taking" etc., we obtained the applicable research reports. The resulting articles which we further examined manually were in the fields of management, finance and economics. Like Van Essen et al. (2012), we used two-way "snowballing," to backward trace all references reported in previously identified articles and forward-tracing all articles that cited these articles, using Google Scholar. Consequently, these sequential steps yielded a sample of 47 primary studies with the relevant effect size information. These consisted of 35 published and 12 unpublished studies. It was unnecessary that bank BoD-financial performance relationships be the main focus of a study, only that a correlation between these variables be available. See Table 1.1 for detailed information about each of the studies. We then read all articles, and developed a coding protocol (Lipsey & Wilson, 2001) for extracting data on effect sizes, sample sizes, the field of

the journal in which the article was published, number of coverage years and variable which allowed us to control for various statistical and methodological artifacts in order to obtain aggregate results across our sample studies. In this regard, we differentiated between two types of bank performance: accounting performance and market performance, whether the study has an international sample or not, whether the study accounted for characteristics peculiar to the banking industry (i.e. regulation) and whether statistically, the study accounted for endogeneity or not. To test our research question, we collected data on country-level institutional development from secondary sources mainly from the World Bank.

1.3.2 Meta-Analytic Procedures

We used two methodological strategies: the Hedges-Olkin-type meta-analysis (HOMA) and meta-analytic regression analysis (MARA), which help achieve the distinct explorative objectives related to our first and second hypotheses respectively.

1.3.2.1 Hedges-Olkin-type Meta-Analysis (HOMA) Procedure

We used HOMA to estimate the meta-analytic (aggregate) mean correlation between bank BoD and bank performance and the corresponding confidence intervals (Hedges & Olkin, 1985; Lipsey & Wilson, 2001). For the purpose of validating any findings, we estimated this procedure using both the Pearson product-moment correlations (r) and partial correlation coefficients $(r_{xy.z})$ as effect sizes, as these are easily interpretable and scale-free measures of linear relationship (Geyskens et al, 2009). $r_{xy.z}$ represents the relationship between BoD and bank performance given a number of control variables (z) and can easily be derived from the t–statistics and degrees of freedom reported in the primary studies (Greene, 2008). Following the general statistical consensus, we performed our computations using random-effects HOMA, which accounts for potential heterogeneity in the effect size distribution and is more

Table 1. 1:Studies included in the Meta-analysis (N=47)

Study (Year of publication)	Theories Applied	Performance Outcome Variable	Sample Firms	Country	Coverage years	Relations with Performance Variable(s)
Liang et al (2013) #	Agency	ROE, ROA, NPL	53	China	8	BS (-), BINDP (+), WOB (+), CEOD (-)
Pathan & Faff (2013) †	N/A	Pre-Tax Operating Income, ROA, ROE, Net interest margin, Tobin's Q, Stock Returns	212	USA	15	BS (-), BINDP (-), WOB (+)
Adams & Mehran (2012) #	Agency	Tobin's Q	32	USA	34	BS (+), BINDP (+)
Zulkafli & Abdul Samad (2007) #	Agency	Tobin's Q, ROA	107	Malaysia, Thailand, Philippines, Indonesia, Korea, Singapore, Hong Kong, Taiwan, India	1	BS (-), BINDP (-), CEOD (+), INST (-)
Praptiningsih (2009) #	Agency	ROA	52	Indonesia, Thailand, Philippines, Malaysia	5	BS (+), BINDP (-), CEOD (-), INST (-)
Dutta & Bose (2007) #	N/A	ROA		Bangladesh	N/A	WOB (+)
De Cabo et al (2012) #	RDT, Agency, Human capital and Social Psychology	ROA	612	Austria, Begium, Cyprus, Cezh Republic, Denmark, Finland, France, Sweden, Greece, Hungry, Ireland, Italy, Luxemburg, Netherlands, Poland, Portugal, Slovenia, Spain, United Kingdom	7	WOB (+)
Dedu & Chitan (2013)#	Agency	ROA	N/A	Romania	8	BINDP (+), WOB (+)
Aebi et al (2012) #	Agency	Buy-and-hold Returns, ROE	372	USA	1	BS (+), BINDP (-), INST (-)
Belkhir (2009) #	Agency	Tobin's Q	260	USA	1	BS (-), BINDP (+), CEOD (+), INST (+)
Romano et al (2012) #	Agency	ROE, ROA	25	Italy	5	BS (-), BINDP (+), WOB (+)
Griffith et al (2002) #	Agency, Convergence of Interest and Entrenchment	Tobin's Q, EVA	100	USA	5	CEOD (-)
Grove et al (2011) #	Agency	ROA, Future Excess Returns, NPL	236	USA	3	BS (+), CEOD (-), INST (+)
Belkhir (2009) †	Agency	Tobin's Q, ROA	174	USA	8	BS (+), BINDP (-), CEOD (+)
Adams & Mehran (2008) #	Agency	Tobin's Q, ROA	32	USA	14	BS (+), BINDP (-)
Kama & Chuku (2009) #	Agency	Tobin's Q, ROA	19	Nigeria	9	BS (+), BINDP (+)
Staikouras et al (2007) †	Agency	ROA, ROE, Tobin's Q	59	Germany, France, Netherlands, Spain, Italy	3	BS (-), BINDP (+)
Basuony et al (2015) #	Agency	Tobin's Q, ROA, Profit Margin	50	Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, UAE, Yemen	1	BS (+), BINDP (-), CEOD (-), INST (-)
Al-Manaseer et al (2012) #	Agency	ROA, ROE, Profit Margin, EPS	15	Jordan	3	BS (-), BINDP (+), CEOD (-)
García-Meca et al (2015) †	RDT, Agency, social psychology	ROA, Tobin's Q	159	Canada, France, Germany, Italy, The Netherlands, Spain, Sweden, the UK, USA	7	BS (+), BINDP (+), WOB (+), CEOD (-)
Gulamhussen & Santa (2015) #	Agency, RDT	ROA, ROE, Net interest income to total of Earning Asset, Operating income to total average assets, Tobin's Q	461	24 OECD Countries	1	BS (-), WOB (+),
Farag & Mallin (2017) *	RDT, Agency Theory	ROA	99	Austria	9	BS (+), BINDP (+), WOB (+), CEOD (+)

Study (Year of publication)	Theories Applied	Performance Outcome Variable	Sample Firms	Country	Coverage years	Relations with Performance Variable(s)
Talavera et al (2018) †	Agency, RDT, Human Capital, Social Psychology	ROA, ROE, NPL, Net Interest Margin, Pre- Provision Profit Ratio.	97	China	5	BS (-), BINDP (-), WOB (+), CEOD (+)
Ivashina et al (2008) *	N/A	ROA, Market to Book Value	N/A	USA	14	INST (+)
Minton et al (2014) #	N/A	Stock Returns	119-206	USA	6	BS (-), BINDP (+), CEOD (-)
Adusei (2011) †	Agency and Stewardship	ROE, Cost Income Ratio	17	Ghana	5	BS (-), BINDP (-)
Adusei (2012) †	Agency and Stewardship	Cost Income Ratio, ROE, Market to Book Value	17	Ghana	5	BS (+), BINDP (+)
Bebeji et al (2015) †	Agency	ROE, ROA	25	Nigeria	9	BS (-), BINDP (+)
Choi & Hasan (2005) †	Agency, Managerial Hegemony	ROE, ROA	14-21	Korea	5	BINDP (-)
Jizi et al (2014) *	Agency	ROA	107	USA	3	BS (+), BINDP (+), CEOD (+)
Pathan et al (2007) †	Agency, Stewardship, RDT	ROE, SHARPE RATIO	13	Thailand	5	BS (-), BINDP (+)
Magalhaes et al (2010) *	Agency, Stewardship	ROA	795	47 countries	11	INST (-)
Hoque et al (2013) †	Agency and Stewardship	ROE, ROA	25	Bangladesh	9	BS (+), BINDP (+), INST (-)
Ştefănescu (2011) *	Agency	ROA, ROE		Romania	N/A	BS (-), BINDP (+)
Tomar et al (2013) †	Agency, Property cost, Theory of finance and Ownership structure.	ROA, ROE	14	Jordan	10	BS (+), BINDP (-), INST (+)
Mallin et al (2014) *	Agency	ROA, ROE	90	13 countries	2	BS (-), BINDP (+)
Marcia et al (2013) #	Agency	ROA, ROE	277	USA	8	BS (+), INST (+)
Raman & Bukair (2013) *	N/A	ROE	53	Bahrain, Kuwait, Qatar, Saudi Arabia, the United Arab Emirates and Oman	1	BS (-)
Khan (2010) *	Legitimacy	ROE	30	Bangladesh	2	BINDP (+), WOB (+)
Sharif & Rashid (2014) *	Stewardship, Legitimacy, Agency	ROE	22	Pakistan	6	BINDP (+)
Mishra et al (2000) #	Agency, Substitution-monitoring hypothesis	ROA	67	USA	1	BINDP (+), CEOD (-)
Soana (2011) *	Stakeholder	ROE, ROA	31	Italy	1	INST (-)
De Andres et al (2008) #	Agency	Tobin's Q, ROA, Market Return	69	Canada, France, Italy, Spain, UK, USA	11	BS (+), INST (+)
Fernandes & Fich (2009) #	N/A	Stock Returns	398	USA	1	BINDP (+), CEOD (-), INST (-)
Beltratti & Stulz (2009) #	N/A	Buy-and-hold Returns	98	USA	1	BINDP (+), INST (+)
James et al (2015) #	Resource Based View, Agency	ROA	18	Malaysia	5	BS (-), BINDP (-)
Eddine Mkadmi & Halioui(2013) †	Agency and Stewardship	ROA, ROE, Cost Income Ratio	17	Malaysia	12	BS (-), BINDP (+), CEOD (+)

[a] Studies marked with #, *, † have data on partial correlations, bivariate correlations and both respectively.

[b] **ROE**= Return on Equity measured as net income divided by shareholder's equity expressed as a percentage; **ROA**= Return on Assets measured as net income divided by total assets expressed as a percentage; **NPL**= non-performing loan ratio, is operationalized as a measure of bank efficiency is computed as non-performing loans to total loans; **EVA**=Economic Value Added defined as the incremental difference in the rate of return over a bank's cost of capital; **EPS**=Earnings Per Share defined as the portion of a company's profit allocated to each share of common stock; **Market to Book Value** is measured as the ratio of the book value of the bank to its market value; **Stock Returns** is defined as the appreciation in the price plus any dividends paid, divided by the original price of the bank's stock; **Cost Income Ratio** is defined as the ratio of the bank's operating costs to its operating income; **Sharpe Ratio** is the average bank return earned in excess of the risk-free rate per unit of volatility; **Tobin's Q** is measured as the market value of bank divided by its assets' replacement cost; **Buy-and-hold Returns** is the banks' stock returns over a 18-months period; **Pre-Tax operating Income** is a measure of a bank's operating efficiency measured as the difference between a bank's operating revenues from its core operations and its direct expenses (except taxes); **Net Interest Margin** is measured by net interest income divided by total earning assets; **Future Excess Returns** is defined as the returns from a bank's stock that exceed the risk-free rate; **Profit Margin** is the ratio of the net income to the total revenues; **Pre-Provision Profit Ratio** is calculated as the difference between operating income and operating expense to total assets.

[c] BS= Board Size; BINDP=Board Independence; WOB= Proportion of Female bank board directors; CEOD=CEO Duality; INSTO=Institutional Ownership.

conservative than fixed-effects HOMA (Geyskens et al, 2009: Raudenbush & Bryk, 2002).

In a situation where a study reports multiple measures of the focal effect (for instance, due to the reporting of results for different proxies of bank performance), we included all of them in our analyses. Monte Carlo simulations have shown that procedures using the complete set of measurements outperform those representing each study with a single value (Bijmolt & Pieters, 2001). To further make our HOMA estimates reliable, the skewness in effect-size distribution was corrected for using the Fisher's (1928) *Zr*-transformation according to the Hedges & Olkin (1985) approach. Finally, in order to accurately estimate the aggregate mean effect size, we accounted for differences across effect sizes by weighting each effect size by its inverse variance weight *w*. Thus, the inverse of the squared standard error (Hedges & Olkin, 1985).[2] These weights are then used to compute the standard error of the mean effect size and its corresponding confidence interval.[3]

1.3.2.2 Meta-Analytic Regression Analysis (MARA) Procedure

According to Lipsey & Wilson (2001) and Van Essen et al (2012), MARA is a special type of Weighted Least Square regression technique, aimed at assessing the relationship between effect size and moderator variables in order to model previously unexplored variances in the effect size distribution. MARA uses weighted regression to account for differences in precision across effect sizes, using the statistically preferred inverse variance weight, *w* (Hedges & Olkin, 1985), as our weighting variable.

Our dependent variable for our MARA analysis is the partial correlations estimates of the relationship between the BoD variables and bank performance in a given sample (e.g., board size and bank performance), such that all independent variables in the regression equation are

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[2] *w* is calculated as follows: $w_i = \frac{1}{se_i^2+v_0}$, where SE is the standard error of the effect size and v_0 is the random effects variance component, which is in turn calculated as $SE(z_r) = \frac{1}{\sqrt{n-3}}$, and the formula of random effect variance is $v_0 = \frac{Q_r-k-1}{\sum w-[\frac{\sum w^2}{\sum w}]}$.

[3] The meta-analytic mean is calculated as follows: $ES = \frac{\sum(w\times ES)}{\sum w}$, with its standard error calculated as $SE_{ES} = \sqrt{\frac{1}{\sum w}}$ and with its 95% confidence interval computed as $Lower = ES - 1.96(SE_{ES}),\ Upper = ES + 1.96(SE_{ES})$.

modeled as moderators of the focal relationship (van Essen, Otten, & Carberry, 2015). Our use of random-effects estimation methods for the MARA analyses is justified by the current standards in the meta-analytic literature (Geyskens et al., 2009; Beugelsdijk et. al, 2018). This estimation approach is widely opined as more conservative than conventional fixed-effects methods as it allows for differences in the treatment effect across all the sample studies. Therefore, we specify our generic MARA regression as follows:

$$\boldsymbol{R_i = \alpha + \beta X_i + \theta D_i + \gamma Z_i + \eta_i} \qquad (\mathbf{1})$$

where $\boldsymbol{R_i}$ is the correlation between bank performance and each of the governance mechanisms under consideration (i.e., board size, proportion of independent directors, female board directors, CEO duality and control exerted by institutional owners), $\boldsymbol{\alpha}$ is the constant term, $\boldsymbol{X_i}$ and $\boldsymbol{D_i}$ are vectors of measurement and methodological artifacts, $\boldsymbol{Z_i}$ is the set of country-level institutional characteristics, and $\boldsymbol{\eta_i}$ is the random component.

1.3.3 Variables

Corporate Governance Variables. Focusing on the first research question, our study examines the aggregate bank performance effect of what has been termed as "strong board mechanisms": board size, board independence, female directorship and institutional ownership. As posited and empirically demonstrated by the agency theory and governance researches respectively, these have predominantly emerged as effective alignment and shareholder interest promoting mechanisms (Pathan, 2009; Bayar et al, 2017; Devers et al., 2007). While agency theorists ideally associate synergistic performance with strong boards, corporate governance scholars tend to explore whether the focal relationship weakens in the case of deficiencies in a firm's governance setup with regard to its leadership structure. Therefore, we also assess the bank performance linkages with CEO duality (Fama & Jensen, 1983, p. 314; Jensen, 1993, p. 862: Larcker et al. 2007; Yermack 1996). Board size was

operationalized as the number of directors on the bank board at the end of the financial year. Board independence is measured as the proportion of bank directors without any material or pecuniary relationship with company, except the board seat. Female directorship was generally operationalized by our sample studies as the percentage of board directors who are women, while institutional ownership was proxied as the average proportion of outstanding shares of the bank held by institutional investors. Finally, CEO duality was defined by all of our sample studies an indicator variable which equals to 1 when CEO chairs the board and 0 otherwise.

Country-level institutions variables. For the purposes of addressing our second research question, we operationalized a host of variables as indicators for country-level institutions. To proxy for formal institutions, we first included the investor protection index which measures the extent to which jurisdictions protect minority shareholders against opportunism by insiders (Djankov et al., 2008). To assess how governance quality of a country moderates our focal relationship, we operationalize on the Governance Effectiveness Index, an incremental index between 1-100 which captures perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies to capture. Mainly, all of these country-level institutional data are sourced from the World Bank “doing business project” database.

In order to test the moderating role of national culture influences, we rely on the cultural framework developed by Hofstede (1984) and Hofstede and Minkov (2010). These studies identified seven cultural dimensions: power distance, individualism, masculinity, uncertainty avoidance, long-term orientation and indulgence versus restraint dimensions. Like Beugelsdijk et. al, (2018) we also notice that the correlation between the fifth and sixth dimensions was very high, and these were eliminated from our regression analysis. Finally, we included several country-level control variables to reduce the effects of omitted variable bias. Because the economic outlook is known to affect the profitability of banks through decisions made by their

BoD (Pathan, 2009), we controlled for this influence with the natural log of per capita gross domestic product. To control for the influences of the national business environment on entity performance (Zahra et al, 2000), we included the ease of doing business, the extent of corporate transparency, level of financial development and extent of business disclosure indices.

Control variables. When performing the MARA analysis, we included several control variables that have been continuously raised by the critics, aimed to account for the effect of various artifacts on the relationships of interest. In order to test for the moderating effect of measurement, model and methodological artifacts, we saliently controlled, first, for the "file drawer problem" (Meyer, Van Witteloostuijn, & Beugelsdijk, 2017; Rosenthal, 1979), by including a dummy variable denoting whether a study was published (1) in the management, economics and finance journals or unpublished (0). Controlling for the file drawer bias in this manner also allows us to assess whether publication traditions vary across academic fields relating to our study sample (Van Essen, 2012). Regardless, our sample mostly includes published studies in these academic fields which may attenuate any possibility of selection bias. Second, we added dummy variables indicating whether the bank performance was measured as accounting (1) or market (0) performance. Third, we controlled for the sample median year to test whether the base relationship has changed over time (Gregg, Machin, & Szymanski, 1993). Next, we included dummy variables to identified effect sizes stemming from bank regulation, an industry-specific characteristic that has a significant impact on bank risk-taking and profitability (Laeven and Levine, 2009). Next, we included dummy variables indicating whether effect sizes derived from a study controlling for the endogeneity between BoD mechanisms and/with bank performance using one of these techniques: year effects, industry effects, two-stage least square regression techniques (2SLS), generalized moments of methods (GMM) and system GMM (Wintoki et al., 2012). Next, we controlled for the number of coverage years on which the analysis of the sample study was based. Lastly, we included a dummy variable to indicate whether the study used an international sample (1) or a single

country sample (0). Table A2 in the appendix shows the summary statistics for all the variables included in the HOMA and MARA analysis.

1.4 Results

1.4.1 HOMA Results

The HOMA results of the bivariate and partial correlations for each of the focal relationships are presented in Table 1.2. Aside from showing the overall results for each of the strong board mechanisms and bank performance relationships, a sub-sample decomposition based on the type of performance measure and endogeneity-controlled studies is also estimated to examine whether our overall results are either driven by or consistent throughout the subsamples (van Essen, 2012). The mean effect size of correlates of bank performance reveals that, with the exception of board independence and female directorship, all the other governance mechanisms are not significant. Although the Pearson/bivariate correlation HOMA entered insignificantly, board independence is strongly associated with bank performance in the case of the partial correlation HOMA (r ES $= -0.02, \text{n.s}$; $r_{xy.z}$ ES $= 0.092, \text{p} < 0.01$). Also, while the bivariate effect size of female directorship shows a negative significant relationship, that of the partial correlation reports an opposite effect (r ES $= -0.046$, $\text{p} < 0.05$; $r_{xy.z}$ ES $= 0.059, \text{P} < 0.05$). We maintain that the discrepancies in the results for both effect size distributions occur for two reasons: the partial correlation estimations account for the influence of other control variables and are also based on a larger sample (Stanley & Jarrell, 1989: van Essen, 2012). However, the significant Q-statistics indicates substantial levels of heterogeneity in both effect-size distributions for board independence $\left(r_{xy.z} \text{ distribution: Q} = 2231.3, I^2 = 0.97; r \text{ distribution: Q} = 326.9,\ I^2 = 0.875 \right)$ and female board directorship $\left(r_{xy.z} \text{ distribution: Q} = 330.5, I^2 = 0.943; r \text{ distribution: Q} = 102.48,\ I^2 = 0.863 \right)$. Hedges and Olkin (1985: 235) explain that the effect sizes under such a situation are best

interpreted as an average rather than a common true correlation value. This implies that further moderator analyses are required.

In addition, the estimates especially associated with the partial correlation effect sizes of the sub-samples (endogeneity sample and performance type) confirm the robustness of the overall effect size results obtained for board independence and female directorship (for e.g. $r_{xy.z}$ ES $= 0.071, \mathrm{p} < 0.05$; $r_{xy.z}$ ES $= 0.061, \mathrm{p} < 0.05$ respectively for endogeneity controlled studies). Similarly, the insignificance of the sub-sample effect sizes for the other insignificant (overall effect sizes) governance mechanisms also affirm the consistency of our HOMA results. Therefore, our HOMA estimates are neither biased as a result of the type of bank performance measure nor are there any issues of endogeneity.

1.4.2 MARA Results

Results in Table 1.3 relate to our MARA analysis which aims to answer our second research question. Model 1 presents the moderator estimates for only the predictors relating to methodological, model and measurement artifacts based on the governance mechanism that has the most data points (Board independence for our case). Including the level 1 predictors in each of our models confirms the importance of controlling for methodological and model specification artifacts and variable operationalization. Models 2 through 6 show the results for each of the governance mechanisms of interest and bank performance. In addition to level 1 predictors, they also control for the moderating effects of the country-level institution variables. Finally, the data fit the models reasonably well, as indicated by an increase in the R^2values for models 2-6 relative to model 1.

Table 1. 2:Random Effect HOMA Analysis: Board mechanisms and Bank Performance

Predictor	Bivariate correlation coefficients								Partial correlation Coefficients							
				CI								CI				
	K	**N**	**Mean ES**	**Low**	**High**	**Q-test**	**I²**	**Tau²**	**K**	**N**	**Mean ES**	**Low**	**High**	**Q-test**	**I²**	**Tau²**
Board Size																
Overall	**43**	**24,930**	**-0.016**	**-0.047**	**0.014**	**156.11*****	**0.744**	**0.005**	**71**	**34,572**	**-0.007**	**-0.121**	**0.106**	**6314.13*****	**0.99**	**0.2115**
Endogeneity Sample									44	31,398	-0.004	-0.152	0.145		0.994	0.2275
Perform. Type																
Accounting	35	17,135	-0.020	-0.050	0.010	100.16***	0.661	0.0038	51	21,950	-0.020	-0.184	0.143	5402***	0.992	0.3109
Market	8	7,795	-0.009	-0.097	0.079	76.38***	0.981	0.0122	20	11,698	0.027	-0.026	0.079	120.76***	0.843	0.0101
Board Independ.																
Overall	**42**	**25,089**	**-0.020**	**-0.061**	**0.021**	**326.9*****	**0.875**	**0.0124**	**73**	**35,852**	**0.092****	**0.027**	**0.157**	**2231.3*****	**0.971**	**0.0653**
Endogeneity Sample									42	31,289	0.071*	0.004	0.138	1300.6***	0.970	0.0432
Perform. Type																
Accounting	34	17,294	-0.015	-0.062	0.033	235.96***	0.86	0.0132	53	24,355	0.119**	0.032	0.206	1860.19***	0.975	0.0833
Market	8	7,795	-0.023	-0.120	0.074	94.58***	0.926	0.0154	20	11,497	0.031	-0.060	0.122	371.06***	0.951	0.0361
Women on Board																
Overall	**15**	**20,934**	**-0.046***	**-0.085**	**-0.01**	**102.48*****	**0.863**	**0.0047**	**23**	**23,588**	**0.059***	**0.002**	**0.116**	**330.5*****	**0.943**	**0.0153**
Endogeneity Sample									22	23,476	0.061*	0.004	0.138	1300.6***	0.970	0.0432
Perform. Type																
Accounting	12	14,777	-0.038	-0.086	0.010	80.37***	0.863	0.0055	19	16,970	0.070†	-0.001	0.140	315.52***	0.949	0.0202
Market	3	6,157	-0.069	-0.156	0.074	21.90***	0.909	0.0053	4	6,618	0.002	-0.024	0.028	0.01	0.000	0.0000
CEO Duality																
Overall	**13**	**6,890**	**0.051**	**-0.033**	**0.135**	**140.68*****	**0.915**	**0.234**	**37**	**15,228**	**-0.067**	**-0.173**	**0.039**	**1179.27*****	**0.971**	**0.0894**
Endogeneity Sample									16	11,303	-0.049	-0.122	0.024	217.80***	0.931	0.0198
Perform. Type																
Accounting	11	4,865	0.046	-0.061	0.153	135.41***	0.926	0.0295	26	10,554	0.003	-0.029	0.034	44.86**	0.487	0.0024
Market	2	2,025	0.071	-0.022	0.163	4.43*	0.774	0.0035	11	4,674	-0.212	-0.572	0.147	876.51***	0.91	0.2966
Inst. Ownership																
Overall	**10**	**62,082**	**-0.026**	**-0.105**	**0.053**	**400.00*****	**0.978**	**0.0109**	**19**	**3,703**	**0.006**	**-0.203**	**0.214**	**577.23*****	**0.972**	**0.1846**
Endogeneity Sample									6	1,595	-0.155	-0.396	0.086	117.03***	0.957	0.0868
Perform. Type																
Accounting	8	33,651	-0.021	-0.111	0.069	103.10***	0.932	0.0104	11	1,985	0.140	-0.177	0.457	382.05**	0.976	0.2529
Market	2	28,431	-0.055***	-0.066	-0.043	0.004***	0.000	0.0338	8	1,718	-0.186	-0.416	0.044	123.26***	0.951	0.0896

Standard errors in parentheses
† p<0.10, * p<0.05, ** p<0.01, *** p<0.001. The overall results for each focal relationship are in bold.

The results in model 1 suggest that relative to other academic fields (disciplinary biases), studies advertising possible linkages between bank governance and performance appear to be modestly accepted more readily by economics scholars. The negative coefficient for the international sample moderating variable shows that the focal relationships, especially for board independence, tend to be stronger for studies that used a single country sample. The endogeneity variable did not moderate the focal relationship, indicating that endogeneity is not a problem in our data. In general, controlling for the impact of bank regulations is recommended for future primary studies, as this tends to influence the focal relationships consistently in models 1, 3 and 6. Finally, the significant negative moderating effect for the median year of the sample window suggests that the link between board size and bank performance has weakened over time. This result tends to lend credence to the performance-enhancing effect of smaller bank boards which has been advocated for by scholars and policy documents in recent times (Pathan, 2009).

Overall, the results presented in Models 2 to 6 support our conjecture that prevailing country-level institutions moderate the governance mechanism and bank performance relationship. Unsurprisingly, we find a positive moderating effect of governance effectiveness index across three focal relationships (0.0664, $p<0.05$ for Board size; 0.281, $p<0.05$ for board independence and 0.681 $p<0.01$ for institutional ownership). This implies that the soundness and stability of the political environment in which banks operate play an incremental role in the extent to which the size of boards, its independence and institutional owners promote its profitability. For instance, if there prevails minimal political interference in bank operations,

Table 1. 3:MARA Partial Correlation Results: The moderating effect of Country-level Institutions on Governance and Bank Performance.

Variable	Model 1	Model 2	Model 3	Model 4	Model 5	Model6
		Board size	Board Independence	WOB	CEO Duality	Inst. Own
Constant	-0.366(1.044)	-30.88**(8.374)	-88.50*(42.62)	597.6 (1169.2)	175.0(140.1)	-59.44*(8.672)
Level 1 Predictors: Measurement & Methodological Artifacts						
Accounting Perform.	-0.428(0.547)	-0.0207(0.174)	-0.363(0.555)	-0.811 (11.70)	0.0485(3.359)	0.142 (0.135)
Economics Journal	1.757†(0.910)	0.213(0.559)	0.332(1.132)		-4.203(6.484)	
Finance Journal	-0.344(0.612)	0.249(0.338)	-0.551(0.967)		4.143(7.119)	
Management Journal	1.012(0.843)	0.754† (0.444)	2.039(1.217)		2.927(5.738)	
Endogeneity Controlled	0.09(0.677)	-0.191(0.456)	-2.887*(1.360)		14.49*(6.009)	
Regulation Controlled	1.022†(0.566)	-0.172(0.290)	2.369*(1.055)			0.795*(0.267)
No. of coverage years	-0.036(0.0317)	0.0093(0.0141)	-0.0267(0.0363)		-0.543† (0.291)	
International Sample	-1.383*(0.673)	0.235(0.361)	-5.185*(1.889)			
Median yr. sample window (=>2007)	0.933(0.717)	-0.924*(0.434)	1.316(1.210)		9.718(6.014)	
Level 2 Predictors: Country-level moderators						
Gov. Effectiveness		0.0664*(0.0226)	0.281*(0.129)	-4.427 (5.600)	-0.651(0.708)	0.681**(0.116)
Investor Protection		-0.110(0.586)	4.875*(1.459)			
Power distance		0.0972**(0.0274)	0.107(0.0843)	-4.680 (6.760)	0.328(0.216)	-0.0508(0.0649)
Individualism		0.115*(0.0501)	0.213† (0.109)	-0.858 (5.677)	0.462† (0.255)	-0.167*(0.0426)
Masculinity		-0.234**(0.0624)	-0.431(0.307)	0.849 (6.769)	-1.293(0.826)	0.336**(0.0661)
Uncertainty avoidance		-0.0139(0.0463)	-0.0935(0.0685)	0.339 (2.013)	-0.957(0.593)	-0.0624(0.0460)
Common law		-1.064(2.192)	-13.07*(4.973)			
Natural log of GDP		0.751**(0.213)	1.772(1.260)			
Ease of doing business		0.0735*(0.0239)	0.234*(0.0978)	-0.280(4.273)	0.128(0.299)	0.205**(0.0379)
Ext. of corp. transp.		0.270(0.297)	-0.163(0.350)		-10.29(6.359)	
Lvl of financial Devt		-0.0025(0.00497)	-0.0322(0.0218)	0.0426 (4.273)	-0.0174(0.0652)	-0.0418*(0.0177)
Ext. of Bus. disclosure		0.436*(0.217)	0.273(0.330)			
R^2	0.0371	0.4041	0.2037	0.5602	0.2451	0.995
K	71	71	71	23	36	18
$Q_{Model\ (p)}$	1.3(0.26)	3.22(0.000)	1.85(0.039)	4.5(0.007)	1.76(0.1187)	307.13(0.000)
$I^2_{Residual}$	0.998	0.997	0.9975	1	0.99	0.994

Standard errors in parentheses
† p<0.10, * p<0.05, ** p<0.01, *** p<0.001.

an efficient civil sector to support banks, quality policy formulation and a high sense of government commitment to policies, the board of directors including institutional owners are likely to plan and effectively monitor managerial decisions to actualize them due to the negligible risk of political disruption of the policies that define the economic environment in which bank operate (Micco et al., 2007).

Investor protection positively moderates the board independence–bank performance relationship $(\boldsymbol{Z_i} = 4.875,\ \mathrm{p} < 0.05)$. To explain this synergistic effect, we recall that in addition to the monitoring role associated with the agency theory, the resource dependence theory assigns bank independent directors an advisory role. In countries where stronger investor protection exists, the agency problem is less severe (La Porta et al., 2000) and independent directors can be more committed to their advisory role with less concern about their vigilance in monitoring managerial opportunism that exploits shareholders.

Turning our attention to the moderating role of culture. Table 1.3 shows a positive moderating effect for the power distant variables on the board size and performance relationship$(\boldsymbol{Z_i} = 0.0972,\ \mathrm{p} < 0.01)$. Countries with power distance cultures are documented to have high recognition for authority which comes with the responsibility and diligence to sustain that authority (Hofstede, 1984;2001). Articulating the rationale behind this finding, we account and build on our HOMA results that board size by itself does not influence bank performance unless in a high-power distance environment. That is, when the BoD's authority is recognized, they, in turn, are likely to pursue the interest of the shareholders diligently to sustain the authoritative recognition assigned to them. Furthermore, the underlying feature of

the power distant culture translates as higher regard for prevailing legal institutions (Hofstede. 2001). This implies that failure to be diligent will have sanctionable repercussions for the members and BoD as a whole. Hence, the need to sustain accorded authority as well as avoid disciplinary action ensures that members of the BoD promotes bank performance.

Individualism positively moderates the focal relationships relating to board size ($\boldsymbol{Z_i} = 0.115,\ \mathrm{p} < 0.05$), independent directors ($\boldsymbol{Z_i} = 0.213,\ \mathrm{p} < 0.10$) and CEO duality ($\boldsymbol{Z_i} = 0.462,\ \mathrm{p} < 0.10$). Since individualism accounts for **t**he degree of interdependence a society maintains among its members, we intuitively explain this finding as follows: directors in high individualistic cultures are more accountable for their own actions (Hofstede, 2001). Hence, the BoD and other class of directors may ideally expend their efforts towards pursuing the shareholder's interest. Even when managerial power accrues to a CEO serving concurrently as the chairman of the board in an individualistic environment, this higher sense of accountability may deter him/her from pursuing their self-interested goals at the detriment of shareholders. On these accounts, the resultant effect of an individualistic culture on the focal relationships is a synergistic one.

The negative moderating coefficient with regard to masculinity on board size and bank performance ($\boldsymbol{Z_i} = -0.234,\ \mathrm{p} < 0.01$) substantiates the importance of female board representation advocated by scholars and policy reports (Farag & Mallin, 2017: Talavera et al, 2018). Muscularity cultures reflect a society in which social gender roles are clearly distinct and emphasize a minimal role for women in higher management and boardroom (Hofstede, 2001). With this established, it implies that the board size will have minimal or no female

representation. However, the positive moderating role for the case of institutional ownership ($\boldsymbol{Z_i} = 0.336,\ \mathrm{p} < 0.01$) is reflective of the higher orientation for achievement characterizing masculinity cultures. As such, institutional owners in masculinity societies take a proactive role by exerting their extensive oversight and are risk-seeking, which as earlier literature has empirically shown, increases bank performance (Hoskisson et al, 2002; Connelly et al., 2010; Laevine and Levine, 2009). Also, Table 1.3 reports no moderating effect on any of our focal relationships for uncertainty avoidance cultures.

Our results further show common law systems limit the role of independent directors in promoting bank performance ($\boldsymbol{Z_i} = -13.07,\ \mathrm{p} < 0.05$). La Porta et al. (2000) account that common law countries have the strongest protection of outside investors —both shareholders and creditors. Hence, we explain this result as the existence of a direct functional replacement of the role of independent directors to protect shareholders interest by the role played by the common law legal system. Hence, if the legal system has provisions which protect and limit shareholders losses from managerial opportunism, concurrently keeping independent directors becomes redundant at an extra cost to banking profitability.

Finally, our results for the control variables relating to the economic and business environment show that the board size and bank performance effect is positively moderated when countries have better economic development, easier regulatory environment for doing business and allow a greater degree of corporate transparency. These results are modestly consistent for models 3 and 6. In short, our MARA results show that country-level institutional

factors moderate the governance mechanism and bank performance relationships and should be understood as national governance bundles (Schiell, Ahmadjian & Filatotchev, 2014).

1.5 Conclusion

This study offers a comprehensive synthesis of the role of governance and bank performance literature in the context of prevailing national institutional factors which moderate these relationships. In line with the predictions of the agency theory (Fama and Jensen, 1983), we find that the aggregate relationship between board independence, female directorship and bank performance is modestly positive. Results based on sub-sample decomposition and the associated statistical power of the test statistics show that the reported HOMA estimates are biased neither by the form (type) of performance nor endogeneity concerns which are inherent in corporate governance studies (see Table 1.2).

Yet the strength of these focal relationships differs considerably as reported by the post-estimation statistics (Q and I^2 test statistics) reported in Table 1.2, which according to Hedges and Olkin (1985) implied that further moderator analyses were required. Based on this, we theorize that the observed heterogeneity may partly result from the inherent difference in the level of development of a given country's institutions. This implies that the agency theoretic propositions which by far have reported inconsistent empirical findings must be conditioned on institutions such as shareholder protection laws, legal systems and national cultures. Specifically, we show that in jurisdictions with high investor protection, the bank performance effect of independent directors as predicted by the agency theory is magnified since such a jurisdiction allows independent directors to commit to and efficiently deliver on their advisory role. In addition, we find diverse moderating roles for national culture: the board size performance relationship is positively moderated by the high recognition of authority characterizing the power distance environments. The high levels of accountability pervasive in individualistic societies positively moderate the bank performance effect of board size,

independent directors and CEO duality. Although we find no moderating effect for uncertainty avoidance cultures, our study makes an important finding to support the crusade for increased female representation on corporate boards by the resource dependency theory (RDT hereafter), policy documents and researchers (Ferreira, 2010: Gulamhussen & Santa, 2015: Farag & Mallin, 2017: Talavera et al, 2018). Specifically, we find an attenuating moderating effect for masculinity cultures on the board size and bank performance relation. However, the high orientation for achievement characterizing masculinity cultures facilitates institutional proactiveness towards extensive oversight which synergistically promote bank performance.

Overall, aside from our study making a multi-facet theoretical contribution to the bank performance and governance mechanism literature, our finding that the relationship between bank performance and governance mechanism is significantly moderated by country-level institutions has an important implication for theory, future research and bank practices and regulations. First, the theoretical upshot of our analysis is that, the agency theory alone cannot fully capture the dynamics of the BoD mechanisms and bank performance, and that it must be complemented by an institution-based view (Schiell, Ahmadjian & Filatotchev, 2014) to develop a more thorough understanding of the conditions determining the performance effect of bank governance mechanisms. Next, our findings implicate scholars to accept this moderating role of national institutions as a stylized fact. Hence, there is a reduced need for further empirical evidence on the focal relationships that our study has assessed, except perhaps for less well-researched national contexts. Also, since our study affirms one particular case of the moderating role of other prevailing factors (national institutions in this case) on focal relationships, we entreat future research to give equal theoretical consideration/attention to the moderating role of simultaneously existing governance mechanisms on the performance and

risk-taking outcomes of banks and other entities. This recommendation particularly coincides with the recently advertised notion of governance mechanism bundling by a stream of growing corporate governance studies (Zajac & Westphal, 1994: Rediker & Seth, 1995: Schepker & Oh, 2013; Oh et al., 2016). Governance mechanism bundling, these scholars argue, facilitates proper understanding of the governance choices of entities under the rubric of cost-benefit analysis and their interactive effect on organizational outcomes, which together addresses the inconsistent results prevalent in the governance studies. Finally, based on the findings of this study, banks practitioners may find the need to undertake a critical assessment of their institutional environment and structure their boards accordingly to enhance their performance. Likewise, given the interconnectedness and critical role of banks in the global economic setting, regulatory stakeholders, especially governments based on the findings of this study may set-up jurisdictional institutions to favourably facilitate bank performance. This in turn will bring regulators such as the FSB closer to goal of reaching global financial stability. Overall, we hope that this study has advanced the existing research one step further towards a deeper understanding of how corporate governance mechanisms interact with country-level institutions in determining bank performance.

CHAPTER 2

Corporate Governance and Systemic Risk: A Test of Bundling Hypothesis

Corporate Governance and Systemic Risk: A Test of Bundling Hypothesis

Abstract

This study aims to contribute to the debate about the determinants of systemic risk by examining how internal and external governance mechanisms are related to systemic risk. This paper extends the literature on corporate governance and systemic risk. Using a sample of large European banks from 2000 to 2016, we examine the relationship between various internal and external corporate governance mechanisms and level of systemic risk. More specifically, we analyze how monitoring by institutional investors complements or substitutes various board-level governance mechanisms in determining a bank's systemic risk taking. Generally, our empirical findings support that external (institutional ownership) and internal (board level) governance mechanisms complement each other to determine systemic risk among sample domestic systemically important banks. Our results are robust to other econometric specification of systemic risk and additional controls. We conclude that banks have strategic flexibility in terms of configuring their corporate governance structures to attain similar levels of systemic risk. We provide useful implications for researchers, practitioners, and policymakers.

Keywords: Board of directors, Systemic Risk, Absorption Ratio, Domestic Systemically Important Banks (D-SIBs), Governance Bundles.

2.1 Introduction and Background

To a large extent, the recent financial crisis can be attributed to weak corporate governance practices in the financial institutions (BCBS, 2010). However, despite these accusations and the implementation of regulations to control risk-taking, very little is known about the role of corporate governance in affecting systemic risk. Several studies have taken a somewhat skewed perspective on risk by focusing on idiosyncratic risks only (see, e.g. Pathan, 2009; Saunders, Strock, & Travolos, 1988; Laeven & Levine, 2009; John, Litov & Yeung, 2008). Iqbal, Strobl, and Vähämaa (2015, p. 43) define systemic risk as "a measure of the relation of a particular financial institution's risk-taking to the overall risk-taking in the financial industry". Despite the acknowledgement of corporate governance (CG) as a tool to determine risk appetite and help a firm to management risk portfolio (John et al., 2008), the role of CG in determining systemic risk has received very little scholarly attention. Surprisingly, as much as the board of directors ultimately determine the actions of the bank, which in-turn determine it risk outcomes (Forbes and Miliken 1999), the discussion on systemic risk by far has focused on its estimation instead (Adrian and Brunnermeier, 2016; Acharya et al., 2010; Billio et al., 2012; Huang, De Haan and Scholtens, 2017). Consequently, the resulting metrics do not account for and/or investigate the governance drivers of systemic risk.

Furthermore, because of high leverage, generous deposit insurance and too-big-to-fail (TBTF) policies, there is a lot of moral hazard in banking. As a result, banks may not only increase their bank-specific risk but also create negative externalities for the financial system by increasing the aggregate level of systemic risk (De Haan and Vlahu, 2016). This warrants researchers to focus on the role of corporate governance in propagating or limiting systemic risk among banks. Yet, the literature in this direction remains scanty and under-explored. So far, the literature mainly has explored broad relations between overall strength of corporate governance structures and systemic risk (see e.g. Iqbal et al., 2015). However, there is limited understanding of the relationship between individual corporate governance mechanisms and

banks' exposure to systemic risk. This study aims to contribute to the debate about the determinants of systemic risk by examining how internal and external governance mechanisms relate to systemic risk of European banks.

Our study is motivated by two considerations. First, firms employ several governance mechanisms simultaneously, governance bundles, which jointly determine outcomes (Rediker & Seth, 1995). Hence, we maintain that the level of a particular mechanism is ideally dependent on the levels of other mechanisms which are simultaneously in place in the bank. Our point of departure from the extant work is as follows; we consider multiple mechanisms by examining both the individual and interactive effects of various governance mechanisms (governance bundles) on bank systemic risk. Since there is limited theory as to the most important board characteristics, the term 'strong boards' focuses on an ad hoc selection of board mechanisms which have been theoretically emphasized as effective in monitoring and aligning the interest of managers and shareholders; small board size, board independence, female directorship and board meetings. Unlike Iqbal et al. (2015), the initial part of analysis investigates the individual rather than an indexed measure effect of bank board mechanisms on systemic risk. We support this focus with the argument that, by using an index measure of board mechanisms, a deeper understanding of how a single bank board mechanism can influence the level of bank systemic risk is forgone.

Board size and its negative relation to bank risk is a common finding in the literature (Cheng, 2008; Pathan, 2009) due to the potential free-riding problems, less cohesiveness, high communication and coordination costs associated with larger boards (Jensen, 1993). Also, since an individual director's incentive to acquire information and monitor managers is low on large boards, CEOs may find larger boards easier to pursue their risk-averse preferences (Jensen, 1993). Independent directors are believed to be better monitors of managers as independent directors value maintaining a reputation in directorship market is important but the findings in this instance are mixed (Fama and Jensen, 1983; Bhagat and Black, 2002).

Existing researches have empirically shown that firms with female representation on their boards performance better (Lückerath-Rovers, 2013: Adams and Ferreira, 2009). They explain that women contribute to the discussions and exchange of ideas from a diverse perspective which enhances the monitoring potential of the board of directors. Finally, Vafeas (1999) shows that years proceeding better firm performance are characterized by an increased frequency in board meetings suggesting board meetings as an effective mechanism for monitoring executive behavior.

Thus, like Pathan (2009) and Iqbal et al. (2015), we would expect a strong board to effectively monitor managers for shareholders to promote bank systemic risk-taking. As counter-intuitive as these findings may seem, they are logical in the context of the agency theory by virtue of the high preference for excessive risk-taking maintained by bank shareholders to maximize their wealth. This appetite for excessive risk-taking is explained by the 'moral hazard' problem associated with the 'too-big-to-fail' phenomenon and deposit insurance schemes (Galai & Masulis 1976; Saunders, Strock & Travols, 1990; Martinez & Schmukler, 2001).

Second, existing research advertises that the effect of governance mechanisms on bank risk is mainly dependent on the existing ownership structure (Choi & Hasan, 2005; Martín-Oliver et al., 2017). Empirically, Laeven and Levine (2009) showed that the intended consequence of regulatory capital on risk-taking is attenuated when banks have large or concentrated ownership. Furtherance on this, the description of dispersed ownership with regard to the separation of ownership and control has been presumed to be universally applicable (Berle and Means, 1932). However, Fernández and Arrondo (2005) emphasized that; the control of managerial actions is mainly based on the board of directors and large shareholders in the European economy.[1] This suggests that the direct control and monitoring of large (institutional) shareholders prevail as a fundamental and/or strong mechanism to increase managerial risk-taking. In this regard, Hoskisson et al, (2002) and Connelly et al. (2010) show that institutional

investors strongly influence a firm's internal innovation and support risk-taking behavior. Ultimately, the key question which remains underexplored in the existing research in banking is, does the simultaneous existence of internal and external governance mechanisms limit or promote the systemic risk?

To address this, we conduct our analysis using data from 38 European banks classified as Domestic Systemically Important Banks (D-SIBs) for the years 2000–2016. Our findings show that although strong boards have a varying effect on bank systemic risk, they synergistically promote prevailing bank systemic risk in the presence of monitoring exerted by institutional shareholders. This evidence informs our conclusion that internal and external governance mechanisms mainly act as complements.

Our study makes several contributions to the literature. First, we extend the scope of bank risk by operationalizing a financial econometric estimation of systemic risk, absorption ratio (AR), proposed by Kritzman, Li, Page and Rigobon (2011). Second, most of the previous works on corporate governance bundling have explored the interactive effects of multiple governance mechanisms without a single focus (see Rediker & Seth, 1995; Schepker & Oh, 2013; Zajac & Westphal, 1994). This arguably attenuates a deeper understanding of the role of a single mechanism conditioned on other mechanisms. In this sense, our study contributes by extending the theoretical boundary into how a single prevalent governance mechanism, monitoring by institutional owners, interacts with "strong board" mechanisms to determine the prevailing systemic risk of banks. To the best of our knowledge, this is the first study to examine the bundling effect of bank governance mechanisms on systemic risk. Finally, Schiell, Ahmadjian and Filatotchev (2014) directed future research to improve understanding of the governance effect on organizational outcomes in the context of a national/regional governance characteristics. By virtue of investigating the interactive effects of institutional control, which characterizes the ownership structure of European organizations, this study offers a relevant response to their call.

The rest of the paper is organized as follows. The second section reviews the relevant literature and states the empirical hypotheses. The third section describes the data, variables and the empirical methodology, while the fourth section presents the results and discussion of our empirical tests. The fifth section concludes by discussing various implications of the findings and offering directions for future research.

2.2 Related Literature and Hypothesis Development

To complement earlier studies and build a convincing case for governance bundling, we first offer a theoretical background for our argument to aid our formulation of individual hypotheses for each of our strong board mechanisms as well as their interactive effects with institutional ownership.

2.2.1 Theoretical Foundations Firm Risk Taking

Agency theory has been widely been utilized to examine risk-return trade-off between principal and agent to determine the optimal levels of risk assumed by entities (Wiseman, 1997). Literature has broadened the agency relationship description to cover principals and agents whom may have different risk-taking objectives (Jensen, 1976). Specifically, top-level executives may experience an agency conflict with shareholders regarding their risk preferences. Shareholders, who are entitled to the residual value generated by a firm, can diversify risk through their ownership portfolio and are therefore assumed to be risk neutral. Managerial agents, by contrast, cannot diversify their employment risk and are thus more risk-averse. If corporate managers are made to bear significant residual risks, they will seek much higher monetary rewards or will make less risky decisions and thereby formulate unattractive corporate strategies (Hoskisson, Castleton, & Withers, 2009). To overcome the problem of risk aversion, agency theory proposes control mechanisms such as monitoring by the board of

directors (board size, independence, female directorship and meetings) or powerful institutional investors.

On this background, Rose (1992) opines that the banking industry due to the opacity of its operations which exacerbate the inability for the principal to fully monitor agents represents one of the most unique 'laboratories' available to test the fundamental propositions of agency theory. Furthermore, the existence of regulatory backed deposit insurance schemes make the moral hazard phenomenon more pronounced for banks, thereby making bank shareholders more risk seeking.

2.2.2 Strong Boards and Bank Risk Taking

Bank board serves as an immediate defense against unsound operations and perils to the wider economy through it monitoring and advisory roles (Hermalin and Weisbach, 2001). The effectiveness with which these roles are undertaken by the board of directors is partly dependent on its size (Jensen, 1993, p. 865). On one hand, larger boards can offer a wider pool of expertise to execute the board's advisory role. On the other hand, larger boards relative to a smaller one may suffer from problems of coordination, control, free-riding and flexibility in the decision-making process (Eisenberg et al., 1998; Fernández et al., 1997). In addition, a larger board size gives excessive control to the CEO, which could harm efficiency. As such, banks, should strategically take into account the trade-offs between the advantages (monitoring and advising) and disadvantages (coordination, control and decision-making problems) associated with an increasing board size. Given the growing opacity and complexity of banking operations in the past decade, we argue flexibility, timeliness of decision making, effective coordination and control functions to be valuable for effective monitoring and aligning of executive and shareholder risk interests (Fosu et al. 2017). Thus, larger boards will be associated with less systemic risk. Particularly, we expect this argument to hold as decisions

relating to a bank's contribution to the overall market fragility must be flexible, well-coordinated and timely. Therefore, we formally state our first hypothesis as follows;

Hypothesis 1: *Board size is negatively related to bank systemic risk.*

The risk-taking literature has reported mixed findings on the case of board independence. However, a considerable number of them have argued independent directors as better monitors of executives since they relate their reputation in directorship market to their performance (Fama and Jensen, 1983; Bhagat and Black, 2002). The presence of heavy external regulations position banks as distinct entities. For this reason, we maintain contrary to the theory that the actions of independent directors on bank boards may rather be risk-attenuating. We argue that the strict external regulations offer an increased opportunity for bank independent directors to maintain a reputation in the directorship market. That is, an independent director's enforcement of bank regulations on board matters does not only avoid sanctions but also signals to the director labour market of the director's diligence (Pathan, 2009). In line, Deutsch et al. (2011) argue that independent directors are agents in their own regard who maintain their own interests. Furthermore, Laeven and Levine (2009) and Barth et al., (2006) show that banking regulations limit bank risk-taking. Putting the pieces together, it follows that if independent directors are instruments through which regulations becomes enforced, then they will impact bank systemic risk negatively. Our argument further reinforces the finding of Darrat et. al, (2014). Inside directors relative to independent directors promote better performance as bank operations are technically sophisticated and require specialist knowledge. That is, the endogenous information asymmetry which characterizes these sophisticated operations will hinder independent directors from effectively monitoring actions which promote risk-taking. Thus, the formal specification of our second hypothesis is as follows:

Hypothesis 2: *Board independence is negatively related to bank systemic risk.*

The idea that women are underrepresented on bank board permeates policy discussions, the media, practice and academic work. The Glass Ceiling Phenomenon– a restrictive force against the inclusion of women on boards– has often been cited as a reason why women are relatively underrepresented as executives and directors (Eagly and Carli, 2003). A different perspective of this phenomenon theoretically offers some explanation as to why female directors have been documented as influential on organizational outcomes in the existing literature (Adams and Ferreira, 2009). Thus, consequently, women are left to demonstrate exceptional competencies to reach directorship positions and are likely to be highly proficient, diligent and better monitors of managers than their male counterparts (Dunn, 2012). If this argument holds, we would expect female directors on bank boards to induce bank's managers to increase risk-taking in accordance to bank shareholder interest. Our argument is corroborated by the recent findings of Adams and Ragunathan (forthcoming) who empirically show that women in finance, especially at the board level may be associated with relatively more risk-taking, not less risk-taking. Therefore, we hypothesize that;

Hypothesis 3: *The proportion of women directors is positively related to bank systemic risk.*

Vafeas (1999) empirically show that board meetings are a good mechanism for the better functioning of the board, as it offers directors the platform to exercise their control over executive actions to improve performance. Thus, meetings provide board members with the chance to come together, to discuss and exchange ideas on how they wish to monitor managers and bank strategy (de Andres & Vallelado, 2008). Hence, the more frequent the meetings, the closer the control over managers and the more directors are able to offer their advisory service to the board. Furthermore, due to the complexity of the banking business and the informational limitations faced by outside/independent directors, there is an increased need for the board to meet to ensure bank shareholder interests are being pursued diligently by management. Hence,

we would expect more board meetings to align managers risk preference to that of bank shareholder and thus, to be associated with higher systemic risks. As such, we hypothesize:

Hypothesis 4: *The frequency of annual board meetings is positively related to bank systemic risk.*

2.2.3 The Monitoring Role of Institutional Ownership and Bank Risk Taking

Several studies affirm the minimal agency cost associated with the intensive direct supervisory activity performed by large shareholders. For instance, there is evidence that when firms are performing poorly, outside monitoring by institutional investors can complement the role of the board of directors by increasing the disciplinary potential of the market for corporate control (Ward, Brown and Rodriguez, 2009; Shleifer & Vishny, 1986; Hirshleifer & Titman, 1990; Chowdhry & Jegadeesh, 1994). Also, institutional investors strongly influence a firm's internal innovation and support long-term competitive (risky) moves (Hoskisson et al, 2002; Connelly et al., 2010). Specifically, the bank risk-taking literature further substantiates the role of large shareholders (institutional investors) in promoting managerial risk-taking. Laeven and Levine (2009) report that more powerful owners with substantial cash flows have the power and incentives to induce bank's managers to increase risk-taking. These evidences together suggest that institutional investors on bank boards will promote systemic risk, hence;

Hypothesis 5: *There is a positive relationship between institutional ownership and bank systemic risk.*

2.2.4 Governance Mechanisms as a Bundle

Governance mechanisms have unique characteristics, roles and focus towards protecting shareholder interest. For instance, Oh et al., (2016) explained that, on the monitoring role, the strategic focus and implications of large shareholders and independent directors may differ as

the former's investment value is directly tied to the firm's performance. Also, as internal mechanisms, performance-related pay and strong board mechanisms (i.e. board size, women on board, board meetings and independence) aligns interests and monitor managerial actions respectively. Given such fine-drawn differences, it is realistic to assume that banks will employ different combinations of mechanisms with similar or maybe conflicting effects contingent on their own circumstances to work simultaneously. Beatty and Zajac (1994) further posit that the decision to use multiple governance instruments involves resource allocation. Hence, governance mechanisms are bundled either as substitutes or complements under the rubric of a cost-benefit trade-offs between the mechanisms employed. On one hand, mechanisms act as substitutes if there is a direct functional replacement of the first mechanism by the second to increase shareholders' wealth. For instance, Rediker and Seth (1995) and Randøya and Goel (2003) empirically demonstrated that when effective monitoring processes are in place, firms are less likely to use long-term incentive plans for CEOs as it becomes a redundant and costlier mechanism. On the other hand, two mechanisms interact as complements if the presence of one mechanism strengthens the other resulting in a synergistic benefit in addressing agency problems. In this regard, Oh et al., (2016) report a mutually enhancing effect between an independent board and executives' incentive pay since the latter makes the agency problem less severe which enables the former to effectively commit to stakeholder management. Thus, in order to ascertain the effect of certain governance practices on the prevailing bank systemic risk, it is necessary to consider a set of other interrelated governance mechanisms.

2.2.4.1 Substitution effect hypothesis

Unlike diffused share ownership, institutional shareholders have increased incentive (well beyond the compensation associated with board membership) to monitor the actions of managers since they will bear greater proportions of the costs associated with the value-destroying decisions of firm managers (Demsetz & Lehn 1985; Shleifer & Vishny, 1997;

Holderness, 2003). This monitoring may take the forms of having some direct representation on boards (Holderness & Sheehan, 1988), exercising decisive voting rights (Tosi & Gomez-Meija, 1989), increasing the disciplinary potential of the market for corporate control (Shleifer & Vishny, 1986; Hirshleifer & Titman, 1990; Chowdhry & Jegadeesh, 1994) or repealing managerial entrenchment provisions (Schepker & Oh, 2013). Rediker and Seth (1995) demonstrated that in the presence of such monitoring, independent directors on the board represent a less important monitoring mechanism due to a reduced need for their management monitoring services. We extend the appeal behind this intuition and argue that, as major providers of capital coupled with their direct monitoring and participation on boards, institutional shareholders become privy to sensitive information that executives will not divulge to independent directors, thereby enabling them to monitor executives better (Li & Harrison, 2008). It follows that we would expect a decreasing requirement for strong board mechanisms to monitor managerial actions. This argument offers some explanation to the report that entities with large outside shareholders have the higher likelihood of director turnover in the event of poor performance (Kaplan & Minton, 1994; Denis & Serrano, 1996). Thus, if there exist effective direct monitoring by institutional investors, employing a smaller bank board, more independent directors, frequent board meetings and female directors as additional mechanisms to further encourage top management to take excessive risk could be redundant and costly and vice-versa. Thus, in-line with the substitution logic, we hypothesize;

Hypothesis 6: *The higher the monitoring effect of institutional owners, the lower the monitoring potential of strong board mechanisms to promote bank systemic risk-taking.*

2.2.4.2 Complementary effect hypothesis

Baysinger and Butler (1985) document that due to the possibility of large pecuniary losses that could result from portfolio restructuring, institutional investors find it more efficient to pursue an "activist approach" through external monitoring that tends to have a synergistic

effect with existing internal governance mechanisms on organizational outcomes. There has been considerable empirical evidence to suggest that external monitoring by institutional shareholders prompt a performance-enhancing restructure of strong board mechanisms. These could result in increased diligence by the board of directors on the internal monitoring (Wahal, 1996; Black, 1998) and prompt a realignment of incentives for managerial performance (Hartzell & Starks 2003: Ward et al., 2009). Furthermore, in extreme situations, large shareholders' threat of a change in control and replacement of management through the market for corporate control equally discipline the board of directors on their monitoring role (Grossman & Hart, 1982). Thus, this activism, even without a change in composition, may prompt passive boards to take action to improve their monitoring and facilitate more executive systemic risk-taking. Putting these evidences together, we hypothesize that:

Hypothesis 7: *The higher the monitoring effect of institutional owners, the higher the monitoring potential of strong board mechanisms to promote bank systemic risk-taking.*

2.3 Data and Econometric Methods

2.3.1 Sample and data

To test our hypotheses, we compiled a panel dataset for EU banks classified as Domestic Systemically Important Banks (D-SIBs) in 2011 by the Financial Stability Board (FSB hereafter) for the period 2000–2016. The ownership structure of EU entities is characterized by high institutional ownership, thereby as reported by Franks and Mayer (1994;1995) and Fernández and Arrondo, (2005) entrenches monitoring by institutional shareholders as a potent monitoring mechanism. Hence, analyzing this purposive sample will offer convincing findings on the impact of governance on bank systemic risk. Essentially, we collected data on bank board variables and financial information, including monthly equity returns and institutional

ownership from Bloomberg and the 13–F statements respectively. These data are then complemented by hand-collected data from the bank annual reports. We resort to diverse sources for our data in order to reduce common source bias as much as possible. Our initial sample begins with the 42 large European banks classified as D–SIBs in 2011 by the FSB.[2] We then eliminate from this sample the banks which for some reasons had insufficient data.[3] This left us with a final sample of 38 D-SIBs and an unbalanced panel of 431 bank years observations.

2.3.2 Dependent variable: measure of systemic risk.

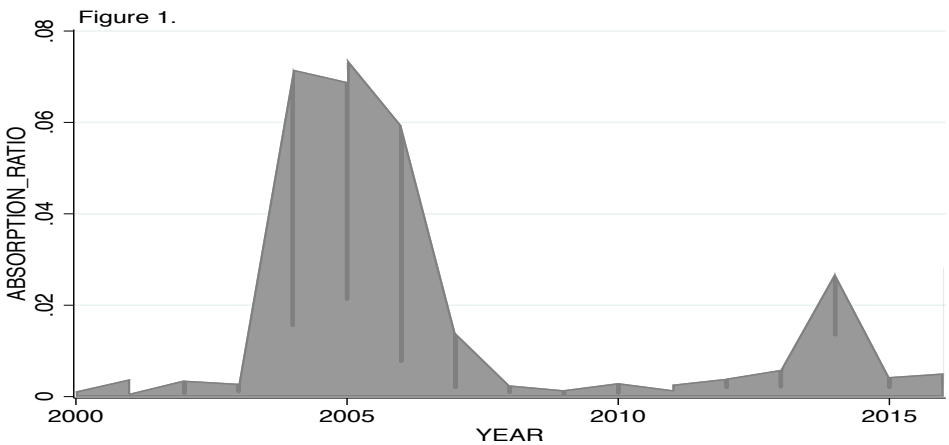
Our dependent variable in our empirical analysis is systemic risk. We use a market–based equity measure, absorption ratio (*AR*), proposed by Kritzman, Li, Page and Rigobon (2011). This measure builds on the works of Ang and Chen (2002) and Billio et al. (2010; 2012) by utilizing principal components analysis (PCA) on periodic (monthly) equity returns to estimate on a rolling basis throughout history, the fraction of total market variance explained by a finite number of factors. Aside from being an effective proxy for market fragility, the absorption ratio, supersedes alternative systemic risk estimation processes. Relative to the CoVaR and the Marginal Expected Shortfall (MES), the AR accounts for the relative importance of each bank's (asset) contribution to the overall system-wide systemic risk. Kritzman et al., (2011) substantiated the superiority of the AR by showing that unlike the alternative measures, the estimated AR from the U.S. housing market data provided early signs of the emergence of a housing bubble. In addition, they show that the absorption ratio systematically rose in advance of market turbulence and that most global financial crises coincided with positive shifts in the absorption ratio. Hence, empirically, the absorption ratio is defined as the fraction of the total variance of a set of asset returns explained or "absorbed" by a fixed number of eigenvectors. Formally AR for bank i at time t is expressed as:

$$AR_{it} = \frac{\sum_{i=1}^{N} \sigma_{Ei}^2}{\sum_{j=1}^{N} \sigma_{Aj}^2} \qquad (1)$$

where N is the number of assets (banks) whose equity returns are being considered; σ_{Ei}^2 is the variance of the ith eigenvector, and σ_{Aj}^2 is the variance of the jth asset returns. Intuitively, since we are focusing on endogenous risk (i.e. from a set of assets), the AR informs on the contribution and the exposure of a focal bank to the overall risk of the system given a strong common component across the returns of all the bank's equity. So, a higher AR corresponds to a higher level of systemic risk posed by a bank's operations and vice versa.

Billio et al. (2012)'s econometric estimation for systemic risk, *the Cumulative Risk Fraction*, measured as the ratio of the risk associated with the first *n* principal components of a covariance matrix of a system of asset returns to total risk of the system follows a similar intuition. In addition, several official reports and studies (BCBS, 2010: Lehar, 2005) converge on the fact that the 2007/2008 crisis was preceded by spikes in systemic risk. Figure 1.1, which is a time series plot of our computed absorption ratio from our sample data is perfectly consistent with this fact. Together, these rest the reliability of our adopted measure on a bedrock.

Figure 2. 1: Trend of Absorption Ratio (AR) computed from sample data



Trend of Absorption Ratio (AR) computed from our sample data

2.3.3 Measures of independent variables

Our four proxies for strong boards are; board size, independent directors, women directorship and board activity. Yermack (1996) and Boone et al., (2007) have argued that board size varies according to firm complexity. So, we standardize board size from any bank complexity effects by operationalizing it as the logarithm of the number of directors on the board at the end of the year. Board independence (INDP) is operationalized as the proportion of board directors without any material or pecuniary relationship with the bank, except the board seat. Women on board (WOB) represents the proportion of board directors who are females. Our measure of board activity is the number of meetings both ordinary and extraordinary, held by the board of directors annually (Vafeas, 1999). Finally, institutional ownership was operationalized at the proportion of outstanding shares controlled by banks, insurance companies, endowment, hedge funds, pension funds and mutual funds. A careful inspection of the 13-F documents indicated that these holdings commensurate voting rights. Hence, it is a good proxy for institutional investors' control over the board.

2.3.4 Control variables

In order to limit omitted variable bias from our results, we controlled for several bank and country-level factors that may affect the level of systemic risk. Following prior bank risk-taking literature (Laeven and Levine, 2009; Pathan, 2009; Iqbal et al., 2015), we control for bank size, performance, growth, asset structure, loan loss provision and non-interest income.

At the country level, we control for the level of economic development, institutional development and bank regulations. The literature documents an association between bank size and systemic risk. Laeven et al., (2014) opine that the business model of large banks makes

them less risky on an individual basis but their contribution to systemic risk is disproportionately high. We measure bank size as the logarithm of total assets (TA). Behavioural agency models document that the willingness of top executives to adopt risky strategies is partly dependent on the firm's performance (Cyert & March, 1992; Kahneman & Tversky, 1979). Sanders (2001) shows that the likelihood to pursue risky strategies (i.e.

Table 2. 1: Definitions of variables

Variable	Definition/ Measure
Panel A: Dependent Variable	
Absorption Ratio (AR)	Ratio of the variance of the ith bank's eigenvectors relating to its equity returns to the total variance of the set of banks' equities returns.
Panel B: Strong Board Variables	
Board Size (BS).	The number of directors on the bank board at the end of the financial year.
Board Independence (INDP)	The proportion of board directors without any material or pecuniary relationship with company, except the board seat.
Gender diversity (WOB)	The percentage of board directors who are women.
Board Meetings (BMEET)	The number of times the board of directors met (ordinary and extra ordinary meetings) in a year as reported by the annual governance report. Written consent of the board and telephonic meetings are excluded since it is likely more difficult for directors to monitor effectively from a distance.
Institutional Ownership (INSTOWN)	The average proportion of outstanding shares of the bank held by institutional investors (i.e. banks, insurance companies, mutual funds, hedge funds etc.) at the end of the year.
Panel C: Control Variables	
Bank size (TA)	Log of total book value of assets as reported in the year-end financial reports
Bank Performance (ROA)	Net income divided by total assets expressed as a percentage.
Tier 1 Ratio (BIS_RATIO)	The ratio of tier 1 capital held by the bank to the average risk weighted asset reported by the financial statements.
Gross Domestic Product per Capita (GDP)	The log of gross domestic product per capita of the country the bank is located.
Revenue Growth	The bank's average sequential growth in total revenues over the year.
Loan Loss Provision Ratio	The ratio of loan loss provisions to average total assets over the period.
Deposits to Asset	The ratio of Total Deposits to total Assets.
Non-interest Income	The bank's revenue(standardized) from non-traditional activities.
Governance Effectiveness (WGI)	An index measuring the institutional strength/effectiveness of a country.

acquisitions product, investment opportunities and geographical diversification) is performance contingent. We include banks' returns on asset (ROA) in our model to control for this effect of bank performance. We also included revenue growth, measured as the percentage change in the sequential total revenue of the bank as an additional bank performance control variable. We control for the bank's asset structure with the ratio of total deposit to total assets (Deposits to assets). Loan loss provision is used to control for the banks' risk culture and

appetite. Finally, to capture the effect of business models of the bank, we use the standardized measure of non-interest income to control for the level of income diversification and non-traditional banking activities (Köhler, 2015).

To account for the country level effects, we control for the level of economic development on banking operations with the log of the gross domestic product of the country (GDP). Fang, Hasan and Marton (2014) show that efficient and developed institutions substantially increase financial stability and more value-enhancing bank risk-taking. We control for this effect with the governance effectiveness index (WGI).[4] Finally, Agoraki et al., (2011) show that regulations have an independent effect on bank risk-taking. However, due to the homogeneity in capital (Tier 1) requirement for our sample banks (8% for EEA banks), we are not able to control for this effect as Barth, Caprio, and Levine (2006) did. Rather, we captured a varying impact of bank regulations by focusing on the extent to which banks conform to the capital requirement regulations using the BIS_RATIO; the ratio of the tier 1 capital to average risk-weighted assets. The detailed definitions of the variables are presented in Table 2.1.

2.3.5 Empirical Method and Model

The generic model used to test our hypotheses is,

$$\boldsymbol{y_{i,t}} = \boldsymbol{\alpha} + \boldsymbol{\beta X_{i,t}} + \boldsymbol{\theta D_{i,t}} + \boldsymbol{\gamma Z_{i,t}} + \boldsymbol{\eta_{i,t}} + \boldsymbol{\varepsilon_{i,t}} \qquad (2)$$

, where The subscripts i identifies individual D-SIB ($i = 1,2,3,\ldots,38$), t the time period (t=2000,2001,…, 2016). $\boldsymbol{y_{i,t}}$ is absorption ratio (AR) and represents our measure for bank systemic risk. $\boldsymbol{X_{i,t}}$ includes board size [Ln(BS)], board independence (INDP), female directorship (WOB), board meeting (BMEET) and institutional ownership (INSTOWN). $\boldsymbol{Z_{i,t}}$ includes bank size (Size), the log of annual per capita income (GDP), tier 1 ratio (BIS_RATIO), return on assets (ROA), deposits to assets ratio, loan loss provision ratio, revenue growth percentage, institutional strength and the non-interest income. At any point, $\boldsymbol{D_{i,t}}$ is an

interaction term between institutional ownership and a strong board mechanism (i.e. board size, board independence, female directorship and board meetings). Finally, η_i and $\varepsilon_{i,t}$ represent the time-invariant unobserved bank-specific factor and the idiosyncratic error term respectively. Our analysis begins with an assessment of the individual effect of governance of our strong board mechanisms on systemic risk using univariate and quantile regression analyses. Afterward, the focus of the analysis is shifted towards the examination of the bundling (interaction) effects. We examined closely the interaction effects using a common complements or substitutes assessment model in the field of economics (see Appendix 2.1). The resulting simple slopes are plotted at 1 standard deviation below and above the mean of INSTOWN as Aiken and West (1991) recommend.

Ownership structure has been found to be endogenously determined, among other factors, by firm risk (Demsetz & Villalonga, 2001). This implies that endogeneity must be taken into account when seeking to ascertain the relation between ownership and bank risk. Failing to do so is bound to yield biased estimates. Primarily, we address this problem by using a 2-Stage Least Square (2SLS) regression to estimate our regression, conditioning INSTOWN as endogenous. Following Laeven & Levine (2009), we use the average institutional ownership held by other banks in the country as an instrument for each bank's ownership structure. Economic intuition validates this instrument because it captures the industry and country factors explaining INSTOWN. Furthermore, the risk innovation of a single bank does not influence the INSTOWN of other banks especially when evidence suggests that bank ownership structure changes extremely little over time.

2.3.6 Descriptive Statistics and Correlation Matrix

In Table 2.2, we present the descriptive statistics for our defined variables. As can be noted, there is sample heterogeneity, indicating that our sample contains banks with strong and weak boards. Panel B show that, board size varies from 6 to 32 with a mean of approximately 15

members. This is comparable to that of De Andres and Vallelado (2008), which reported an average board size of 15 for the large international commercial banks they studied. Variably, the sample banks kept no to complete independent directors with a mean of 0.58. The proportion of female directors range from 0 to 0.65, with a mean of 0.21. The number of board meetings ranged between 1 and 54, with an average of 12 per year. Finally, institutional shareholding varies between 3% and 100%, with a mean of 71%, which substantially differ from the 27.69% reported by Elyasiani and Jia (2008) for a sample of US BHCs. This affirms the prevalence of institutional ownership in continental Europe as Franks and Mayer (1994;1995) and Fernández and Arrondo (2005) asserted. In addition to our board mechanism variables, the sample is also heterogeneous in terms of the contribution they make to the system-wide fragility. Panel A shows AR ranges from 0.0003 to 0.074 with a mean of 0.02. Panel C indicates that the sample is also heterogeneous in terms of size, performance, risk culture, business models and face varying economic and institutional environments. Although

Table 2. 2: Descriptive Statistics

Variable	N	Mean	SD	Min.	Median	Max.	Skew.	Kurt.
Panel A: Dependent Variable								
AR	511	0.02	0.023	0.0003	0.004	0.074	1.76	4.50
Panel B: Bank Board Variables								
BS	595	14.87	4.513	6	14	32	0.37	2.74
INDP (%)	595	55	25	0	58.3	100	-0.284	2.568
WOB (%)	595	21	13.1	0	18	65	0.68	3.19
BMEET	545	11.5	5.466	1	11	54	2.54	16.28
INSTOWN (%)	604	71	28.4	3.9	78	100	-0.73	2.35
Panel C: Control Variables								
Size (in € mil)	568	559.6011	536.6705	5.41903	369.528	2500	1.42	4.36
ROA (%)	572	0.39	0.56	-6.51	0.40	4.74	-3.02	50.33
BIS_RATIO	588	11.32	3.89	5.2	10.6	28.7	1.10	4.69
GDP	646	10.57	0.33	9.59	10.62	11.54	-0.12	3.75
Revenue Growth	557	4.39	26.55	-71.78	-0.30	207.09	2.93	19.12
Loan Loss Prov.	567	0.219	0.367	-0.484	0.16	5.816	9.22	125.9
Deposit to Assets	563	39.15	14.75	2.544	37.98	91.36	0.49	3.28
Non-Interest Inc.	567	8573.531	8095.536	-2952	5698	45209	1.20	4.28
WGI	608	91.41	7.201	60.194	92.78	100	-1.83	6.80

all of our sample banks are publicly traded banks, there is considerable variation in size as the total assets value varying from 54.2 million to 2.5 billion EUROs. Also, the range of 5.2 to 28.7% for the BIS ratio is satisfactorily above the regulatory requirement of 4.4% by the Bank for International Settlements; thereby, reflecting varying regulatory compliance as well as the healthy state of the sample banks. Finally, the statistics relating to the ratios of Deposits to assets and non-interest income inform of the engagement of our sample banks in commercial banking as well as other types of financial operations (investment banking and financial services).

Detailed summary (mean) statistics are provided in appendix A3a-c for each bank, country and year included in the study. While, Dutch banks have the highest institutional ownership (94.5%) and independent directors (90.3%) over the period of our study, Italian banks have the highest number of board membership on average. Unsurprisingly, women are more represented on the boards of Norwegian banks (39.6%), which partly could be explained by the gender quota system introduced in 2008 (see Tables A3a & b). Although bank boards from the Scandinavian region (Norway & Denmark) have the highest number of meetings, the number of meetings since the onset of the crisis in 2007 has increased (from 10 to 13). This may be an indication of an increased intensity in internal oversight over bank operations. Table A3a further shows that, with the exception of the Irish Bank, when the banks in our sample are clustered on the basis of country, contribution towards system-wide systemic risk was similar (between 0.011 to 0.016). Finally, Table A3c shows that, the periods in which AR were high (2004 to 2007) were matched with a substantial bank revenue growth. This affirms the importance of bank risk-taking to profitability as we argued earlier. Overall, it can be concluded from our descriptive statistics that our empirical analysis is based on a very heterogeneous sample of banks.

Table 2.3 presents the Pearson's pair-wise correlation matrix among the variables we use for our analysis. As expected, our systemic risk measure (AR) is significantly correlated with the

higher levels of systemic risk (SRISK). As rightly anticipated, Table 2.3 also shows that the institutional ownership measure is negative and significantly correlated with INDP (-0.081) and BMEET (-0.150), which conjects a possible substitution effect between INSTOWN and strong board mechanisms. In addition to these, the strong positive correlation between INSTOWN and AR offers evidence consistent with Demsetz & Villalonga, (2001) that INSTOWN is endogenously determined by other governance mechanisms and risk.

Finally, it is worth noting that several of our control variables are strongly correlated with each other and their inferences appeal to economic intuition.[5] Most notably, Size is positively correlated with non-interest income (0.571), indicating larger banks may be more involved in non-traditional banking activities. Furthermore, likewise Iqbal et al., (2015), the two variables which measure the asset and income structure (Deposits to assets and Non-interest income) of the banks are strong and negatively correlated with each other. Finally, WGI exhibits a significant positive correlation with GDP and positively correlated positively with ROA, emphasizing the importance of strong institutions for bank (entity) performance and economic development. These indicate our control variables are able to curb biased estimates as expected.

2.4 Results

2.4.1 Univariate Analysis

We begin the analysis by examining the univariate relationship between strong board variables and systemic risk. Table 2.4 presents the two-tailed t-tests difference in mean and Wilcoxon/Mann–Whitney median tests under the null hypothesis that there are no differences between the means and medians of the strong board mechanisms of banks with high and low systemic risk. We dichotomize our sample into two sub-samples using the median AR. Thus, sub-samples with their annual AR above and below the median are categorized as high and low systemic banks respectively.

Table 2. 3:Correlation Matrix

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. AR	1														
2. BS	-0.030	1													
3. INDP	-0.032	-0.406***	1												
4.WOB	-0.022	-0.282***	0.170***	1											
5. BMEET	-0.057	-0.327***	0.135**	0.185***	1										
6. INSTOWN	0.028	0.012	-0.081†	-0.049	-0.150***	1									
7. Size	-0.060	0.299***	0.096*	0.067	-0.161***	-0.013	1								
8. ROA	0.259***	0.001	-0.150***	0.018	-0.087*	-0.014	-0.157***	1							
9. GDP	0.024	-0.497***	0.212***	0.263***	0.205***	-0.014	-0.036	-0.068	1						
10. BIS_ RATIO	-0.28***	-0.317***	0.271***	0.224***	0.167***	0.191***	0.009	-0.184***	0.415***	1					
11. R_GROWTH	0.238***	0.104*	-0.049	-0.001	-0.088*	0.066	-0.054	0.270***	-0.073^{+}	-0.270***	1				
12. Loan Loss P.	-0.147***	-0.005	0.066	-0.100*	0.192***	-0.090*	0.096*	-0.586***	-0.110**	-0.010	-0.140***	1			
13. Dep. to Asset	-0.080†	-0.151***	0.238***	-0.077†	0.103*	0.089*	-0.209***	0.088*	-0.144***	0.141***	0.047	-0.089*	1		
14. Non-Int. Inc.	0.018	0.173***	0.007	0.265***	-0.062	0.053	0.571***	0.131**	0.104*	0.074†	0.036	-0.022	-0.271***	1	
15.WGI	0.043	-0.452***	0.026	0.126**	0.015	0.192***	-0.188***	0.133**	0.413***	0.236***	-0.020	-0.218***	-0.016	0.020	1

$^{\dagger}p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. See Table 2.1 for variable definitions.

As it can be noted from Table 2.4, the difference in board size, independence and female directorship in terms of means and medians are negative and significant. Specifically, high systemic banks have on average, approximately two board members less, 3% and 4% less independent and female directors respectively. Also, high systemic banks on average have approximately two meeting and 11% institutional shareholders more than the banks with low systemic risk. Hence, our univariate analysis provides considerable support for hypotheses 1, 2, 4 and 5. Thus, our argument that smaller board size, few independent directors, board meetings and monitoring by institutional investors increase bank systemic risk are largely supported.

Regarding the control variables, the univariate tests in Table 2.4 show that banks with higher systemic risk are smaller in size, informing the risk diversification effect of the activities of large banks. Also, high systemic banks have better national economic environments, greater Deposits to total assets, a lower percentage of non-interest income and comply more with capital requirement regulations. We proceed to test if these relations hold in a multivariate setting.

Table 2. 4: T-test and Wilcoxon/Mann Whitney tests of differences in Means and Medians

Strong Board Variable	Higher AR		Low AR		Difference in Means	Difference in Median
	Mean	Median	Mean	Median		
Independent Variables						
Board Size	14.2	14	15.8	15	-1.6***	-1**
Board Independence (%)	54.0	57.0	57.0	59.0	-3.0***	-2.0
Board Meetings	12.2	11	10.4	11	1.8***	0
Women on Board (%)	19.0	17.0	23.0	22.0	-4.0***	-5.0**
Institut. Ownership (%)	75.0	85.0	64.0	70.0	11.0***	15.0***
Control Variables						
Size	529798.2	351744.5	598056.5	386846.5	-68258.26†	-35102
Return on Assets (%)	0.386	0.39	0.389	0.42	-0.003	-0.003
GDP	10.58	10.64	10.53	10.57	0.05*	0.07*
BIS RATIO	11.86	11.5	10.56	10	1.30***	1.5**
Loan loss Provision	0.19	0.11	0.26	0.19	-0.07**	-0.08***
Revenue Growth (%)	5.75	0.19	2.69	-0.79	3.05†	0.98
Deposit to Asset	40.06	37.9	37.95	38.1	2.11*	-0.2
Non-Interest Income	8198.5	4845	9055.9	6258.5	-857.4	-1413.5†
Govern. Effectiveness	91.56	92.78	91.2	92.42	0.36	0.37

,† p<0.10, * p<0.05, ** p<0.01, *** p<0.001.

2.4.2 Quantile Regression

Our goal to further analyse the effect of our strong board mechanisms using a quantile regression is to (1) reinforce the relations reported by the univariate tests (2) assess if the mixed results in the literature (see section 2) is accounted for by the distribution of the data used in these studies (See Armstrong et al., 2015 and Hao and Naiman, 2007).

Table 2.5 shows that the direction of our coefficient for our 4 proxies for strong boards are consistent (as per the results with our univariate tests) throughout the ten quantiles. Specifically, WOB is significantly negative in all the quantile distributions. Also, board meetings positively and significantly promote bank systemic risk even at the lower quantiles of the distribution, indicating among others, that board meetings monitor executives to take more risk (Vafeas, 2009). Finally, INST and BINDP are mostly significant at the upper quantile of the distribution (mainly from q50-q90) and are associated with an increase in the pseudo R-squared (from 4.7% to 47%). Subtly these inform that, while a substantial increase in institutional shareholdings propagates more systemic risk, the opposite may result when independent directors make-up more than 60% of the board.

Overall, we ascertain evidence for the consistent effect strong boards mechanisms have on bank risk as predicted by the univariate analysis. In turn, the magnitudes of these effects increase on the continuum with the strong board mechanisms.

2.4.3 Two Stage Least Square (2SLS)

Using the absorption ratio (AR) as a dependent variable, Table 2.6 presents the two-stage least square (2SLS) regression results of the complement versus substitute tests. The average institutional ownership held by other D-SIBs banks in the country is used as a valid instrument for institutional ownership (Laeven & Levine, 2009). The regression models (1-5) are well-fitted with statistically significant test statistics for the tests of endogeneity and of over-identification restrictions, confirming the validity of the instrument and no model mispecific-

Table 2. 5: Quantile Regression Estimates: Corporate Governance Drivers of Bank Systemic Risk: AR

This table reports results the following panel regression specification.

$$AR_{i,t} = \alpha + \beta_1 \ln(BS)_{i,t} + \beta_2(WOB)_{i,t} + \beta_3(INDP)_{i,t} + \beta_4(BMEET)_{i,t} + \psi_5(INSTOWN)_{i,t} + \delta_1 \ln(TA)_{i,t} + \delta_2(ROA)_{i,t} + \delta_3(GDP)_{i,t} + \delta_4(BIS_{RATIO})_{i,t} + \delta_5(Deposit\ to\ Assets)_{i,t} + \delta_6(Loan\ Loss\ Provision)_{i,t} + \delta_7(Revenue\ Growth)_{i,t} + \delta_7(Non\ Interest\ Income)_{i,t} + \delta_9(WGI)_{i,t} + \eta_i + \varepsilon_{i,t}$$

The Table reports the estimates of individual effect of strong board mechanisms on bank risk taking using a quantile regression for 10 quantiles on the data's distribution. The results are based on a sample of 38 domestic systemically important banks (D-SIBs) and 422 bank years from the period (*t*=2000,2001,2002...,2016). *ln* is the natural logarithmic. β, ψ, δ are our parameters to be estimated for the, strong board mechanisms, institutional shareholdings, interaction mechanisms and control variables respectively. Finally, η_i and $\varepsilon_{i,t}$ represent the time-invariant unobserved firm-specific factor and the idiosyncratic error term respectively. Robust standard errors are in parentheses. Superscripts †, *, **, *** indicate statistical significance at 10%, 5%, 1% and 0.1% levels, respectively.

Dependent Variable: Absorption Ration (AR)									
	q10	q20	q30	q40	q50	q60	q70	q80	q90
β_1 Ln (BS)	-0.0191	-0.0097	-0.0350	-0.0670	-0.0310	-0.156	**-0.603***	-0.499	-0.324
	(0.0174)	(0.0226)	(0.0322)	(0.0539)	(0.0976)	(0.237)	**(0.251)**	(0.362)	(0.391)
β_2 WOB	**-0.152*****	**-0.150*****	**-0.169****	**-0.226***	**-0.626****	**-1.048†**	**-2.622*****	**-2.700*****	**-2.250*****
	(0.0315)	**0.0411)**	**(0.0519)**	**(0.110)**	**(0.204)**	**(0.600)**	**(0.598)**	**(0.549)**	**(0.541)**
β_3 INDP	-0.0194	-0.0346	-0.0713*	-0.113	-0.202	-0.518	**-1.657*****	**-1.626*****	**-1.356****
	(0.0206)	(0.0266)	0.0289)	(0.0771)	(0.146)	(0.392)	**(0.362)**	**(0.279)**	**(0.428)**
β_4 BMEET	**0.0028*****	**0.0041*****	**0.0049*****	0.0057	**0.0138*****	0.0184	**0.0416***	**0.0529*****	**0.0682****
	(0.0008)	**(0.0011)**	**(0.0013)**	(0.0035)	**(0.0033)**	(0.0132)	**(0.0196)**	**(0.0147)**	**(0.0231)**
ψ_5 INSTOWN	0.0071	0.0149	0.0147	0.0307	**0.126***	0.284	**0.494†**	**0.461†**	**0.495***
	(0.0141)	(0.0147)	(0.0239)	(0.0426)	**(0.0594)**	(0.221)	**(0.287)**	**(0.253)**	**(0.246)**
δ_1 Size	-0.0019	-0.0038	0.0020	0.0064	0.0132	0.0166	0.0481	0.0421	-0.0294
	(0.0033)	(0.0062)	(0.0053)	(0.0128)	(0.0224)	(0.0173)	(0.0815)	(0.0713)	(0.0625)
δ_2 ROA	-0.0047	0.0003	0.0007	0.0161	0.0691	0.0344	0.133	0.204	0.295*
	(0.0097)	(0.0116)	(0.0169)	(0.0330)	(0.0526)	(0.111)	(0.161)	(0.172)	(0.129)
δ_3 GDP	-0.0125	0.00941	-0.000153	0.0337	0.221**	0.225	0.114	0.492	-0.516
	(0.0190)	(0.0193)	(0.0253)	(0.0718)	(0.0751)	(0.172)	(0.278)	(0.443)	(0.476)
δ_4 BIS RATIO	0.0050**	0.0028*	0.0037**	0.0018	-0.0091†	-0.0209	-0.0694***	-0.105***	-0.0875***
	(0.0018)	(0.0012)	(0.0012)	(0.0046)	(0.0051)	(0.0178)	(0.0201)	(0.0190)	(0.0177)
δ_5 DEPOSITS TO ASSET	-0.0003	-0.0001	0.0004	0.0005	0.00015	0.0009	0.0016	0.0078	-0.0005
	(0.0003)	(0.0003)	(0.0005)	(0.0007)	(0.0021)	(0.0049)	(0.0059)	(0.0095)	(0.006)
δ_6 LOAN LOSS PROV. RATIO	-0.0855*	-0.0688*	-0.0836*	-0.0679	-0.0905	-0.106	-0.339	-0.362	-0.159
	(0.0415)	(0.0326)	(0.0367)	(0.0529)	(0.0749)	(0.151)	(0.384)	(0.257)	(0.262)
δ_7 REVENUE_GROWTH	0.00045	0.0004	0.0069	0.0331	0.122*	0.217**	0.295**	0.227*	0.211*
	(0.0069)	(0.005)	(0.0129)	(0.0333)	(0.0472)	(0.0776)	(0.0994)	(0.0913)	(0.0987)
δ_8 NON-INTEREST INCOME	0.0052	0.0054	0.0071	0.0098	0.0215	0.0521	0.172**	0.142*	0.0497
	(0.0043)	(0.0049)	(0.0065)	(0.0128)	(0.0173)	(0.0445)	(0.0642)	(0.0670)	(0.0722)
δ_9 WGI	-0.0013†	-0.0010†	-0.0014	-0.0023	-0.004	-0.0046	-0.0034	-0.0043	0.0136
	(0.0007)	(0.0006)	(0.001)	(0.0025)	(0.0025)	(0.0059)	(0.0127)	(0.0147)	(0.0142)
Constant	-0.263	-0.501*	-0.355	-0.543	-2.338*	-1.637	1.965	-1.793	7.650
	(0.242)	(0.204)	(0.321)	(0.621)	(0.971)	(2.404)	(3.258)	(5.512)	(5.367)
Pseudo R-Square	0.0437	0.0275	0.0254	0.0269	0.0269	0.0880	0.2260	0.3791	0.4622
No. of Observations	431	431	431	431	431	431	431	431	431

Standard errors in parentheses
,† p<0.10, * p<0.05, ** p<0.01, *** p<0.001.

cation. Model 1 included our control variables and governance mechanisms variables as the main effects. We dwell more on Models 2 to 5 which report the interaction effects of institutional ownership (INSTOWN) and the strong board mechanisms of interest on systemic risk.

In each model, the main effects of the governance variables, bank and country-specific variables were controlled for. Model 1 reaffirms the findings from the univariate and quantile analyses that strong board mechanisms with the exception of board independence and female directorship individually promote bank systemic risk-taking. This result is largely consistent with the findings of Pathan (2009) and demonstrates that our hypotheses 1, 2, 4 and 5 are well argued for.

In Model 2, the interaction term between an external monitoring mechanism (INSTOWN) and an internal monitoring mechanism (BS) is negatively significant ($\beta = -1.545,\ p < 0.01$). An additional simple-slope test indicates that the relationship between board size and systemic risk was not significant when INSTOWN was low ($\text{simple slope} = 0.036, \text{n.s.}$) but was significant when INSTOWN was high ($\text{simple slope} = -0.830, p < 0.001$), lending support for the complementary hypothesis. Thus, although a smaller board individually promotes systemic risk, a larger bank board can equally achieve high systemic risk if there is considerable monitoring and control by institutional owners. This evidence points out that, the risk attenuating consequences associated with the less efficient, delayed and uncoordinated decisions of large boards may be alleviated by the monitoring and oversight exerted by institutional shareholders to induce higher bank systemic risk. Furthermore, a larger board size offers institutional owners the possibility of ample board representation to pursue their preference for high risk more closely by prompting executive and director diligence and discipline (Ward et al., 2009; Grossman & Hart, 1982).

In Model 3, the interaction term between two monitoring mechanisms, board independence and institutional ownership ($\text{INSTOWN} \times \text{INDP}$), is not statistically significant ($\beta =$

$0.683, p > 0.10$). In Model 4, we found a positive and significant interaction between BMEET and INSTOWN ($\beta = 0.0963, p < 0.001$). The simple-slope test confirms a complementary effect between these two monitoring mechanisms; at a low level of INSTOWN, the relationship between BMEET and bank systemic risk was not significant (simple slope $= -0.159, n.s.$) but was significant when institutional investor monitoring was high (simple slope $= 0.075, p < 0.001$). Thus, banks systemic risk increases when managerial actions are concurrently monitored through meetings and institutional investors. Consistent with theory, this finding illuminates the instrumental role of board meetings in the pursuit of shareholder goals. Through board meetings, the activist roles of influential owners are effectively undertaken to promote systemic risk. Board meetings bring institutional owners in direct contact with executives and directors to ask questions, seek explanations about issues, review meeting materials and most importantly exercising decisive voting rights to influence critical decisions (Tosi & Gomez-Meija, 1989). This allows institutional owners in their interest to supervise managers and independent directors, collect information and engage in strategic decisions for the bank (Adams & Ferreira, 2008: Chou, Chung &Yin,2013). So, it appeals to conventional wisdom that the synergistic effect of frequent board meetings and institutional ownership monitoring yield high systemic risk.

Finally, Model 5 which examined the interaction between WOB and INSTOWN and reported a negative significant coefficient ($\beta = -3.310, p < 0.001$). A simple-slope test confirms a complementary effect between these mechanisms; the effect of WOB on bank systemic risk-taking is not significant when monitoring by institutional investors was low (simple slope $= -1.404, n.s.$), but was significant when INSTOWN was high (simple slope $= -3.258, p < 0.001$). Hence, when there exists considerable monitoring by institutional investors, the appointment of women to bank board synergistically promote systemic risk. Institutional shareholders have been documented to possess disciplinary potency. The presence of an outside (institutional) blockholder increases the sensitivity of top

Table 2. 6: 2SLS Estimates: Corporate Governance Drivers of Bank Systemic Risk: AR

This table reports results the following panel regression specification.

$$AR_{i,t} = \alpha + \beta_1 \ln(BS)_{i,t} + \beta_2(WOB)_{i,t} + \beta_3(INDP)_{i,t} + \beta_4(BMEET)_{i,t} + \psi_5(INSTOWN)_{i,t} + \theta D_{i,t} + \delta_1 \ln(TA)_{i,t} + \delta_2(ROA)_{i,t} + \delta_3(GDP)_{i,t} + \delta_4(BIS_{RATIO})_{i,t} + \delta_5(Deposit\ to\ Assets)_{i,t} + \delta_6(Loan\ Loss\ Provision)_{i,t} + \delta_7(Revenue\ Growth)_{i,t} + \delta_7(Non\ Interest\ Income)_{i,t} + \delta_9(WGI)_{i,t} + \eta_i + \varepsilon_{i,t}$$

The model employs a two stage least square regression (2SLS) which instruments institutional ownership with the average institutional ownership held by other DSIBs in the country of a focal bank. The results are based on a sample of 38 domestic systemically important banks (D-SIBs) and 422 bank years from the period (*t*=2000,2001,2002...,2016). *ln* is the natural logarithmic. At any point, $D_{i,t}$ denotes the interactions between our measure of institutional shareholding and our variables of interest. $\beta, \psi, \theta, \delta$ are our parameters to be estimated for the, strong board mechanisms, institutional shareholdings, interaction mechanisms and control variables respectively. Finally, η_i and $\varepsilon_{i,t}$ represent the time-invariant unobserved firm-specific factor and the idiosyncratic error term respectively. Robust standard errors are in parentheses. Superscripts †, *, **, *** indicate statistical significance at 10%, 5%, 1% and 0.1% levels, respectively. The F-test for excluded instruments (exogeneity test) as well as the Test statistics for test of over identification restrictions indicate the validity of our chosen instrument throughout models 1-5. The associated significance supports the validity of the instruments and no model misspecification.

	Dependent Variable: Absorption Ratio				
	Model 1	Model 2	Model 3	Model 4	Model 5
δ_1 Size	0.0447	0.000938	0.0307	0.0292	0.0263
	(0.0444)	(0.0496)	(0.0485)	(0.0442)	(0.0447)
δ_2 ROA	0.211*	0.245*	0.212*	0.197†	0.217*
	(0.105)	(0.104)	(0.104)	(0.106)	(0.105)
δ_3 GDP	0.360*	0.410*	0.363*	0.405*	0.309†
	(0.171)	(0.171)	(0.173)	(0.167)	(0.167)
δ_4 BIS RATIO	-0.0586***	-0.0589***	-0.0587***	-0.0566***	-0.0547***
	(0.0117)	(0.0114)	(0.0116)	(0.0113)	(0.0118)
δ_5 DEPOSITS TO ASSET	0.0006	-0.0004	0.0001	-0.0011	-0.0002
	(0.0032)	(0.0032)	(0.0031)	(0.0031)	(0.0032)
δ_6 LOAN LOSS PROV. RATIO	-0.227	-0.133	-0.220	-0.234	-0.223
	(0.216)	(0.213)	(0.215)	(0.232)	(0.217)
δ_7 REVENUE_GROWTH	0.176**	0.178**	0.175**	0.202***	0.173**
	(0.0611)	(0.0612)	(0.0609)	(0.0607)	(0.0605)
δ_8 NON-INTEREST INCOME	0.0624	0.0803†	0.0704	0.0677	0.0716
	(0.0434)	(0.0446)	(0.0446)	(0.0430)	(0.0438)
δ_9 WGI	-0.0074	-0.0049	-0.0086	-0.0062	-0.007
	(0.0068)	(0.0069)	(0.0071)	(0.0066)	(0.0066)
β_1 Ln (BS)	-0.457*	0.699	-0.445*	-0.323†	-0.490*
	(0.193)	(0.476)	(0.194)	(0.190)	(0.194)
β_2 WOB	-2.147***	-2.349***	-2.167***	-2.389***	0.0191
	(0.300)	(0.319)	(0.301)	(0.311)	(0.660)
β_3 INDP	-1.270***	-1.238***	-1.747**	-1.224***	-1.244***
	(0.223)	(0.221)	(0.599)	(0.219)	(0.221)
β_4 BMEET	0.0365***	0.0351***	0.0362***	-0.0207*	0.0382***
	(0.0082)	(0.0076)	(0.0081)	(0.0105)	(0.0083)
ψ_5 INSTOWN	0.442**	4.535**	0.0349	-0.691**	1.114***
	(0.148)	(1.599)	(0.518)	(0.250)	(0.275)
θ_1 INSTOWN × Ln(BS)		-1.545**			
		(0.598)			
θ_2 INSTOWN × INDP			0.683		
			(0.771)		
θ_3 INSTOWN × BMEET				0.0963***	
				(0.0194)	
θ_4 INSTOWN × WOB					-3.310***
					(0.946)
Constant	-1.400	-4.633†	-0.873	-1.399	-1.067
	(2.235)	(2.467)	(2.397)	(2.186)	(2.192)
Adjusted R^2	0.410	0.419	0.410	0.432	0.415
Over-identification Test-stat (critical value)	0.00(3.84)	0.00(3.84)	0.00(3.84)	0.00(3.84)	0.00(3.84)
F-test of Excluded Instrument	14.789***	6.394**	10.420***	8.116***	13.184***
No. of Observations	422	422	422	422	422

Standard errors in parentheses
† p<0.10, * p<0.05, ** p<0.01, *** p<0.001

executive turnover to firm performance (Kaplan & Minton,1994; Franks & Mayer,1994; Denis & Serrano, 1996). For example, takeovers have been a viable strategy used by institutional shareholders to replace previously ineffective monitors of management (Shleifer & Vishny, 1986). Furthermore, in-line with our results so far, women tend to be less overconfident than their male counterparts hence take minimal risk (Barber & Odean 2001; Niederle & Vesterlund, 2007). Consequently, it follows that female directors are more likely to be sanctioned by institutional shareholders. This possible threat of being sanctioned offers an explanation to our finding that when institutional investor monitoring exists, female directors on bank boards encourage and endorse decisions that promote more systemic risk.

In addition to being statistically significant, the economic significance of our results is compelling. Given that the reported mean and median for AR are 0.02 and 0.004 respectively, the coefficients of the interaction variables suppose that, a one standard deviation change in board size, board meetings and female directorship will on average change a bank's contribution to system fragility (AR) by 0.0049, 0.53 and 0.43 points respectively when there is considerable institutional ownership. Overall, our results show that external monitoring by institutional owners complements various internal monitoring governance mechanisms to promote bank systemic risk-taking.

2.4.4 Robustness Tests

We perform a number of additional tests to examine the sensitivity of our empirical results. First, Adams et al., (2010) argue that corporate governance mechanisms are largely endogenous. So, to ensure the results presented above are to a greater extent rid of endogeneity and reverse causality concerns emanating from the other governance variables other than institutional ownership, we re-estimate our model using the Hausman-Taylor estimation (Hausman & Taylor, 1981). This estimation technique, unlike the fixed and random-effect models, addresses the endogeneity problem by estimating time-invariant regressors while using the between and within-variations of a subset of variables that are specified to be endogenous

as instruments. Accordingly, we specified all our governance mechanisms variables as endogenous variables. The results, slope test analysis and conclusions of this alternative estimation remained very similar and are reported in Table 2.7.

Second, since there is no consensus on the appropriate proxy for systemic risk, we examine the sensitivity of our result using an alternative measure for systemic risk. As an alternative dependent variable, we used another market-based systemic risk measure, SRISK, proposed by Acharya et al. (2012). Simply, SRISK is defined as the amount of "capital that a firm is expected to need if we have another financial crisis". The data for SRISK was obtained from NYU Stern's V-Lab website. The methodology behind the computation of SRISK is based on the approach of Brownlees and Engle (2011) and utilize publicly available stock market data and attempt to capture the capital shortfall of an institution amidst a financial crisis based on its stock return volatility and correlation with the market. Overall, the estimates with SRISK as a dependent variable are very similar to the results reported in Table 2.6 (see Table 2.8). More importantly, the coefficient estimates for the interactions, (INSTOWN × BS) and (INSTOWN × BMEET), are significantly indicating a complementary effect.

In addition, we found the interaction (INSTOWN × INDP) to be significant at 1% level, which suggests a substitutive effect between these variables. That is, when independent board directors exist, the monitoring and control exerted by institutional investors do not marginally increase bank systemic risk. Interestingly, unlike Tables 2.6 and 2.7, the interaction between WOB and INST entered insignificantly in this case. These discrepancies we maintain can be attributed to the different perspectives AR and SRISK offer on systemic risk. Kritzman et al. (2011) simply define the AR as the contribution and the exposure of a focal bank to the overall risk of the system given a strong common component across the returns of all the bank's equity while Acharya et al. (2012) define systemic risk (SRISK) as the amount of "capital that a firm is expected to need if we have another financial crisis". That is, while AR basically looks at a bank's role in the entire system fragility, the SRISK takes a view on the potential pecuniary

Table 2. 7: Hausman-Taylor Estimates: Corporate Governance Drivers of Bank Systemic Risk: AR

This table reports results the following panel regression specification.

$$AR_{i,t} = \alpha + \beta_1 \ln(BS)_{i,t} + \beta_2(WOB)_{i,t} + \beta_3(INDP)_{i,t} + \beta_4(BMEET)_{i,t} + \psi_5(INSTOWN)_{i,t} + \theta D_{i,t} + \delta_1 \ln(TA)_{i,t} + \delta_2(ROA)_{i,t} + \delta_3(GDP)_{i,t} + \delta_4(BIS_{RATIO})_{i,t} + \delta_5(Deposit\ to\ Assets)_{i,t} + \delta_6(Loan\ Loss\ Provision)_{i,t} + \delta_7(Revenue\ Growth)_{i,t} + \delta_7(Non\ Interest\ Income)_{i,t} + \delta_9(WGI)_{i,t} + \eta_i + \varepsilon_{i,t}$$

The model employs a Hausman-Taylor Estimation (Hausman &Taylor, 1989) which allows us to eliminate the bias in parameter estimates stemming from endogenous unobserved effects. We specify all our corporate governance variables (BS, WOB, INDP, BMEET, INST) and country dummies as endogenous and time-invariant exogenous variables respectively. The results are based on a sample of 38 domestic systemically important banks (D-SIBs) and 431 bank years from the period (*t*=2000,2001,2002...,2016). *ln* is the natural logarithmic. At any point, $D_{i,t}$ denotes the interactions between our measure of institutional shareholding and our variables of interest. $\beta, \psi, \theta, \delta$ are our parameters to be estimated for the, strong board mechanisms, institutional shareholdings, interaction mechanisms and control variables respectively. Finally, η_i and $\varepsilon_{i,t}$ represent the time-invariant unobserved firm-specific factor and the idiosyncratic error term respectively. Robust standard errors are in parentheses. Superscripts †, *, **, *** indicate statistical significance at 10%, 5%, 1% and 0.1% levels, respectively. The Wald-Chi Square of models 1-5 are significant to show the overall validity of the model.

	Dependent Variable: Absorption Ratio				
	Model 1	Model 2	Model 3	Model 4	Model 5
δ_1 Size	-0.0962	-0.0951	-0.0963	-0.0886	-0.128
	(0.106)	(0.105)	(0.107)	(0.104)	(0.108)
δ_2 ROA	0.208†	0.207†	0.209†	0.182	0.200†
	(0.111)	(0.111)	(0.111)	(0.111)	(0.111)
δ_3 GDP	0.706**	0.768**	0.710**	0.715**	0.748**
	(0.261)	(0.263)	(0.263)	(0.259)	(0.261)
δ_4 BIS RATIO	-0.0545***	-0.0560***	-0.0541***	-0.0540***	-0.0511***
	(0.0137)	(0.0137)	(0.0137)	(0.0136)	(0.0137)
δ_5 DEPOSITS TO ASSET	-0.0011	-0.0008	-0.0006	-0.0014	-0.0007
	(0.0064)	(0.0063)	(0.0065)	(0.0063)	(0.0064)
δ_6 LOAN LOSS PROV. RATIO	-0.124	-0.0988	-0.124	-0.147	-0.117
	(0.133)	(0.133)	(0.133)	(0.133)	(0.132)
δ_7 REVENUE_GROWTH	0.173***	0.180***	0.173***	0.187***	0.176***
	(0.0464)	(0.0465)	(0.0465)	(0.0466)	(0.0461)
δ_8 NON-INTEREST INCOME	0.0799	0.0832	0.0813	0.0775	0.0769
	(0.0917)	(0.0909)	(0.0922)	(0.0905)	(0.0919)
δ_9 WGI	0.0120	0.0119	0.0142	0.0117	0.0129
	(0.0137)	(0.0135)	(0.0140)	(0.0135)	(0.0139)
β_1 Ln (BS)	-0.486	0.686	-0.491	-0.388	-0.534†
	(0.300)	(0.675)	(0.300)	(0.300)	(0.298)
β_2 WOB	-2.006***	-2.107***	-2.009***	-2.084***	0.112
	(0.374)	(0.377)	(0.375)	(0.373)	(0.876)
β_3 INDP	-1.571***	-1.585***	-1.134†	-1.572***	-1.559***
	(0.221)	(0.221)	(0.611)	(0.220)	(0.220)
β_4 BMEET	0.0391***	0.0394***	0.0389***	0.00354	0.0407***
	(0.008)	(0.008)	(0.0078)	(0.0170)	(0.008)
ψ_5 INSTOWN	1.434***	5.590**	1.799***	0.595	2.112***
	(0.256)	(2.168)	(0.536)	(0.434)	(0.358)
θ_1 INSTOWN × Ln(BS)		-1.565†			
		(0.809)			
θ_2 INSTOWN × INDP			-0.601		
			(0.785)		
θ_3 INSTOWN × BMEET				0.0617*	
				(0.0261)	
θ_4 INSTOWN × WOB					-3.277**
					(1.231)
Constant	-5.471	-9.201*	-5.984	-5.359	-5.947
	(3.664)	(4.150)	(3.718)	(3.621)	(3.667)
Wald Chi-Square	354.0***	358.5***	355.1***	362.9***	367.4***
No. of Observations	431	431	431	431	431

Standard errors in parentheses
† p<0.10, * p<0.05, ** p<0.01, *** p<0.001.

losses which a bank may face in times of financial turmoil. For this reason, it is empirically suggestive that, independent directors in their quest to promote shareholder interests risk higher monetary losses to the bank should the entire market undergo a turmoil. In a parallel fashion, female directors, in the presence of institutional control, increases system-wide fragility by increasing an individual banks contribution to that fragility.

Third, we confirmed our findings by employing an additional instrument which was operationalized and validated by the work of Laeven and Levine (2009). As a different instrument for institutional ownership control (INSTOWN), we identified the year in which the bank was founded using the Bankscope databases and computed the age (AGE) of the bank. To rationalise this choice of instrument, we argued that older banks have had more time to diversify ownership. Furthermore, AGE is unlikely to affect bank risk directly. Instead, by reducing the ownership of the large (institutional) owner over time, there are incentives for the owner to influence risk. The concluding results from this analysis also remained similar to our main results. Finally, we undertook our analysis with more control variables and the results are very similar. We included capital ratio, net loans to total assets and an additional measure of regulation, the relative number of years the bank's country have had deposit insurance schemes in place. These did not affect the conclusions. Finally, we also controlled for the possibility of our result being influenced by outliers.

Specifically, we in turns excluded each country from the analysis to check if our results will change significantly. All of the results still remained similar.

2.5 Conclusion

By studying the case of D-SIBs, we hope to have extended knowledge on an important governance mechanism (i.e. monitoring by institutional owners) and it interactive implications with strong bank board mechanisms for bank systemic risk. A novelty of our study lies in the operationalization of a financial econometric measure of systemic risk, whose aptness is sub-

Table 2. 8: 2SLS Estimates: Corporate Governance Drivers of Bank Systemic Risk: SRISK

This table reports results the following panel regression specification.

$$AR_{i,t} = \alpha + \beta_1 \ln(BS)_{i,t} + \beta_2(WOB)_{i,t} + \beta_3(INDP)_{i,t} + \beta_4(BMEET)_{i,t} + \psi_5(INSTOWN)_{i,t} + \theta D_{i,t} + \delta_1 \ln(TA)_{i,t} + \delta_2(ROA)_{i,t} + \delta_3(GDP)_{i,t} + \delta_4(BIS_{RATIO})_{i,t} + \delta_5(Deposit\ to\ Assets)_{i,t} + \delta_6(Loan\ Loss\ Provision)_{i,t} + \delta_7(Revenue\ Growth)_{i,t} + \delta_7(Non\ Interest\ Income)_{i,t} + \delta_9(WGI)_{i,t} + \eta_i + \varepsilon_{i,t}$$

The model employs a two stage least square regression (2SLS) which instruments institutional ownership with the average institutional ownership held by other DSIBs in the country of a focal bank. The results are based on a sample of 38 domestic systemically important banks (D-SIBs) and 422 bank years from the period (*t*=2000,2001,2002...,2016). *ln* is the natural logarithmic. At any point, $D_{i,t}$ denotes the interactions between our measure of institutional shareholding and our variables of interest. $\beta, \psi, \theta, \delta$ are our parameters to be estimated for the, strong board mechanisms, institutional shareholdings, interaction mechanisms and control variables respectively. Finally, η_i and $\varepsilon_{i,t}$ represent the time-invariant unobserved firm-specific factor and the idiosyncratic error term respectively. Robust standard errors are in parentheses. Superscripts †, *, **, *** indicate statistical significance at 10%, 5%, 1% and 0.1% levels, respectively. The F-test for excluded instruments (exogeneity test) as well as the Test statistics for test of over identification restrictions indicate the validity of our chosen instrument throughout models 1-5. The associated significance supports the validity of the instruments and no model misspecification.

	Dependent Variable: SRISK				
	Model 1	Model 2	Model 3	Model 4	Model 5
δ_1 Size	-0.578***	-0.613***	-0.555***	-0.580***	-0.574***
	(0.0487)	(0.0494)	(0.0471)	(0.0490)	(0.0487)
δ_2 ROA	0.743***	0.771***	0.718***	0.725***	0.745***
	(0.154)	(0.153)	(0.151)	(0.153)	(0.153)
δ_3 GDP	0.0232	0.0745	0.0168	0.0374	0.0274
	(0.138)	(0.140)	(0.133)	(0.140)	(0.137)
δ_4 BIS RATIO	-0.0185†	-0.0202†	-0.0154	-0.0181	-0.0190†
	(0.0112)	(0.0109)	(0.0111)	(0.0113)	(0.0113)
δ_5 DEPOSITS TO ASSET	0.0219***	0.0223***	0.0229***	0.0220***	0.0219***
	(0.0045)	(0.0045)	(0.0044)	(0.0045)	(0.0045)
δ_6 LOAN LOSS PROV. RATIO	0.639*	0.726*	0.597*	0.632*	0.641*
	(0.285)	(0.283)	(0.283)	(0.283)	(0.283)
δ_7 REVENUE_GROWTH	0.109**	0.115**	0.113**	0.121**	0.109**
	(0.0389)	(0.0383)	(0.0395)	(0.0392)	(0.0389)
δ_8 NON-INTEREST INCOME	0.101*	0.111*	0.0885†	0.101*	0.0991*
	(0.0461)	(0.0453)	(0.0454)	(0.0459)	(0.0463)
δ_9 WGI	-0.0045	-0.0012	-0.0024	-0.0031	-0.0044
	(0.0054)	(0.0056)	(0.0054)	(0.0055)	(0.0054)
β_1 Ln (BS)	0.506**	1.653**	0.483*	0.556**	0.506**
	(0.192)	(0.504)	(0.194)	(0.194)	(0.192)
β_2 WOB	0.165	0.0265	0.134	0.0654	-0.0841
	(0.325)	(0.336)	(0.328)	(0.334)	(0.565)
β_3 INDP	-0.183	-0.152	0.993*	-0.160	-0.182
	(0.180)	(0.178)	(0.441)	(0.180)	(0.180)
β_4 BMEET	0.0172*	0.0176**	0.0167*	-0.00667	0.0170*
	(0.007)	(0.0064)	(0.0071)	(0.0110)	(0.0070)
ψ_5 INSTOWN	0.370**	4.522**	1.421***	-0.170	0.285
	(0.126)	(1.743)	(0.409)	(0.292)	(0.269)
θ_1 INSTOWN × Ln(BS)		-1.566*			
		(0.663)			
θ_2 INSTOWN × INDP			-1.774**		
			(0.602)		
θ_3 INSTOWN × BMEET				0.0437*	
				(0.0202)	
θ_4 INSTOWN × WOB					0.386
					(0.938)
Constant	4.774*	1.304	3.680*	4.712*	4.737*
	(1.946)	(2.511)	(1.858)	(1.947)	(1.938)
Adjusted R^2	0.617	0.622	0.627	0.621	0.617
Over-identification Test-stat (critical value)	0.00(3.84)	0.00(3.84)	0.00(3.84)	0.00(3.84)	0.00(3.84)
F-test of Excluded Instrument	4.1843†	3.371†	5.221†	4.941†	2.358†
No. of Observations	344	344	344	344	344

Standard errors in parentheses
† p<0.10, * p<0.05, ** p<0.01, *** p<0.001.

stantiated by the consistency of its trend with what existing literature postulates. As theory suggests and earlier empirical evidence have confirmed, this study further affirms the relevance of ownership structure on firms' corporate governance choices and outcomes. This study concludes that, in order to properly align the interests of bank executives and owners, banks should find an "optimal" balance between the external monitoring by institutional investors and various internal monitoring to achieve a desired level of risk.

The findings of this paper have some important theoretical, practical and policy implications. Theoretically, our study demonstrates that outside the setting of diffuse ownership, countervailing outcomes to the propositions of agency theory are imminent. In this regard, our findings provide some insights to reconcile the inconsistent findings documented for governance mechanisms and bank risk-taking. For instance, previous studies that reported no relationship between strong boards and risk-taking might have been conducted under conditions of minimal or no institutional shareholdings, while those reporting a significant relationship might have been conducted in jurisdictions with significant institutional shareholdings. Also, our findings reinforce the agenda for researchers to pursue and reshape generalizable understanding on how bundles of governance mechanisms affect organizational outcomes within the framework of the agency theory.

Practically, the findings of this study iterate that, given the structural and resource constraints faced by banks, managers could be informed on how different combinations of governance practices can yield similar levels of systemic risk desired by shareholders (Rediker and Seth, 1995:98; Gresov and Drazin, 1997). As such, banks should strategically consider the trade-offs associated with the concurrent implementation of diverse governance mechanisms within the means of their resource. So, banks have the strategic flexibility in designing a bundle of governance practices to achieve the desired level of systemic risk. For example, for banks to promote systemic risk when there is active monitoring by institutional investors, they could

either maintain a large board size or greater proportion of female directors to equally promote systemic risk further.

Finally, heightened unification of markets hints regulators of imminent crisis. On the verge of such indications, our study can offer regulators 'unconventional' remedies to curtail systemic risk to optimal levels. For instance, since monitoring by institutional investors is an entrenched mechanism within European banks, the Basel Commission for Banking Supervision (BCBS) could mandate banks to maintain smaller boards (relative to size and operations) and a minimal proportion of female to severe systemic risk to appropriate levels

Table 2. 9: Summary of Results

BUNDLE	AR	HT	SRISK	SUPPORT	HYPOTHESIS
INSTOWN × Ln(BS)	–	–	–	Consistent	Complements (H7)
INSTOWN × INDP	X	X	–	Partial	Substitutes (H6)
INSTOWN × BMEET	+	+	+	Consistent	Complements (H7)
INSTOWN × WOB	–	–	X	Partial	Complements (H7)

–: significant negative bundling effect; +: significant positive bundling effect; **X**: No significant bundling effect. As expected, the estimation technique relating to Absorption Ration (AR) column, 2SLS, and Hausman Taylor technique produces the same relationships for our bundles due to their sophistication to overcome endogeneity problems. Hence, by comparing the AR and SRISK columns, we are able to summarize our results systematically.

Our findings are limited in several ways that open up new avenues for future research. Our study considers European banks, which are often characterized by large institutional owners who are not highly diversified and presumably risk seeking. However, American or Asian banks face different institutional environments that define different ownership structures, stakeholder risk attitude and subsequently corporate governance practices (La Porta et al., 2000). As such, our study might need replication with sample banks from Asia and America. This particularly will be important in view of the recent findings that variations in firm characteristics such as ownership interact with national institutions and leads to variation in governance choices (Filatotchev, Jackson & Nakajima, 2013; Schiell, Ahmadjian & Filatotchev, 2014).

Furthermore, Hoskisson et al. (2002) and Neubaum and Zahra (2006) argue that different types of institutional investors, based on their interest and motivations, are likely to affect

firms' behavior differently. However, due to the lack of sufficiently fine-grained data on the different types of institutional investor ownership, we resorted to the aggregate institutional ownership data for our analysis. For this reason, we entreat future research to make a more finely grained distinction between institutional investors. This, when done, will advance understanding on the dynamics behind the monitoring potential of different institutional investors. Overall, we hope that our paper advances the existing research one step further towards a deeper understanding of how corporate governance mechanisms together determine bank systemic risk.

Notes

1. Franks and Mayer (1994;1995) iterated a different system –insider system of governance– that existed in continental Europe by virtue of a remarkably high level of ownership concentration of the listed companies. Specifically, the authors reported the existence of a single shareholder owning more than 25% of shares in over 80% of the largest 170 companies listed on stock markets in France and Germany. Furthermore, in more than 50% of companies, there is a single majority shareholder. Standing in sharp contrast, the corresponding figures for the UK, 16% of largest 170 listed companies had single shareholders owning more than 25% of shares while 6% had single majority shareholders. Hence, concentration of ownership is staggeringly high on the European continent relative to the Anglo-American ownership control structure.

2. The Basel Committee for Banking Supervision (BCBS) methodology for identifying D-SIBs is based on several criteria, notably size, interconnectedness and substitutability (in practice, size appears to be the dominant criterion). The BCBS/FSB methodology for the identification of D-SIBs has been transposed in the EU regulatory framework (see Article 131 of the Capital Requirements Directive IV (CRDIV), which defines domestic systemically important institutions or G-SIIs).

3. DLR, Nyekredit and Credit Mutuel banks were dropped due to the lack of the annual report information. Banca Civica after 2011 was integrated into Caixa Bank, thereby limiting the availability of information to analyze its case. Nordea Bank as a group presented one corporate governance report for its subsidiaries, hence data on Nordea Bank are represented as one bank.

4. Government Effectiveness Index captures perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies. These resultantly determine the soundness and uncertainty of the economic environment which entity operate. Percentile rank indicates the country's rank among all countries covered by the aggregate indicator, with 0 corresponding to the lowest rank, and 100 to the highest rank. Percentile ranks have been adjusted to correct for changes over time in the composition of the countries covered by the WGI.

5. Multicollinearity among the regressors should not be a concern as the maximum value of the correlation coefficient is 0.57. Furthermore, in a multivariate setting, the average variance inflation factor (VIF) for our models is between 1.46 and 4.31, which falls below the conventional threshold of 10 (Hair et al. (2006).

CHAPTER 3

The Effect of Corporate Social Responsibility Committee on Corporate Tax Avoidance

The Effect of Corporate Social Responsibility Committee on Corporate Tax Avoidance

Abstract

Research related to corporate tax avoidance has become a matter of concern for many societies in the recent years. Corporations are considered the biggest consumers of economic, environmental, societal and human resources. Their biggest contribution towards society is in the form of corporate tax payments. The governments and tax authorities are interested in knowing whether firms are paying the due taxes or involved in tax sheltering and tax evasion. Shareholders, on one hand, are interested in whether their wealth is increasing and on the other hand, they may view management that "cheats the government" as a management that may also "cheat" its shareholders. The other stakeholders including the general public have interests in knowing the ethical corporate behaviour in the form of payment of a fair share of corporate taxes.

To protect the interests, shareholders pay a huge amount of agency cost in the form of putting in place a vigilant board of governors and establishing governance committees. One of these governance committees is the corporate social responsibility (CSR) committee. Despite these initiatives, there remains an unresolved debate of whether the CSR structures either play an ethical or risk management (hedging) role to determine corporate tax avoidance. This paper extends this debate by positing that the actual role of CSR structures is contingent on the prevailing corporate governance mechanisms.

By building our arguments on the corporate culture and legitimacy theories, we adopt the governance bundling approach and show that while CSR committees bundle with board independence and managerial power governance as substitutes, they complement the effect of board size to determine corporate tax avoidance. These findings imply that CSR committee is mostly a risk management tool for firm legitimization that consequently facilitates the primary interests of independent directors. Our findings subtly emphasize a new role of the board of directors opined by the stakeholder theory to balance stakeholder interests. Our results are robust to an alternative indicator of tax avoidance and a different estimation technique.

Keywords: Tax avoidance, Corporate Social Responsibility, Board of directors, Governance Bundles, Risk management.

The Effect of Corporate Social Responsibility Committee on Corporate Tax Avoidance

3.1 Introduction

Research related to corporate tax avoidance has become a matter of concern for many societies in the recent years (D'Ascenzo, 2010, p.3). Corporations are considered the biggest consumers of economic, environmental, societal and human resources. Tax payment is the most fundamental way in which corporations contribute towards the broader society. Consequently, a resulting shortfall in corporate tax revenue yields marginal benefits to owners at the detriment of other stakeholders by producing a significant and potentially irrecoverable loss to society as a whole; infrastructure and social capital wise (Slemrod, 2004; Williams, 2007). For this reason, governments, tax authorities and the general public are interested in knowing whether firms are paying the due taxes or involved in tax sheltering and evasion. To the shareholder, corporate tax avoidance propagates conflicting concerns: as much as they are interested in whether their wealth is increasing through tax management, it also creates the reputation of a management that has the potential to also "cheat" its shareholders (Huseynov & Klamm, 2012). To protect the interests, shareholders pay a huge amount of agency cost in the form of putting in place a vigilant board of governors and establishing governance committees. One of these governance committees is the corporate social responsibility (CSR hereafter) committee. Regrettably, the literature on CSR which has touched on virtually every other area of corporate engagement with broader society (McWilliams and Siegel, 2001; Garriga and Melé, 2004; Aguinis and Glavas, 2012), has scarcely investigated this area where corporate citizenship is most tangible and most important.

This study is motivated by two diverging theoretical views on the tax avoidance effect of CSR committees advanced by the scanty literature. On one hand, the corporate culture theory

(see Kreps, 1990; Hoi et al, 2013) holds the view that CSR is a set of actions which extends positive outcomes beyond the economic well-being of owners to all stakeholders. In this context, CSR is regarded as a shared organizational value which considers aggressive tax avoidance practices as unethical, irresponsible and costly to society (Christensen & Murphy, 2004). It follows that maintaining a CSR committee signals a firm's socially responsible intentions, commitment to the interests of the wider society and efforts to attenuate tax aggressive actions and their consequences. Accordingly, firms view both CSR committees and tax payments as paths towards contributing to society and are therefore theorized to be negatively associated.

On the other hand, the legitimacy theory associates an opposing (positive) effect with CSR structures (Lindblom,1994; Gray et al., 1995). Since firms legitimize and sustain relationships in the broader social and political environment in which they operate through disclosures, CSR structures then become a risk management tool for reputation enhancement. Subsequently, legitimizations of other societal actions over-shadows the firm from the risk of adverse political, regulatory, and social sanctions/penalties resulting from their tax aggressive actions (Hoi et al., 2013 and Lanis & Richardson,2003). Despite these opposing yet equally convincing perspectives, it is still unclear from the existing literature which governance structures facilitate either roles of CSR committees. This paper gives empirical attention in this direction by trying to answer the following question: does prevailing governance mechanisms determine the roles of CSR committee either as an ethical or risk management structure?

Pushing the research agenda forward, Armstrong et al., (2015)'s review concluded that inferences are still limited regarding whether (and how) corporate governance influences firms' tax avoidance since there is little research that directly tests this relationship. The few that studied this relationship found little or no evidence of a link (see Minnick and Noga, 2010: Rego and Wilson, 2012). Furthermore, given that firms may employ CSR committees and other governance mechanisms simultaneously, it appeals to intuition that the tax avoidance effect of

the former will depend on the levels of the latter. Hence, they act as governance mechanism bundles (Zajac & Westphal,1994; Rediker & Seth, 1995; Schepker & Oh, 2013). On these backgrounds, we try to answer the above question on the conjecture that the role (effect) of the CSR committee (in the context of these opposing views) is dependent on other corporate governance mechanisms. Specifically, we assert that CSR committees and corporate governance mechanisms either bundle as complements or substitutes to significantly determine tax avoidance.

Since there is limited theory as to which board-level governance characteristics are the most important, we make an ad hoc selection of board-level mechanisms which have been theoretically documented to significantly affect organizational outcomes; board size, board independence, female directorship and CEO duality. Larger boards offer a greater pool of knowledge and thorough deliberations on matters. Accordingly, Coles et al., (2008) found that the value of companies with complex decisions increases with board size. Independent directors are argued to be better monitors of managers as independent directors value maintaining a reputation in directorship market, but the findings in this instance are mixed (Fama & Jensen, 1983). Existing research has empirically demonstrated that firms with females are associated with less tax aggressiveness (Francis et. al, 2014). They explain that women are risk-averse and more cautious with aggressive tax-avoidance activities. Finally, CEO duality has been documented to proxy managerial power which entrenches managers to pursue their interest of rent diversion to the detriment of shareholders (Jizi et al., 2014; Pathan, 2009). On these accounts, we would expect the first three mechanisms and the latter to attenuate and promote corporate tax avoidance respectively.

We test our hypotheses using a global sample of firms drawn across several industries from the Compustat (US and global) and Thompson Reuters Asset4 databases for the years 2002-2015. Our sample excluded financial service industry. Overall, we find that CSR committees serve the ethical role by promoting tax payment through their complementary and substitution

effects with board size and CEO duality respectively. Furthermore, the risk management role is more pronounced when there is a functional replacement of the tax avoidance effect of independent directors by that of CSR committees. Although our results are provocative, the latter illuminates the CSR as a legitimization mechanism which subsequently helps agents to concurrently balance stakeholder interests as advertised by the stakeholder theory.

Our study makes several contributions to the literature. First, the study establishes evidence which may resolve the inconsistent results reported so far on the role of CSR committees on corporate tax avoidance (Hoi et al., 2013; Lanis & Richardson,2003). Particularly, our study shows that the role of the CSR committees is conditioned on the existing corporate governance mechanism. Hence, it may be that earlier studies that have reported inconsistent findings took no account of the simultaneous effects of other corporate governance structures. Second, our study extends the scope of the governance and tax aggression literature and subsequently opens up new considerations for future research. To our knowledge, this is the first study to examine the interactive effect of individual elements of corporate governance (CSR and Board mechanisms) on corporate tax avoidance. Third, Sikka (2010, p. 155) directed future research to investigate the dynamics behind the taxation aspects of CSR because of the socio-economic repercussions of tax avoidance. By extending the boundaries of the agency, legitimacy and corporate culture theories in the context of CSR using tax avoidance as a focal point, we believe our empirical findings offer relevant responses to aspects of this call.

The rest of the paper is organized as follows. The second section reviews the relevant literature and states the empirical hypotheses. The third section describes the data, variables and the empirical methodology, while the fourth section presents the results and discussion of our empirical tests. The fifth section concludes by discussing various implications of the findings and offering directions for future research.

3.2 Related Literature and Hypothesis Development

3.2.1 Theoretical Perspectives on CSR

Generally, agency theory has been the foundational theory for corporate governance-related studies. CSR unravels a different dimension of the traditional agency problem to highlight the potential conflicts between the interests of shareholders and other stakeholders. Friedman (1970) argues that engaging in CSR is symptomatic of an agency conflict between the interests of managers and shareholders. He exposited that managers may use CSR as a means to further their own social, political, or career agendas, at the expense of shareholders. According to this view, resources devoted to CSR would be more wisely spent, from a social perspective, which in turns boosts the firm's reputation and performance. Thus, a potential agency conflict of whether to commit resources to societal interests or towards increasing shareholder wealth prevails.

Agency theory has evolved in several new and interesting ways. In particular, Freeman (1984) asserts that firms have relationships with many constituent groups who both affect and are affected by the actions of the firm. Consequently, the stakeholder theory has emerged as the dominant and most relevant paradigm in CSR researches since the scope of agency conflicts it considers extends to that between owners and the society.

The stakeholder theory and its relationship to conventional theories in economics and corporate strategy have also received considerable attention in the literature. For instance, Jones (1995) developed a model that integrates economic theory and ethics. The author concluded that firms conducting business with stakeholders on the basis of trust and corporation have an incentive to demonstrate a sincere commitment to ethical behaviour in order to achieve a competitive advantage through the lasting, productive relationships developed with these stakeholders. Also, Russo and Fouts (1997) integrated the resource-based view and the stakeholder theories to explain how the dimensions of CSR (specifically, environmental performance) may constitute a source of competitive advantage, especially in

high-growth industries. Like these studies, we adopt an integrative theoretical framework to outline additional theories–i.e. corporate culture and legitimacy theories. Together with the agency theory, they will allow us to develop a set of hypotheses regarding the governance antecedents of the role of the CSR committee.

3.2.2 The Dual Role of Corporate Social Responsibility on Tax avoidance

The relevance of CSR performance has gained further credibility with the increased realization by firms of their ethical and moral duty to the wider society in which they exist (Freedman 2003; Porter and Kramer 2006; Williams, 2007; Avi-Yonah, 2008). Firms, therefore, represent more than simply a nexus of contracts as implied by the agency theory and should consider stakeholders other than shareholders as also being important to its ongoing operations (Ibrahim & Angelidis 1995; Ibrahim et al. 2003). Consequently, CSR structures by default are in place to pursue this duty to the wider society. However, on account of recent corporate scandals (e.g. Google, Amazon and Starbucks cases), questions arise on the effectiveness of CSR structures with regard to the roles which they play in corporate tax management. The extant literature theoretically emphasizes a dual role of CSR structures; although CSR structures may exist for ethical purposes–to promote societal interests–, they may serve as an instrument for concealing the societal exploitation firms may be engaging in (Hoi et al., 2013; Godfrey 2005; Mao, 2018).

Research has generally acknowledged and formalized the relevance of corporate culture in many corporate policies. Hermalin (2001) opines that corporate image is mainly shaped by a set of shared beliefs and conventions about the right (optimal) corporate behavior; corporate culture theory. Cronqvist et al. (2007) find evidence of a significant culture effect on policy choices in a study of a matched-pair sample of spinoff-parent firms. Also, Frank et al. (2011) show that aggressive financial policies and aggressive operating policies are related. Specifically, Fleischer (2007) finds that tax-sheltering activities and aggressive compensation

culture are related. On this premise, CSR can be viewed as the shared belief within an organization about the right course of action that takes into account the interests of the corporation's stakeholders and other externalized impacts of the company's activities (Kreps,1990; Hoi et al, 2013). Since corporate culture systematically affects corporate decisions (Kreps 1990; Hermalin, 2001; Fleischer 2007; Frank et al. 2011), we argue that ethical considerations from that direction may supersede the agency theory's requirement of placing the interest of the shareholder's interest (i.e. paying lesser taxes) paramount. It follows that CSR should influence corporate practices and subsequently mitigate tax avoidance activities that affect the government's claim on the firm and the welfare of the society. Thus, CSR structures play an ethical role in this case.

As an opposing view, the legitimacy theory has opened a new window for academics and practitioners to rethink an alternative role for CSR structures and activities. Under this perspective, firms could manage its positive CSR reputation to potentially mitigate the risk associated with negative corporate events. Notably, a positive CSR reputation is particularly important when negative corporate events occur because it provides some degree of insurance protection by increasing the likelihood of positive attributions from society's arbiters ''who then temper their negative judgments and sanctions toward firms because of this goodwill'' (Godfrey, 2005). So, as a pre-emptive measure, corporations may use CSR activities such as its disclosures on other positive societal engagements to legitimize their existence in the societies they exist (Lanis & Richardson, 2013) so as to insulate and hedge against intensive surveillance from stakeholders on their aggressive tax activities. As such, as firms legitimize their existence through other CSR activities, they may capitalize on such reputational capital to engage in tax aggressive strategies. The findings of Minor and Morgan (2011) that responsible CSR activities enhance firm reputation which in turns provides some degree of insurance protection against market, political, regulatory, and social sanctions risk when

negative corporate events occur substantiate this risk management argument. In this case, CSR structures are positively associated with tax avoidance.

3.2.3 Corporate Governance and Tax Avoidance

Overall, the evidence presented by the existing literature on the relationships among corporate governance elements and tax avoidance are mixed and advance inconclusive inferences. For instance, Minnick and Noga (2010) investigate whether several measures of corporate governance are associated with a variety of proxies intended to capture firms' level of tax avoidance but find little evidence of a link. Although Rego and Wilson (2012) reported that managerial risk-taking equity incentive is associated with tax avoidance, they fail to find evidence of any relation between other governance mechanisms and tax avoidance. Finally, Robinson et al. (2012) empirically demonstrated that audit committee financial expertise is positively associated with tax planning, but that this association is negative when tax planning is thought to be risky (i.e. aggressive).

As a point of departure from these studies, we re-examine the individual effects of our governance mechanisms in the light of the corporate risk-taking literature. Prior studies have reported a positive association between corporate tax avoidance and increases in firm risk-taking[1] (Rego and Wilson 2012; Robinson et al. 2012; Cozmei and Serban, 2014; Armstrong et al., 2015). Consistent with this view, Armstrong et al., (2015) described tax avoidance as one of many risky investment opportunities available to management. Furthermore, Hanlon and Heitzman (2010) state that ‘‘if tax avoidance represents a continuum of tax planning strategies where something like municipal bond investments are at one end, then terms such as ‘noncompliance,’ ‘evasion,’ ‘aggressiveness,’ and ‘sheltering’ would be closer to the other end of the continuum’’. These accounts lend credence to the fact that corporate tax avoidance can

[1] Measured by low cash effective tax rates or high reserves for unrecognized tax benefits. Notably, engaging in any form of tax-avoiding strategies generates hostility, cause reputational damage to the corporation and, at worst, the possible cessation of business operations (Landolf, 2006; Erle, 2008; Hartnett, 2008).

be perceived as a risk-taking activity with returns that commensurate with the aggressiveness of the strategy.

The effectiveness with which the board of directors undertakes its roles' is partly dependent on its size (Jensen, 1993, p. 865). Board size and its negative relation to corporate risk-taking is a common finding in the literature (Cheng, 2008; Pathan, 2009). Consistent with this, Minnick and Noga (2010) argue that small boards may be nimbler when making decisions to divert resources to tax management. Following this logic, we argue that a larger board will suffice to mitigate corporate tax avoidance activities (i.e. pay more cash tax). Specifically, given the complex considerations (risk, costs and potential benefits assessment) involved in tax management decisions (see Hanlon & Slemrod, 2009 p.127; Annuar et. al., 2014), a larger board is likely to offer a wider pool of expertise to understand and thoroughly deliberate against the terminal costs and significant uncertainty involved in aggressive tax strategies to the firm and society. We further argue that, although boards are set up mainly to pursue shareholder interests they are also strategically inclined to the future/long-term existence of the firm in the societies which is partly dependent on the firm's diligent engagement with the society. Based on these arguments we formally state our first hypothesis as follows:

> **Hypothesis 1**: *Board size is positively related to the payment of corporate tax (i.e. less tax avoidance)*.

Agency theory attributes the better monitoring potential of outside directors to their parallel goal to maintain a reputation in directorship market (see Peng, 2004; Fama and Jensen, 1983). This to an extent exposes a countervailing insight to the idea that independent directors solely pursue shareholder interests. For instance, Pathan (2009) and Laeven and Levine (2009) show that independent directors are risk attenuating due to the incentive to adhere to regulatory requirements which will signal their diligence to the managerial labour market. Consistent with this, Deutsch et al. (2011) describe independent directors as agents in their own regard who

maintain their own interests. We resort to this and argue that since task avoidance is generally considered unethical and its reputational costs span beyond the firm to its directors as well, independent directors are likely to monitor and control managers to engage in acts which will project a good corporate image to safeguard and increase their value in the directorship market. Therefore, we hypothesize that:

> **Hypothesis 2**: *Board Independence is positively related to the payment of corporate tax (i.e. less tax avoidance).*

Most studies in the economic and psychology literature support the notion that women are more risk averse than men in the general population (Eckel and Grossman 2004; Croson & Gneezy, 2009). Croson & Gneezy (2009)'s survey summarizes three possible explanations for this difference between genders when it comes to risk-taking behaviour. First, women are more likely to experience intense nervousness and fear than men in an uncertain situation. Second, women are less confident than men, which may affect the perception of the probability distribution underlying a risk. Finally, women tend to view risky situations as threats rather than challenges, which also lead to increased risk aversion. These pieces of evidence coincide with the findings of Francis et al., (2014) who reported that female CFOs are less likely to engage in tax-avoiding activities. Hence if females indeed have higher degrees of risk aversion, then we expect female board directors to be more cautious with tax-avoidance activities. Hence, we hypothesize that:

> **Hypothesis 3**: *Female board directors are positively related to the payment of corporate tax (i.e. less tax avoidance).*

CEO duality has been documented to proxy managerial power (Pathan, 2009; Hermalin and Weisbach, 1998). CEOs who control the activities of the board have more power or ability which entrenches them to compel board decisions to their favour. In addition, a powerful CEO could restrict the information flow (information asymmetric environment) to other board

directors, hence reducing the board's independent oversight of management. Resultantly, these give managers the incentive to engage in aggressive tax management with the principal aim of diverting the resulting rent at the detriment of other stakeholders. Besides managers may also seek to consolidate their positions by engaging in tax planning activities to increase the shareholder's wealth. Based on these, we hypothesize:

> ***Hypothesis 4****: CEO duality is negatively related to the amount of tax paid (i.e. more tax avoidance).*

3.2.4 Substitution and Complementary Roles of CSR Structures

Recent studies in the field of corporate governance acknowledge the interdependencies among governance mechanisms and the need for research to consider their interactive impact other than their individual impact: governance mechanism bundling effect (see Rediker & Seth, 1995: Zajac & Westphal,1994; Schepker & Oh, 2013; Oh et al., 2016). These authors opine that the inconsistent results pervasive in governance mechanisms and organizational outcomes literature are partly due to the failure to account for the moderating effect of simultaneously existing mechanisms. Furthermore, since each governance mechanism has unique characteristics, roles and focus towards protecting shareholder interest, Oh et al., (2016) conclude that firms will employ different combinations of mechanisms with similar or conflicting effects contingent on their own circumstances. Subsequently, mechanisms are bundled either as substitutes or complements under the rubric of a cost-benefit trade-off between the mechanisms employed. On one hand, mechanisms bundle as substitutes if there is a direct functional replacement of the first mechanism by the second to determine organizational outcomes. On the other hand, two mechanisms interact as complements if the presence of one mechanism strengthens the other resulting in a synergistic effect on organizational outcomes.

Motivated by this notion, our prior discussions in relation to the unresolved role of CSR structures could properly be examined from its interactive effects with other governance mechanisms. Based on our prior discussions, we could refer to the governance mechanisms argued to individually curtail corporate tax avoidance as "stakeholder-oriented governance mechanisms". Nevertheless, the agency theory suggests board mechanisms are primarily in place to prioritize[4] shareholder interest and serve as an immediate defense against wealth loss through its monitoring and advisory roles (Hermalin & Weisbach, 2001). Therefore, the discretion to pay democratically agreed taxes is severely constrained by shareholders' preference for more risk[5] (i.e. tax savings in this case) (see the review of Hoskisson et al., 2017). On one hand, shareholder-oriented governance mechanisms are faced with the task of maintaining a balance between serving the interests of owners and other stakeholders (government and society). We argue that, by using the CSR committee's as a means to legitimize their operations and build positive reputational capital through societal engagements other than tax payments, stakeholder-oriented governance mechanisms can facilitate tax avoidance activities to concurrently increase shareholder wealth. Conversely, when governance mechanisms are not stakeholder oriented–CEO duality–, we posit that this positive reputational capital resulting from the CSR committee risk management role becomes a vehicle that exacerbates managerial rent extraction. In an information asymmetric environment, the ethical efforts of an effective CSR committee may at best be rendered ineffective due to the deficiency in reliable information. Furthermore, more CEO power may weaken the oversight role of the board of directors as it presents managers the opportunity to appoint onto the CSR committee, directors who will facilitate their ulterior goal of rent extraction (Haniffa & Cooke,

[4] Consistent with this view, Section 172 of the UK Companies Act 2006 requires directors to promote the long-term success of the company for the good of the shareholders as a whole, and in that process have regard for the interests of other stakeholders (e.g. the environment, customers, suppliers, employees, community).

[5] Hoskisson et al., (2017) argue shareholders contrary to managers prefer more risk-taking which partly results from the moral hazard accompanying the limited liability status of corporations and deposit insurance schemes put in place to protect shareholders.

2002; Pathan 2009). Our argument coincides with Gallemore and Labro's (2015) finding that firms with opaque information environment encourage managerial rent extraction strategies which include tax management strategies. We, therefore, conclude our arguments with these hypotheses;

Hypothesis 5a: *The effect of CSR committees will substitute the effects of board size, board independence and female directorship to promote tax avoidance.*

Hypothesis 5b: *The effect of CSR committees will complement the effect of CEO duality to promote tax avoidance.*

On the other hand, Desai and Dharmapala (2006)'s agency theoretic model argue that tax avoidance and managerial rent extraction can be complementary. That is, increased managerial rent diversion results from increased incidence of tax avoidance which reduces corporate transparency. However, the authors further assume that well-governed firms are more likely to have internal control mechanisms (i.e. corporate culture theory) to prevent such diversions. As such, for firms with stakeholder-oriented governance mechanisms (board size, independence and female directorship), we maintain that the CSR committee will be an internal control measure that synergistically limits tax avoidance activities and any subsequent managerial rent diversions. Furthermore, auxiliary governance mechanisms such as independent directors will endogenously strengthen the potency of the CSR committees to demand accountability which in turns may also limit irresponsible corporate behaviour such as tax avoidance. Furthermore, if firms that maintain CSR committees are ethically oriented as the corporate culture theory suggests, then it appeals to conventional wisdom that the CSR committees may be genuinely limit tax avoidance practices regardless of the CEO power. In such a situation, the effect of the CSR committee attenuates the tax avoiding effect of powerful CEOs. Based on these ethical discussions on CSR committees, we hypothesize that;

Hypothesis 6a: *The effect of CSR committees will complement the effects of board size, board independence and female directorship to reduce tax avoidance (i.e. pay more tax).*

Hypothesis 6b: *The effect of CSR committees will substitute the effect of CEO duality to reduce tax avoidance (i.e. pay more tax).*

Figure 3.1 a: Conceptual Model: Risk Management Role of CSR Committees

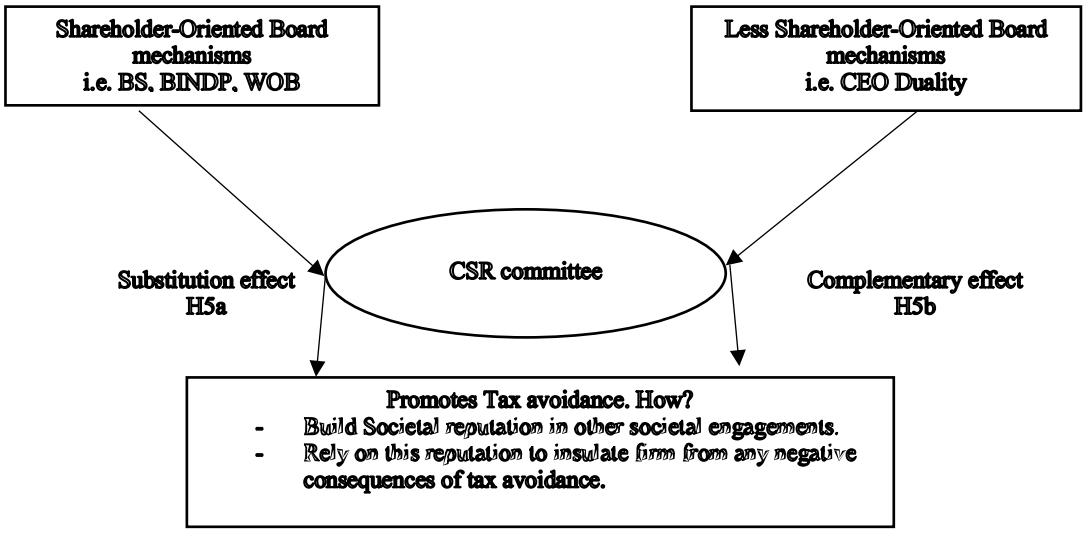
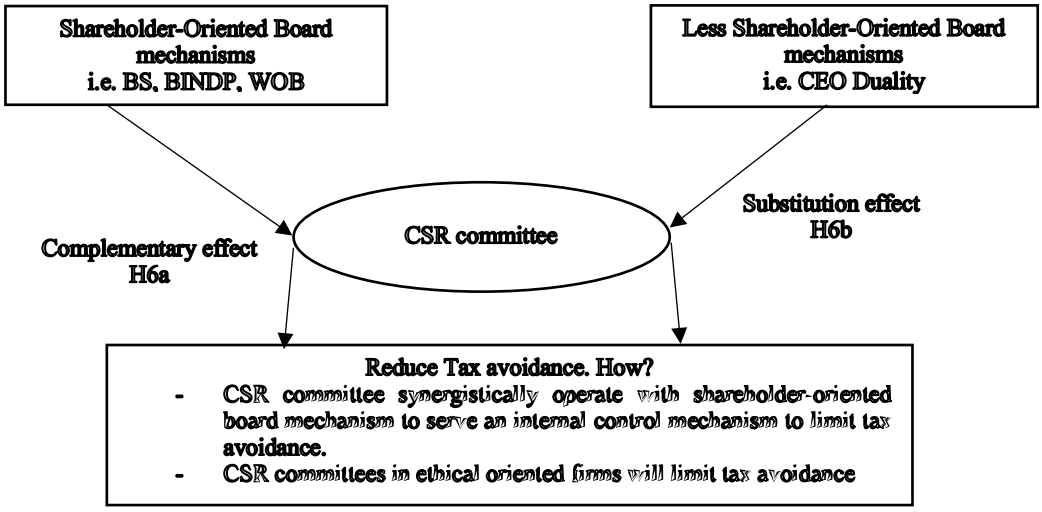


Figure 3.1 b: Conceptual Model: The Ethical Role of CSR Committees



3.3 Data and Econometric Methods

3.3.1 Sample and data

Our sample selection starts with all firms listed on Compustat US and Global for the 2003–2015 fiscal years for which we have data to compute at least one of the tax avoidance measures that we define below in Table 3.1. We further merged sequentially corporate governance and country-level data sourced from Thompson Reuters Asset4 and World Economic Forum Global Competitiveness Index (World Bank) databases using common identifiers such as Global Company Key (GVKEY) and Country ISO codes. Inferences from prior tax planning studies are based on samples that have excluded financial firms from their analysis due to differences in the treatment of some tax items (see Bayar et al., 2017; Hoi et al.,2003; Law & Mills, 2017). To bring our findings at par with these earlier studies and further demonstrate their generalizability across industries regardless of any differences in tax treatments, we filtered our search to exclude firm-year observations of financial institutions. We then retained firm-year observations for which we have data available for our control variables (defined in Table 1). Also, firm-years for which we did not have data available for our corporate governance variables were dropped. Finally, we systemically eliminated firms with missing GVKEYs and ISO codes to overcome the confounding challenges they pose to the panel structure of our data: appropriate year observations could not be matched appropriately. This yields a final sample of between 15,097 and 24,785 firm-year observations of 4,773 firms depending on the measure of tax avoidance used as a dependent variable.

Panels A to D of Table 3.1 report the descriptive statistics for all the variables used in our analysis including measures of tax avoidance, governance and the control variables.

3.3.2 Dependent variable: Tax avoidance measures

Following Dyreng et al., (2008), we define tax avoidance broadly to encompass all actions that reduce a firm's taxes relative to its pretax accounting income. We, therefore, use multiple measures to triangulate our results for two reasons; either the robustness of the results is confirmed by their consistency across various measures or any differences in the results across various measures will open up new avenues to assess and further understand the relations.

Given our focus, we are most interested in empirical proxies that could capture the general outlook of a corporation's tax engagements. Hence, we use Cash and GAAP effective tax rates (ETRs) as our main and sensitivity check measures of corporate tax avoidance respectively. We rely on these limited measures of tax avoidance because of measurement objectivity across different jurisdictions. In addition, their availability for most firm-years maintains parsimony (data loss) to facilitate the conduct of generalizable analyses.

Cash ETR is documented to capture consequences of broad tax avoidance practices and defined as income taxes paid, divided by pre-tax income minus special items (Kim et al., 2011; Law and Mills 2017). GAAP ETR equals income tax expense, divided by pre-tax income minus special items. Cash ETR and GAAP ETR represent different sources of explicit tax avoidance behaviours. While the Cash ETR captures all sources of non-conforming tax avoidance, including temporary differences between book and taxable income, permanent differences, credits, and applicable national tax rates, the GAAP ETR ignores them. Moreover, the former depends on the actual timing of cash flow, whereas the latter captures tax avoidance measures that impact earnings through income tax expense. Guenther et al. (2014) account that to the extent that financial accruals management increases the pre-tax income denominator, Cash ETR could falsely indicate tax avoidance, but the GAAP ETR would not be affected. As such, our use of GAAP ETR to triangulate our results is justified. Finally, we truncate our computed CETRs at [0,1] to avoid the influence of outliers (Gupta & Newberry 1997; Francis et al.,2014).

Consistent with Law and Mills (2016), we would expect a lower ETR to indicate more tax aggression.

3.3.3 Measures of independent variables: Governance measures

Since this study also aims to examine the effect of corporate governance mechanisms on tax aggressiveness, our primary research design employs measures that closely indicates the orientation of the board as stakeholder focused or not (per the discussion in the preceding section). Our five governance mechanisms are; board size, board independence, women directorship, CEO duality and CSR committee. Board size (BS) is measured as the number of directors on the board at the end of the year. Board independence (BINDP) is operationalized as the proportion of board directors without any material or pecuniary relationship with the bank, except the board seat. Women directorship (WOB) represents the proportion of board directors who are females. CEO duality (CEO_DUA) is an indicator variable which equals to 1 when CEO chairs the board and 0 otherwise. Finally, we operationalize CSR structures as a dummy variable, CSR_COM, coded as 1 if the firm has a committee designated for CSR activities and 0 otherwise.

3.3.4 Control variables: Firm and county level characteristics

We control for several firm-specific characteristics, which the finance and accounting literature have shown to affect tax avoidance practices (Mills 1998, Manzon & Plesko 2002; Frank et al. 2009; Chen et al. 2010; Dyreng et al., 2010; Francis et al., 2014; Law & Mills, 2017; Bayar et al., 2017). They include return on assets (ROA) in year *t* (operating income scaled by lagged total assets); the value of property, plant, and equipment (PPE) in year *t* scaled by lagged total assets; intangible assets (INTANG) in year *t*, scaled by lagged total assets; firm size (SIZE) at year *t* (natural logarithm of total assets) and cash holdings (CASH_HLDN) at year *t* (cash balance scaled by total book value of assets). These control variables can be broadly

classified into three categories. The first group includes firm size and growth opportunities (SIZE and cash holdings). The second group, which consists of property, plant, and equipment, equity income and intangible assets controls for differences between the book and tax reporting elements that can influence the amount of tax paid. The last group controls for firms' operations and profitability. These include return on assets and cash holdings. Our firm-level variables are measured in year t, because Chen et al. (2010) demonstrated that these variables correlate with firms' tax avoidance contemporaneously.

Studies suggest that differences in institutional and economic environments across countries affect corporate tax avoidance behavior (Atwood et al., 2012), perceptions on the importance of corporate ethics and CSR (Riahi-Belkaoui, 2004; Shafer, Fukukawa, & Lee, 2007) and attitudes toward CSR (Muller & Kolk, 2015). For this reason we control for the tax avoidance effects of any differences in the quality of institutions, levels of financial development, levels of economic development and investor protection rights, we use the governance effectiveness index (WGI) [6], standardized foreign direct investment inflow (FDI), the log of the annual gross domestic product per capita (GDP) and the strength of investor protection index (INV_PRO).[7] By controlling for these firm and country level effects, we circumvent to a greater extent endogeneity concerns which may emanate from omitted variable bias. Panel E of Table 1 defines the construction of our variables.

3.3.5 Empirical method and model

To test our hypotheses, we specify the following generic model that links our measures of tax avoidance to our governance, CSR, firm and country level control variables:

[6] Government Effectiveness captures perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies. These resultantly determine the soundness and uncertainty of the economic environment which entity operate. Percentile rank indicates the country's rank among all countries covered by the aggregate indicator, with 0 corresponding to the lowest rank, and 100 to the highest rank. Percentile ranks have been adjusted to correct for changes over time in the composition of the countries covered by the WGI.

[7] The strength of investor protection index is an average of 3 indices--the extent of disclosure index, the extent of director liability index, and the ease of shareholder suit index. The index ranges from 0 (little to no investor protection) to 10 (greater investor protection). The data are from a survey of corporate lawyers and are based on securities regulations, company laws and court rules of evidence.

$$\boldsymbol{y_{i,t}} = \boldsymbol{\alpha} + \boldsymbol{\beta X_{i,t}} + \boldsymbol{\theta D_{i,t}} + \boldsymbol{\gamma Z_{i,t}} + \boldsymbol{\eta_{i,t}} + \boldsymbol{\varepsilon_{i,t}} \qquad (2)$$

The subscripts *i* identifies individual firms, *t* the time period (*t*=2003, 2001,…, 2015). $\boldsymbol{y_{i,t}}$ is our measure for tax avoidance which could either be CETR or GETR. $\boldsymbol{X_{i,t}}$ represents our variables of interest and includes board size (BS), board independence (BINDP), female directorship (WOB), CEO duality (CEO_DUA) and CSR committee (CSR_COM). $\boldsymbol{Z_{i,t}}$ includes our firm and country level control variables; return on assets (ROA), property, plant, and equipment (PPE), intangible assets (INTANG), firm size (Size), cash holdings (CASH_HLDN), governance effectiveness index (WGI), level of financial development (FDI) and gross domestic product per capita (GDP). At any point, $\boldsymbol{D_{i,t}}$ is an interaction term between CSR committee and another governance mechanism (i.e. board size, board independence, female directorship and CEO duality). η_i and $\varepsilon_{i,t}$ represent the time-invariant unobserved firm-specific factor and the idiosyncratic error term respectively. Finally, we control for year fixed effects (FE). Year FEs rid our estimates from bias resulting from annual exogenous shocks in the firms' operating environment which might have an effect on its tax management decisions yet could not be captured explicitly by our model. For example, spontaneous changes in tax legislation.

We initiate our analysis with an initial examination of the individual effects of our corporate governance mechanisms on tax avoidance using univariate analyses. Afterward, the focus of the analysis is shifted towards the examination of the bundling (interaction) effects using a multivariate regression analysis when the independent variables are CETR and GETR respectively. We examined closely the interaction effects using a common complementarity or substitution assessment model in the field of economics (see Appendix 1). The resulting simple slopes are plotted at 1 standard deviation below and above the mean of CSR_COM as Aiken and West (1991) recommend.

3.4 Results

3.4.1 Summary statistics and correlation matrix

We report the summary statistics of all variables in Panels A to D of Table 1. Due to data requirements in the estimation procedures, the firm-year observations for our dependent variables vary significantly from 15,097 to 24,785 for CETR and GETR respectively. Our sample statistics for tax avoidance measures are comparable to those in the extant literature. The mean (median) value of CETR is 0.24 (0.22), which is comparable to the 0.25 (0.24) reported by the studies of Hoi et al., (2013). GETR reports a mean (median) of 0.28 (0.28) which is comparable to one report by Dyreng et al., (2010). In dollar terms, by reducing tax liability by 1% of pretax income of an average firm can result in savings of about $2.97 million per year (mean pretax income in our sample is about $297 million). Thus, saving cash taxes by a few percentage points can have a significant positive impact on a firm's profitability and incentivize agents (directors and managers) to engage in tax planning. Compared to their means, the standard deviation of CETR and GETR are about 0.183 and 0.16 respectively, indicating that some firms avoid taxes significantly more than others.

On average, Panel B indicates that our sample firms on average regard 49% of their board members as independent. Globally, the average board has approximately ten members of which approximately 12% could be women. Also, 46.7% of our sample firms have committees designated for CSR purposes. In addition, 59.4% of our sample firms have their boards being chaired by the CEO. The mean and percentile statistics presented under Panels C and D inform that our sample firms are variably operating in environments with considerable differences in the levels of financial, economic and institutional development and are individually different in terms of size, performance, operational and growth opportunities. Overall, it can be concluded from Table 1 that our empirical analysis is based on a very heterogeneous sample of firms.

Table 3. 1: Descriptive Statistics and Variable Definitions

Variable	N	Mean	Std. Dev.	Percentile P25	P50	P75	Min.	Max.
Panel A: ***Tax Avoidance Measures***								
CETR	15,097	0.24	0.183	0.121	0.220	0.314	0	1
GETR	24,785	0.28	0.160	0.191	0.281	0.353	0	1
Panel B: ***Governance Characteristics***								
CSR_COM	24,785	0.467	0.498	0	0	1	0	1
BS	24,785	10.36	3.528	8	10	12	1	37
WOB (%)	24,785	12.20	11.56	0	11.11	20	0	85.71
BINDP (%)	24,785	49.41	30.62	20.92	51.72	79.37	0.55	95.28
CEO_DUA	24,785	0.594	0.513	0	1	1	0	1
Panel C: Firm level Control								
PPE	24,785	0.565	0.533	0.157	0.446	0.862	0	5.545
INTANG	24,785	0.180	0.238	0.011	0.075	0.273	0	1.733
SIZE	24,785	9.576	2.641	7.77	9.10	11.04	0	24.484
ROA (%)	24,785	0.092	0.078	0.036	0.073	0.125	0	0.467
CASH_HLDN	24,785	0.098	0.103	0.028	0.065	0.131	0	0.998
Panel D: ***Country level controls***								
FDI (in Billions)	24,785	2.320	4.176	0	0	3.962	-36.7	34.5
GDP	24,785	23.55	1.873	22.24	23.00	24.65	19.584	29.456
INV_PRO	24,785	3.01	2.53	0	4	5	0	7.7
WGI	24,785	60.67	35.49	20.38	77.03	95.12	0.948	99.52

This table describes the variables used in the study.

Panel E: Variable Definitions:

Cash ETR (CETR)	= the cash effective tax rate, defined as cash paid for income taxes scaled by the pre-tax book income (net of special items).
GAAP ETR (CETR)	= the financial accounting effective tax rate, defined as the ratio of total tax expenses to pre-tax book income.
CSR Committee (CSR_COM)	= a binary variable equalling 1 if the firm has a CSR committee and 0 otherwise.
Board Size (BS).	= the number of directors on the board at the end of the financial year.
Board Independence (BINDP)	= the proportion of board directors without any material or pecuniary relationship with company, except the board seat.
Female Directorship (WOB)	= the percentage of board directors who are women.
CEO Duality (CEO_DUA)	= a dummy variable coded as 1 if the CEO of a firm serves as the chair of the BoD and 0 otherwise.
Plant Property & Equipment (PPE)	= gross property, plant & equipment scaled by lagged total assets.
Intangible Assets (INTANG)	= the ratio of total intangible assets scaled by lagged total assets.
Firm Size (SIZE)	= log of total book value of assets as reported in the financial reports
Return on Assets (ROA)	= net income divided by total assets expressed as a percentage.
Cash Holdings (CSH_HLDN)	= is the balance of cash scaled by total assets
Level of Financial Dev. (FDI)	= standardized value of a country's annual foreign direct investment inflow
Gross Domestic Product (GDP)	= log of gross domestic product of the country the firm is located in.
Investor Protection Index (INV_PRO)	= scored on a 1-10 scale to indicate the extent of a country's corporate disclosure, director liability and ease of shareholder suits.
Governance Effectiveness (WGI)	= An index measuring the institutional strength/effectiveness of a country.

Table 2–correlation matrix– offers some initial empirical support for our hypotheses 1, 3 and 4. Specifically, board size and female directorship are both positive and significantly correlated with the ETRs while CEO_DUA reports a negative significant correlation with the ETRs. Furthermore, the positive correlations between CSR committee and ETRs (0.022 and 0.036) emphasize CSR committees as an ethical structure to promote corporate tax payments. With regards to our country-level variables, while it is counter-intuitive that firms in high economic and financially developed countries may be paying less tax, the negative correlation between INV_PRO and GETR (-0.06) is consistent with the argument that in countries with strong investor protection, managers may use their reporting discretion to misstate their firm's performance which may facilitate paying lesser taxes (Leuz et al.,2003).

Also, it is worth noting that several of our control variables are strongly correlated[8] with each other and their inferences appeal to economic intuition. Most notably, the positive correlation between CSH_HLDN and ROA (0.334) further substantiates the negative correlation observed between ROA, CSH_HLDN and the ETRs. Together, these may explain that the higher cash holdings of profitable firms may be resulting from tax planning activities. Finally, WGI exhibits a significant positive correlation with ROA (0.053) to emphasize the importance of strong institutions for corporate performance.

3.4.2 Univariate Test Results

If our hypotheses1-4 are well argued for, we would expect our proposed relationships to be supported within varying levels of our corporate governance variables. For instance, firms with higher levels of board independence must exhibit lower levels of tax avoidance than firms with lower levels of board independence. Likewise, we would expect a higher proportion of firms

[8] Multicollinearity among the regressors should not be a concern as the maximum value of the correlation coefficient is 0.63. Furthermore, in a multivariate setting, the average variance inflation factor (VIF) for our models is between 1.75 and 3.08, which falls below the conventional threshold of 10 (Hair et al. (2006).

Table 3. 2:Correlation Matrix

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1. CETR	1.000															
2. GETR	0.340***	1.000														
3. CSR_COM	0.022**	0.036***	1.000													
4. BS	0.048***	0.045***	0.158***	1.000												
5. BINDP	-0.008	-0.004	-0.014*	-0.153***	1.000											
6.WOB	0.037***	-0.007	0.151***	0.049***	0.301***	1.000										
7. CEO_DUA	0.011	-0.064***	0.055***	-0.050***	-0.184***	-0.012†	1.000									
8. PPE	0.007	-0.002	0.005	-0.004	-0.008	-0.004	0.009	1.000								
9. INTANG	0.005	0.003	-0.002	-0.004	-0.007	0.004	0.010	0.510***	1.000							
10. SIZE	0.024**	0.081***	0.207***	0.309***	-0.301***	-0.184***	-0.005	0.048***	0.039***	1.000						
11. ROA	-0.052**	-0.041***	-0.049***	-0.166***	0.076***	0.039***	-0.030***	0.004	-0.000	-0.301***	1.000					
12. CSH_HLDN	-0.021*	-0.025***	-0.092***	-0.159***	-0.049***	-0.073***	-0.016*	-0.004	-0.009	-0.173***	0.334***	1.000				
13. FDI	-0.019*	-0.035***	0.011†	0.126***	-0.098***	-0.003	0.044***	-0.003	-0.004	0.009	-0.04***	-0.06***	1.000			
14. GDP	0.011	-0.019**	0.061***	-0.084***	-0.294***	-0.156***	0.147***	0.017**	0.009	0.238***	-0.03***	0.044***	-0.25***	1.000		
15. INV_PRO	0.026**	-0.060***	0.106***	-0.001	-0.513***	-0.159***	0.323***	-0.001	0.004	-0.231***	-0.071***	0.005	0.114***	0.629***	1.000	
16. WGI	-0.005	-0.004	-0.075***	0.101***	0.449***	0.157***	-0.313***	-0.002	0.003	-0.076***	0.053***	-0.05***	-0.10***	-0.18***	-0.58***	1.000

The table reports pairwise correlations for the variables used in the empirical analysis. Cash ETR for firm *i* at time *t* is computed according to Dyreng et al's (2010): the cash paid for income taxes divided by pre-tax income (net of special items). GETR is the financial accounting effective tax rate, defined as the ratio of total tax expenses to pre-tax book income. CSR $\text{Committee}_{i,t}$ is an indicator variable represented as 1 if firm *i* in period *t* has a committee designated for CSR activities and 0 otherwise. Board $\text{Size}_{i,t}$ refers to the number of directors on the board at the end of the financial year. Board $\text{Independence}_{i,t}$ is the proportion of board directors without any material or pecuniary relationship with company, except the board seat. Female $\text{Directorship}_{i,t}$ is measured as the proportion of directors who are women. CEO $\text{Duality}_{i,t}$ is a dummy which equals 1 if the CEO of the firm is the chairman of the board and 0 otherwise. The control variables are defined as follows: Financial $\text{Development}_{i,t}$ is the standardized value of a country's annual foreign direct investment inflow Return on assets is the ratio of net income to total assets, Property plant and equipment is the gross value property, plant & equipment scaled by lagged total assets, Intangible Asset is measured as the ratio of total intangible assets scaled by lagged total assets, Cash Holdings is the cash balance scaled by lagged total assets, Size is measured as the logarithm of total assets, GDP is the log of gross domestic product of the country the firm is located in, Strength of Investor Protection is an index scored on a 1-10 scale to indicate the extent of a country's corporate disclosure, director liability and ease of shareholder suits and Governance Effectiveness is an index measuring the institutional strength/effectiveness of a country. Superscripts †, *, **, *** indicate statistical significance at 10%, 5%, 1% and 0.1% levels, respectively.

Table 3. 3: T-test and Wilcoxon/Mann Whitney tests of difference in Means

	CASH ETR			GAAP ETR		
	High N=7,548	Low N=7,549	High–Low	High N=12,393	Low N=12,392	High–Low
Independent Variables						
Board Size	10.29	10.04	0.238***(0.049)	10.45	10.26	0.176*** (0.045)
Board Independ.(%)	59.05	58.12	0.932* (0 .521)	50.94	47.89	3.04*** (0.388)
WOB (%)	14.44	13.05	1.391***(0.181)	12.36	12.05	0.31* (0.146)
CEO Duality	0.527	0.538	-0.010 (0.013)	0.541	0.648	-0.107*** (0.006)
CSR Committee	0.443	0.435	0.008 (0.008)	0.471	0.464	0.006 (0.006)
Control Variables						
Intangible Assets	0.511	0.253	0.257 (0.166)	0.353	0.314	0.038 (0.107)
Size	8.78	8.81	0.037 (0.029)	9.60	9.55	0.049 (0.033)
ROA (%)	0.104	0.086	0.017***(0.001)	0.097	0.088	0.009*** (0.001)
Cash Holdings	0.098	0.104	0.006***(0.002)	0.095	0.101	-0.006*** (0.001)
GDP	23.20	23.24	0.043 (0.028)	23.41	23.68	0.277*** (0.024)
Investor Protection	2.12	2.20	-0.084* (0.041)	2.64	3.37	-0.724*** (0.032)
Financial Develop.	1.51	1.60	-0.09 (0.061)	2.11	2.53	-0.418*** (0.053)
Gov. Effectiveness	72.22	69.90	2.33 (0.549)	62.87	58.47	4.397***(0.449)

The table reports the results of two-tailed t-tests and Wilcoxon rank-sum tests for the null hypothesis that there is no difference in the means between firms with high and low corporate tax avoidance. The high and low corporate tax avoidance sub-samples consist of corporations whose annual reported ETRs are above and below the annual median ETR respectively. CETR is the cash paid for income taxes divided by pre-tax income (net of special items). GETR is the financial accounting effective tax rate, defined as the ratio of total tax expenses to pre-tax book income. Superscripts †, *, **, *** indicate statistical significance at 10%, 5%, 1% and 0.1% levels, respective.

who engage in higher levels of tax avoidance to have CEOs who concurrently serve as the board chairman compared to the group of firms who engage in lower levels of tax avoidance.

We, therefore, classify the sample firms as high and low tax-avoiding firms if their computed ETRs are below and above the sample median ETRs respectively. Finally, we compare the mean values of the high and low tax avoidance groups across our strong and weak corporate governance proxies. Results of this univariate test are reported in Table 3 and shows that on average firms with low tax avoidance (high ETRs) have on average larger boards, 3.04% more independent directors, 1.39% more female directors than firms with high tax avoidance (Low ETR). Table 3 also shows that firms with low ETRs have 10.7% more of their CEOs serving as the chairman of their boards than their counterparts with high ETRs. Finally, Table 3 shows no systematic differences in the proportion of high tax paying firms who maintain CSR committees and low tax paying firms across both measures of tax avoidance (CETR and GETR). This offers evidence that CSR committees are not solely purported as ethical structures as traditionally theorized and implied by the correlation matrix in Table 2. Hence, the aim of this study to understand the

conditions under which the CSR committee serves either as an ethical or risk management structure is offered empirical substantiation.

Regarding our control variables, the univariate test in Table 3 indicates that tax avoiding and non-tax avoiding firms are not different in terms of size and intangible assets. Furthermore, consistent with the result from the correlation matrix, firms that pay less tax are situated in jurisdictions with high investor protection. Finally, low tax-avoiding firms have better economic and institutional environments. Overall, for both measures of tax avoidance, the results of our univariate analysis consistently lend preliminary support to hypotheses 1, 2, 3 and 4. We undertake further analysis to check if these relations envisaged from the summary, correlation tables and univariate tests are substantive in a multivariate setting.

3.4.3 Multivariate Analysis: OLS Regression Results

Using the CETR as a dependent variable, Table 4 presents the Ordinary Least Square regression estimates of the complement versus substitute tests. Model 1 includes our control variables and the main effects of the corporate governance measures. Models 2 to 5 which report the sequential interaction effects of CSR committees and a corporate governance mechanism further allows us to examine the validity of hypotheses 5 and 6.

The positive and significant coefficients of BS $(\beta = 0.00272, p < 0.001)$ and WOB $(\beta = 0.000509, p < 0.001)$ in Model 1 reaffirm the findings from the univariate analysis, that board size and female board directors limit corporate tax avoidance activities. This results in addition to also being consistent in Models 2-5, is consistent with our argument that larger boards are likely to be more endowed expertise-wise to understand and thoroughly deliberate against the significant uncertainty and terminal costs associated with the firm's engagement in tax avoidance strategies. Likewise, female directors are more cautious with tax-avoidance activities due to the risk-averse inclinations. Therefore, using CETR as a dependent variable, we ascertain consolidatory support for our hypotheses 1 and 3.

In Model 2, the interaction term between CSR_COM and our first governance mechanism (BS) is positive and significant ($\beta = 0.00332,\ p < 0.01$). An additional simple-slope test indicates that the relationship between BS and CETR was not significant when CSR_COM was low but was significant when CSR_COM was high ($\text{simple slope} = -0.029, p < 0.05$). A graphical representation of this results by figure 1 depicts that, having a CRS committee in addition to an increasing board size will marginally increase CETR and vice versa. This result confirms a complementary effect between the two variables to lend support for our hypothesis 6a for the case of board size. Therefore, increasing board membership facilitates the CSR committee's role as an ethical structure to promote corporate tax payment. We offer an explanation for this result: board size endogenously determines the structure/constituent of other board level mechanism (Hermalin & Weisbach, 2001) of which the CSR committee is no exception. This also is affirmed by the positive and significant correlation between BS and CSR committee (0.158) in Table 2. As such, we maintain that the strategic goal or agenda of the entire (large) board to pay the right amount of taxes is consequently crusaded by a CSR committee which was formed from it. Hence this strategic alignment of ethical agenda between the entire board and CSR may propagate the observed synergistic effect which limits corporate tax avoidance activities.

The coefficient of the interaction term, ($\text{CSR_COM} \times \text{BINDP}$) in Models 3 is negative and significant ($\beta = -0.000314,\ p < 0.01$). An inspection of the slope of the graphical representation of this reported relationship in figure 2 confirms CSR committee and board independence as substitutes in determining the level of CETR. That is, when CSR committee was low, the assessed relationship between BINDP and CETR is significant ($\text{simple slope} = 0.019, p < 0.01$), but this relationship becomes insignificant when CSR_COM was high. Hence, for the case of independent directors, our hypothesis 5a is well argued for and demonstrated. Intuitively this informs that although independent directors may generally promote cash tax payment to safeguard external reputations, they rely on the risk management role of the CSR

Table 3. 4: Main Results
OLS REGRESSION ESTIMATES: Corporate Governance, CSR and Corporate Tax Avoidance

	Dependent Variable: Cash Effective Tax Rate (CETR)				
	Model1	Model2	Model3	Model4	Model5
δ_1 FDI	-0.0065***	-0.0065***	-0.0065***	-0.0065***	-0.0064***
	(0.0018)	(0.0018)	(0.0018)	(0.0018)	(0.0018)
δ_2 PPE	0.00001†	0.00001†	0.00001	0.00001 †	0.00001 †
	(0.000004)	(0.000004)	(0.000004)	(0.000004)	(0.000004)
δ_3 INTANG	0.00001	0.00001	0.00002	0.00001	0.00001
	(0.00002)	(0.00002)	(0.00002)	(0.00002)	(0.00002)
δ_4 SIZE	-0.0011	-0.0011	-0.0008	-0.0011	-0.0010
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
δ_5 ROA	-0.0876***	-0.0893***	-0.0867***	-0.0881***	-0.0882***
	(0.0228)	(0.0228)	(0.0228)	(0.0228)	(0.0228)
δ_6 CSH_HLDN	-0.0028	-0.0046	-0.0027	-0.0027	-0.0021
	(0.016)	(0.016)	(0.016)	(0.016)	(0.016)
δ_7 GDP	-0.0046**	-0.0047**	-0.0046**	-0.0046**	-0.0045**
	(0.0014)	(0.0014)	(0.0014)	(0.0014)	(0.0014)
δ_8 INV_PRO	0.0046***	0.0046***	0.0046***	0.0046***	0.0046***
	(0.0012)	(0.0012)	(0.0012)	(0.0012)	(0.0012)
δ_9 WGI	0.0001*	0.0001†	0.0001†	0.0001*	0.0001*
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)
β_1 CSR_COM	0.0007	-0.0326**	0.0189**	-0.0026	-0.0056
	(0.0032)	(0.0113)	(0.0072)	(0.0052)	(0.0044)
β_2 BS	0.0027***	0.0012	0.0026***	0.0027***	0.0028***
	(0.0006)	(0.0008)	(0.0006)	(0.0006)	(0.0006)
β_3 BINDP	0.00003	0.00004	0.0002*	0.00003	0.00003
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)
β_4 WOB	0.0005***	0.0005***	0.0005***	0.0004*	0.0005***
	(0.0001)	(0.0001)	(0.0001)	(0.0002)	(0.0001)
β_5 CEO_DUA	0.0009	0.001	0.0007	0.0009	-0.0033
	(0.0031)	(0.0031)	(0.0031)	(0.0031)	(0.0038)
θ_1 CSR_COM × BS		0.0032**			
		(0.0011)			
θ_2 CSR_COM × BINDP			-0.0003**		
			(0.0001)		
θ_3 CSR_COM × WOB				0.0002	
				(0.0003)	
θ_4 CSR_COM × CEO_DUA					0.0116*
					(0.0057)
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes
Constant	0.271***	0.288***	0.262***	0.273***	0.270***
	(0.0331)	(0.0336)	(0.0334)	(0.0333)	(0.0331)
Adjusted R^2	0.0200	0.0207	0.0206	0.0201	0.0203
F-Statistics	11.56***	11.42***	11.42***	11.16***	11.25***
Observations	15,097	15,097	15,097	15,097	15,097

Standard errors in parentheses
† p<0.10, * p<0.05, ** p<0.01, *** p<0.001

The table reports the estimates of six alternative versions of the following panel regression specification:

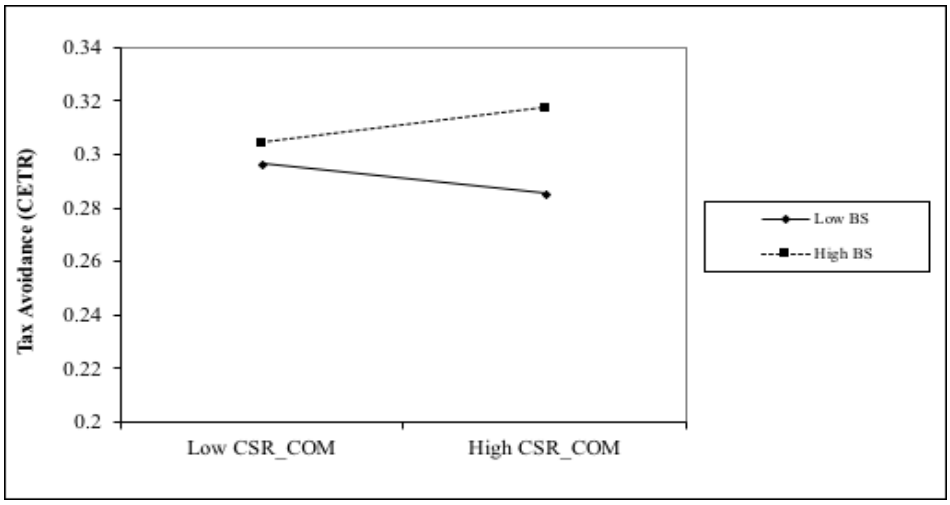
$$\begin{aligned}\text{Cash ETR}_{i,t} = {} & \alpha + \beta_1(\text{CSR Committee})_{i,t} + \beta_2(\text{Board Size})_{i,t} + \beta_3(\text{Board Independence})e_{\ i,t} + \beta_4(\text{Female Directorship})_{i,t} \\ & + \beta_5(\text{CEO Duality})_{i,t} + \theta D_{i,t} + \delta_1(\text{Financial Development})_{i,t} + \delta_2(\text{Property Plant and Equipment})_{i,t} \\ & + \delta_3(\text{Intangible Assets})_{i,t} + \delta_4(\text{Size})_{i,t} + \delta_5(\text{Return on Assets})_{i,t} + \delta_6(\text{Cash Holdings})_{i,t} \\ & + \delta_7(\text{GDP Per Capita})_{i,t} + \delta_8(\text{Strength of Investor Protection})_{i,t} + \delta_9(\text{Governance Effectiveness})_{i,t} \\ & + \sum_{y=2015}^{2006} \omega_y \text{Year}_i^y + \varepsilon_{i,t}\end{aligned}$$

where the dependent variable Cash ETR for firm *i* at time *t* is computed according to Dyreng et al's (2010): the cash paid for income taxes divided by pre-tax income (net of special items). CSR $\text{Committee}_{i,t}$ is an indicator variable represented as 1 if firm *i* in period *t* has a committee designated for CSR activities and 0 otherwise. Board $\text{Size}_{i,t}$ refers to the number of directors on the board at the end of the financial year. Board $\text{Independence}_{i,t}$ is the proportion of board directors without any material or pecuniary relationship with company, except the board seat. Female $\text{Directorship}_{i,t}$ is measured as the proportion of directors who are women. CEO $\text{Duality}_{i,t}$ is a dummy which equals 1 if the CEO of the firm is the chairman of the board and 0 otherwise. The control variables are defined as follows: Financial $\text{Development}_{i,t}$ is the standardized value of a country's annual foreign direct investment inflow Return on assets is the ratio of net income to total assets, Property plant and equipment is the gross value property, plant & equipment scaled by lagged total assets, Intangible Asset is measured as the ratio of total intangible assets scaled by lagged total assets, Cash Holdings is the cash balance scaled by lagged total assets, Size is measured as the logarithm of total assets, GDP is the log of gross domestic product of the country the firm is located in, Strength of Investor Protection is an index scored on a 1-10 scale to indicate the extent of a country's corporate disclosure, director liability and ease of shareholder suits and Governance Effectiveness is an index measuring the institutional strength/effectiveness of a country. Year_i^y is a dummy variable for fiscal year y to reduce endogeneity bias resulting from unobserved heterogeneous fixed effect. The reported adjusted R^2s are the overall R^2s which account for the explanatory power of the covariates on our dependent variables. The t-statistics (reported in parentheses) are based on robust standard errors to adjusted for heteroskedasticity. Superscripts †, *, **, *** indicate statistical significance at 10%, 5%, 1% and 0.1% levels, respectively. The F-test reported shows the overall validity of our specified models 1-6.

committees to concurrently pursue their primary goal of increasing shareholder wealth.

Specifically, savings resulting from paying lesser taxes increase shareholder wealth when re-invested or paid as dividends. We envisage that independent directors may achieve this through extensive monitoring and advocacy for firm's engagement in other CSR activities other than cash tax payment. Consequently, this builds the needed positive CSR reputation to insulate firms from the risk that comes with the payment of less than required taxes. Further examination of the coefficients of BINDP and its interaction with CSR_COM concludes provocative inferences. BINDP significantly enters our group of regressions positively only when it's included in the regression together with its interaction with CSR_COM. This shows that independent directors pursue stakeholder (society and government) interests with regard to tax payment only when there is a CSR committee in place to facilitate a balance between that and their primary duty of pursuing owners interest. By offsetting the coefficients against each other ($0.000164 - 0.000322 = -0.000158$), it is economically evident that shareholder's interest is of more concern to independent directors. Together, we gather convincing empirical evidence to suggest that independent directors use CSR committees to attain a balance in their efforts to meet the interests of all stakeholders (i.e. society, government and shareholders).

Figure 3.2: Complementary Effect of Board size and CSR committee on Corporate Tax Avoidance



However, the interaction term between female directorship and CSR committees (CSR_COM × WOB) in Model 4 of Table 4 is not statistically significant. Institutional theory suggests that firms may appoint female directors for several reasons. At a first glance, this seems like a case of coercive isomorphism (Meyer and Rowan 1977). That is, firms may have appointed female directors to influence corporate tax planning merely because of mandatory regulations and public advocacy for gender diversified corporate organizational structure.

Figure 3.3: Substitution Effect of Board Independence and CSR committee on Corporate Tax Avoidance

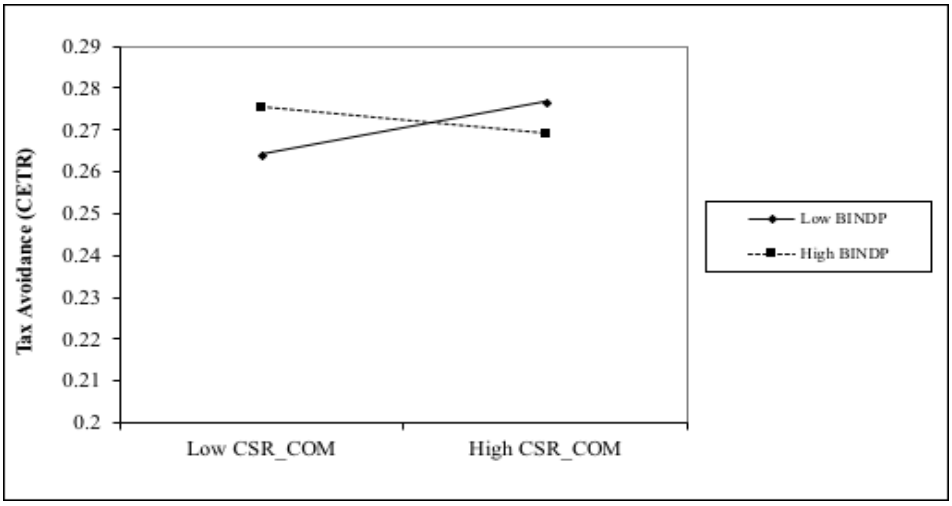
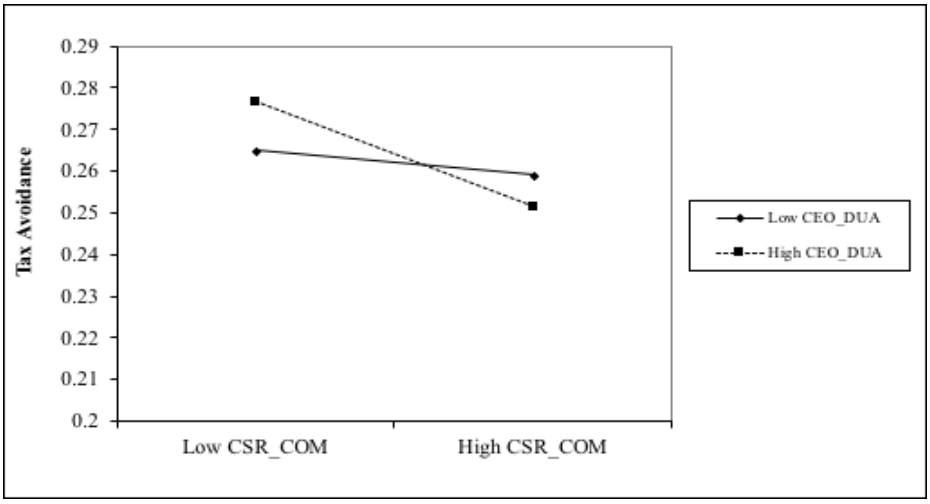


Figure 3.4: Substitution Effect of CEO Duality and CSR committee on Corporate Tax Avoidance



CEO_DUA in Model 5 although not significant individually, interacts positively and significantly with CSR_COM to offer support for hypothesis 6b which stated that, the effect of will act as substitutes to promote tax payment. Our conclusion of a substitution effect between these mechanisms was reached after the simple slope test graphically represented in figure 3 showed that relationship between CEO_DUA and CETR was not significant when there was CSR_COM was high, but this relationship becomes significant when CSR_ COM was low (simple slope $= 0.000002, p < 0.10$). This result support for our argument that CSR committees play an ethical role to limit the tax avoidance activities of powerful managers who aim to divert resources through tax management and planning.

Overall, our empirical results provide evidence consistent with our conjecture; the role of CSR committees is dependent on the prevailing corporate governance mechanisms.

3.3.5 Robustness Tests

We conducted a battery of sensitivity test on our main empirical results. First, we examine the sensitivity of our result using an alternative measure. Guenther et al. (2014) account that relative to CETR, the GAAP ETR (GETR) is not influenced by accrual management and may indicate tax avoidance better. To bring our findings at par with this account and further demonstrate their generalizability across comparable indicators of tax avoidance regardless of any differences in their computations, we re-estimated our model using CETR as a dependent variable. Table 5 presents the results which are very similar to our main findings in Table 4. However, we find a positive significant relationship between CEO_DUA and GETR to support for our hypothesis 4 in this case. Hence, managerial power facilitates corporate tax planning as argued.

Second, Adams et al., (2010) argue that corporate governance mechanisms are largely endogenous. So, to ensure the results presented above are to a greater extent rid of endogeneity

and reverse causality concerns emanating from the other governance variables, we re-estimate our model using the system generalized methods of moments (SYS-GMM) technique (Arellano & Bover, 1995; Wintoki et al., 2012). Furthermore, SYS-GMM is robust to first-order autoregressive [AR (1)] disturbance, cross-sectional and heteroskedasticity correlation within unbalanced-panels (Holtz-Eakin, Newey, & Rosen, 1988). The results, slope test analysis and conclusions of this alternative estimation remained mostly consistent and are reported in Table 6.

Finally, to further ensure that our results were not driven by the incidence of potential outliers, we excluded data for each of the years under study one after the other from the analysis to check if our results will change significantly. All of the results still remained similar. Generally, these sensitivity tests, by and large, emphasize that our findings, especially on strong corporate governance structures, are robust regarding the role of CSR structures as an ethical and risk management structure for managing tax avoidance when there are large boards and greater board independence respective.

3.5 Conclusion

Our study set out to understand the circumstances under which the two main roles of CSR structures discussed extensively by the literature are manifested. We contribute to the literature by theorizing and empirically demonstrating that the moderating effect of the prevailing corporate governance mechanisms illuminate understanding in this direction. Specifically, our results demonstrated that larger boards with/and greater proportions of independent directors reduce corporate tax avoidance. Also, powerful (entrenched) managers engage in less tax payment to pursue self-interested rent diversions as previous studies reported (Desai & Dharmapala, 2006: Pathan, 2009). Surprisingly, our results showed no individual or interactive effect of female directors on corporate tax avoidance. This leads us to conclude that with regard to tax planning,

Table 3. 5: Robustness Test
OLS REGRESSION ESTIMATES: Corporate Governance, CSR and Corporate Tax Avoidance

	Dependent Variable: GAAP Effective Tax Rate (GETR)				
	Model1	Model2	Model3	Model4	Model5
δ_1 FDI	-0.0034**	-0.0034**	-0.0034**	-0.0034**	-0.0033**
	(0.0011)	(0.0011)	(0.0012)	(0.0011)	(0.0011)
δ_2 PPE	-0.00001**	-0.00001**	-0.00001**	-0.00001**	-0.00001**
	(0.000004)	(0.000004)	(0.000004)	(0.000004)	(0.000004)
δ_3 INTANG	0.0001*	0.0001*	0.0001*	0.0001*	0.0001*
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.00004)
δ_4 SIZE	0.005***	0.005***	0.0051***	0.005***	0.0051***
	(0.0005)	(0.0005)	(0.0005)	(0.0005)	(0.0005)
δ_5 ROA	-0.0376*	-0.0377*	-0.0343*	-0.0373*	-0.0380*
	(0.0157)	(0.0157)	(0.0156)	(0.0157)	(0.0157)
δ_6 CSH_HLDN	-0.0048	-0.0048	-0.0043	-0.0049	-0.0039
	(0.0111)	(0.0111)	(0.0111)	(0.0111)	(0.0112)
δ_7 GDP	0.0039***	0.0039***	0.0037***	0.0039***	0.004***
	(0.001)	(0.001)	(0.0009)	(0.001)	(0.001)
δ_8 INV_PRO	-0.00947***	-0.00947***	-0.00923***	-0.00945***	-0.00946***
	(0.000769)	(0.000769)	(0.000769)	(0.000768)	(0.000769)
δ_9 WGI	-0.0004***	-0.0004***	-0.0004***	-0.0004***	-0.0004***
	(0.00004)	(0.00004)	(0.00004)	(0.00004)	(0.00004)
β_1 CSR_COM	0.007***	0.0059	0.0299***	0.01**	-0.0061*
	(0.0021)	(0.0067)	(0.004)	(0.0032)	(0.0031)
β_2 BS	0.0011**	0.001*	0.0011**	0.0011**	0.0011***
	(0.0003)	(0.0004)	(0.0003)	(0.0003)	(0.0003)
β_3 BINDP	-0.0001	-0.0001	0.0002***	-0.00004	-0.00004
	(0.00004)	(0.00004)	(0.0001)	(0.00004)	(0.00004)
β_4 WOB	0.0001	0.0001	0.0001	0.0002	0.0001
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)
β_5 CEO_DUA	-0.0159***	-0.0159***	-0.0158***	-0.0159***	-0.0249***
	(0.0021)	(0.0021)	(0.0021)	(0.0021)	(0.0028)
θ_1 CSR_COM × BS		0.0001			
		(0.0001)			
θ_2 CSR_COM × BINDP			-0.0005***		
			(0.0001)		
θ_3 CSR_COM × WOB				-0.0002	
				(0.0002)	
θ_4 CSR_COM × CEO_DUA					0.0216***
					(0.004)
Year Fixed Effects	Yes	Yes	Yes	Yes)	Yes
Constant	0.217***	0.218***	0.207***	0.216***	0.218***
	(0.0200)	(0.0201)	(0.0201)	(0.0200)	(0.0200)
Adjusted R^2	0.0252	0.0252	0.0272	0.0253	0.0264
F-Statistics	24.41***	23.51***	25.25***	23.53***	23.95***
Observations	24,785	24,785	24,785	24,785	24,785

Standard errors in parentheses
† p<0.10, * p<0.05, ** p<0.01, *** p<0.001

The table reports the estimates of six alternative versions of the following panel regression specification:

$$\begin{aligned}\text{GETR}_{i,t} = {} & \alpha + \beta_1(\text{CSR Committee})_{i,t} + \beta_2(\text{Board Size})_{i,t} + \beta_3(\text{Board Independence})e_{\,i,t} + \beta_4(\text{Female Directorship})_{i,t} + \beta_5(\text{CEO Duality})_{i,t} + \theta D_{i,t} \\ & + \delta_1(\text{Financial Development})_{i,t} + \delta_2(\text{Property Plant and Equipment})_{i,t} + \delta_3(\text{Intangible Assets})_{i,t} + \delta_4(\text{Size})_{i,t} \\ & + \delta_5(\text{Return on Assets})_{i,t} + \delta_6(\text{Cash Holdings})_{i,t} + \delta_7(\text{GDP Per Capita})_{i,t} + \delta_8(\text{Strength of Investor Protection})_{i,t} \\ & + \delta_9(\text{Governance Effectiveness})_{i,t} + \sum_{y=2015}^{2006} \omega_y \text{Year}_i^y + \varepsilon_{i,t}\end{aligned}$$

where the dependent variable GETR for firm *i* at time *t* is computed according to Dyreng et al's (2010): the financial accounting effective tax rate, defined as the ratio of total tax expenses to pre-tax book income. $\text{CSR Committee}_{i,t}$ is an indicator variable represented as 1 if firm *i* in period *t* has a committee designated for CSR activities and 0 otherwise. $\text{Board Size}_{i,t}$ refers to the number of directors on the board at the end of the financial year. $\text{Board Independence}_{i,t}$ is the proportion of board directors without any material or pecuniary relationship with company, except the board seat. $\text{Female Directorship}_{i,t}$ is measured as the proportion of directors who are women. $\text{CEO Duality}_{i,t}$ is a dummy which equals 1 if the CEO of the firm is the chairman of the board and 0 otherwise. The control variables are defined as follows: $\text{Financial Development}_{i,t}$ is the standardized value of a country's annual foreign direct investment inflow Return on assets is the ratio of net income to total assets, Property plant and equipment is the gross value property, plant & equipment scaled by lagged total assets, Intangible Asset is measured as the ratio of total intangible assets scaled by lagged total assets, Cash Holdings is the cash balance scaled by lagged total assets, Size is measured as the logarithm of total assets, GDP is the log of gross domestic product of the country the firm is located in, Strength of Investor Protection is an index scored on a 1-10 scale to indicate the extent of a country's corporate disclosure, director liability and ease of shareholder suits and Governance Effectiveness is an index measuring the institutional strength/effectiveness of a country. Year_i^y is a dummy variable for fiscal year y to reduce endogeneity bias resulting from unobserved heterogeneous fixed effect. The reported adjusted R^2s are the overall R^2s which account for the explanatory power of the covariates on our dependent variables. The t-statistics (reported in parentheses) are based on robust standard errors to adjusted for heteroskedasticity. Superscripts †, *, **, *** indicate statistical significance at 10%, 5%, 1% and 0.1% levels, respectively. The F-test reported shows the overall validity of our specified models 1-6.

Table 3. 6: Robustness Test:
SYS-GMM ESTIMATES: Corporate Governance, CSR and Corporate Tax Avoidance

	Dependent Variable: Cash Effective Tax Rate (CETR)				
	Model1	Model2	Model3	Model4	Model5
ω $CETR_{t-1}$	0.154***	0.154***	0.154***	0.154***	0.154***
	(0.0241)	(0.0241)	(0.0241)	(0.0241)	(0.0241)
δ_1 FDI	-0.004	-0.0041	-0.004	-0.004	-0.004
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
δ_2 PPE	0.00001	0.00001	0.00001	0.00001	0.00001
	(0.00001)	(0.00001)	(0.00001)	(0.00001)	(0.00001)
δ_3 INTANG	-0.0003	-0.0003	-0.0003	-0.0003	-0.0003
	(0.0003)	(0.0003)	(0.0003)	(0.0003)	(0.0003)
δ_4 SIZE	0.0082	0.0084	0.0084	0.0082	0.0082
	(0.0084)	(0.0084)	(0.0083)	(0.0084)	(0.0084)
δ_5 ROA	-0.460***	-0.461***	-0.459***	-0.460***	-0.460***
	(0.0722)	(0.072)	(0.072)	(0.0722)	(0.0721)
δ_6 CSH_HLDN	-0.171***	-0.170***	-0.171***	-0.170***	-0.171***
	(0.0504)	(0.0503)	(0.0505)	(0.0503)	(0.0504)
δ_7 GDP	0.00156	0.0016	0.0018	0.0016	0.0016
	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)
δ_8 INV_PRO	-0.0079	-0.0079	-0.008	-0.0079	-0.0079
	(0.0059)	(0.0059)	(0.0059)	(0.0058)	(0.0059)
δ_9 WGI	-0.0002	-0.0002	-0.0002	-0.0002	-0.0002
	(0.0004)	(0.0004)	(0.0004)	(0.0004)	(0.0004)
β_1 CSR_COM	0.0078	-0.0270	0.0284*	0.0100	0.009
	(0.006)	(0.0184)	(0.0128)	(0.0087)	(0.0067)
β_2 BS	0.0004	-0.0011	0.0003	0.0004	0.0004
	(0.0013)	(0.0016)	(0.0013)	(0.0013)	(0.0013)
β_3 BINDP	-0.0001	-0.0001	0.00001	-0.0001	-0.0001
	(0.0001)	(0.0002)	(0.0002)	(0.0002)	(0.0001)
β_4 WOB	0.0002	0.0002	0.0002	0.0003	0.0002
	(0.0003)	(0.0003)	(0.0004)	(0.0004)	(0.0003)
β_5 CEO_DUA	-0.0041	-0.0041	-0.0039	-0.0042	-0.0033
	(0.005)	(0.005)	(0.0049)	(0.0049)	(0.005)
θ_1 CSR_COM × BS		0.0033*			
		(0.0017)			
θ_2 CSR_COM × BINDP			-0.0003†		
			(0.0002)		
θ_3 CSR_COM × WOB				0.0002	
				(0.0005)	
θ_4 CSR_COM × CEO_DUA					-0.0024
					(0.0069)
Constant	0.185	0.199	0.171	0.183	0.185
	(0.145)	(0.146)	(0.145	(0.145)	(0.145)
Model fits:					
AR (1)	-12.23***	-12.24***	-12.26***	-12.23***	-12.23***
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
AR (2)	-1.486	-1.53	-1.49	-1.48	-1.48
	[0.1373]	[0.13]	[0.1339]	[0.1400]	[0.1386]
Wald chi2	158.3***	161.4***	160.4***	158.9***	160.4***
Number of Instruments	105	106	106	106	106
Observations	12,786	12,786	12,786	12,786	12,786

The table reports the SYS-GMM estimates of six alternative versions of the following panel regression specification:

$$\begin{aligned}\text{CETR}_{i,t} = {} & \alpha + \omega\text{CETR}_{i,t-1} + \beta_1(\text{CSR Committee})_{i,t} + \beta_2(\text{Board Size})_{i,t} + \beta_3(\text{Board Independence})e_{\ i,t} + \beta_4(\text{Female Directorship})_{i,t} \\ & + \beta_5(\text{CEO Duality})_{i,t} + \theta D_{i,t} + \delta_1(\text{Financial Development})_{i,t} + \delta_2(\text{Property Plant and Equipment})_{i,t} \\ & + \delta_3(\text{Intangible Assets})_{i,t} + \delta_4(\text{Size})_{i,t} + \delta_5(\text{Return on Assets})_{i,t} + \delta_6(\text{Cash Holdings})_{i,t} + \delta_7(\text{GDP Per Capita})_{i,t} \\ & + \delta_8(\text{Strength of Investor Protection})_{i,t} + \delta_9(\text{Governance Effectiveness})_{i,t} + \eta_i + \varepsilon_{i,t}\end{aligned}$$

where the dependent variable CETR for firm *i* at time *t* is computed according to Dyreng et al.,'s (2010): the cash paid for income taxes divided by pre-tax income (net of special items). CSR $\text{Committee}_{i,t}$ is an indicator variable represented as 1 if firm *i* in period *t* has a committee designated for CSR activities and 0 otherwise. Board $\text{Size}_{i,t}$ refers to the number of directors on the board at the end of the financial year. Board $\text{Independence}_{i,t}$ is the proportion of board directors without any material or pecuniary relationship with company, except the board seat. Female $\text{Directorship}_{i,t}$ is measured as the proportion of directors who are women. CEO $\text{Duality}_{i,t}$ is a dummy which equals 1 if the CEO of the firm is the chairman of the board and 0 otherwise. The control variables are defined as follows: Financial $\text{Development}_{i,t}$ is the standardized value of a country's annual foreign direct investment inflow Return on assets is the ratio of net income to total assets, Property plant and equipment is the gross value property, plant & equipment scaled by lagged total assets, Intangible Asset is measured as the ratio of total intangible assets scaled by lagged total assets, Cash Holdings is the cash balance scaled by lagged total assets, Size is measured as the logarithm of total assets, GDP is the log of gross domestic product of the country the firm is located in, Strength of Investor Protection is an index scored on a 1-10 scale to indicate the extent of a country's corporate disclosure, director liability and ease of shareholder suits and Governance Effectiveness is an index measuring the institutional strength/effectiveness of a country. Robust standard errors and p-values are in parentheses and brackets respectively. Superscripts †, *, **, *** indicate statistical significance at 10%, 5%, 1% and 0.1% levels, respectively. The Sargan statistic cannot be calculated (reported) as the SYS-GMM specification was a robust estimation [i.e. vce (robust)]. In this case, a test for serial correlation as Arellano and Bond (1991) and Stata Manuals (13) suggested suffices as a technique of ensuring there is no evidence of model misspecification. Thus, AR (1) and AR (2) are tests for first-order and second-order serial correlation in the first-differenced residuals, under the null of no serial correlation. The associated p-values indicate independently and identically distributed (i.i.d) errors supporting no evidence for serial correlation, the validity of the instruments and no model misspecification.

the advertised effects of female directors by the earlier literature and policy documents may be a theoretical façade. Furthermore, while the CSR committee plays an ethical role to limit corporate tax avoidance if there exist a larger board and greater managerial power, its risk management role coincides with the efforts of independent directors to simultaneously meet the interests of shareholders and stakeholder.

Table 3. 7: Summary of Results

BUNDLE	CETR	SYS-GMM	GETR	SUPPORT	HYPOTHESIS
CSR_COM × BS	+	+	X	Partial	Complements (6a)
CSR_COM × BINDP	-	-	-	Consistent	Substitutes (5a)
CSR_COM × WOB	X	X	X	Consistent	None
CSR_COM × CEO_DUA	+	X	+	Partial	Substitutes (6b)

+; significant positive bundling effect, -; significant negative bundling effect, **X;** no significant bundling effect. Mainly we compare our results for CETR, GETR (alternative dependent variable) and SYS-GMM to know which of our results and hypotheses are consistent and supported respectively.

The findings of this paper have some important theoretical and policy implications. The main theoretical implication of the findings is that, contrary to the widely held view that the CSR committee functions as an integral part of an organization's existence purposely for ethical engagements, its existence may rather prompt firms to configure their boards to achieve a balance between the interests of shareholders and other stakeholders (i.e. government and society). Specifically, our results convincingly propound the idea that, independent directors may rely on the risk management role of CSR committees to concurrently pursue their primary goal of protecting and increasing shareholder wealth while promoting corporate tax payments. Consequently, the ethical role of CSR structures just as expected protects stakeholders' interest only when there are larger boards and greater managerial power. Finally, this study also provides important insights for policymakers and regulators who seek to identify the circumstances under which CSR structures will be relevant for the mitigation of the risk of tax avoidance. As our empirical results have shown, by mandating firms to maintain CSR committees, a larger board and greater managerial power will ensure that firms become responsible corporate citizens.

Our findings are limited in a way that opens up new avenues for future research. Our study considers only ETRs which Hanlon and Heitzman (2010) explain are on one end (less aggressive end) of the tax avoidance continuum. As such, in order to enhance the generalizability of our findings, our study might need replication using proxies of the more aggressive forms of tax avoidance. This particularly will be important in view of the recent opinion that firms contemporaneously employ complex strategies to perpetrate aggressive tax avoidance (Williams, 2007). Overall, we hope that our paper advances the existing research one step further towards a deeper understanding of the circumstances under which CSR may entrench either as an ethical structure or its risk management structure.

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Appendix

1.

According to Vives (1990), below are the conditions under which complementary and substitution matching between variables are assessed.

- Substitutive effect: $f(X_{_H}, Y_{_H}) - f(X_{_L}, Y_{_H}) < f(X_{_H}, Y_{_L}) - f(X_{_L}, Y_{_L})$
- Complementary effect: $f(X_{_H}, Y_{_H}) - f(X_{_L}, Y_{_H}) > f(X_{_H}, Y_{_L}) - f(X_{_L}, Y_{_L})$

Where X and Y represent our two bank corporate governance mechanisms of interest, whereas H and L denote the high and low levels of our governance mechanisms respectively. The gains from any match (interaction) is represented by an increasing function, positive valued function f, which gives the match output $f\ (X, Y)$ for any pair of governance mechanisms. For instance, suppose from the function, $f\ (X, Y)$, BIND is X and CSR_COM is Y, then $X_{_H}$(vs. $X_{_L}$) indicate a high (vs. low) level of BINDP. In a similar manner, $Y_{_H}$(vs. $Y_{_L}$) indicates a high (vs. low) level of CSR_COM. If BINDP and CRS_COM interact as substitutes, the marginal gains between the high level of BINDP and low level of CSR_COM [i.e. $f(X_{_H}, Y_{_L}) - f(X_{_L}, Y_{_L})$] should be greater when they work under a lower CSR_COM rather than under a high CSR_COM [i.e. $f(X_{_H}, Y_{_H}) - f(X_{_L}, Y_{_H})$]. On the contrary, BINDP and CSR_COM interact as complements, the marginal gain between high level of BINDP and low level of BINDP should be greater when they work under higher CSR_COM. That is, $f(X_{_H}, Y_{_H}) - f(X_{_L}, Y_{_H})$ will be greater than $f(X_{_H}, Y_{_L}) - f(X_{_L}, Y_{_L})$.

2.

Table A2 a: Descriptive Statistics of Variables Included in Meta-Analysis

Variable	N	Mean	SD	Min	Max
Panel A: Effect size (ES) of Board Mechanisms					
BS	71	-0.040	0.150	-0.37	0.233
BINDP	73	0.019	0.182	-0.21	0.679
WOB	23	-0.035	0.082	-0.15	0.112
CEO Duality	37	0.057	0.153	-0.039	0.5
Inst. Own	19	-0.081	0.233	-0.513	0.191
Panel B: Measurements & Methodological Artefacts					
Finance Journal	49	0.288	0.456	0	1
Management Journal	49	0.367	0.487	0	1
Economics Journal	49	0.142	0.353	0	1
Unpublished	49	0.204	0.407	1	1
Accounting Perform.	102	0.725	0.448	0	1
No. of coverage years	47	6.191	5.716	1	34
Median yr. sample window (=>2007)	47	0.829	0.379	0	1
International Sample	49	0.244	0.434	0	1
Regulation Controlled	49	0.367	0.487	0	1
Endogeneity Controlled	49	0.469	0.504	0	1
Panel C: Country Level Moderators					
Natural log of GDP	49	4.92e+12	5.65e+12	1.09e+10	1.50e+13
Gov. Effectiveness	49	70.159	23.135	14.05266	92.0562
Investor Protection	49	6.124	0.771	4	7.8
Power distance	49	64.456	20.466	40	104
Individualism	49	47.872	30.564	14	91
Masculinity	49	55.847	9.279	34	70
Uncertainty avoidance	49	55.504	16.762	30	90
Common law	49	0.500	0.465	0	1
Ease of doing business	49	50.661	50.646	4	177
Ext. of corp. transp.	49	6.511	1.414	3	9
Lvl of financial Devt.	49	75.487	46.711	6.4375	185.2
Ext. of Bus. disclosure	49	7.176	1.354	4	10

Table A3 a: Mean statistics for each of the sample Bank for the years 2000-2016.

Bank	**AR**	BS	INDP (%)	WOB (%)	BMEET	INSTOWN (%)	ROA (%)	Size (in € mil)	BIS_RATIO	Revenue Growth (%)	Loan Loss Prov.	Deposit to Assets	Non-Interest Inc.
1. Deutsche Bank	0.005	20.12	51.2	34.5	5.13	79.2	0.199	1478907	11.54	1.95	0.111	32.037	18593
2. Commerzbank	0.016	20.47	47.1	21.7	9	68.8	0.038	558643	9.78	-2.03	0.278	31.020	4323.353
3. Landesbank BW	0.021	22.5	38.4	16.3	5.7	70.7	0.019	345420.1	11.86	1.94	0.206	21.371	1315.88
4. DZ Bank	0.007	19.93	38.6	15.1	5.57	100	0.195	414399.6	12	0.88	0.145	21.641	16974.33
5. Bayerische Landesbank	0.008	10.36	68.3	2.4	11.46	33	-0.019	309726.8	9.84	-3.00	0.395	26.938	939.634
6. Danske Bank	0.017	16.12	43.5	29.7	12.92	68.4	0.343	373260.6	12.10	6.32	0.148	24.418	12710.65
7. Jyske Bank	0.017	9.24	63.6	15	20.12	48.5	0.668	34264.22	13.1	7.97	0.196	41.837	2721.756
8. Sydbank	0.017	11.07	59.4	20.1	10.88	33.78	0.728	16215.6	11.84	3.93	0.208	47.422	47.422
9. BNP	0.016	16.59	50.6	25.4	11	70.75	0.389	1559524	9.68	4.26	0.198	26.316	20858.76
10. Crédit Agricole	0.019	21.19	24.2	18.8	10.13	41.13	0.182	1249402	10.18	1.10	0.218	32.252	9543
11. Société Générale	0.017	14.75	54.3	24.7	9.88	18.72	0.326	964835.2	9.97	4.11	0.244	29.334	14756.76
12. Banque Populaire CE Group	0.008	17	8.5	10.6	10.38	100	0.509	45730.03	14.16	-7.08	0.106	34.519	1447.034
13. HSBC France	0.008	17.83	41.5	16.7	4.83	99.99	0.677	202333.8	12.8	7.16	0.018	20.497	2210.5
14. Unicredit	0.018	20.69	82.9	26.1	13.62	60.49	0.179	696487.4	8.42	8.76	0.374	40.481	9395.984
15. Intesa SanPaolo	0.017	20.88	49.4	21.2	11.06	39.16	0.347	517126.5	9.33	9.70	0.281	34.910	6732.612
16. ING Bank NV	0.018	10.41	83.2	13.6	10.27	99.93	0.346	906506.8	13.86	-5.15	0.133	50.878	4609.8
17. Rabobank	0.017	11.53	95.0	14.1	10.82	100	0.354	567281	13.44	1.78	0.138	45.056	3665.588
18. ABN AMRO Bank NV	0.011	9.65	92.9	23.3	11.07	82.94	0.269	390373.8	12.92	-1.88	0.202	56.028	3181.5
19.DNB ASA	0.017	9.18	64.1	34.8	16.57	61.37	0.825	189446.8	9.89	8.13	0.080	39.048	14556.53
20. Kommunalbanken	0.012	7.88	78.5	44.6	N/A	22.71	0.278	34771.24	12.89	21.71	-0.025	N/A	719.4761
21. Banco Santander	0.017	18.59	44.1	20.5	11.88	59	0.659	911962.2	9.63	8.53	0.292	42.644	14231.64
22. BBVA	0.017	16.35	74.4	11.9	12.35	38.72	0.737	491584.4	9.53	6.26	0.252	45.074	7787.058
23. Bankia	0.008	11.83	67.7	10.7	20.33	65.65	-1.029	251385.6	10.16	-13.84	1.252	45.709	1329.803
24. Banco de Sabadell	0.017	13	46.2	7.6	12.67	42.89	0.672	95338.21	9.35	13.61	0.293	53.373	1082.784
25. La Caixa	0.007	19.41	33.0	22.5	12.9	87.76	0.213	323273	12.43	-0.17	0.586	50.293	3766.321
26. Nordea Bank	0.017	13.11	58.1	27.3	14.41	56.75	0.620	460501.8	11.12	7.45	0.085	31.905	4116.353
27. Swedbank	0.017	12.29	55.1	40	17.59	89.55	0.652	166303.2	13.54	2.25	0.135	29.589	15920.88
28. Svenska Handelsbanken	0.002	11.88	34.3	25.1	11.12	79.20	0.660	208963	13.73	0.37	0.039	27.567	10767.76
29. Skandinaviska Enskilda Bank	0.017	12.41	58.8	27.5	10.24	85.74	0.50	218908.7	12.77	5.46	0.105	33.354	24531.06
30. Merrill Lynch International	0.008	11.46	35.1	.6.6	11	100	-0.088	290695.1	10.84	-31.29	0.822	4.9812	955.890
31. HSBC	0.018	19.65	61.3	21	9	68.70	0.688	1534645	10.74	5.47	0.254	53.663	27904.36
32. Barclays	0.017	14.41	62.1	.15.3	11.12	84.67	0.369	1346652	10.41	5.19	0.269	32.037	12300.94
33. Royal Bank of Scotland	0.017	13.94	62.7	.15.8	9.82	88.23	0.172	1309056	10.8	11.82	0.294	39.647	9738.412
34. Santander	0.004	12.76	51.9	.16.3	12.18	91.95	0.252	320929.4	11.08	-0.47	0.132	45.126	1392.412
35. Standard Chartered	0.017	16.18	59.2	.15.5	10.41	56.84	0.728	313504.1	10.72	12.37	0.186	58.094	5111.444
36. Nationwide Building Society	0.006	12.57	58.1	.16.5	12	100	0.291	200583.2	14.51	4.33	0.120	71.723	419.506
37. Lloyds Banking Group	0.017	14.47	54.0	.18.1	11.53	76.39	0.499	743130.4	11.03	6.66	0.295	45.176	7804.882
38. Cooperative Bank	0.008	14.57	53.2	.13.3	14.29	100	-0.417	37195.48	13.19	10.18	0.074	76.247	196.508

Refer to Table 2.1 for the definitions of the variables.

Table A3 b: Country level (mean) statistics.

	Country									
Variable	**Germany [N=5]**	**Denmark [N=3]**	**France [N=5]**	**Italy [N=2]**	**Netherlands [N=3]**	**Norway [N=2]**	**Spain [N=5]**	**Sweden [N=4]**	**Ireland [N=1]**	**United Kingdom [N=8]**
AR	0.011	0.016	0.0155	0.016	0.016	0.0147	0.0144	0.016	0.007	0.0153
BS	18.956	12.183	17.435	20.8	10.529	8.529	16.479	12.426	11.461	14.876
INDP (%)	48.5	55.3	35.3	63.9	90.3	71.2	50.9	51.5	35.0	57.9
WOB (%)	19.6	21.6	19.3	23.3	17.0	39.6	15.3	29.9	6.5	16.5
BMEET	7.163	14.826	9.452	12.166	10.734	16.571	13.1238	13.338	11.000	11.207
INSTOWN (%)	70.7	51.6	66.4	48.4	94.5	42.0	55.7	77.8	100	84.1
ROA (%)	.080	.579	.394	.263	.336	.610	.480	.607	-.087	0.351
Size (in € mil)	641766.6	141246.8	973296.7	606806.9	623766.7	125443.1	453902.3	263669.2	290695.1	746576.2
bs_tier1_c~o	10.878	12.348	10.634	8.873	13.407	10.847	9.890	12.7916	10.843	11.514
Revenue Growth	-0.2035855	6.073	2.339	9.230	-.888	13.465	6.327	3.882	-31.286	6.819
Loan Loss Prov.	0.232	0.183	0.182	0.327	0.151	0.036	0.417	0.091	0.822	0.206
Deposit to Assets	27.053	37.892	29.190	37.695	49.433	39.047	47.239	30.604	4.981	51.988
Non-Interest Inc.	8063.872	5732.801	11894.850	8064.298	3824.714	8830.852	6590.74	13834.01	955.889	8348.317

Refer to Table 2.1 for the definitions of the variables.

Table A3 c: Year-by-Year (mean) statistics.

Year	**AR**	BS	INDP (%)	WOB (%)	BMEET	INSTOWN (%)	ROA (%)	Size (in € mil)	BIS_RATIO	Revenue Growth (%)	Loan Loss Prov.	Deposit to Assets	Non-Interest Inc.
2000	0.001	17.185	54.4	30.4	4.909	70.2	0.799	309635.6	7.883	40.544	0.118	41.644	6692.886
2001	0.003	16.703	51.3	17.2	10.315	69.0	0.551	332407.1	8.137	5.331	0.170	42.407	6325.34
2002	0.003	16.100	52.1	16.6	10.375	72.7	0.418	318960.3	8.344	11.305	0.220	41.284	5692.449
2003	0.002	15.468	51.7	18.3	9.115	73.1	0.677	337433.1	8.858	-2.138	0.175	40.692	6306.807
2004	0.068	14.969	31.2	13.2	12.000	76.6	0.655	377362.9	8.992	4.004	0.104	40.013	7208.962
2005	0.071	15.194	33.1	12.4	12.500	84.0	0.693	476645.4	8.827	23.589	0.080	36.145	8591.738
2006	0.057	14.600	57.0	12.5	12.181	71.3	0.673	555852.9	8.482	29.060	0.086	34.844	10430.51
2007	0.013	15.694	56.2	17.3	10.794	68.7	0.591	670701.2	8.287	21.729	0.105	35.038	10697.38
2008	0.002	14.810	57.4	20.5	11.314	67.6	0.236	703596.8	9.439	5.4861	0.278	33.534	8112.492
2009	0.001	14.891	56.7	24.0	11.222	64.4	0.227	637130.5	11.407	-13.871	0.405	36.511	9254.67
2010	0.002	14.783	56.8	20.5	10.638	64.1	0.317	642801.1	12.320	-0.447	0.255	38.933	9257.327
2011	0.002	14.526	63.6	22.3	11.081	67.8	0.153	687438.5	12.730	5.582	0.292	37.220	8918.971
2012	0.003	14.263	62.5	21.8	13.000	65.4	0.013	667236.1	13.871	-1.150	0.536	37.897	8881.987
2013	0.005	14.131	62.7	23.8	12.513	69.7	0.134	601253.7	14.365	-8.748	0.330	41.478	8999.53
2014	0.026	13.657	62.0	17.1	12.837	73.4	0.271	645544.5	14.526	-2.155	0.173	40.784	9164.842
2015	0.004	13.684	64.6	27.8	12.378	73.0	0.272	628751.7	15.893	-5.427	0.131	42.876	9346.444
2016	0.005	13.710	61.3	31.8	13.750	70.7	0.246	640321.8	16.673	-0.8853	0.129	44.415	9679.702

Refer to Table 2.1 for the definitions of the variables.