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INCAS

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Professionals On Corporate Boards In Japan: How Do they Affect The Bottom Line?

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INCAS

Understanding institutional change in Asia: a comparative perspective with Europe

<http://incas.hypotheses.org/>



ABOUT THE INCAS PROJECT

INCAS is a Marie Skłodowska-Curie Actions R.I.S.E funded project under the European Commission's H2020 Programme.

The project INCAS aims at creating a top-level research and advanced training network on institutional change in Asia, in comparative perspective with Europe.

The coordinator, Ecole des Hautes Etudes en Sciences Sociales (France), promotes this network together with Oxford University (UK), Freie Universität Berlin (Germany), and in collaboration with Waseda University (Japan). The aim of the proposed mobility scheme is to give birth to a European consortium and network of faculties and advanced graduate students specialized in the comparative analysis of institutional change in Asia and Europe. The partners have chosen Japan as a reference point because of its comparability with Europe as shown by previous studies, its historical influence on development and further institutional changes in Asia, and the expertise accumulated within our research team.

Analyzing current economic dynamics in Japan and later expanding this analysis to other Asian countries promises to generate insights that might be help to better understand challenges for Europe and to prepare relevant policy proposals. Our purpose is to compare the results obtained in the case of Japan and few other Asian countries (South Korea, Taiwan, China, and possibly Thailand, after having checked the data availability), not only to previous results on Europe but also to original results we will get on European countries (primarily France – which will be our reference country in Europe – and then the UK, Germany, and Italy) in mobilizing new historical data and applying our theoretical framework.

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Mari Sako & Katsuyuki Kubo

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Comments welcome

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Abstract

Licensed professionals, such as accountants and lawyers, play a variety of roles when they sit on corporate boards. This paper sheds light on what role professional-directors play under what circumstances, and its consequences for corporate performance. We develop a theory that links professional roles (as cops, counsel, or entrepreneur) to antecedents in terms of external environment (notably the extent of government regulation) and to consequences for firm performance (profitability, corporate valuation, and stock return volatility). Using a data of all publicly quoted companies in Japan during 2004-2015, we demonstrate that the presence of professional-directors increases profitability and corporate valuation in all sectors, and that they contribute to higher stock return volatility in regulated and lower volatility in less regulated industries. The differential impacts of professional roles on firm performance – by acting as ‘entrepreneur’ in regulated industries and as ‘cops’ in non-regulated industries – have implications for board composition and board effectiveness. We provide discussion of the implications in the context of corporate governance reforms in Japan.

Keywords: Professionals, lawyers, accountants, corporate governance, board of directors, actor-centered institutionalism.

JEL Codes: M12, L84, G32, G34.

1. Introduction

In recent decades, firms have been appointing more licensed professionals such as accountants and lawyers on their boards (Litov, Sepe, & Whitehead, 2014; Naiker & Sharma, 2009). But we do not know enough about what roles they play under what circumstances. Indeed, these ‘professional-directors’ (i.e. professionals on boards) play various roles with tensions between them, acting as gatekeepers (‘cops’) to reduce malfeasance (Coffee, 2006), as strategic advisors (‘counsel’) to add value to the firm (Bagley, 2008), or as promoters of creative solutions to new opportunities (‘entrepreneurs’) thus enhancing the firm’s risk appetite (Nelson & Nielsen, 2000).

However, different streams of research have prioritized one role over another. In particular, the monitoring (or gatekeeping) role is emphasized in the corporate governance literature grounded in finance and economics (Adams, Hermalin, & Weisbach, 2010; Shleifer & Vishny, 1997). By contrast, strategy scholars regard professionals as playing a counsel or entrepreneurial function, enhancing competitive advantage (Bagley, 2008; Bagley, 2010; Hillman & Dalziel, 2003). Recent legal scholarship also focuses on the strategic value-adding role of lawyer-directors and lawyer-CEOs (Henderson, Hutton, Jiang, & Pierson, 2017; Litov et al., 2014).

Against this backdrop, the professions literature has not forgotten the multiple roles that professionals play in relation to corporate management (Empson, Muzio, Joseph Broschak, & Hinings, 2015; Nelson & Nielsen, 2000). This paper builds on this insight to develop theory and evidence on contingencies of varied professional roles and their impact on corporate performance. What are the circumstances under which professional-directors are likely to play one role rather than others? And what is the impact of each role on firm performance?

This study addresses this issue by building on, and modifying, the professions literature to apply to the specific situation of professionals on corporate boards. Professional-directors are under-studied in corporate governance literature (much more attention has gone to the role of CEOs and board independence for example) (Adams et al., 2010; Johnson, Daily, & Ellstrand, 1996). Professionals on boards are also understudied relative to their role as external advisory agents (Coffee, 2006) working at professional service firms (Empson et al., 2015; Greenwood, Hinings, & Brown, 1990) or as in-house functional heads (Morse, Wang, & Wu, 2016). Moreover, given separate scholarship in accounting and law, there is a tendency to focus on lawyers only (Litov et al., 2014) or accountants only (Naiker & Sharma, 2009). This study attempts to combine the two fields to investigate the co-presence of more than one type of professional-directors.

We develop and test our hypotheses using a panel data of all publicly quoted companies in Japan during 2004-2015. Japan provides an ideal setting for analyzing board effectiveness given its compressed history of dramatic changes in corporate governance practices since the late 1990s. Lawyers and accountants have sat on corporate boards in the US and UK at least since the middle of the twentieth century. By contrast, they had been relatively absent on Japanese boards until 2000, but have grown rapidly since then. Notwithstanding cynicism that their appointment is mere window dressing, we demonstrate that licensed professionals constitute an important subset of board members, many of whom are outside directors (Miyajima & Ogawa, 2012). Moreover, strategy research on Japanese boards is rare (exceptions are Wiersema and Bird (1993) and Wiersema, Nishimura, and Suzuki (2018)), a missed opportunity given that Japanese top management teams possess many of the attributes that the upper echelons approach emphasizes, such as behavioral integration (Hambrick, 2005) and shared responsibility (Aoki, Jackson, & Miyajima, 2007; Dore, 1988).

This study contributes to research on the contingent effects of executive backgrounds on organizational outcomes, by focusing on licensed professionals on corporate boards. Our study provides insights on contributions professionals make to strategic decision-making inside corporations, a neglected topic in the professions literature (Sako, 2013). In particular, we identify professional-director roles along two distinct dimensions, the ‘wise counsel’ role based on their human and relational capital – what we call *professional capital*, and the ‘cop’ and ‘entrepreneur’ roles that result from their attitude to risk-taking. This study also draws implications for corporate governance generally and board composition specifically (Adams et al., 2010). By clarifying in what ways licensed professionals contribute to board independence and effectiveness, we go beyond the agency role of directors to examine their roles in bringing resources and influencing strategy (Daily, Dalton, & Cannella, 2003; Johnson et al., 1996).

The rest of the paper is structured as follows. The next section develops hypotheses concerning the contingent performance effects of professional-directors as cops, counsel, and entrepreneur. One contingency we examine is government regulation. Next, we justify why Japan provides an appropriate context for this study of the impact of professional-directors on company performance, present the data and findings, and address the endogeneity problem noted by Hambrick and Mason (1984) and Hambrick (2005). We then interpret our findings in light of other evidence (interviews with professional-directors and media coverage), discuss implications, and conclude.

2. Theory and hypotheses

2.1 Professionals on Corporate Boards

A central issue in our study is the varied impact of the presence of professional-directors on corporate performance. We begin with reviewing the professions literature to inform this question, in order to characterize a variety of roles that professional-directors play as a result of their training, expertise, and ethics.

Licensed professionals such as accountants and lawyers possess expert knowledge in a specific domain (Abbott, 1988; Teece, 2003). They work within professional service firms or in-house to contribute to improve the quality of strategic decisions companies make (Empson et al., 2015). At the same time, by virtue of their training and professional ethics inculcated through such training (Dinovitzer, Gunz, & Gunz, 2015), professionals are predisposed to defend specific values which may be beneficial to board effectiveness. In particular, licensed professionals are bound by codes of ethics, which ensure that they act in the interest of their clients and the public at large. Accountants and auditors value objectivity and independence in the sense of being free from conflict of interest, and have formal obligations for public disclosure (Coffee, 2006). Lawyers value autonomy, and are similarly suited to act as gatekeepers with respect to corporate management (Coffee, 2006; Morse et al., 2016).

Given their expertise and ethics, licensed professionals may be expected to play a variety of roles particularly when they work inside business corporations. This is concisely summarized in Nelson and Nielsen's study which identified three distinctive roles that in-house lawyers construct for themselves, as cops, counsel, or entrepreneurs (Nelson & Nielsen, 2000). Cops limit their advice to legal mandates, and police business decisions that compromise legal risks. Counsel give legal advice to business managers in order to facilitate wise business decisions. By contrast, in-house lawyers acting as entrepreneurs participate in the pursuit of business opportunities, as they believe that such opportunities may be unlocked by innovative use of law. Nelson & Nielsen (2000) consider these roles as behavioral dispositions that the same lawyer adopts as he sees fit. That is, the same lawyer may play different roles in different circumstances. They also regard 'counsel' as the default role for most inside lawyers, though some are more predisposed to play the 'cop' role or the 'entrepreneur' role.

Building on their insight, this study goes beyond, and modifies, Nelson & Nielsen (2000) in four ways. First, the three roles applied to in-house lawyers will be applied to professionals who sit on corporate boards. While accountants and lawyers have different areas of expertise, they play overlapping and at times similar roles with respect to monitoring the corporations' financial performance and advising in business projects such as M&A deals ("...the world of corporate lawyers probably more closely borders on that of the accountant than that of the litigator/advocate" (Coffee, 2006: 193)). Being directors sitting on boards, professional-directors do not merely advise and monitor, but take on considerable responsibilities by participating in strategic decision-making.

Second, we seek to identify the firms' external environmental contingencies that facilitate and give opportunity for professional-directors to adopt one role rather than others. Professionals may have their individual disposition to adopt a certain role, given their perception about the legitimate role of professionals inside business corporations. But they have to be put in specific circumstances and given corresponding opportunities to be able to enact that role in practice. One prominent approach is to identify incentives (financial or positional) to allocate professional time to these roles. For example, general counsel (Chief Legal Officers) may be compensated in stock options, and have a financial incentive to trade off gatekeeping in favor of greater risk-taking (Morse et al., 2016). General counsel who join senior management are also found to increase firm credit risk (Ham & Koharki, 2016). In our study, we hold these positional and financial incentives relatively constant, as professionals we examine are all on boards and tend to be paid a flat fee as non-executive directors.¹ An alternative approach taken here is to identify environmental contingencies, such as the market and non-market (e.g. regulatory) conditions in which the firm is situated. The alignment of professional roles to the environment is under-explored and is a focus of our study.

Third, we theorize and empirically demonstrate the specific impact of each professional role on corporate performance. Here, we take a cue from the upper echelons theory (Hambrick, 2007; Hambrick & Mason, 1984), which examines top management team (TMT) characteristics as proxies for the executives' cognitive and psychological processes (Hambrick, 2007) and link them to firms' strategic direction and performance (Finkelstein, 1992; Finkelstein & Hambrick, 1990; Hambrick, Cho, & Chen, 1996; Tihanyi, Ellstrand, Daily, & Dalton, 2000; Wiersema & Bantel, 1992). Building on these

1. According to a corporate governance survey in 2002, 13.8% of outside directors were paid in stock options compared to 91.4% of inside directors (see Miyajima, H., Haramura, K., & Inagaki, K. (2003), Chart 3-20).

studies, we focus on the specific case of links between professional expertise as one type of TMT characteristics and corporate performance, mindful of the need to unpack the endogeneity problem. The possibility of two-way causation, that TMT characteristics are both an antecedent and a consequence of firm outcomes, was highlighted upfront by Hambrick and Mason (1984), and remains a major methodological challenge (Carpenter, Geletkanycz, & Sanders, 2004).

Last but not least, we identify two separate dimensions, the *professional-capital* dimension and the *risk-taking* dimension, which we assert are necessary to fully characterize the varied roles of professional-directors. The *professional-capital* dimension is about the quality of professionals' human capital and relational capital, which influence the quality of professional advice and judgment in specific situations. The *risk-taking* dimension, by contrast, is about the extent to which professional-directors influence the board's risk appetite regardless of the quality of professional capital. Unpacking the two dimensions imply that the varied professional roles of 'cop, counsel, entrepreneur' do not lie on a single spectrum. We develop hypotheses for each of these dimensions below.

2.2 Professional-Directors as 'Wise Counsel'

Firms select board members for their capacity to provide 'wise counsel' to enable making strategic decisions that enhance sustainable competitive advantage. The wisdom of any counsel derives from essential management resources, which may be broken down into human capital (Becker, 1964) and relational capital (Kale, Singh, & Perlmutter, 2000; Nahapiet & Ghoshal, 1998). Human capital is about expertise and experience, which is applied to make effective strategic decisions. Relational capital is the relational aspect of social capital and is derived from personal relations that professionals develop over time (Adler & Kwon, 2002), including with other professionals, policy-makers, and regulators. This enables the firm to better control its external environment (Boyd, 1990; Hillman, Cannella, & Paetzold, 2000; Hillman & Dalziel, 2003; Pfeffer, 1972; Pfeffer & Salancik, 1978). We argue that wise counsel derives from professional-directors' capacity to combine their human capital and relational capital.

Licensed professional-directors bring specific kinds of expertise – e.g. accounting or legal – which is combined with their knowledge of the company's business operations and their environment to arrive at board-level decisions. Prior research in resource dependence tradition focused on relational capital, and found evidence of board-environment alignment. In particular, companies in regulated and capital intensive industries tended to have lawyers and finance specialists (Pfeffer, 1972) and outside directors with backgrounds in politics or law (Agrawal & Knoeber, 2001) on their boards. Professional-directors may help firms to shape the environment in their favor by influencing government regulations (Pfeffer & Salancik, 1978). Professionals might also work alongside ex-politicians on corporate boards to advance political connections for the firm (Agrawal & Knoeber, 2001; Helland & Sykuta, 2004; Lester, Hillman, Zardkoohi, & Cannella, 2008). While these studies provide systematic evidence of board-environment alignment, the performance impact of such alignment is presumed but not tested (an exception is Hillman (2005)).

By contrast, prior research in law and strategy has focused on human capital, arguing that professional-directors' expertise add to the quality of strategic decisions made. Studies in this tradition theoretically and empirically demonstrate the impact on enhancing firm competitive advantage. In particular, Bagley argues that 'legally astute' firms have top management teams with an absorptive capacity to take legal advice into account when making strategic decisions (Bagley, 2008). Empirical evidence also exists that lawyer-directors (Litov et al., 2014) and lawyer-CEOs (Henderson et al., 2017) enhance corporate valuation. This strand of research however gives no regard to the external environment nor relational capital, thus ignores board-environment alignment.

Professional-directors can be 'counsel' in the sense of providing professional advice in specific business context, with a view to enhancing the firm's long-term competitive advantage. Financial compliance for listed companies, disclosure rules, and accounting regulations have become more complex, leaving significant scope for interpretation. In this context, professional-directors apply their expert knowledge to interpret the relevant laws and regulation, and provide advice on how best to comply in specific situations. Given much scope for interpreting laws and regulations in specific circumstances to arrive at case-by-case solutions, the impact of acting as 'counsel' applies equally to all sectors. The test of the claim that the counsel has been wise is in its impact on corporate valuation and profitability. Moreover, as their knowledge about the company's internal operations and its environment deepens with tenure, professional-directors become more effective in applying their human and relational capital over time.

These arguments lead us to our first hypothesis:

Hypothesis 1A (Counsel). Professionals on boards bring functional benefits to companies, increasing profitability and

corporate valuation.

Hypothesis 1B (Counsel). Professional-directors with longer tenure bring greater functional benefits to companies than those with shorter tenure, increasing profitability and corporate valuation more.

2.3 Professional-Directors as Cops vs Entrepreneurs

Professional-directors sit on corporate boards, and as such go beyond giving advice. They are party to the decisions boards make. This section addresses the question of what determines the professional-directors' opportunities to influence the risk appetite on the boards on which they sit. Accountants and lawyers who sit on boards are guardians of financial and legal risks. Strategic decisions, to acquire a company or to establish overseas operations for instance, involve balancing judgments about business opportunities against these risks. At two ends of the risk-taking spectrum, risk-averse 'cops' tend to trump these business opportunities, while 'entrepreneurs' endorse or at times enhance the board's risk appetite.

As applied to professionals at large, in-house lawyers act as 'cops' when they limit their advice to legal mandates (Nelson & Nielsen, 2000), and similarly accountants acting as 'cops' limit their work to audit and financial regulatory compliance. When professional-directors function as 'cops', they act as gatekeepers who promote compliance and monitor management to reduce malfeasance (Coffee, 2006; Morse et al., 2016). Cops may be guardians of financial reporting compliance, reducing compliance breaches in accounting and insider trading regulations. They may also monitor a broader variety of management behavior in order to enhance internal controls of corporations. Cops essentially safeguard shareholders' interests, contributing towards lowering agency costs of monitoring managerial behavior, particularly when such agency costs are high in the face of dispersed share ownership.

An important environmental factor that may influence the extent to which professional-directors act as 'cops' is the nature of government regulation. Corporate boards in regulated industries require professionals to advise on how to comply with regulations, and to avoid infringements and subsequent litigation (Hillman, 2005). Of course, there are more gates to be kept in regulated than in less regulated industries. In regulated industries, however, all board directors, professional and non-professional, are keenly aware of the need to comply. Moreover, professionals (including internal and external auditors, and external and in-house lawyers) act as 'cops' to conduct due diligence in regulated sectors. By the time business proposals are placed on board agenda, there is little scope remaining for professional-directors in regulated industries to add further value as 'cops'.

By contrast in relatively unregulated industries, professional-directors are more likely to be put on the spot to act as gatekeepers given greater discretion in management decisions in such environment. 'Cops' are watchdogs that reduce downside risks, and their risk-averse disposition is given greater scope for application in less regulated industries. This risk-averse stance will be reflected in corporate performance in the form of reduced volatility in profitability and stock returns. Thus, our second hypothesis is as follows.

Hypothesis 2 (Cops). Professionals on boards act as cops, reducing volatility in profits and stock returns, especially in less regulated industries.

At the other end of the *risk-taking* spectrum, professional-directors may act as 'entrepreneurs'. Lawyers and accountants are guardians of legal risk and financial risk respectively. As such, they may become naysayers when they see new business opportunities that would lead to taking greater-than-acceptable risks. But professionals acting as 'entrepreneurs' find creative solutions to business deals, endorsing or effecting an increase in the board's risk appetite, thus realizing both upside and downside risks.

Nelson and Nielsen (2000) define entrepreneurial professional roles, applied to in-house lawyers, as giving priority to business objectives than legal analysis, and attribute the entrepreneurial tendencies of in-house lawyers to their efforts to 'adapt their images and lawyering styles to the prerogatives of contemporary management' (abstract). They go on to describe how entrepreneurial lawyers see 'law itself as a source of profits and an instrument to be used aggressively in the marketplace' (p.466). This view of law as a mechanism through which major transactions are executed applies to M&A deals, new market entry, and venture funding. More broadly, professional-directors may regard their knowledge in accounting or law as enabling the creation and implementation of novel options in structuring business contracts, enhancing the value of intangible assets (such as patents and brands), and pushing the boundary of legality via taking advantage of legal loopholes (Bagley, 2010).

With respect to the firm's external environmental factor, the degree of regulation is relevant. The relative absence

of regulation may predispose all board members, including professional-directors, to veer towards becoming 'entrepreneurs'. However, professional-directors can make a material difference especially at companies in regulated sectors, where the board may look to them to anticipate and manage financial and legal compliance in highly risky projects. Thus, the endorsement of risk-taking by professional-directors may lead firms to take riskier decisions than in their absence. The above argument leads us to the third hypothesis, as follows:

Hypothesis 3 (Entrepreneurs). Professionals on boards act as entrepreneurs, increasing volatility in profits and stock returns, especially in regulated industries.

Our theoretical and empirical approach ultimately identifies the professional role as revealed via its impact on corporate performance. Thus, the wise 'counsel' role is manifested in investment decisions that lead to higher profit and corporate valuation. The wisdom derives from putting *professional capital*, combining professional-directors' human capital and relational capital, in the service of specific contexts of the firm and the environment. Separate from this *professional-capital* dimension, the other two roles lie along the *risk-taking* dimension. At one extreme, the 'cop' role is most clearly manifested in corporate performance resulting from risk-averse decisions, such as low volatility in profits and stock returns. At the other extreme, the 'entrepreneur' role is manifested in much risk-taking, leading to high volatility in profits and stock returns.

3. Data & Methods

To test our hypotheses, we focus on publicly quoted companies in Japan. Constructing our dataset involved matching data from three sources, namely Nikkei Needs CGES (Corporate Governance Evaluation System), Directory of Directors (*Yakuin shikiho*) by Toyo Keizai, and Development Bank of Japan (DBJ) data. We start from the 2004 list of listed firms and construct an unbalanced panel of listed firms from 2004 to 2015. We chose to start the data in 2004 because some corporate governance variables we employ are available only from 2004. After dropping observations with missing data, our final sample consists of 39877 firm-year observations during the 2004-2015 period. Before describing the variables for analysis, we highlight substantial changes in corporate governance practices in Japan just prior to and during the period of our study, as a background to why and how professionals came to be appointed on corporate boards in Japan.

3.1 Changes in Corporate Governance Practices in Japan

Japan provides an ideal setting for analyzing the impact of corporate governance reforms. More specifically, professionals such as lawyers and accountants have sat on US and UK corporate boards at least since the middle of the twentieth century. By contrast, professional-directors had been relatively absent on Japanese boards until 2000, but have grown rapidly since then. This compressed contemporary history enables us to examine the impact of appointing a professional for the first time on corporate performance. But why have Japanese firms come to appoint professionals on their boards with this timing?

A confluence of factors has led to a dramatic reduction in board size and the emergence of outside directors in Japan. During the 'lost decade' of the 1990s, corporate leaders came to voice their concern over the lackluster performance of Japanese companies. This led to a number of legislative and non-legislative responses. Among the former, the pure holding company became legal again in 1997 after 50 years of banning this corporate form. Corporate boards at the holding company level were expected to focus on group-wide strategy. The adoption of consolidated accounts since 1999 also facilitated providing boards with group-wide overview in an era when Japanese companies became more diversified and international (Miyajima, Haramura, & Inagaki, 2003).

Another legislative push came in the form of the 2003 revision of the Commercial Code and the subsequent 2006 revision of the Company Law, which gave the option for quoted companies to introduce a committee system (*shimei iinkai tou setchi gaisha*). The committee system refers to the establishment of the audit, nomination, and remuneration committees for which each must have at least 3 members of whom the majority must be outside directors. The diffusion of this committee system has been slow. In 2017, 83.4% of all quoted companies (72.9% of companies quoted on TSE First Section) did not have a nomination committee; and 81.5% (70.1% of TSE First Section companies) did not have a remuneration committee (JPX, 2017). However, awareness of this system is thought to have promoted the appointment of outside directors. This bodes a major shift for Japanese corporate boards traditionally dominated by internally promoted top managers along with directors sent from main banks and group companies. According to Saito (2011), three-quarters of the largest 500 firms in Japan had a board composed entirely of inside directors in 1997. The proportion of firms listed in the first section of Tokyo Stock Exchange with at least one outside director rose gradually

to 35% in 2005 (Saito, 2015) and 48.7% in 2010, then jumped from 64.4% in 2014 to 95.8% in 2016 (JPX, 2017).

Among the non-legislative responses, two are notable. First, in the past, Japanese companies were marked by cross-shareholding among companies. But following the onset of the banking crisis in 1997, companies and banks swiftly dissolved their cross-shareholdings, while domestic and foreign institutional investors managing investment trusts or pension funds emerged as prominent shareholders after 2000. Consequently, the proportion of cross-shareholdings in total shares declined from 15.3% in 1995 to 9.0% in 2008, and the proportion of shares held by foreigners increased from 15.0% in 2004 to 26.7% in 2015 (Miyajima & Hoda, 2015; Miyajima & Kuroki, 2007; Miyajima & Nitta., 2011). Both factors lowered the protection from stock market pressures on which many Japanese companies relied. Second, starting with Sony's initiative in 1997, major companies created the executive officer (*shikko yakuin*) system with the aim of separating strategy from execution. Specifically, the board was to focus on agile decision-making about company-wide strategic directions, while executive officers attended to day-to-day execution at each business operation (Kubo, 2010). This led to a dramatic decline in board size, for example from 38 directors in 1997 to 10 in 1998 at Sony, and from 58 in 2002 to 26 in 2003 at Toyota. Toyota further reduced its board size to 16 directors in 2013, of whom 3 were outside directors and 1 foreign director.

Our data reflect these shifts in board size and structure. In our sample, the average board size declined from 10.9 directors in 2004 to 7.5 directors in 2015. In addition, the proportion of companies in our sample with outside directors increased from 23.5% in 2004 to 64.8% in 2015 (and 88.6% in 2016). In the past, outside directors were not truly outsiders, as they were sent from main banks and parent companies (Kubo 2010). More recently, they are more genuinely independent outsiders, including professionals who are the focus of our study. Securing outside directors has proven difficult (Miyajima et al., 2003), and increasing the ratio of outside to inside directors remains a top concern in improving board composition (Deloitte, 2017). In this context, professionals may be considered one pool of talent which corporate boards can tap into.

Insert Table 1 about here

3.2 Dependent Variables

Our study tests the three hypotheses with various measures of corporate performance as the main dependent variables (see Table 1 for variable descriptions). Following the literature, we chose three indicators of firm performance for this study. The data source is the Nikkei Needs CGES (Corporate Governance Evaluation System).

Return on assets. Our first dependent variable is return on assets, *Roa*, which is calculated using the usual method of returns divided by total assets for firm *i* in time *t*.

Tobin's Q. The second dependent variable is calculated as the ratio of the total market value of the firm divided by the total asset value for firm *i* in time *t*.

Volatility of stock returns. We calculate a measure of the volatility of stock returns. The variable *vol3_0* is calculated as the standard deviation of daily stock returns over a three-year period (i.e. from *t-3* to *t*) for firm *i* in time *t*.

3.3 Independent Variables

We construct our independent variables on professionals by using the Directory of Directors (*Yakuin shikiho*) published by Toyo Keizai. This directory lists all the members of the board of publicly listed companies in Japan. These board members are either directors (*torishimariyaku*) or auditors (*kansayaku*), and directors may be either executive (inside) (*shanai*) or non-executive (outside) (*shagai*). The directory also provides details concerning each director or auditor, including his or her educational and professional qualifications and work experience. We focus on whether or not a director is one of two professional types requiring a license to practice: a lawyer (*bengoshi*), or an accountant (*kaikeishi*).

Professionals. We calculate a variable *ratio_professional2_d* as the proportion (percentage) of professionals (lawyers and accountants) to the total number of directors on the board for firm *i* in year *t*. The proportion of professionals to the total number of directors increased from 0.41% in 2004 to 2.69% in 2015 (see Figure 1). The proportion of companies with either lawyers and/or accountants on their boards also increased from 2.67% in 2004 to 17.09% in 2015 (see Figure 2). In some of our analyses, we also make a distinction between *ratio_professional2_d_in*, the ratio of licensed

professionals who are executive directors, and *ratio_professional2_d_out*, the ratio of licensed professionals who are non-executive directors.

Lawyers. We calculate a variable *ratio_lawyer_d* as the percentage of lawyers to the total number of directors on the board for firm *i* in year *t*. As shown in Figure 1, the ratio of lawyers increased from 0.18% in 2004 to 1.64% in 2015. Moreover, as shown in Figure 2, the proportion of companies that have at least one lawyer on their boards increased from 1.40% in 2004 to 11.59% in 2015. In some of our analyses, we also make a distinction between *ratio_lawyer_d_in*, the ratio of lawyers who are executive directors, and *ratio_lawyer_d_out*, the ratio of lawyers who are non-executive directors.

Accountants. We calculate a variable *ratio_accountant_d* as the proportion (percentage) of accountants to the total number of directors and auditors on the board for firm *i* in year *t*. As shown in Figure 1, the ratio of accountants increased from 0.22% in 2004 to 1.04% in 2015. Moreover the proportion of companies that have at least one accountant on their boards increased from 1.32% in 2004 to 6.66% in 2015 (see Figure 2). In some of our analyses, we also make a distinction between *ratio_accountant_d_in*, the ratio of accountants who are executive directors, and *ratio_accountant_d_out*, the ratio of accountants who are non-executive directors.

Insert Figures 1 and 2 about here

3.4 Defining Heavily Regulated and Less Regulated Industries

In order to test our hypotheses H2 and H3, we subdivide our sample into two groups, those firms in heavily regulated industries and those in less regulated industries, following Hillman (2005). In our Japanese sample, heavily regulated industries are Foods, Chemicals, Pharmaceuticals, Oil & Coal Products, Electric Power & Gas, Information & Communication, Banks, Securities & Commodity Futures, Insurance, Other Financial Business, and Real Estate. Less regulated industries consist of Machinery, Electrical Appliances, Transportation Equipment, Precision Instruments, and Wholesale and Retail Trade. These industrial sector definitions are based on the one used in Tokyo Stock Exchange, which identifies 33 separate sectors. See Appendix 1 for how the 33 sectors correspond to our classification of regulated and less regulated industries.

3.5 Control Variables

We use seven control variables in our main regressions, as follows.

Firm size. We indicate firm size by using a variable *lnass1*, which is the natural log of the total asset of the firm. The data source is the Development Bank of Japan (DBJ) data. Large firms are likely to have larger boards. They may also have better access to professionals on their board.

Board size. We deploy a measure of board size, *Brd_num* which counts the total number of directors. Board size may lead to effective decision-making due to the heterogeneity of expertise and experience on the board, but it may also have a deleterious effect due to difficulty in reaching consensus.

Tokyo Stock Exchange listing. A dummy variable *l_tky_p* takes the value of 1 if the firm is listed on the First Section of Tokyo Stock Exchange, 0 otherwise. This dummy captures firm size, but also high incidence of adopting good corporate governance practices (JPX, 2017).

Entrenchment. We wish to distinguish between firms run by a top management team that is entrenched in the firm they run, and those firms led by salaried top managers. Here, we deploy a common measure of entrenchment, *ent*, which calculates the proportion of total shares owned by members of the board. A high share is an indicator of the likely presence of a founder-CEO.

Institutional and foreign investors. Another control variable is the presence of institutional and foreign shareholders many of whom are institutional investors. We calculate a variable *inst* as the proportion of the firm's total shares held by institutional investors, and a variable *frgn* as the proportion of the firm's total shares owned by foreign shareholders. Foreign and institutional shareholders are associated with more rigorous corporate governance standards, including the use of outside directors who may be professionals (Ferreira & Matos, 2008; Miyajima & Hoda, 2015).

Sector median volatility. Our last control variable is a measure of stock return volatility when the dependent variable is other than stock returns. We calculate a variable *sector_vol_median* as the median value of stock return volatility measure, *vol3_0*, for each of the 33 sectors identified by Tokyo Stock Exchange.

3.6 Instrumental Variables

As we explain below in the section on Econometric Specifications, we consider four variables as instrumental variables. *Litigationpf* is the sector mean of the number of intellectual property litigation cases per firm in 2013, using the annual Intellectual Property Activity Survey by the Japan Patent Office. We chose the 2013 (rather than a more recent) survey as it contains data on IP litigation cases. *Rightspf*, from the same survey, is the sector mean of the number of intellectual property rights (including patents, utility model patents, design rights, copyrights and trademarks) per firm. Firms are classified into 18 sectors in the Intellectual Property Activity Survey while our sector code consists of 33 sectors (see Appendix 1). We match each sector in the Intellectual Property Activity Survey to the most appropriate of the 33 sectors². We also employ two further instruments, namely *Randd_ratio2*, the proportion of research and development cost to sales, and *adv_ratio2*, the ratio of advertisement cost to sales. Both variables are calculated using DBJ data.

Tables 1 presents the variable descriptions and Table 2 the descriptive statistics. Table 3 presents the correlations matrix.

Insert Tables 1, 2 and 3 about here

3.7 Econometric Specifications

Hypotheses H1, H2, and H3 are concerned with the impact of the presence of professionals on the board on firm performance. Given that our dependent variables are continuous variables, the choice of Ordinary Least Squares (OLS) with robust standard errors clustered at the firm level is appropriate.

Our study however has a number of characteristics that render alternative estimation methods desirable. In particular, our hypotheses involve the possibility of two-way causation, with the number of professionals being determined in part by firm performance. In order to address this endogeneity issue, we employ two approaches, the use of Instrumental Variables and the Difference-in-Differences approach (Roberts & Whited, 2012). First, we employ an Instrumental Variables procedure to estimate the presence or absence of professionals using four instruments, *litigationpf*, *rightspf*, *randd_ratio2* and *adv_ratio2*, and then use the estimated values for the main regressions. These instruments are considered to affect the presence of professionals positively, but do not affect our dependent variables in our main regressions.

Second, we adopt a Difference-in-Differences approach, used also by Morse et al. (2016). In this approach, we focus, not on the presence of professionals, but on the first introduction of professionals on corporate boards. This enables us to examine performance changes before and after the introduction. We then compare the difference between performance changes at firms with the introduction and performance changes at those without, one year after the introduction and in subsequent years.

4. Analysis and Results

4.1 Professionals and corporate performance

Table 4 presents the results of our analysis for the impact of professionals on corporate performance for the whole sample. Looking at models (1) and (3), the impacts of professionals on ROA and Tobin's Q are both positive and significant, supporting Hypothesis 1A. In order to address the two-way causation problem, we also run Instrumental Variable regressions. In models (2) and (4), the impacts of professionals on both measures of corporate performance remain positive and significant, and their magnitude increases.

² For example, firms in 'Textiles and Apparels' sector and those in 'Textiles and Apparels' are classified in the same sector code in the Intellectual Property Activity Survey while they are classified into two different sector codes in our sample. Therefore, we use sector mean value for 'Textile, Apparels, Pulp and Paper' sector for firms in 'Textiles and Apparels' and 'Textiles and Apparels' sectors.

Insert Table 4 about here

Looking at the control variables we find effects broadly consistent with our expectations. In particular, listing in the First Section of Tokyo Stock Exchange is associated with higher ROA and Tobin's Q, as is the presence of institutional investors in the firm's share ownership. This is hardly surprising given that these two features are associated with better corporate governance. Board size is associated with positive corporate performance, but total asset as an indicator of firm size is negatively associated with corporate performance. One interesting result is the variable on entrenchment: the higher the extent of shares owned by board directors, the higher the corporate performance.

Next, Table 5 presents the Difference-in-Difference analysis results, focused on the first introduction of professionals on company boards. As shown, appointing a professional on boards leads to a premium on ROA from the first year after the appointment [0,1]. The premium on ROA is increasing and becomes significant from the third year after the appointment [0,3]. This provides support for our hypothesis H1B. The effects on Tobin's Q, however, were not significant.

Insert Table 5 about here

4.2 Professionals in heavily regulated vs less regulated industries

Table 6 presents our regression results for testing Hypotheses 2 and 3. Focusing on instrumental variable regression results, we compare models (5) and (6). They demonstrate that the impact of professionals on stock return volatility is positive and significant for firms in heavily regulated industries, in support of H2, but negative and but significant in less regulated industries in support of H3. Among the control variables, perhaps the most interesting result is that entrenchment (high percent of shares held by directors) significantly increases volatility, an indicator of entrenched managers' willingness to take greater risks.

Table 7 examines the impact of the first introduction of professionals on stock return volatility using the difference-in-difference approach. The introduction of a professional on boards leads to a higher premium on volatility increases, but it is significant only in regulated sectors and not in less regulated sectors.

Insert Tables 6 and 7 about here

4.3 Additional Analyses

We perform additional analyses in order to discuss extensions of our results and to consider alternative explanations. In particular, we discuss here whether professional-directors as 'insiders' (i.e. executive directors) or as 'outsiders' (i.e. non-executive directors) make a difference to performance outcomes. We find that the performance impact as measured by Tobin's Q is positive and significant for inside professional-directors but not for outside professional-directors (the results are inconsistent across different estimations for the impact on ROA) (see Appendix 2).

This result is consistent with the explanation that outside directors provide independent voice and thus improve the quality of top management decisions, but there is a trade-off, as they tend to be less knowledgeable about the company and its environment than inside directors. By contrast, inside directors are steeped in company-specific knowledge but lack independence. Our results suggest that inside professional-directors can combine the best of both worlds. Professional-directors who are insiders are independent by virtue of having a professional license to practice, which makes them able to challenge the CEO's decisions without being beholden to the company for jobs. They are also knowledgeable about the company by virtue of being insiders. Thus, the voice exercised by *independent insiders* may be more effective than that by non-executive outside directors *per se*.

5. Discussion

This study explored the contingent effects of professionals on company boards, by focusing on two types of professionals, namely accountants and lawyers. Its main aim was to develop and test a set of hypotheses that modified the professions

literature to apply to corporate governance. Our data on quoted companies in Japan provided an ideal context for testing the introduction, as well as the presence, of licensed professionals on corporate boards and their varied performance impacts.

Our theory and findings provide insights to a key question in strategic management, that is, the role of professionals as a specific type of resource in explaining performance heterogeneity and (sustainable) competitive advantage. We find robust evidence that the presence of licensed professionals on company boards matters for company performance in two distinct ways. First, the presence of professional-directors enhances profitability and corporate value, which we interpret as evidence of their role as ‘wise counsel’. Second, distinct from this first performance effect, the presence of professional-directors leads to higher stock return volatility in regulated industries, evidence of their role as ‘entrepreneurs’. By contrast, the presence of professional-directors lowers stock return volatility in less regulated industries, which is evidence of their role as ‘cops’.

5.1 Theoretical Implications

Our key theoretical contribution lies in clarifying in what ways the presence of professionals on company boards affect the bottom line. To date, functional backgrounds of board members have been captured either by taking note of the overall heterogeneity on the board (Murray, 2000), or by studying one type of professional (accountant or lawyer) at a time (Bagley, 2008; Litov et al., 2014; Naiker & Sharma, 2009). The impact of professional-directors on corporate performance has been studied using a non-contingent framework, in which their presence improves competitive advantage under all circumstances (Bagley, 2008). We build our theory beyond these approaches in a number of ways.

First, the three professional roles, ‘cop, counsel, and entrepreneur’ identified by Nelson and Nielsen (2000) lie not on a single spectrum but along two separate dimensions which we call the *professional-capital* dimension and the *risk-taking* dimension. Professional capital consists of human capital (Becker, 1964) and relational capital (Moran, 2005), which influence the quality of professional advice and judgment in specific situations. Risk-taking is about the professional-directors’ own attitude to taking business risk, which in turn influence the board’s risk appetite regardless of their professional capital. Unpacking the two dimensions enables us to identify the ‘wise counsel’ role in relation to the *professional-capital* dimension, and the ‘cop’ and ‘entrepreneur’ roles in relation to the *risk-taking* dimension. This typology is novel in relation to the professions literature for which the notion of professional capital comes naturally but not the idea of risk-taking by professionals themselves. By focusing on professional-directors, our theory regards professionals not as mere advisors of financial or legal risks, but as participants in taking (or decisions about taking) business risks.

Second, which role professional-directors are likely to adopt depends on the external environment of the firm, as well recognized by resource dependence theory. We add insight beyond resource dependence theory by linking the adoption of a specific role along the *risk-taking* dimension to corporate performance outcomes. In particular, contrasting external environments into regulated vs less regulated, we identify the former (regulated) as an opportune environment for professional-directors to demonstrate their function in endorsing greater risk-taking, that is, acting as ‘entrepreneurs’. By contrast, the latter (less regulated) environment facilitates professional-directors to manifest their role in restraining risk-taking, that is, acting as ‘cops’. Of course, the adoption of specific professional roles is influenced by other factors including personal disposition influenced by experience (e.g. career trajectory in external vs in-house work), or by incentives (e.g. performance-related compensation). But external environment provides an additional important contingency.

5.2 Implications for Corporate Governance in Japan

In the context of debates about corporate governance in Japan (and elsewhere), our study provides a number of insights for corporations and professionals. We discuss two topics below: the independence of directors and the material impact of professional-directors.

As discussed earlier, the independence of board directors is a key issue in policy and practice in Japan. Not so long time ago, most large corporations had large boards composed entirely of inside directors who were promoted from within. Today, nearly all (95.8% in 2016) of the firms listed in the first section of Tokyo Stock Exchange have at least one outside director (JPX, 2017), and the proportion is not much less (88.6% in 2016) in our sample of all quoted companies in Japan. In this context, it is important to clarify in what ways professional-directors might contribute to board independence.

Conventional account clarifies who is putting pressure on Japanese companies to appoint outside directors. Institutional investors and foreign investors loom large in this discussion. These investors expect independent voice by outside directors to challenge insider-dominated top management, with a view to improving the quality of strategic decisions. But our study demonstrates that independence may be grounded in more than one source. One well-recognized source of independence lies in the non-executive status of directors, that is, outside directors are not beholden to the company for livelihood due to the availability of alternative sources of compensation.

Further, an important basis for independence for professional-directors is their ethics and the professional license. Through some interviews of professional-directors, we note a strong sense among them of having cultivated distinctive cognitions, values and perceptions as accountants or lawyers, which in turn affect their strategic orientation (Carpenter et al., 2004). Professional training as lawyer, for example, is not just about acquiring legal knowledge and expertise, but also about learning how to think like a lawyer (with emphasis on objectivity and integrity) and act like a lawyer. Moreover, some interviewees considered the possession of a professional license as accountant or lawyer as a passport to alternative employment, which gives them the freedom to challenge the board without fearing adverse effects on their livelihood. Moreover, as noted earlier, inside professional-directors, though they are few in number, can remain independent by virtue of having a professional license to practice.³ These *independent insiders*, armed with better access to company information, may well be more effective than non-executive outside directors *per se*, in accelerating corporate restructuring or changes in the company's strategic direction.⁴ These accounts demonstrate that the effectiveness of board directors are not just about the structural aspects (outsider vs insider) of boards.

Second, there exists considerable skepticism about the material impact of board diversity and the quality of work carried out by lawyers and accountants (and academics!) who are asked to become outside directors. Skepticism about professionals who failed to be effective gatekeepers in the wake of Enron and WorldCom is well-taken (Coffee, 2006). Given this background, risk-taking by professionals tends to be regarded as somewhat 'unprofessional', when they become agents of self-interested top managers rather than shareholders as principal.

There also exists skepticism about whether Japanese professionals can provide independent voice. In audit and accounting, for example, auditors tended to follow the lead of banks to trust what corporate clients provided in their accounts (Matsubara & Endo, 2018). By the 2000s, they were expected to provide more rigorous auditing services as the government (Financial Services Agency in particular) changed its policy. The role of accountant-directors must be interpreted with this recent contextual change in mind. If policy shifts were not reflected in business practice, then accountant-directors would have had no material impact on corporate practice and performance.

Such skepticism notwithstanding, our study demonstrates that professional-directors are not mere window-dressing but have had material impacts on risk-taking and corporate performance under certain circumstances. Although specific cases of attributing direct impact of professional-directors are hard to come by, the case of a real estate rental company Apaman Shop is illustrative.⁵ In this case, a major investor sued the company directors for neglecting their obligation to pay good attention before arriving at the decision to merge a subsidiary into another subsidiary. The court cited the company's record that it sought advice from a lawyer, as evidence to support its ruling that the directors did not neglect their obligation when they decided on this merger plan.

5.3 Limitations & Future Research

Our study has a number of limitations we wish to highlight. First, by arbitrarily dividing industrial sectors into heavily regulated and less regulated industries, we have skirted over the exact nature of regulations and their enforcement. Further investigations into regulatory changes over time enables us to analyze their impact on the appointment of professionals and company performance.

Second, we may capture the two dimensions directly; the *professional-capital* can be measured by various measures of human and relational capital (Wiersema et al., 2018), and *risk-taking* may be proxied by the ratio of the number of years professionals have spent inside business corporations to the number of years they spent outside. We might also identify more proximate performance indicators such as M&A deals, supplemented by interviews to capture professional-directors' cognitive processes more directly.

3. *Nikkei Business* (19 March 2012 issue, pp.38-43) reports the case of Nissen Holdings which turned around its performance by appointing 4 outside directors including a lawyer. The company ensured that 'the lawyer-director would not limit his opinion to matters directly related to compliance', by giving a briefing on board meeting agenda items prior to the meeting.

4. *Nikkei Business* (6 February 2012, pp.56-60) reports the case of Kokuyo, which has a lawyer as an executive director, contributing to proactive corporate reorganization.

5. Supreme Court judgment No.183 on 15 July 2010.

Third, our sample includes all listed companies, but some are newer, listed on the MOTHERS and JASDAQ sections of Tokyo Stock Exchange. TSE First Section listing was a dummy variable in our regressions, but deserves further investigation. In particular, the role of professional-directors is likely to be different for newer firms, with the board role evolving over time at different stages in the firm's lifecycle (Lynall, Golden, & Hillman, 2003)(see also Hillman, Withers, and Collins (2009) pp.1409 for a review). It is worth studying how the 'counsel, cop, entrepreneur' roles apply to professional-directors to entrepreneurial firms prior to Initial Public Offering (IPO) and after IPO as firms mature with greater formalization and institutionalization.

Conclusion

Firms differ in their need to have professionals on their board. Notwithstanding the limitations discussed above, this study draws attention to an important factor affecting performance, namely the role of professionals as 'wise counsel' improving the overall corporate performance, and as 'cop' vs 'entrepreneur' affecting the board's risk appetite. Professional-directors bring with them their human capital, relational capital, and risk-taking disposition, and recognizing all these elements leads to a better understanding of strategy formulation and corporate governance.

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Figure 1: Proportion (%) of professionals among directors in Japanese companies

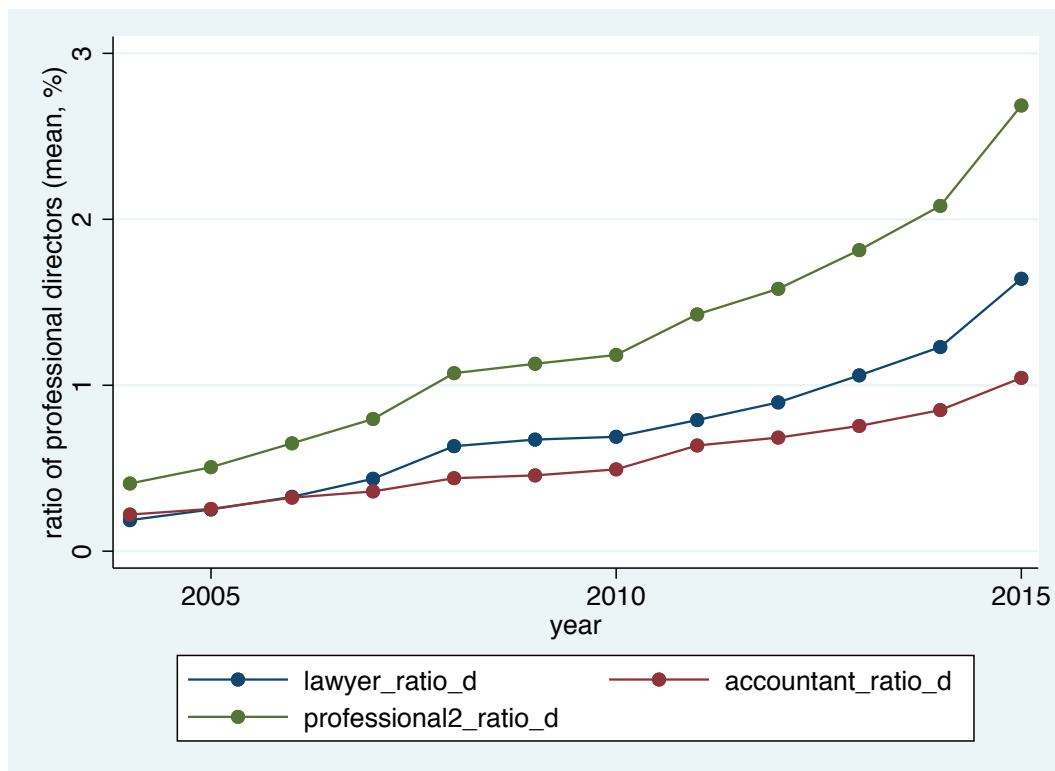


Figure 2: Proportion (%) of companies with professionals on boards in Japan

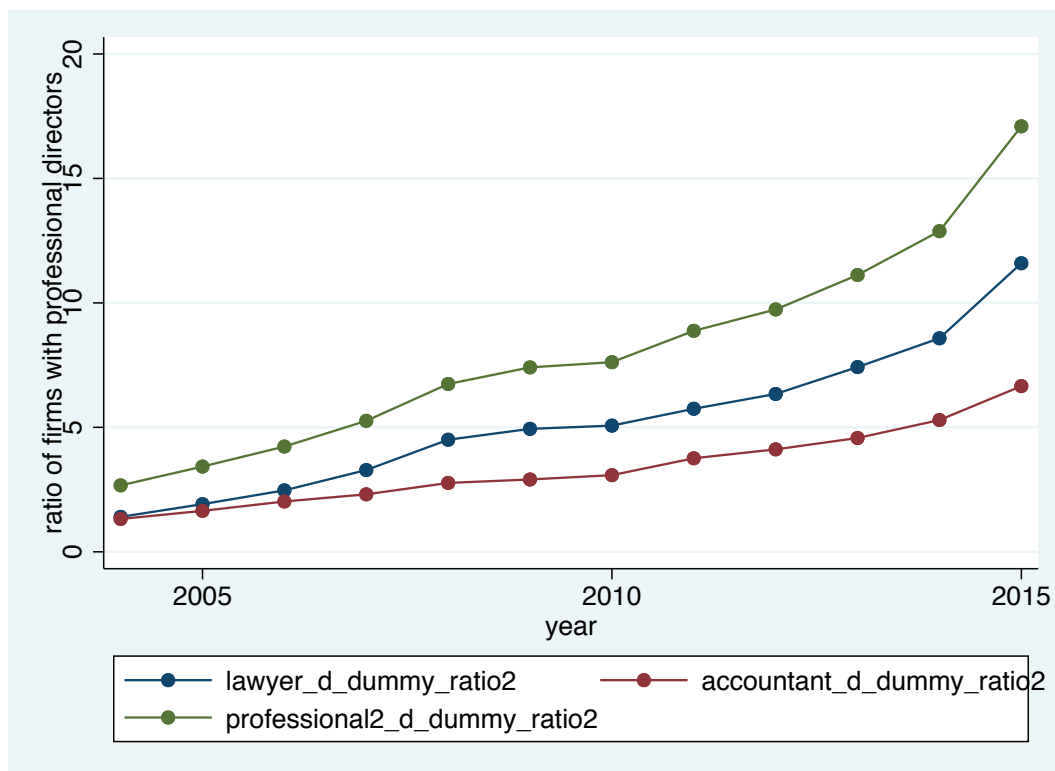


Table 1 Variable names, descriptions, and sources

Variable name	Description	Source
<i>rea_0</i>	Return on asset for firm <i>i</i> in year <i>t</i>	Nikkei Needs CGES
<i>aveq_0</i>	Tobin's Q calculated by dividing firm value plus liability by total asset for firm <i>i</i> in year <i>t</i>	Nikkei Needs CGES
<i>vol3_0</i>	Volatility of daily stock returns over three years (i.e. <i>t-3</i> to <i>t</i>) for firm <i>i</i> in year <i>t</i>	Nikkei Needs CGES
<i>ratio_lawyer_d</i>	Proportion (%) of lawyer directors to total number of directors at the firm	directory of directors (<i>yakuin shikibo</i>)
<i>ratio_accountant_d</i>	Proportion (%) of accountant directors to total number of directors at the firm	directory of directors (<i>yakuin shikibo</i>)
<i>ratio_professional2_d</i>	Proportion (%) of professional (lawyer or accountant) directors to total number of directors at the firm	directory of directors (<i>yakuin shikibo</i>)
<i>ratio_lawyer_d_in</i>	Proportion (%) of inside lawyer directors to total number of directors and auditors at the firm	directory of directors (<i>yakuin shikibo</i>)
<i>ratio_lawyer_d_out</i>	Proportion (%) of outside lawyer director to total number of directors and auditors at the firm	directory of directors (<i>yakuin shikibo</i>)
<i>ratio_accountant_d_in</i>	Proportion (%) of inside accountant director to total number of directors and auditors at the firm	directory of directors (<i>yakuin shikibo</i>)
<i>ratio_accountant_d_out</i>	Proportion (%) of outside accountant director to total number of directors and auditors at the firm	directory of directors (<i>yakuin shikibo</i>)
<i>ratio_professional2_d_in</i>	Proportion (%) of inside professional director to total number of directors and auditors at the firm	directory of directors (<i>yakuin shikibo</i>)
<i>ratio_professional2_d_out</i>	Proportion (%) of outside professional director to total directors at the firm	directory of directors (<i>yakuin shikibo</i>)
Control variables		
<i>lnass1</i>	Natural log of the total asset of the firm	DBJ data
<i>brd_num</i>	Total number of directors at the firm	Nikkei Needs CGES
<i>l_tky_p</i>	A dummy variable taking the value of 1 if the firm is listed on the first section of Tokyo Stock Exchange, 0 otherwise.	Nikkei Needs CGES
<i>ent</i>	Entrenchement, measured as proportion (%) of the firm's total shares owned by directors	Nikkei Needs CGES
<i>frgn</i>	Proportion (%) of the firm's shares held by foreign shareholders	Nikkei Needs CGES
<i>sector_vol_median</i>	Median value of stock return volatility, <i>vol3_0</i> , by sector, using the 33 sectors identified by Tokyo Stock Exchange	Nikkei Needs CGES

Table 2: Descriptive statistics

	N	Mean	Standard deviation	Median
<i>roa_0</i>	43980	5.448	11.236	4.375
<i>aveq_0</i>	43705	1.255	1.366	0.991
<i>vol3_0</i>	40061	2.756	1.258	2.476
<i>ratio_lawyer_d</i>	44560	0.726	3.356	0
<i>ratio_accountant_d</i>	44560	0.537	3.184	0
<i>ratio_professional2_d</i>	44560	1.263	4.761	0
<i>ratio_lawyer_d_in</i>	44560	0.041	0.844	0
<i>ratio_lawyer_d_out</i>	44560	0.684	3.244	0
<i>ratio_accountant_d_in</i>	44560	0.232	2.208	0
<i>ratio_accountant_d_out</i>	44560	0.306	2.233	0
<i>ratio_professional2_d_in</i>	44560	0.273	2.364	0
<i>ratio_professional2_d_out</i>	44560	0.990	4.104	0
<i>lnass1</i>	43981	10.429	1.879	10.214
<i>brd_num</i>	44329	7.874	3.330	7
<i>l_tky_p</i>	46086	0.446	0.497	0
<i>ent</i>	43632	8.969	15.893	1.958
<i>inst</i>	43430	13.638	15.112	7.985
<i>frgn</i>	44231	8.530	11.623	3.640
<i>sector_vol_median</i>	44329	2.519	0.475	2.538

Table 3: Correlation matrix

	<i>roe_0</i>	<i>avg_0</i>	<i>vol_0</i>	<i>ratio_lawyer_d</i>	<i>ratio_accountant_d</i>	<i>ratio_professional2_d</i>	<i>ratio_lawyer_d_in</i>
<i>roe_0</i>	1						
<i>avg_0</i>	0.2732*	1					
<i>vol_0</i>	-0.1983*	0.2130*	1				
<i>ratio_lawyer_d</i>	0.0230*	0.0243*	0.0044	1			
<i>ratio_accountant_d</i>	0.0371*	0.0517*	0.0610*	0.0693*	1		
<i>ratio_professional2_d</i>	0.0411*	0.0517*	0.0433*	0.7532*	0.7084*	1	
<i>ratio_lawyer_d_in</i>	0.0199*	0.0183*	0.0034	0.2644*	0.003	0.1890*	1
<i>ratio_lawyer_d_out</i>	0.0190*	0.0207*	0.0038	0.9660*	0.0711*	0.7303*	0.0062
<i>ratio_accountant_d_in</i>	0.0398*	0.0583*	0.0532*	-0.0028	0.6899*	0.4529*	0.0048
<i>ratio_accountant_d_out</i>	0.0135*	0.0159*	0.0350*	0.0984*	0.7421*	0.5589*	-0.0003
<i>ratio_professional2_d_in</i>	0.0441*	0.0611*	0.0512*	0.0983*	0.6376*	0.4899*	0.3859*
<i>ratio_professional2_d_out</i>	0.0223*	0.0250*	0.0219*	0.8099*	0.4621*	0.8777*	0.0047
<i>buant</i>	-0.0565*	-0.1913*	-0.3657*	0.0645*	-0.0735*	-0.004	0.0059
<i>brd_man</i>	-0.0018	-0.0866*	-0.2845*	-0.0158*	-0.0681*	-0.0568*	0.0016
<i>l_dty_p</i>	0.0411*	-0.0428*	-0.2656*	0.0413*	-0.0263*	0.0119*	-0.0057
<i>ent</i>	0.1516*	0.1398*	0.1450*	-0.0002	0.0765*	0.0512*	0.0084
<i>int</i>	0.1396*	0.0551*	-0.1636*	0.0989*	-0.005	0.0662*	0.0128*
<i>figs</i>	0.1066*	0.0765*	-0.0906*	0.1115*	0.008	0.0836*	0.0149*
<i>actor_vol_median</i>	0.0334*	0.0704*	0.3902*	-0.0167*	0.0359*	0.0124*	0.0202*

	<i>ratio_lawyer_d_out</i>	<i>ratio_accountant_d_in</i>	<i>ratio_accountant_d_out</i>	<i>ratio_professional2_d_in</i>	<i>ratio_professional2_d_out</i>	<i>buant</i>	<i>brd_man</i>
<i>ratio_lawyer_d_out</i>	1						
<i>ratio_accountant_d_in</i>	-0.0042	1					
<i>ratio_accountant_d_out</i>	0.1021*	0.0267*	1				
<i>ratio_professional2_d_in</i>	-0.0015	0.9044*	0.0245*	1			
<i>ratio_professional2_d_out</i>	0.8385*	0.0113*	0.6276*	0.0123*	1		
<i>buant</i>	0.0650*	-0.0833*	-0.0224*	-0.0767*	0.0393*	1	
<i>brd_man</i>	-0.0167*	-0.0614*	-0.0364*	-0.0575*	-0.0330*	0.5567*	1
<i>l_dty_p</i>	0.0443*	-0.0350*	-0.0038	-0.0345*	0.0326*	0.6426*	0.3721*
<i>ent</i>	-0.0022	0.0877*	0.0221*	0.0856*	0.0103*	-0.3575*	-0.2303*
<i>int</i>	0.0988*	-0.0280*	0.0209*	-0.0223*	0.0896*	0.6103*	0.3321*
<i>figs</i>	0.1113*	-0.0182*	0.0295*	-0.0123*	0.1040*	0.4845*	0.2464*
<i>actor_vol_median</i>	-0.0220*	0.0560*	-0.0044	0.0595*	-0.0198*	-0.1786*	-0.1241*

	<i>l_dty_p</i>	<i>ent</i>	<i>int</i>	<i>figs</i>	<i>actor_vol_median</i>
<i>l_dty_p</i>	1				
<i>ent</i>	-0.2760*	1			
<i>int</i>	0.5731*	-0.1893*	1		
<i>figs</i>	0.3999*	-0.1599*	0.8113*	1	
<i>actor_vol_median</i>	-0.0913*	0.0945*	-0.0139*	-0.0084	1

Table 4: Regression of effect of professionals on corporate performance, 2004-2015

	(1)	(2)	(3)	(4)
Dependent variable	ROA	ROA	Tobin's Q	Tobin's Q
Estimation method	OLS	IV	OLS	IV
<i>ratio_professional2_d</i>	0.0381 [0.0203]*	1.0929 [0.2569]***	0.0038 [0.0023]*	0.319 [0.0371]***
Control variables				
<i>lnass1</i>	-0.4332 [0.1720]**	-0.8883 [0.0799]***	-0.2358 [0.0163]***	-0.2047 [0.0103]***
<i>brd_num</i>	0.0638 [0.0247]***	0.2471 [0.0281]***	0.0091 [0.0034]***	0.0442 [0.0045]***
<i>l_tky_p</i>	1.2337 [0.2342]***	1.2298 [0.1673]***	0.2299 [0.0304]***	0.1258 [0.0254]***
<i>ent</i>	0.0799 [0.0245]***	0.0707 [0.0231]***	0.0033 [0.0013]***	0.0002 [0.0009]
<i>inst</i>	0.1329 [0.0162]***	0.1337 [0.0079]***	0.01 [0.0025]***	0.0072 [0.0017]***
<i>frgn</i>	0.0113 [0.0205]	-0.0129 [0.0134]	0.0137 [0.0031]***	0.003 [0.0025]
<i>sector_vol_median</i>	-0.9627 [0.3422]***	-0.3749 [0.1109]***	0.2481 [0.0486]***	0.0216 [0.0202]
R^2	0.1	.	0.16	.
N	42,602	42,602	42,532	42,532

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

We use OLS with robust standard errors clustered at the firm level.

We use the four instruments together in our IV regressions.

Table 5: The effect of the introduction of professionals on ROA and Tobin's q: Propensity score matching

	ROA		Tobin's q	
	First introduction		First introduction	
	DID	Robust Std. Err.	DID	Robust Std. Err.
[-1, 1]	-0.2676	[1.8462]	0.2058	[0.1391]
[0, 1]	0.6391	[1.3097]	-0.0409	[0.0770]
[0, 2]	1.2876	[1.2745]	-0.0965	[0.0979]
[0, 3]	2.2907	[0.9122]**	0.2387	[0.2322]
[0, 4]	1.3885	[0.7969]*	0.139	[0.0999]

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

The difference-in-difference (DID) analysis looks at the difference in performance change between firms that introduced a professional and those that did not.

In the first column [-1, 1], -1 refers to t-1 from the time that a professional was first introduced, and 1 to t+1. Year 0 refers to the year when a professional was first introduced.

Table 6 The effect of professional on stock return volatility

	(1)	(2)	(3)	(4)	(5)	(6)
	OLS	IV	OLS	OLS	IV	IV
	Whole sample	Whole sample	Regulated	Less regulated	Regulated	Less regulated
<i>ratio_professional2_d</i>	0.0081 [0.0033]**	-0.163 [0.0313]***	0.0038 [0.0045]	0.0104 [0.0043]**	0.4235 [0.0380]***	-1.5554 [0.3871]***
<u>Control variables</u>						
<i>lnassl</i>	-0.2814 [0.0187]***	-0.2331 [0.0075]***	-0.2475 [0.0242]***	-0.297 [0.0253]***	-0.177 [0.0163]***	-0.5878 [0.0813]***
<i>brd_num</i>	-0.0303 [0.0036]***	-0.0594 [0.0038]***	-0.0396 [0.0069]***	-0.0263 [0.0042]***	-0.0001 [0.0088]	-0.1213 [0.0268]***
<i>l_tky_p</i>	-0.1612 [0.0352]***	-0.1816 [0.0205]***	-0.3432 [0.0668]***	-0.0884 [0.0413]**	-0.6715 [0.0645]***	0.1816 [0.1212]
<i>ent</i>	-0.0016 [0.0013]	0.003 [0.0011]***	0.0009 [0.0023]	-0.0027 [0.0016]*	0.0006 [0.0025]	0.0273 [0.0101]***
<i>inst</i>	0.0038 [0.0017]**	0.0064 [0.0010]***	0.0086 [0.0027]***	0.0017 [0.0021]	0.0072 [0.0032]**	0.0317 [0.0099]***
<i>frgn</i>	0.0115 [0.0023]***	0.0152 [0.0016]***	0.0079 [0.0033]**	0.0132 [0.0029]***	-0.0027 [0.0040]	0.0679 [0.0164]***
<i>R</i> ²	0.28	.	0.39	0.23	.	.
<i>N</i>	39,858	39,858	11,364	28,494	11,364	28,494

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

Table 7: The effect effect of the introduction of professionals on volatility: propensity score matching

	Whole sample		Regulated sectors		Less regulated sectors	
	DID	Robust Std. Err.	DID	Robust Std. Err.	DID	Robust Std. Err.
[-1, 1]	0.1516	[0.0761]**	0.3684	[0.0553]***	0.0619	[0.0777]
[0, 1]	0.0829	[0.0354]**	0.1241	[0.0409]***	0.0612	[0.0403]
[0, 2]	0.0446	[0.1115]	0.1726	[0.1886]	0.028	[0.0968]
[0, 3]	-0.1348	[0.1583]	0.0705	[0.1126]	0.0683	[0.1532]
[0, 4]	-0.21	[0.1072]**	0.0612	[0.1228]	-0.2708	[0.1432]*

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

The difference-in-difference (DID) analysis looks at the difference in performance change between firms that introduced a professional and those that did not.

In the first column [-1, 1], -1 refers to t-1 from the time that a professional was first introduced, and 1 to t+1.

Year 0 refers to the year when a professional was first introduced.

Appendix 1: Industry classification into regulated and less regulated

Sub classification	Sector code	Regulated
Fishery, Agriculture & Forestry	50	0
Mining	1050	0
Construction	2050	0
Foods	3050	1
Textiles & Apparels	3100	0
Pulp & Paper	3150	0
Chemicals	3200	1
Pharmaceutical	3250	1
Oil & Coal Products	3300	1
Rubber Products	3350	0
Glass & Ceramics Products	3400	0
Iron & Steel	3450	0
Nonferrous Metals	3500	0
Metal Products	3550	0
Machinery	3600	0
Electric Appliances	3650	0
Transportation Equipment	3700	0
Precision Instruments	3750	0
Other Products	3800	0
Electric Power & Gas	4050	1
Land Transportation	5050	0
Marine Transportation	5100	0
Air Transportation	5150	0
Warehousing & Harbor Transportation Services	5200	0
Information & Communication	5250	1
Wholesale Trade	6050	0
Retail Trade	6100	0
Banks	7050	1
Securities & Commodity Futures	7100	1
Insurance	7150	1
Other Financing Business	7200	1
Real Estate	8050	1
Services	9050	0

Source: Tokyo Stock Exchange.

Appendix 2: The effect inside and outside professional-directors

	(1)	(2)	(3)	(4)
Dep. Vars.	ROA	ROA	Tobin's Q	Tobin's Q
Estimation	OLS	IV	OLS	IV
<i>ratio_professional2_d_in</i>	0.0978 [0.0457]**	0.6009 [0.8610]	0.0116 [0.0055]**	0.6875 [0.1096]***
<i>ratio_professional2_d_out</i>	0.0176 [0.0218]	1.4118 [0.5640]**	0.0012 [0.0023]	0.0784 [0.0640]
<u>Control variables</u>				
<i>lnass1</i>	-0.4303 [0.1719]**	-0.931 [0.0948]***	-0.2354 [0.0163]***	-0.1727 [0.0111]***
<i>brd_num</i>	0.0633 [0.0247]**	0.2712 [0.0469]***	0.009 [0.0034]***	0.0261 [0.0058]***
<i>l_tky_p</i>	1.2374 [0.2340]***	1.1547 [0.2045]***	0.2304 [0.0304]***	0.1818 [0.0296]***
<i>ent</i>	0.0795 [0.0244]***	0.0732 [0.0247]***	0.0033 [0.0013]***	-0.0017 [0.0012]
<i>inst</i>	0.1328 [0.0162]***	0.1333 [0.0084]***	0.01 [0.0025]***	0.0076 [0.0016]***
<i>frgn</i>	0.0118 [0.0205]	-0.0218 [0.0203]	0.0137 [0.0032]***	0.0097 [0.0029]***
<i>sector_vol_median</i>	-0.9544 [0.3421]***		0.2492 [0.0486]***	
R^2	0.1	.	0.16	.
N	42,602	42,602	42,532	42,532

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$