Bundles of Firm Corporate Governance Practices: A Fuzzy Set Analysis

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ABSTRACT

Manuscript Type: Empirical

Research Question/Issue: We explore how the combinations of firm-level corporate governance (CG) practices embedded in different national governance systems lead to high firm performance.

Research Findings/Insights: Using fuzzy set/qualitative comparative analysis, we uncover a variety of findings. First, we show that within each of the stylized national CG models, there are multiple bundles of firm-level governance practices leading to high firm performance (i.e., equifinality). Second, we provide evidence of complementarity as well as functional equivalence between CG practices. Finally, we demonstrate that there can be heterogeneity ("differences in kind") in firm governance practices within each stylized model of CG.

Theoretical/Academic Implications: We build on the configurational and complementarity-based approaches to make the following theoretical claims. First, governance practices within firm bundles do not always relate to each other in a monotonic and cumulative fashion as this entails higher costs and possibly over-governance. Second, practices in bundles do not need to be aligned toward the insider or the outsider model ("similar in kind"). We argue that non-aligned practices can also be complementary, creating hybrid governance forms. Third, we predict functional equivalence across bundles of CG practices which grants firms agency on which of the practices to implement in order to achieve high performance.

Practitioner/Policy Implications: We contribute to comparative CG research by demonstrating that there are multiple governance paths leading to high firm performance, and that these practices do not always belong to the same national governance tradition. Therefore, our findings alert of the perils of "one size fits all" governance solutions when designing and implementing CG policies.

Keywords: Corporate Governance, Board of Director Mechanisms, Market Control Mechanisms, Legal Control Mechanisms, Corporate Financial Performance

INTRODUCTION

There is a rich tradition in comparative corporate governance research highlighting the diversity of national governance systems and the complementarities of governance practices within systems (Aguilera & Jackson, 2003; Goyer, 2010; Hall & Soskice, 2001; Hancke, Rhodes, & Thatcher, 2008; Kogut, 2009; Schmidt & Spindler, 2004). This research aggregates *firm-level* governance characteristics to the *national-level* governance traits and suggests two stylized national models of corporate governance: outsider (or shareholder-oriented) vs. insider (or stakeholder-oriented) models, where governance practices are aligned within each system. For instance, Aguilera and Jackson (2003) argue that there are different sets of coalitions of governance practices

among three main stakeholders (management, labor, and capital) competing for firm resources, and that these practices align into bundles within these two dichotomous national models. A parallel body of research in the law and economics tradition (La Porta, Lopez-de-Silanes, Shleifer, & Vishny, 1998; Shleifer & Vishny, 1997) has identified similar country-level models of corporate governance defined by the strength of minority shareholder protection, where firm governance traits are tied to the country-level regulatory features.

A completely separate body of governance research examines corporate governance practices at the firm level, mostly within countries, and questions whether there is a direct and monotonic causal link between firm-level governance practices and firm financial performance. These empirical studies have, for example, investigated the relationship between governance practices such as board independence and CEO duality (Dalton, Daily, Ellstrand, & Johnson, 1998),

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executive pay (Bebchuck & Fried, 2004), ownership structure (Hoskisson, Hitt, Johnson, & Grossman, 2002), and firm performance. Interestingly, results from these empirical studies are inconclusive in showing an either positive or negative relationship between firm governance and performance (Aguilera, Filatotchev, Gospel, & Jackson, 2008; Daily, Dalton, & Cannella, 2003; Dalton et al., 1998).

Our study seeks to link these two, for the most part unconnected, bodies of governance research by drawing on configurational logic and empirically examining how firm governance practices, embedded within different national systems of corporate governance, interact with each other and in turn lead to different firm level outcomes (e.g., firm performance). Although, there exists some comparative empirical research, mostly within the field of finance, which has explored the interaction between country-level institutions and firm-level practices (Aggarwal, Erel, Stulz, & Williamson, 2010; Durnev & Kim, 2005), these studies overlook the interaction between governance practices within firms (i.e., firm-level governance bundles).

We are motivated by the two main limitations when exploring the relationships between firm governance and firm performance as identified by Aguilera et al. (2008). First, existing research tends to be under-socialized or neglect corporate governance patterned variations contingent on different institutional environments. Second, it is rarely conceptually and empirically modeled that governance practices are not independent from each other but rather they are highly interrelated (complementary) as well as costly to adopt. In fact, these two theoretical voids might be the reason why current research exploring governance practices and firm performance is inconclusive. Therefore, we propose to adopt a configurational perspective, which allows us to account for both the institutional environment as well as firm combinatory governance when exploring firm outcomes.

While cross-national governance research tends to aggregate firm-level practices, we want to contribute by analyzing different combinations or bundles of firm-level governance practices and showing that there are important differences in the bundles at the firm level within countries and within the stylized national governance models. We conceptualize firm governance practices as embedded within the stylized insider–outsider national corporate governance models and subject to costs and complementarities. We draw on the configurational logic and the complementary-based approach to argue that firm governance practices combine into different bundles leading to high firm performance. In particular, we first examine the notion of "internal fit" among a positive combination of practices leading to high firm performance, and test whether more practices is better – this is an underlying assumption within much corporate governance research. Second, we explore the existing notion of "internal fit" with the national models of corporate governance, that is, the idea that the more *aligned* governance practices are the better (Hall & Soskice, 2001). Our empirical findings uncover the existence of *intra-corporate governance models heterogeneity*. That is to say, there are firms in the insider (outsider) governance model reaching high firm performance with a governance bundle which includes outsider (insider) governance practices. We conclude that there is not

a "one path fits all combination" of governance practices or a single magic bullet governance bundle leading to high firm performance.

We use set-theoretic methods to study in detail the potential combinations between different CG practices. Given that CG bundles remain to be systematically theorized and investigated empirically (Aguilera et al., 2008), our study is an empirical exploration of theory-informed propositions. We find set-theoretic methods particularly appropriate to explore and map the different existing configurations of CG within firms and in the insider–outsider governance models, and to evaluate their relative efficiency. In the rest of the article, we proceed as follows. We first discuss configurations and complementarities in CG at the firm level and identify its critical dimensions. Then, we use fuzzy set methods (fs/QCA analysis) to uncover the causal conditions and the CG firm configurations leading to superior firm financial performance within the two stylized governance models. Lastly, we offer a conclusion of our main findings and discuss their implications for comparative CG and corporate strategy research.

CONFIGURATIONS AND COMPLEMENTARITIES IN FIRM GOVERNANCE

Our conceptual model draws on the configurational and complementarity approach to understand the bundles of firm-level corporate governance practices leading to high firm performance. Organizational and economic theory research has empirically demonstrated the importance of configurational practices (Meyer, Tsui, & Hinnings, 1993) and their complementarities (Milgrom & Roberts, 1995) to explain firm outcomes. Yet these two perspectives are not always integrated. On the one hand, *configurational* refers to the fact that organizational practices interact with each other, and as a result there might be multiple combinations of practices (grouped into bundles) generating a given firm outcome. It assumes that there is not a one best configuration or a single "fit all" configuration (Grandori & Furnari, 2008:462). There exists empirical research in different fields of management demonstrating that alternative configurations can lead through different paths (bundles of practices) to the same organizational outcome – i.e., equifinality. For example, research in human resource management has shown that different bundles of high-performance work practices are likely to cause high financial performance (Delery & Doty, 1996; Macduffie, 1995). Similar studies exist in organization theory (Etzioni, 1961; Perrow, 1970) and corporate strategy (Fiss, 2011; Miles & Snow, 1978). Cross-national governance research has also incorporated the logic of configuration or bundles of practices, yet mostly conceptually (Hall & Gingerich, 2009; Jackson, 2005).

On the other hand, the notion of *complementarity* is generally theorized around the concept of internal fit in the interaction among different organizational attributes. Complementarity is defined as a relation between elements, whereby applying one practice raises the value of employing another practice (Aoki, 2001; Milgrom & Roberts, 1990, 1995). Unlike configurational thinking, complementarities

do not necessarily refer to a whole set of tightly grouped practices. Thus, complementarity-based superior efficiency might stem from reducing combinations of practices to two or more practices that enhance each other. One main implication of complementarities research is that high firm performance does not emerge from a universal monotonic, one best way. Instead, high performance arises only when particular combinations of practices with similar or different attributes interact with each other in a positive way.

Turning to the field of corporate governance research, there exist some key studies of firm governance practices which set the field for further configurational and complementarity research. First, Rediker and Seth (1995) introduce one of the initial empirical articles in corporate governance arguing for the need to examine the linkages between different governance mechanisms in bundles (configurations) in order to capture how the alignment between managers and owners' interests can be achieved. They uncover a substitutive relationship between governance monitoring mechanisms. Second, in two related articles, Beatty and Zajac (1994) and Zajac and Westphal (1994) adopt a contingency approach to identify the existing trade-offs between board monitoring and managerial compensation under different risk levels and corporate strategies. A main finding in these two studies is that board monitoring and managerial compensation may work as substitutes of each other under certain risk and corporate strategy conditions, but not always. Third, Rutherford, Buchholtz, and Brown (2007) find a complementarity relationship between board independence and CEO incentive systems. They reveal that independent boards can be functional in prohibiting managers from re-pricing stock options and that strong CEO alignment incentives may reinforce the effectiveness of board monitoring by enabling independent boards to focus on strategies beyond moral hazard issues. More recently, Ward, Brown, and Rodriguez (2009) present a conceptual model of CG complementarities and substitutability and argue that the trade-offs between the different governance practices are contingent on firm performance. Thus, in high performing firms, board monitoring and incentives work mostly as substitutes, while in poorly performing firms, outside monitoring by institutional investors may complement internal monitoring by boards. These four studies adopt a narrow view of governance by focusing mainly on the relationship between board monitoring and incentives' alignment. Our goal is to offer a broader definition of the scope of governance by including governance practices such as the employment relationship and firm disclosure (Aguilera & Jackson, 2003, 2010), and by also accounting for the institutional context.

In applying the configurational and complementary approaches to bundles of firm-level corporate governance practices, we begin by exploring two dominant assumptions within cross-national corporate governance research and policy. The first assumption is that firm-level governance practices must be aligned (Aguilera & Jackson, 2003; Aoki, 2001; Hall & Soskice, 2001), that is, practices must share similar attributes ("similar in kind" using the language of Grandori & Furnari, 2008), aligning themselves toward an overall common logic, e.g., either outsider- or insider-oriented models of corporate control. This alignment and fit is both with the institutional environment in which firms are embedded as well as across firm-level governance practices. Proper governance alignment will result in effective firm governance and enable firms to reach high performance (Aguilera et al., 2008; Shleifer & Vishny, 1997). Moreover, as contested by Grandori and Furnari (2008), there is the implicit monotonic combinatory assumption, also in corporate governance, that the higher the alignment among governance practices, the better (Aggarwal et al., 2010; La Porta et al., 1998). We refer to the configurational properties of alignment and the additive nature of its practices as the "strong form" bundle propositions, suggesting that the more practices in alignment the better.

In the second assumption, we extend the notion of complementarity by loosely drawing on the combinatory laws developed by Grandori and Furnari (2008) as well as Aguilera et al.'s (2008) concern for the cost of implementing corporate governance practices. In our context, this implies that incorporating simultaneously as many aligned corporate governance practices in a firm as possible might curtail potential synergies toward high firm performance. We know that the adoption of governance practices encompasses multiple costs (systemic, opportunity, reputation, etc.) as discussed by Aguilera et al. (2008). We argue that firms might not need to engage in costly "over-governance" with the presence of all possible similar in kind or aligned governance practices to maximize complementarity, because it is likely to compromise firm performance due to governance costs (Bruno & Claessens, 2007). The idea of selective bundles of governance practices is consistent with Grandori and Furnari's (2008:469) combinatory law that there is a point of decreasing marginal returns in organizational homogeneity. We refer to the configurational properties of combining selective governance practices as the "weak form" bundle propositions.

OUTSIDER AND INSIDER CORPORATE GOVERNANCE BUNDLES

The comparative corporate governance research has identified two contrasting ideal-type national models of CG: outsider and insider models. The outsider (or shareholder-oriented; Anglo-American) configuration is characterized by a deep stock market capitalization, lax employment protection, weak collective bargaining, and high employee investments in general training. Firms in countries in the outsider model (e.g., UK and the US) tend to have a strong shareholder value orientation, a common law tradition (La Porta, Lopez-de-Silanes, Shleifer, & Vishny, 1998, 2000), and the CG focus is typically geared toward the firm's outside dispersed investors. Top managers are monitored by means of market-based incentives, and typically firms engage in low levels of commitment towards labor and capital (Jensen, 1986).

Conversely, the insider (or stakeholder-oriented; Continental) model is characterized by a dominance of bank financing, a dense network of firm collaborations, comprehensive employee protection, strong collective bargaining, and high investment in occupational and firm-specific training. Firms in insider model countries (e.g., Germany and

Japan) tend to be constrained by multiple stakeholders' claims, beyond the shareholders, which are internalized in top management decisions through a mix of formal and informal mechanisms such as working within a longer term view of the firm, with patient capital and with highly involved employees. For example, in Germany, traditionally influential stakeholders – comprising mainly employees and banks, and their welfare – are internalized to a certain extent by top managers through co-determination systems of governance, having a small percentage of firms' total stock in free float, and linking managers' compensation less to current profitability (Yoshimori, 2005).

Although these two national models are ideal-types, they contain important differentiating institutional characteristics which shape firm governance bundles. The idea is that firm governance practices within each ideal-type are aligned with each other ("similarity in kind") as well as with the institutional environment in which they are embedded. Hall and Soskice (2001) were pioneers in proposing that the nature of the firms' strategy and governance is generally aligned with their ideal-type national institutional systems – which they label as market coordinated versus liberal systems. Some empirical research also confirms the alignment with the institutional environment, mostly by focusing on individual strategies and practices. For example, García-Castro, Ariño, Rodriguez, and Ayuso (2008) find that contingent pay such as stock options are more effective in the outsider system, in part because this system reckons with a developed stock market where to place the options. Similarly, from Jackson's (2005) research on Germany's codetermination and labor markets, we can infer that employee loyalty is likely to be higher in Germany than in the United States due to the protective nature of the labor market institutions. Pushing this research agenda forward, we argue that although firm-level governance practices are influenced by national institutions, firms possess some degree of discretion (agency) over the type of relationships they wish to establish with their shareholders, financiers, employees, and society at large. This is in line with studies suggesting that "within-country differences" in CG mechanisms across firms are much larger than scholars have assumed so far (Jacoby, 2005). Thus, allowing for heterogeneity in CG practices within the two national corporate governance systems might help better explain the relationship between CG bundles and firm outcomes.

At the firm level, the specific CG practices studied in previous research as precursors of firm performance are (1) board of directors' structure and functioning (Bhagat & Black, 1999; Rechner & Dalton, 1991); (2) executive compensation (Buchholtz, Young, & Powell, 1998; Core, Holthausen, & Larcker, 1999); (3) market for corporate control (Agrawal & Knoeber, 1996; Brickley & James, 1987; Ho, 2005); (4) employment relations (Cappelli, 1999; Delery & Doty, 1996); and (5) other institutional mechanisms (Aguilera et al., 2008; Blair & Roe, 1999; Fiss, 2008). In light of these previous studies on CG, we identify six key governance practices which are typically combined into different governance bundles: board independence, board information disclosure, remuneration disclosure, performance-related compensation, employee loyalty, and efficient market for corporate control.

Propositions Development

In general, the dominant logic of configurational and complementarities-based analysis is that complementarities mainly stem from similarity. Hence, performance arises from the internal coherence and homogeneity of the CG practices in the bundle. Under this logic, effective CG arrangements are generated by a monotonic combinatory rule based on the internal alignment and mutual reinforcement of the practices. The very notion of "bundle" is related to the internal homogeneity or "similarity in kind" of its underlying practices.

Thus, if we turn to the outsider CG archetype, Aguilera et al. (2008) sustain, for example, that performance incentives for executives are more effective when complemented within a high level of board independence, an efficient market for corporate control, and a high level of information disclosure to investors. At the same time, strong independent directors engage in more effective information disclosure efforts. And to the extent that stock prices reflect company information, performance-related incentives (e.g., stock options) will be an effective way to align managers' interests with the principals and reduce agency problems (Dalton, Hitt, Certo, & Dalton, 2007). Taken together, independent directors, executive pay incentives, external information disclosure, and takeover markets have been grouped to form a bundle of complementary practices (Aguilera et al., 2008; García-Castro et al., 2008). These governance practices are similar in kind as well as aligned with its broader outsider governance system because they are all oriented towards shareholder value.

In addition, the outsider constellation of CG practices draws on a market-type of contract between the firm and its employees. Employees' lack of voice and participation in the firm governance process is complemented by a highly active job market through which employees can show their disagreement with the firm by opting to leave the company (Gospel & Pendleton, 2004; Hirschman, 1970; Jackson, 2005). Therefore, firms operating in an environment characterized by a highly active job market would find it relatively inefficient to foster strong firm employee loyalty and attachment because the market constraints imposed on managers (e.g., stock options) make management promises less credible under these circumstances (i.e., breach of trust). Under such conditions, firms will find it relatively more efficient to foster looser employee relationships. Thus, the underlying assumption that we are seeking to examine is whether the more similar the practices included in the CG bundle, the higher the firm performance. More formally, we propose the following "strong form" proposition of complementarities:

Proposition 1a. High board independence, high board information disclosure, high remuneration disclosure, high executive pay incentives, low employee loyalty, and a relatively efficient market for corporate control constitute a sufficient bundle to achieve high performance.

At the other extreme of the spectrum, there is the insider CG bundle which will have the opposite traits to the outsider CG bundle discussed in P1a. Again, firm governance practices are expected to be "similar in kind" in the sense of being aligned with each other as well as with their institutional

context in order to reach high firm performance. Under an insider CG system, market-oriented mechanisms such as independent directors, intensive executive pay compensation, or intensive information disclosure to external investors are seen as counterproductive because they are not consistent with long-term value and overall stakeholder-oriented firm goals (Arthurs, Hoskisson, Busenitz, & Johnson, 2008; Dowell, Shackell, & Stuart, 2011). In addition, one could argue that outsider-oriented CG practices may distort directors and top management incentives, reducing the marginal effectiveness of the other practices. For example, excessive stock options plans may lead to employee-management breaches of trust (mis-alignment towards stakeholder-oriented outcomes), reducing the amount of firm-specific investments made in the firm (Aguilera & Jackson, 2003). By contrast, high employee loyalty is aligned with other insider CG practices that induce a more active role of employees, as their investments in firm-specific capital are protected from breaches of trust (Aoki, 2001; Blair, 1995; Jackson, 2005). Employee's firm-specific investments can be protected through appropriate non-market incentives to management and voice and loyalty mechanisms (Aguilera et al., 2008; Hirschman, 1970). Furthermore, insider employee voice mechanisms (e.g., co-determination CG schemes) encourage managers to become more accountable because they have to justify and negotiate key strategic decisions with different stakeholders groups including the employees (Streeck, 1992). In sum, these are all governance practices that fit within the insider model of corporate governance and are working together towards stakeholder-oriented values. In turn, we propose the following "strong form" proposition of complementarities:

Proposition 1b. Weak board independence, weak board information disclosure, weak remuneration disclosure, weak executive pay incentives, high employee loyalty, and a relatively inefficient market for corporate control constitute a sufficient bundle to achieve high performance.

Although these first two propositions suggest that the mechanisms described work as a holistic bundle, exactly which of them or if all of these particular CG practices are complementary within firms in explaining high firm performance is ultimately an empirical question. Based on non-trivial costs of adopting governance practices (Aguilera et al., 2008), we argue that often a reduced number of CG practices suffice to explain performance (Boyer, 2006:19).

Consistent with the idea of number of required practices, it is possible that some firms that deviate from perfect archetypes (e.g., pure outsider or insider model of CG) may also achieve high financial performance due to gained efficiencies. Grandori and Furnari (2008) introduce a noteworthy distinction between "different in kind" and "similar in kind" complementarities. They suggest that, contrary to the dominant logic of complementarities based on "the more, the better" rule, there is no theoretical reason why complementarities should stem from similarity. They argue and demonstrate that practices of different kinds can also be successfully combined (Grandori & Furnari, 2008:467). In the governance domain, Whittington, Pettigrew, Peck, Fenton, and Conyon (1999) had already shown that the

wider and more differentiated the set of practices introduced, the higher the firm performance in a large sample of 500 European firms. As a corollary to this, Grandori and Furnari (2008) claim that there might be decreasing marginal returns, and even negative returns, to increases in organizational homogeneity. In other words, given that CG practices are costly to adopt (Aguilera et al., 2008), an excessive number of redundant and closely aligned practices might lead to over-governance which, in turn, may damage financial performance (Aguilera et al., 2008; Bruno & Claessens, 2007; Dowell et al., 2011).

Recent studies also find that the introduction of new CG regulations such as the Sarbanes-Oxley Act in the US can be counterproductive for some companies' valuation (Chhaochharia & Grinstein, 2007; Wintoki, 2007). Moreover, over-governance costs can be related, in outsider systems, to corporate expenses associated with routine compliance with governance rules and regulations such as cash expenditures on recruitment and remuneration of executive and independent directors, over-allocation of stock options to managers (Frey & Osterloh, 2005), and costs of external disclosure systems, including external reporting. Similarly, an excessive reliance on redundant relational insider governance mechanisms such as internal committees and meetings may lead to unnecessarily high costs and bureaucracy that exceeds potential benefits and that diminishes the overall effectiveness of the firm.

Building on these constrained complementarity arguments, we investigate which precise combinations of CG practices provide sufficient conditions for high firm performance. The notion of complementarities precludes any isolated CG practice from explaining financial success by itself, hence we argue that partial combinations of CG practices (i.e., pairs of practices) can account for a positive outcome as well. In other words, the only constraint is that no single practice in isolation can produce by itself a significant positive effect on financial performance. Two practices, a dyad, is the smallest possible complementarity unit because, by definition, a single practice in isolation cannot produce complementarity and, at the same time, combinations of more than two practices will always be more complex variations stemming from this basic pairwise combination.

More formally, we propose the following "weak form" propositions of complementarities for both the outsider and the insider model:

Proposition 2a. The joint presence of at least two CG mechanisms (high board independence, high board information disclosure, high remuneration disclosure, high executive pay incentives, low employee loyalty, and/or a relatively efficient market for corporate control) is sufficient to achieve high firm performance.

Proposition 2b. The joint presence of at least two CG mechanisms (weak board independence, weak board information disclosure, weak remuneration disclosure, weak executive pay incentives, high employee loyalty, and/or a relatively inefficient market for corporate control) is sufficient to achieve high firm performance.

Lastly, and consistent with the weak form propositions of complementarities (P2a and P2b), we expect to find more

complex, intermediate configurations than the two dichotomous bundles described in P1a and P1b. However, there is a lack of systematic categorization of all possible theoretical configurations in the literature (Aguilera et al., 2008). One of the advantages of using fuzzy sets methods is precisely the opportunity to "discover" new hybrid CG configurations that also lead to high firm performance while testing for the existence of complementarities by analyzing the effect of different single combinations of mechanisms on firm performance. In this sense, the nature of our research is both exploratory and confirmatory.

RESEARCH METHODS

Fuzzy Sets and fs/QCA

Fuzzy sets qualitative comparative analysis (fs/QCA) permits the assessment of causal conditions or combinations of causal conditions that lead to an outcome based on set-subset connections using Boolean algebra (Ragin, 2000, 2008). It has recently been used in the context of comparative management (Fiss, 2011; Kogut & Ragin, 2006; Schneider, Schulze-Bentrop, & Paunescu, 2010). The fs/QCA method is ideal to detect combinatory effects among multiple CG practices, possible equifinality of different combinations in reaching the same outcome, and capture the likely complexity of resulting combinations. The advantages and disadvantages of using set-theoretic methods and the main differences with other econometric techniques are extensively discussed elsewhere (Fiss, 2007, 2011; Ragin, 2008). It suffices to say that set-theoretic methods are increasingly present in strategic management and organization studies, partly because of recent methodological improvements such as the possibility of using fuzzy sets rather than crisp sets and the newer possibilities to apply statistical tests using STATA (Longest & Vaisey, 2008).

One main feature of fs/QCA is that it allows the investigator to see cases as configurations of conditions that jointly produce outcomes as opposed to traditional correlation-based research, which keeps variables constant while analyzing the effect of one variable in isolation. Although interaction effects have enriched standard linear regression to assess nonlinear relationships, they estimate the fitness of a single path to an outcome, not allowing for a fine-grained exploration of equifinality (Fiss, 2007; Ragin, 2008). Recent theoretical and empirical works speak to the advantages of using fuzzy sets over traditional regression methods when analyzing three-way or more interactions leading to an outcome (Fiss, 2007, 2011; Kogut, 2009; Kogut, Macduffie, & Ragin, 2004).

The transformation of variables into sets requires the specification of full membership, full non-membership to the set of interest, and the crossover point of maximum ambiguity. Crossover point is the score that makes an element have a degree of membership .5 in the set of interest, and also a degree of non-membership of .5. Only for dummy variables (0, 1) can this transformation be done directly from the original variable into a crisp set where 1 indicates full membership and 0 indicates full non-membership. For the construction of the fuzzy sets, we use the anchors specified above and have followed the "direct method" described in

Ragin (2008:85–104). Our analysis and results are computed with STATA using a new command called *fuzzy*, which uses the Quine–McCluskey algorithm to logically reduce the configurations (Longest & Vaisey, 2008).

The truth table algorithm calculates the consistency and coverage of the solutions obtained (Ragin, 2008). The consistency indicates how closely a perfect subset relation is approximated. The consistency ranges from 0 to 1, where 1 would indicate a perfect subset relation. Coverage assesses the degree to which a cause or a causal combination accounts for instances of an outcome. The coverage can be thought of as a measure similar to an R-square in regression analysis, allowing the researcher to evaluate the empirical relevance of the solutions found. The calculation of fuzzy set-theoretic consistency and coverage is done as follows:

$$Consistency\,(X \subseteq Y) = \sum \min(x_i, y_i) \Big/ \sum x_i$$

$$Coverage\,(X \subseteq Y) = \sum \min(x_i, y_i) \Big/ \sum y_i$$

where x_i is the degree of membership of individual i in configuration X and y_i is its degree of membership in outcome Y.

Sample and Data Description

Our sample was drawn from the companies assessed as part of the 2004 annual review for the Dow Jones Sustainability Indexes (DJSI) by SAM Group.[1] SAM Group is an independent asset management group that provides annual assessments of economic, environmental, and social performance of the Dow Jones Global Index universe since 1999 (Cerin & Dobers, 2001; Knoepfel, 2001). Further sources include company and third-party documents as well as personal contacts between the analysts and companies. SAM, in their 2004 DJSI annual review, analyzed a total of 983 companies. Since some companies were assessed after closing for the DJSI and some firms were acquired during the period considered or did not have sufficient data, we dropped them from our sample, resulting in a final sample of 363 firms from 31 countries and operating in 18 different market sectors. The sample's heterogeneity, particularly its cross-nationality, is especially relevant for our study. Additional firm financial and operations data for each firm were obtained independently from Bloomberg and Datastream. As the data for the independent and dependent variables were collected from two different sources, we avoid the frequent problem of common method bias.

Variables Description and Set Calibration

Following propositions 1 and 2, we consider one outcome to capture firm financial performance, return on equity (ROE) and six causal conditions – five at the firm level and the last one capturing the two ideal-type outsider–insider national CG models. These are: (1) board independence, (2) board information disclosure, (3) remuneration disclosure, (4) performance-related compensation, (5) employee loyalty and (6) efficient market for corporate control.

The calibration of these variables has been done according to the criteria detailed in Table 1. One advantage of fuzzy

TABLE 1
Original Variables and Set Calibration (Fuzzy and Crisp Sets)[a]

Variable	# in SAM questionnaire 2004	Membership criteria	Calibration[b]
Board independence	Q#4. *Is the Board headed by a non-executive and independent chairman and/or an independent lead director?*	• Chairman is non-executive and independent since several years	• Full
		• Chairman is non-executive and independent since one year	• More in than out
		• Former CEO is now chairman but independent lead director	• More in than out
		• Role of CEO and chairman is joint, but independent lead director	• More in than out
		• Role of CEO and chairman is split and former CEO is now chairman. No independent director.	• Out
		• Role of CEO and chairman is joint. No independent director.	• Out
		• Chairman is not independent	• Out
Information disclosure	Q#6. *Please indicate if the board of directors of your company has issued a formal CG policy and provides publicly available information regarding its CG framework such as charters of committees or biographies of directors.*	• Score based on the information disclosed externally: ○ Detailed explanation of why corporate governance matters to the company ○ Board of directors CVs, biographies ○ Board of directors members other mandates ○ Attendance of meetings by board of directors members ○ Remuneration framework/evaluation ○ Independency statement of board of directors	Criteria: Full: 5 or 6 items (out of 6) More in than out: 3 or 4 items (out of 6) More out than in: 1 or 2 items (out of 6)
		• Only status published or proxy statement or stock listing requirements	• Out
		• Only list of names of board of directors	• Out
Remuneration disclosure	Q#10. *Does your company communicate the remuneration/compensation of your board of directors/supervisory board members and other highest paid senior director executives (e.g., CEO) externally?*	• Yes, on individual level of each board member and CEO and additional highest paid senior executives	• Full
		• Yes, on individual level of each board member and CEO	• More in than out
		• Yes, on aggregate level for non-executive directors AND on aggregate level for executives directors	• More out than in
		• Yes, on aggregated level of board/supervisory board and senior executives	• Out
		• No	• Out
Performance-related compensation	Q#54. *What percentage of compensation/annual salary (excluding fringe benefits such as pension plans or company car) of skilled employees and managers is on average performance related?*	• Performance related compensation 40–100% • Performance related compensation 20–40% • Performance related compensation 1–20% • Performance related compensation <1%	• Full • More in than out • More out than in • Out
Employee loyalty (retention)	Q#50. *Indicate the percentage of skilled employees (managerial, professional, and technical employees) leaving the company in the course of the past year relative to the total average number of skilled employees during the last year*	• Turnover ≤5% • Turnover 6%–10% • Turnover 11%–20% • Turnover >21%	• Full • More in than out • More out than in • Out
Efficient market for corporate control	Classification of countries according to their legal tradition and financial market attributes as developed by La Porta et al. (1998)	• Outsider system • German, Scandinavian, French system	• Full • Out
ROE	Firm' return on equity for 2004	• ROE > 20% • ROE 20–12% • ROE 12–4% • ROE < 4%	• Full • More in than out • More out than in • Out

[a]We reproduce in Table 1 the full question and the question number as used by SAM in their annual questionnaire (Q#).
[b]**Full:** full membership in the set.
More in than out: above the crossover point of maximum ambiguity.
More out than in: below the crossover point of maximum ambiguity.
Out: full non-membership in the set.

sets over crisp sets is that we do not need to be categorical (1/0) about membership in a set. Thus, we can establish different degrees of membership in a set reflecting the different possibilities found in reality.

Board Independence. This variable is not operationalized as a binary variable (1/0), but as a measure to capture the different degrees of board independence in firms. Thus, we differentiate among seven degrees of board independence. Our calibration reflects these degrees categorized as *full membership*, *more in than out*, *more out than in*, and *fully out* (see Table 1). Prior literature generally acknowledges a director's independence when he/she is independent from senior management of the company (Dulewicz & Herbert, 2004; Kang, Cheng, & Gray, 2007). In general, board independence requires that the board includes outsider directors, the chairperson should be an independent director, and the role of chairperson and CEO should not be exercised by the same individual. For the purpose of this study, we specifically analyze board independence based on chairmanship characteristics. We perform a fuzzy calibration ranging from 1, when the chairman is non-executive and independent (outsider) for several years, to 0, when the role of chairman and CEO is joint and the chairman is not independent. While the full membership and full non-membership points are clear-cut, there are some intermediate situations depicted in Table 1, such as when the role of CEO and chairman is joint but the board has an independent lead director, that are more fuzzy and that we calibrated according to the criteria shown in Table 1. While these cut-off points are based on previous research on board independence (Kang et al., 2007; Rechner & Dalton, 1991), they may have a subjective component, so we have taken some steps to ensure that our results are robust. First, all these calibrations were done independently by two investigators, and they reached identical cut-off points. Further, as a robustness check, we calibrated all the sets, except the crisp set "efficient market for corporate control," following the 20th, 50th, and 80th percentile cut-off points used in previous studies (Fiss, 2011). All the resulting sets were almost identical to the originally calibrated sets and in all cases significantly correlated (p-value < .01). These robustness checks were done for all the fuzzy variables used in this study.

Board Information Disclosure. This variable measures the degree to which firms provide full information disclosure of their activities, biographies of board of directors and policies. The range goes from *non-membership*, when the firm only lists the names of the directors, to *full membership*, when the firm discloses all the information listed in Table 1.

Remuneration Disclosure. A company is *fully included* in this set when it communicates the remuneration of the board members and their highest paid executives individually. In contrast, it is considered *fully out* when the firm does not disclose any information regarding remuneration of board members and top executives. The intermediate situations range from 0 to 1 according to the scheme shown in Table 1.

Performance-Based Compensation. This causal condition is based on the average percentage of skilled employees

and managers' annual salary that is contingent to firm performance. *Full membership* in this set is assigned to firms which offer over 40 percent of their annual salary as performance-related compensation and *full non-membership* corresponds to performance-related compensation lower than 1 percent. Firms that fall between 1 and 40 range from 0 to 1 as described in Table 1.

Employee Loyalty. Employee loyalty is operationalized based on the percentage of skilled employees leaving the company in the last year. Firms with a turnover lower than 5 percent are assigned *full membership*, while firms with a turnover higher than 21 percent are assigned *full non-membership*. Firms that fall between 5 percent and 21 percent are assigned a value between 0 and 1, according to the scheme shown in Table 1.

Efficient Market for Corporate Control. This causal condition is operationalized as a crisp set where firms in an outsider institutional environment are considered to have *full membership* in the set of firms that operate under an efficient market for corporate control, whereas firms operating in a non-outsider (e.g., German, French, Scandinavian) institutional environment were fully excluded from the set. We followed the classification made by La Porta et al. (1998) of countries' legal traditions and financial market characteristics.

ROE. Return on equity has been frequently used in previous empirical studies as a measure of firms' financial performance (e.g., Huselid, 1995; Wiggins & Ruefli, 2002). We calculated ROE based on net income over total equity. While SAM data on CG practices come from 2004, the financial performance was independently obtained from Datastream using 2005 data (1-year time lag) in order to alleviate reverse causality concerns. ROE is a continuous variable that has been transformed, following Fiss (2011), into a fuzzy set using the 80th, 50th and 20th percentiles for *full membership*, *crossover point of maximum ambiguity*, and *full non-membership*, respectively.

RESULTS

Prior to conducting our fuzzy set analysis, we performed a regression analysis in order to check whether the selected six CG practices had an overall effect on firm performance. The regression coefficient and standard errors from the OLS regression analysis are included in Table 2. Before (Model 2) and after (Model 1) controlling for firm size, country, industry, and debt-equity ratio, we find no significant individual effect at conventional levels for any of the six CG practices, confirming previous studies of mixed findings regarding the relationship between individual CG practices and firm performance (Daily, Dalton, & Rajagopalan, 2003; Dalton et al., 1998; Filatotchev, Jackson, Gospel, & Allcock, 2007; Ho, 2005). We are aware that this is a crude test as adding interaction effects among some of the CG attributes may lead to different regression results. Yet the absence of significant regression coefficients when CG practices are taken

	Model 1[a]	Model 2[b]
Board independence	−.05 (.04)	.00 (.03)
Information disclosure	−.06 (.09)	.04 (.07)
Remuneration disclosure	.04 (.07)	.08 (.06)
Performance-related compensation	−.11 (.08)	−.09 (.07)
Employee loyalty	.04 (.09)	.03 (.08)
Efficient market for corporate control	13.20 (34.54)	1.62 (3.80)
R-square	.15	.02
N	**349**	**363**

*p < .10; **p < .05; ***p < .01.
[a]Control variables included: size (log of 2004 sales), debt/equity ratio, industry (17) and country (31).
[b]No control variables included.

individually suggests the need to study the contribution of CG practices to firm performance from a configurational perspective, a task that we undertake in this article. In particular, we explore potential interactions among CG practices in greater detail using set-theoretic methods, examining whether the existence of bundles or mixed combinations of CG practices can explain previous ambiguous and inconclusive empirical findings.

Table 3a and b are "nested" truth tables, where all the configurations are structured in an orderly fashion. They show all possible configurations that result from combining the six selected CG practices and the total number of firms in our sample that better match each of them. There exists a maximum of 64 possible configurations of CG. For instance, as illustrated in the first row of Table 3a, among outsider firms, there are 44 firms which have board independence, information disclosure, performance-related compensation, and employee loyalty. These two tables uncover that heterogeneous bundles of CG practices coexist within the two stylized (insider/outsider) CG national models. For example, within outsider firms (Table 3a), we have 122 firms with board independence and 50 firms with non-independent boards. Likewise, we have 114 firms with high employee retention as well as 58 firms with high employee turnover. Yet, the existence of board independence in an outsider firm is not always accompanied by high employee turnover as illustrated by 76 firms in our sample (Table 3a) with high employee loyalty. Therefore, the presence of within-country and within-firm diversity in terms of CG practices and labor contracts confirms earlier observations in the field (Jacoby, 2005) as well as conceptual arguments regarding the potential combinatory strength of differences in kind and structural heterogeneity (Grandori & Furnari, 2008, 2009). In the last three columns, we highlight which particular configurations are associated with higher ROE – configurations whose consistency is statistically significantly at higher than .70. In the very last column, we report the

configurations leading to higher ROE with the configurations presented in Table 4.

Configurations Leading to High ROE

The results shown in Table 4 follow the notation recently introduced by Ragin and Fiss (2008) and the frequency threshold of two or more cases. The frequency threshold used is quite consistent with Ragin's (2008) advice that the threshold adopted should capture at least 75–80 percent of the cases. Our adoption of a threshold of two enables us to capture more than 90 percent of the cases.[2]

The results correspond to the *complex* solution – results of the intermediate and parsimonious solutions were not computed in our analysis because we limited our analysis strictly to the dataset used and no counterfactuals were employed in our analysis. The use of counterfactuals has the advantage of potentially reducing the complexity of the resulting configurations but the disadvantage of being relatively subjective and they may vary from one researcher to another (Ragin, 2008). Counterfactuals analysis is justified mainly in situations of limited diversity and small sample size, which arguably is not the situation in our case, given the size of our sample. Put another way, if a configuration is not present in our sample, it is likely that such configuration is rare or non-existent within the population. In addition, as we obtained just eight configurations with the complex solution using a relatively large sample, we decided not to introduce any additional external assumptions to maintain our resulting configurations as close as possible to the database used.[3]

The results in Table 4 suggest that the eight configurations we uncover are sufficiently linked to financial performance. We have divided our results into two groups: Firms that belong either to the outsider (Anglo-Saxon) or insider (Continental) model, where efficient market for corporate control is either prevalent or relatively inefficient, respectively.

In total, we find eight causal paths explaining high firm performance and each displays a consistency higher than the .75 threshold. In addition, we perform a statistical test of each configuration consistency and the eight resulting configurations' consistencies are statistically higher than .7 (p < .05) (see the last two columns in Table 3a and b). The overall solution consistency is .79. Coverage is also in the acceptable range, with a total raw coverage of .38. Configurations 1N and 1AN, with an individual coverage of .13 and .16, respectively, are the two configurations that account for a higher number of cases leading to high performance. One implication of the overall coverage of our model being .38 is that the solutions in Table 4 are far from covering all possible paths to achieving high performance (i.e., equifinality) – there are other configurations that do not pass the consistency and frequency thresholds we imposed but still lead to high performance. This result suggests that there is no necessary condition for achieving high performance. Therefore, in what follows, we will focus on the analysis of the sufficient conditions.

Solutions 1N (consistency = .80) and 2N (consistency = .81) are CG configurations of firms operating in countries with a relatively inefficient market for corporate control (insider countries). The most notable and interesting

TABLE 3A
Nested Truth Table for Outsider Firms

Corporate governance practices[a]					Sample			High ROE	
Board independence	Information disclosure	Remuneration disclosure	Performance-related compensation	Employee loyalty	Firms#	%		Consistency vs. Set value[b]	Configurations in Table 4
1	1	1	1	1	44	12.1%			
				0	27	7.4%			
			0	1	2	0.6%			
				0	2	0.6%			
		0	1	1	15	4.1%			
				0	3	0.8%	Yes	7.83***	4A
			0	1	1	0.3%			
				0	2	0.6%			
	0	1	1	1	10	2.8%			
				0	9	2.5%			
			0	1	–	–			
				0	–	–			
		0	1	1	4	1.1%	Yes	10.09***	3A
				0	2	0.6%			
			0	1	–	–			
				0	1	0.3%			
0	1	1	1	1	18	5.0%			
				0	6	1.7%	Yes	7.63***	2A
			0	1	–	–			
				0	–	–			
		0	1	1	6	1.7%	Yes	5.60**	1A/1AN
				0	1	0.3%			
			0	1	2	0.6%	Yes	23.37***	1A
				0	–	–			
	0	1	1	1	6	1.7%	Yes	18.49***	5A
				0	1	0.3%			
			0	1	1	0.3%			
				0	–	–			
		0	1	1	4	1.1%			
				0	3	0.8%			
			0	1	1	0.3%			
				0	1	0.3%			

[a]For the sake of simplicity, we represent in this table all the sets as "crisp sets" (1 = above the cross-over point; 0 = below the cross-over point). However, it is important to note that the CG practices are fuzzy sets, where each firm has a different degree of membership in that set ranging from 0 (fully out) to 1 (fully in).
[b]We only report the Wald test F-statistic for those configurations whose consistency is statistically significantly higher than .70.
*p < .10
**p < .05
***p < .01

TABLE 3B
Nested Truth Table for Insider Firms

Corporate governance practices[a]					Sample		High ROE		
Board independence	Information disclosure	Remuneration disclosure	Performance-related compensation	Employee loyalty	Firms#	%	Leads to high ROE	Consistency vs. Value set[b]	Configurations in Table 4
1	1	1	1	1	17	4.7%			
				0	4	1.1%	Yes	7.4***	2N
			0	1	2	0.6%	Yes	4.85**	1N
				0	–	–			
		0	1	1	15	4.1%			
				0	–	–			
			0	1	1	0.3%			
				0	–	–			
	0	1	1	1	9	2.5%			
				0	2	0.6%			
			0	1	5	1.4%	Yes	23.20***	1N
				0	–	–			
		0	1	1	26	7.2%			
				0	5	1.4%			
			0	1	6	1.7%			
				0	1	0.3%			
0	1	1	1	1	18	5.0%			
				0	3	0.8%			
			0	1	2	0.6%	Yes	16.79***	1N
				0	–	–			
		0	1	1	5	1.4%	Yes	6.01**	1AN
				0	2	0.6%			
			0	1	1	0.3%			
				0	–	–			
	0	1	1	1	8	2.2%			
				0	6	1.7%			
			0	1	4	1.1%	Yes	15.16***	1N
				0	–	–			
		0	1	1	34	9.4%			
				0	3	0.8%			
			0	1	12	3.3%			
				0	–	–			

[a]For the sake of simplicity, we represent in this table all the sets as "crisp sets" (**1** = above the cross-over point; **0** = below the cross-over point). However, it is important to note that the CG practices are fuzzy sets, where each firm has a different degree of membership in that set ranging from 0 (fully out) to 1 (fully in).

[b]We only report the Wald test F-statistic for those configurations whose consistency is statistically significantly higher than .70.

*p < .10
**p < .05
***p < .01

TABLE 4
Fuzzy Sets Results. High ROE[c]

	Solutions[a] (sufficient causal conditions for High ROE)							
	Insider[b]			Outsider[b]				
	1N	2N	1AN	1A	2A	3A	4A	5A
Board independence		●	⊗	⊗	⊗	●	●	⊗
Information disclosure		●	●	●	●	⊗	●	⊗
Remuneration disclosure	●	●	⊗	⊗	●	⊗	⊗	●
Performance-related comp.	⊗	●	●		●	●	●	●
Employee loyalty	●	⊗	●	●	⊗	●	⊗	●
Efficient market for corporate control	⊗	⊗		●	●	●	●	●
Consistency	.80	.81	.81	.82	.82	.81	.80	.85
Coverage(raw)	.13	.08	.16	.08	.09	.06	.09	.07
Coverage(unique)	.07	.03	.03	.01	.03	.01	.03	.02
Overall consistency	**.79**							
Overall coverage	**.38**							
Examples (sample):	Statoil UPM-Kymmene Oy Total	Heineken N.V. ABN-AMRO Holding N.V. Zurich Financial Services L.M. Ericsson	Telefonica Moviles Red Electrica Iberia UBS Group	Rohm & Haas Co. Sempra Energy Lockheed Martin Analog Devices E. I. Du Pont	Taiwan Semicond. Manufacturing Dell Corp Dow Jones & Co. Exelon Corp. Barclays Plc	Li & Fung Ltd. Procter & Gamble Co.	Bank of Nova Scotia Allergan Inc. Staples Inc.	Johnson Controls Inc. Caterpillar FPL Group Pulte Homes. Inc. Lear Corp

[a] ● Presence of conditions; ⊗ Absence of conditions; Blank cells: non-binding conditions (i.e., the condition can be either present or absent in that configuration).
[b] We used LaPorta et al.'s (1998) classification of countries based on their legal tradition and financial systems in order to separate Outsider from Insider countries. Configurations 1N-3N are configurations of CG practices followed by firms located in Insider countries. Configurations 1A-5A are configurations of CG practices followed by firms located in Outsider countries. Configuration 1AN corresponds to configurations of firms that can be either in an Outsider or an Insider country.
[c] For robustness purposes, we have used an alternative measure of firm performance, Tobin's Q. We find that three configurations overlap with our current results in Table 4 (1A, 2A, and 3A), and one is idiosyncratic to Tobin's Q.

finding is the heterogeneity of CG practices within these two configurations from countries in an archetypical insider model. While configuration 1N conforms to the stylized insider CG bundle (with the exception of director's remuneration disclosure), 2N presents all the features typical of outsider CG systems: independent board, high external information disclosure to investors, top management and directors remuneration disclosure, performance-related compensation, and low employee loyalty. This result lends support to the claim that firms in insider countries are adopting outsider CG practices and that these mechanisms induce high performance.

Solutions 1A (consistency = .82), 2A (consistency = .82), 3A (consistency = .81), 4A (consistency = .80), and 5A (consistency = .85) are bundles of CG practices, each of them sufficient to induce high financial performance in outsider environments, under a relatively efficient market for corporate control (i.e., outsider). The resulting solutions show that, similar to insider firms, those operating in outsider countries exhibit differing degrees of practices from the two archetypical CG models. Some of these configurations have high employee loyalty (1A, 3A, and 5A), non-intensive performance-related compensation (1A), no directors' remuneration disclosure to investors (1A, 3A, and 4A), no information disclosure to investors (3A and 5A), or a non-independent board (1A, 2A, or 5A). Solutions 2A and 4A are the configurations that better conform to the stylized outsider model of CG. Finally, we find one hybrid configuration – 1AN (consistency = .81) – of sufficient causal conditions

leading to high ROE that can be found both in outsider as well as insider firms. 1AN shows elements of outsider as well as insider CG.

Regarding the strong and weak form propositions of complementarities, our results lend higher support to the latter. The relatively large number of different hybrid configurations leading to high firm performance within outsider environments (1A–5A) favors propositions P2a over P1a. The reason is that we did not find two unique holistic bundles of CG practices but rather at least eight different configurations explaining high performance. In other words: at least *two* CG practices are needed to explain high performance, while no single CG practice in isolation constitutes a sufficient causal condition to explain high performance.

Similarly, the results shown in Table 4 support P2b instead of P1b and are more consistent with the explanation derived from the weak form proposition of complementarities (P2b), where CG mechanisms produce positive financial results working in dyads or triads, etc., rather than as fixed, polarized bundles of practices (i.e., insider–outsider).

Configurations Leading to Low ROE

Interestingly, in fuzzy-set analysis the set of causal conditions leading to the presence of the outcome is frequently different from the negation of the set of conditions leading to the absence of the outcome – unlike in regression analysis, where results remain unchanged except for the sign of the coefficients if one uses the inverse of the outcome (Fiss,

TABLE 5
Fuzzy Sets Results. Low ROE

Solutions[a] (sufficient causal conditions for Low ROE)

	1L	2L	3L
Board independence	⊗		⊗
Information disclosure		⊗	
Remuneration disclosure	●	●	
Performance-related compensation	⊗	●	●
Employee loyalty	●	⊗	⊗
Efficient market for corporate control	⊗	⊗	⊗
Consistency	.80	.80	.82
Coverage(raw)	.09	.11	.12
Coverage (unique)	.04	.02	.04
Overall solution consistency		**.79**	
Overall coverage		**.19**	

[a] ● Presence of conditions; ⊗ Absence of conditions; Blank cells: non-binding conditions (i.e., the condition can be either present or absent in that configuration).

2011). Given this feature of fs/QCA, we perform a test of the causal conditions leading to low ROE. The results are presented in Table 5.

We find only three consistent paths sufficient to lead to low ROE: 1L (consistency = .80), 2L (consistency = .80), and 3L (consistency = .82). These three configurations combine different governance practices but they share the common feature of firms belonging to the relatively inefficient market for corporate control (i.e., insider countries). The relatively low overall coverage (.19) indicates that there exist other paths to low performance, although it can be the result of many configurational choices and combinations, with no particular ones to be avoided except for the three shown in Table 5 (1L, 2L, and 3L). Overall, our results suggest that while there is a good number of concrete configurational choices that reliably lead to high ROE (Table 4), when it comes to low ROE the number of known causal "recipes" are much more reduced (i.e., there are too many alternative paths leading to low ROE, preventing a systematic categorization of them).

Firm-Level Illustration of Our Findings

Once we have uncovered the different possible paths of CG practices leading to high firm performance, we take our findings a step further by filling in the solutions with a discussion of how firms in these different solutions might look like. Specifically, we have gone back to our data and found examples of companies for each of the uncovered configurations in order to illustrate how different configurations of CG practices operate in their respective institutional contexts.

Configuration 1N. This configuration is the closest to the ideal-type insider CG model. Companies with configuration 1N generally belong to countries where markets for corpo-

rate control are relatively less efficient than those of outsider countries. Such firms are characterized by high employee loyalty and directors and top management are compensated like "bureaucrats" with very little or no use of stock options and performance-related incentives. The only exception to the ideal insider configuration is the presence of a director's remuneration disclosure policy, which in our sample, might be related to the fact that most of the firms are either state-owned or formerly state-owned. Thus, some European oil and energy-related companies such as *Statoil* (Norway), *Total* (France) or *UPM-Kymmene Oy* (Finland) fit well in configuration 1N.

Configuration 2N. This configuration is typically found in European firms that operate in countries with a French, Scandinavian or German legal tradition. In these countries, the market for corporate control is relatively less efficient than in outsider countries. Furthermore, firms with configuration 2N tend to have high employee turnover (e.g., *Heineken*) and follow the outsider CG practices: high board independence, board of directors information disclosure, directors remuneration disclosure, and a large percentage of directors and top management remuneration based on stock options and performance-related metrics. This configuration provides clear evidence that CG mechanisms *within* countries are more heterogeneous than scholars have assumed so far because in insider-oriented countries (French, German or Scandinavian legal system), we can find bundles of outsider-oriented CG practices in a reduced number of firms that also achieve high performance. Some examples of companies adopting a 2N configuration and achieving high performance in the period analyzed are: *Heineken*, *ABN-AMRO*, *Zurich Financial Services* or *Ericsson.*

Configuration 1AN. Firms included in this configuration can be found operating under various legal systems (Anglos-Saxon, German, French or Scandinavian). These firms externally communicate board of directors' practices/ decisions but there is no transparency regarding directors' remunerations. Board independence and directors' remuneration disclosure is not mandatory for these firms (i.e., no legal obligation). They make intensive use, however, of stock options and performance-related incentive schemes, typical of outsider-oriented CG systems. Thus, configuration 1AN is a hybrid between outsider and insider CG configurations. Under 1AN configuration we find, for example, some prominent Spanish firms (e.g., *Iberia*, *Red Electrica*, *Telefonica*) and large European banks such as *UBS*.

Configuration 1A. Firms with configuration 1A operate in countries with a highly efficient market for corporate control (e.g., US and UK firms). As expected, companies with configuration 1A meet the board of directors' information disclosure requirements. However, 1A firms are in mature, stable industries and, thus, enjoy higher employee tenure. These firms do not disclose director's remuneration to outsiders and the role of CEO and chairman can be either joint or if split, then the former CEO is now chairman. In many cases, we find the former CEO acting as the current chairman in firms operating with configuration 1A. Naturally, such an arrangement negatively influences board inde-

pendence. We find many 1A firms in the chemical, military, and energy industries (e.g., *Du Pont*, *Lockheed Martin*, *Rohm & Haas*, and *Sempra Energy*).

Configuration 2A. Together with configuration 4A, configuration 2A is the closest to the ideal type outsider configuration. These firms have high employee turnover and display characteristics most common to outsider-oriented CG practices such as intensive performance-related incentives for directors and top management, director's remuneration disclosure, and board of directors' disclosure of practices and decisions. However, in these firms, there is no effective board independence as the role of CEO and chairman is joint or in the case that the role of CEO and chairman is split, the former CEO becomes the current chairman. Configuration 2A comprises mainly US high-tech firms (*Dell*, *Exelon*), a few Taiwanese high-tech firms (e.g., *Taiwan Semiconductor Company*) and a few Anglo-Saxon financial services firms (e.g., *Barclays*, *H&R Block*).

Configuration 3A. This is a truly hybrid configuration in that it has three elements of insider-oriented CG systems (high employee loyalty, no board of directors information disclosure, and non-directors' remuneration disclosure to outsiders) and two elements of outsider-oriented CG systems (high board independence and performance-related compensation schemes). Retailers *Li & Fung* (Hong Kong) and *Procter & Gamble* (US) are examples of firms operating under configuration 3A.

Configuration 4A. The basic attributes of firms with configuration 4A are identical to those of firms included in configuration 2A, except the former exhibit board independence while the latter exhibit remuneration disclosure as these two practices seem to work as functional equivalents (Gresov & Drazin, 1997). The notion of functional equivalence is associated with the idea of equifinality in the sense that some causal conditions can be interchangeable or substitutable across configurations. In the particular case of configurations 2A and 4A, it implies that companies with board independence and no remuneration disclosure perform well (4A), while firms that do not have board independence but provide remuneration disclosure perform equally well (2A), given all the other conditions included in configurations 2A and 4A are met. A heterogeneous group of firms operate under configuration 4A including *Bank of Nova Scotia* (Canada; Financial services), *Allergan* (US; Healthcare) and *Staples* (US; Retailing).

Configuration 5A. Configurations 3A and 5A are also identical, but the former shows high board independence and low remuneration disclosure levels, while the reverse is true for the latter. Similar to the properties between 2A and 4A, board independence and remuneration disclosure act once again as functional equivalents (Gresov & Drazin, 1997) in configurations 3A and 5A, lending support to the idea that board independence and remuneration disclosure work as substitutes of each other. US firms in the automobile, construction, energy, and heavy equipment industries such as *Johnson Controls* (Auto components and energy),

Caterpillar (Heavy equipment and engines), *FPL Group* (Electric utilities), *Pulte Homes* (Construction) and *Lear Corporation* (Automobile interiors) operate under this configuration.

DISCUSSION AND CONCLUSION

This article seeks to build a bridge between the rich tradition on cross-national studies of CG complementarities (Hall & Soskice, 2001) and the fast growing literature on CG firm-level practices (Ward et al., 2009). While external, national-level institutional variables such as market for corporate control, regulations, and investor monitoring systems influence firm-level governance configurations, firm-level practices including the board of directors, management incentives, and employment contracts also have an effect on a firm's CG configuration, and ultimately firm performance. A large number of previous studies examining CG practices either focus on a particular firm-level governance practice overlooking the broader governance bundle configuration, or categorize firms under an over-generalized national category without considering significant intra-country heterogeneity (Aguilera et al., 2008; Fiss, 2008). This study contributes to the existing body of literature by focusing on the complementarities between CG practices at the firm level and identifying specific CG bundles that lead to high firm performance. While there is a good number of previous studies that have looked at firm-level hybrid organizational forms (Leblebici, 2000; Menard, 2004), our study shows that there are also effective organizational hybrids when it comes to corporate governance practices.

We also show that different methodologies can shed new (and hopefully better) light on currently unexplained phenomena in the field of comparative CG. In particular, we explore and map CG complementarities from a configurational perspective, using fuzzy-set methods. Much CG research to date has focused, in general, on the potential linear complementarity and substitutability of monitoring and incentive systems to alleviate agency conflicts and improve CG effectiveness (Rediker & Seth, 1995; Ward et al., 2009). Our study implicitly assumes that the complementarity effects are produced among aligned bundles of practices under the rule that "the more existing aligned practices, the better the outcome." For example, to achieve strong board monitoring, all the underlying governance practices such as board duality, board independence, and external information disclosure are expected to also be high. In fact, the assumption is that the higher they are, the stronger the complementarities and the higher the ultimate firm performance will be. Instead, we demonstrate that complementarities can emerge from overly dissimilar practices as well. Thus, we find empirical support for complementarities between relatively heterogeneous practices such as board independence and employee loyalty or between managerial incentives and efficient market for corporate control among others, as shown in Table 4. The idea that complementarity can emerge both from "similar in kind" as well as "different in kind" organizational practices has been proposed by Grandori and Furnari (2008), and we show with QCA that this provocative idea opens an entirely new avenue for comparative CG research, as our findings illustrate.

We draw on the configurational and complementary approaches (Grandori & Furnari, 2008) and on existing CG research (Aguilera & Jackson, 2003; Aguilera et al., 2008) to offer a detailed analysis into the complementarities between six selected firm-level CG practices. We use fs/QCA to uncover eight causal paths (configurations) leading to high firm performance in a sample of 946 firms from 31 countries. Our most salient finding is that the empirical evidence for high order complementarities among aligned CG practices based on the two stylized insider and outsider models is quite weak. Instead, our results support the existence of heterogeneous bundles of governance practices within and across the stylized national CG models that combine in dyads, triads, or higher order combinations and lead to superior financial performance.

Our findings also contribute to the debate on whether different CG practices are complementary and substitutes (Rediker & Seth, 1995; Ward et al., 2009). We offer empirical evidence that supports and identifies configurations in which complementarities of practices are in place – each of the eight solutions reported in Table 4 require at least two CG practices in order to achieve high performance – or in which practices are substitutable (functional equivalents operating between configurations 2A and 4A and between 3A and 5A).

First, by identifying eight causal paths leading to high ROE, we carefully suggest that we have provided a foundation for subsequent clinical/case study research which can explore the complementarities existing between the CG practices in further detail. For example, although previous research suggests that board independence and board of directors' information disclosure are highly complementary in outsider environments (configuration 4A), our results indicate that the two variables do not seem to generate complementarity with high employee loyalty (e.g., configurations 1A and 3A). Exploring the reasons behind this finding may be a fruitful avenue of further research. Second, by conducting a more detailed analysis of firms operating with configurations such as 2N, future research can provide a more complete picture as to why and how certain firms in insider environments can isolate themselves from national CG macro-mechanisms and adopt a CG configuration typical of outsider countries to generate higher performance than their counterparts that do not adopt such CG configurations under similar institutional environment. In order to facilitate these suggested in-depth studies of particular firms, fs/QCA presents several advantages in terms of combining qualitative and quantitative methodologies. One of those advantages is that fs/QCA allows researchers to go back to the data and identify the particular firms (units) that are included in each configuration (see examples in Table 4). At the same time, fs/QCA permits researchers to discover complex relationships between the causal conditions and the outcome that may remain hidden using correlational-based methods as suggested by the contrast between Tables 2 and 4. This methodological aspect is an important contribution of this article to the study of CG bundles at the firm level.

Our findings also have some legal implications. In terms of the debate on hard law (e.g., US Sarbanes-Oxley Act) vs. soft law (e.g., UK Combined Code) approaches to CG regulation (Aguilera, Goyer & Kabbach de Castro, 2013), our results suggest that the latter approach is more beneficial from an economic efficiency point of view because, within a given country, firms operate under various configurations of CG practices and attaining higher financial performance. For example, within the US, very different configurations in terms of compliance with CG codes 1A–5A lead independently to higher financial performance. Under a soft law approach, firms within the same country or jurisdiction can self-regulate and choose the more appropriate CG practices in terms of the existing firm-specific complementarities with other CG practices already in place. However, going beyond economic efficiency, soft law also presents problems of its own such as weaker degree of enforcement and inability to mandate uniform minimum standards (Aguilera et al., 2008).

Our study does have some limitations. First, there are some concerns about the QCA methodology itself (see, for example, Kogut, 2009). QCA does not make good use of over-time variation (e.g., panel data) and therefore we can only analyze causal conditions for current performance. However, to the extent that CG practices are part of an institutional framework that remains relatively constant over time, this criticism can be mitigated. Second, while our dataset brings in detailed information of CG practices at the firm level, it also presents some limitations. SAM Research Group uses its own scoring system to measure CG practices and, therefore, we have to rely on this proprietary scoring system. Thus, some variables such as board independence have been measured according to who is heading up the board and how independent he/she is, when previous studies have measured board independence in different ways.

Third, there are some institutional differences driven by national regulatory context that are likely to affect the firm-level CG practices. Although some of these institutional differences are captured through the distinction between outsider and insider countries, our study does not discriminate whether the presence/absence of a given CG practice is due to a firm-level or a national-level choice. This could, in fact, have an impact on some of the combinatory outcomes shown in Table 4. Future research could explore this issue in further detail by accounting for more specific national differences (e.g., French, German, and Scandinavian legal traditions).

Lastly, we do not claim that the configurations shown in Table 4 are exhaustive nor cover all contingencies. More comprehensive and complete classifications of governance systems with a greater level of detail should be developed in future research. It is our hope that this study will be the "first stone" in a long and well-used pathway of configurational research in corporate governance. However, any study aiming to examine the wide range of CG configurations can only select a reduced set of practices because of the increasing complexity involved when any additional category is included. For example, our study deals with six CG practices which generate a total of 64 (2^6) different configurations, as shown in Table 3a and b. Adding more practices will inevitably increase the complexity at an exponential rate, creating a serious technical burden for researchers in both conducting the research and presenting the findings.

In conclusion, despite the challenges in conducting configurational and complementary-based research, we demonstrate that there exist in the two stylized CG models multiple

bundles of firm-level corporate governance practices embedded leading to high firm performance. In addition, we reveal three important conceptual findings. First, governance practices in these bundles do not always relate to each other in a monotonic and cumulative fashion because this is likely to generate higher costs and over-governance. Second, consistent with Grandori and Furnari (2008), practices in bundles do not need to be aligned toward the insider or the outsider model (similar in kind) as we show that non-aligned practices can also be complementary, creating hybrid governance forms. Third, we discover the functional equivalence across bundles of corporate governance practices, which gives firms some agency on which practices to implement to achieve high performance.

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NOTES

1. SAM (Sustainability Asset Management) Group Holding AG, Josefstrasse 218, CH-8005 Zurich, Switzerland.
2. With a frequency threshold of three, the number of cases captured goes down to 89 percent and to 85 percent when a threshold of four is used. The results presented in Table 4 are quite robust to changes in the frequency threshold used. For instance, when a threshold of three is used instead of two, the overall model coverage and consistency do not change much. Seven out of the eight original configurations remain identical and only one configuration (1A) drops when we use the increased frequency threshold.
3. Recent articles based on set-theoretic methods might distinguish between core and peripheral conditions by using the intermediate and parsimonious solutions. In this article we report the complex solution solely due to the reduced number of resulting configurations of this solution and the relatively large sample used in the empirical section which mitigates our concerns of limited diversity issues. By so doing, the results reported in Tables 4 and 5 are as close to the data as possible, with no *a priori* assumptions.

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