



RIETI Discussion Paper Series 26-E-075

Board Reforms and Employee Downsizing: The Effect of Board Independence on Voluntary Retirement Offers

UCHIDA, Daisuke

Keio University

USHIJIMA, Tatsuo

Keio University



Research Institute of Economy, Trade & Industry, IAA

The Research Institute of Economy, Trade and Industry
<https://www.rieti.go.jp/en/>

**Board Reforms and Employee Downsizing:
The Effect of Board Independence on Voluntary Retirement Offers***

Daisuke Uchida (Keio University)

Tatsuo Ushijima (Keio University)

Abstract

This study examines how board reforms influence employee downsizing, focusing on the role of board independence in voluntary retirement offers in Japan. Using panel data on Japanese listed firms from 2002 to 2024, we find that higher board independence significantly increases the likelihood of voluntary retirement offers. This effect is stronger in firms with longer employee tenure and in high-performing firms. Furthermore, we find that board independence most strongly increases the likelihood of voluntary retirement offers when high performance aligns with long employee tenure.

Keywords: agency theory, board independence, employee downsizing, voluntary retirement offer

JEL classification: M10

The RIETI Discussion Paper Series aims at widely disseminating research results in the form of professional papers, with the goal of stimulating lively discussion. The views expressed in the papers are solely those of the author(s), and neither represent those of the organization(s) to which the author(s) belong(s) nor the Research Institute of Economy, Trade and Industry.

*This study is conducted as a part of the Project “Frontiers in Corporate Governance Analysis” undertaken at the Research Institute of Economy, Trade and Industry (RIETI). The draft of this paper was presented at the RIETI DP seminar for the paper. We would like to thank participants of the RIETI DP Seminar for their helpful comments.

1 INTRODUCTION

Over the last four decades, employment relations have undergone significant transformations (Bamber *et al.* 2021; Jackson *et al.* 2013). For example, in the post-World War II period, the United States (US) was characterized by closed, hierarchically governed employment relations in which employees were expected to remain with the same firm throughout their careers. Since the 1980s, however, these relations have begun to change: firms have employed an increasing number of contingent workers, employee tenure has declined, and downsizing has become more common (Baumol *et al.* 2003; Bidwell 2013). These changes were first observed in the US and subsequently in other countries such as Japan, where long-term employment was still the norm even in the 1980s (Hamaaki *et al.* 2012; Kambayashi and Kato 2017; Morris *et al.* 2018).

One of the key drivers of these changes in employment relations is the prevalence of shareholder primacy—the notion that managers should prioritize shareholders over other stakeholders by maximizing profits to increase shareholder wealth—in corporate governance (Bidwell *et al.* 2013; Datta *et al.* 2010; Pendleton and Gospel 2013). Given that corporate governance concerns “the structure of rights and responsibilities among the parties with a stake in the firm” (Aoki 2001: 11), various stakeholders, including employees, deserve consideration (Aguilera *et al.* 2008; Aguilera and Jackson 2003). However, scholars, practitioners, and policymakers have frequently downplayed the importance of these stakeholders, emphasizing shareholder value instead (Lund and Pollman 2021; Wiersema *et al.* 2026). Consequently, as shareholder primacy has become the dominant principle in corporate governance, managers are under pressure to reduce the workforce in order to increase profits, and their ability to maintain long-term employment commitments to employees has been severely constrained (Budros 1997;

Fligstein and Shin 2007; Jung 2015).

The prevalence of shareholder primacy is epitomized by the worldwide diffusion of board reforms that encourage firms to design their boards of directors in a way that increases shareholder value, primarily by recommending or imposing greater board independence—the relative representation of outside directors on the board (Cuomo *et al.* 2016; Fauver *et al.* 2017). Independent boards are considered to be better positioned to impartially and dispassionately monitor firm managers and curb opportunistic management behavior that deviates from maximizing shareholder value (Dalton *et al.* 2007; Fama and Jensen 1983). Reflecting their growing prominence in academia, practice, and policy, independent boards are now considered “synonymous with good governance” (Neville et al., 2019:2539) or “global corporate governance norms” (Witt et al., 2022:132). Consistent with these arguments, an important body of research has confirmed an association between board independence and an increase in employee downsizing (Jung 2015; Perry and Shivdasani 2005; Yawson 2006).

However, these studies have primarily focused on the US and the United Kingdom (UK), which are considered representative examples of liberal market economies (LMEs) and are associated not only with weaker employee rights but also with less emphasis on employee voice in managerial decisions. Meanwhile, coordinated market economies (CMEs), such as those in Germany and Japan, are characterized by comprehensive employment protection (Hall and Soskice 2001). Despite these differences in national economic systems, the role of independent boards in shaping employment relations in CMEs has received little attention, even though employment relations within CMEs are also under pressure to change in response to the worldwide diffusion of board reforms.

This study examines how board independence influences employment relations in Japan,

a typical example of a CME, specifically focusing on the adoption of voluntary retirement programs. Japanese firms employ a variety of gradual employment adjustment measures (*koyochosei*) for workforce downsizing, one of which is voluntary retirement programs (Mroczkowski and Hanaoka 1997).¹ These programs offer financial incentives—such as enhanced severance pay—and job placement assistance to mitigate worker discontent. Since firms and employees in Japan have traditionally had long-term relationships (Abegglen 1958; Dore 1973; Moriguchi and Ono 2006), these programs are considered a last resort during severe financial distress (Mroczkowski and Hanaoka 1997). However, as these relationships have eroded somewhat following the burst of the bubble economy in the early 1990s (Hamaaki *et al.* 2012; Kambayashi and Kato 2017; Morris *et al.* 2018), they have also served in recent years as a proactive tool to reduce labor costs and optimize the age composition of the workforce (Nikkei Business 2025).

We argue that one cause of such a change is board reforms since 2000s and a subsequent increase in board independence among Japanese firms. Our empirical analysis using a firm-level panel data of Japanese listed firms from 2002 to 2024 presents evidence on how corporate governance reforms influence employment relations in Japan by revealing several key findings. First, we find that higher board independence significantly increases the likelihood of a firm offering voluntary retirement programs. Second, this positive effect is particularly pronounced in firms with longer average employee tenure and in high-performing firms. Furthermore, our results demonstrate a significant three-way interaction: independent boards most strongly induce

¹ The concept of *koyochosei* is categorized into three stages. Voluntary retirement programs are considered a final-stage measure. Before reaching this stage, Japanese firms typically exhaust other methods, such as restrictions on overtime, internal transfers, temporary leave with pay cuts, and transferring staff to other companies (*shukko*) (Mroczkowski and Hanaoka 1997).

voluntary retirement offers when high firm performance aligns with long employee tenure. These findings underscore that board reforms driven by shareholder primacy can erode traditional long-term employment commitments even within a CME, offering important implications for the intersection of employment relations and corporate governance.

The remainder of this paper is structured as follows. Section 2 provides institutional backgrounds, and Section 3 describes the data and empirical methodology used for our analysis. Section 4 presents the main empirical results, along with a series of robustness checks including analyses that address potential endogeneity concerns. Section 5 discusses contributions, implications, and limitations of the study. Finally, Section 6 concludes the paper.

2 BACKGROUNDS

2.1 Employment relations in Japan

Economies in developed countries are generally categorized into two types—LMEs and CMEs—distinguished by the institutional mechanisms through which firms resolve coordination problems (Hall and Soskice 2001). LMEs, such as the US and the UK, primarily use competitive market arrangements and formal contracting for coordination. Corporate governance in these countries is characterized by reliance on public equity markets, where dispersed shareholders prioritize short-term profitability, which encourages highly fluid labor markets and enables firms to swiftly adjust their workforce in response to market fluctuations. In contrast, CMEs rely on non-market institutions and interactions involving industry associations, labor unions, and interlocking corporate networks. Governance structures often feature patient capital provided by banks or cross-shareholdings, which insulates management from short-term market pressures and enables long-term planning. This stability creates internal labor markets with long-term employment and high job security. Alongside Germany, Japan is typically considered a representative CME. In fact,

according to the OECD, CMEs, like Japan and Germany, maintain stricter dismissal regulations for regular workers than LMEs, such as the US and the UK (OECD 2026).²

Consistent with these arguments, long-term employment has been considered a defining feature of Japanese firms, often referred to as “lifetime employment” (Abegglen 1958; Dore 1973; Moriguchi and Ono 2006). Even during periods of business difficulty, Japanese firms tend not to dismiss employees, and employees do not quit or refuse job assignments; consequently, the relationship between firms and employees lasts for the employees’ occupational lifetime. Such a relationship is underpinned by a set of interdependent practices encompassing multiple aspects of firm–employee relations: (1) human capital development that raises an employee’s productivity over their tenure and provides managerial incentives to retain the employee (e.g., corporate training), (2) a compensation system that provides incentives for employees to exert effort, acquire desirable human capital, and remain with the firm (e.g., seniority-plus-merit wages), (3) employment adjustment methods that protect the level of employment, while providing management with alternative ways to reduce labor costs during business downturns (e.g., hiring freezes), and (4) internal enforcement and coordination mechanisms that facilitate information sharing, enable employees to monitor management, and encourage firm–employee cooperation (e.g., enterprise unions) (Kato 2001; Koike 1988; Moriguchi and Ono 2006). Importantly, this employment system based on internal labor markets extends into the highest ranks of leadership positions. Consequently, in Japanese firms, top executive promotion acts as the ultimate incentive mechanism driving internal labor markets, and chief executive officer (CEO) succession is structured as a long-term internal tournament among cohorts of lifetime employees (Jung *et al.*

² However, although Japan and Germany have higher OECD dismissal regulation for regular workers than the US and UK, their protection levels remain relatively moderate compared to continental European peers, such as the Netherlands and Italy (OECD 2026) .

2026; Uchida 2021).

However, this relationship is implicit, not formalized in a contract. There are no explicit clauses in formal employment contracts regarding these practices, and firms are under no legal obligation to guarantee lifetime employment. Since changes in product or labor market conditions affect the incentives of one of the two parties—the firm or the employees—lifetime employment is fragile by nature. For example, during periods of economic prosperity, employees are incentivized to leave their firms in search of better terms. In contrast, during recessions, firms are incentivized to downsize their workforce in order to reduce labor costs. Therefore, lifetime employment must be enforced internally and is better understood as a long-term commitment between firms and employees than as a permanent employment contract (Ono 2010).

2.2 Employee downsizing and voluntary retirement programs

The fact that Japanese firms engage in these practices does not mean that they never downsize their workforce. While the Japanese Civil Code stipulates that either party can terminate an employment contract with a short notice period, the Labor Contract Act and established case law make it difficult for employers flexibly to dismiss their employees. To be legally valid, such terminations must be based on objectively reasonable grounds and considered appropriate in light of social norms; otherwise, they are deemed an abuse of dismissal rights and rendered void. Consequently, layoffs—the temporary or permanent termination of employment by an employer for reasons unrelated to an employee’s individual performance—are uncommon in Japan. Therefore, Japanese firms use voluntary retirement programs to downsize their workforce.

A voluntary retirement program encourages employees, typically in their 40s or 50s, to retire early in exchange for financial incentives and job placement assistance. In this practice, firms consult with employees in advance and offer a substantial amount of severance pay, which

increases with the length of tenure and helps mitigate worker discontent. Although employee downsizing through voluntary retirement programs has been considered a “last resort” implemented only when firms experience serious financial distress (Mroczkowski and Hanaoka 1997), firms have more recently offered these programs to reduce labor costs and optimize the age composition of their workforce (Nikkei Business 2025).

Previous studies that examine the antecedents of employee downsizing among Japanese firms have identified that enterprise unions and shareholders (including main banks) play key roles (Ahmadjian and Robbins 2005; Ahmadjian and Robinson 2001; Kang and Shivdasani 1997; Noda 2013; Noda and Hirano 2013; Noda and Hirano 2024; Noda and Hirano 2026). For example, Noda and Hirano (2013), using a sample of Japanese firms between 1991 and 2004, demonstrate that the attitudes of enterprise unions toward downsizing changed around 1997: although firms with strong unions were likely to maintain employment until they experienced two consecutive years of losses before 1997, these firms tended to implement downsizing before suffering deficits after 1997. Furthermore, Kang and Shivdasani (1997), using a sample of Japanese firms suffering performance declines between 1986 and 1990, document that compared to US firms with a similar decline in performance, Japanese firms were less likely to engage in employee downsizing, while the probability increased with shareholding by their main banks. In a similar vein, Ahmadjian and Robbins (2005), using a sample of Japanese firms between 1991 and 2000, provide evidence that foreign shareholders are the primary drivers of the shift toward employee downsizing, while the effect is mitigated when firms are members of business groups.

2.3 Board reforms and independent boards

Since the observation period of these studies ends in the early 2000s, little attention has been paid to the role of the board of directors (Noda and Hirano 2026, for an exception). However, the boards

of directors in Japanese firms have been reformed since then (Aoki *et al.* 2007; Miyajima and Arikawa 2025). Until the early 2000s, the boards of directors of many Japanese firms were primarily composed of inside directors and maintained a hierarchical structure with the CEO at the top, in which the position of director was often viewed as a promotion goal extending from an employee's career path. However, as the Japanese economy entered a prolonged slump after the burst of the bubble economy in the 1990s, the failure of the board's monitoring function began to be regarded as one of the important reasons for the poor performance of Japanese firms. Amidst this situation, the 2001 revision of the Commercial Code legally defined outside directors—who have no significant relationship with the firm and its managers beyond their position on the board—for the first time, which took effect in 2002.

However, the diffusion of outside directors among Japanese firms was far from smooth and faced considerable resistance. Although this regulatory change prompted a small number of progressive firms to begin appointing them, many firms remained reluctant, resulting in a prolonged period of stagnant adoption. Indeed, as late as 2010, more than half of the firms listed on the Tokyo Stock Exchange (TSE) had not appointed a single outside director. It was not until the mid-2010s that both the number of Japanese firms appointing outside directors and the overall level of board independence—measured by the proportion of independent outside directors—began to increase in earnest. One trigger for the increase in the mid-2010s was the publication of Japan's Corporate Governance Code by the Tokyo Stock Exchange in 2015. The Code requested firms listed on the TSE First and Second Sections to appoint two or more outside directors in the form of “comply or explain”—requiring either compliance with these principles or an explanation of reasons for non-compliance (Tokyo Stock Exchange 2015).

As a result of these reforms, boards of directors in Japanese firms have seen a significant

increase in the proportion of outside directors and enhanced their board independence³, which can influence the relationship between the firm and its employees. Independent boards are expected to monitor managers more objectively and help mitigate opportunistic management behavior that deviates from maximizing shareholder value (Dalton *et al.* 2007; Fama and Jensen 1983). Outside directors are in a better position to be objective and effectively monitor managers compared to inside directors who have operational experience within the firm. By monitoring managers, outside directors can ensure that shareholders' interests are prioritized, and such monitoring effectively changes the behavior of managers. Therefore, independent boards are expected to increase employee downsizing by mitigating the agency problem, in which managers prioritize personal interests over shareholder value. While managers who are subject to weak monitoring from the board of directors avoid making difficult decisions such as employee downsizing for fear of internal friction (Bertrand and Mullainathan 2003; Ikeda *et al.* 2018), independent boards push—or even force—them to make difficult decisions they might otherwise avoid, enabling them to break the managerial status quo and rationalize redundant labor to maximize shareholder value.

Consistent with these arguments, previous research, which primarily focuses on US and UK firms, has demonstrated that independent boards spur firms to reduce their workforces (Jung 2015; Perry and Shivdasani 2005; Yawson 2006). For example, Yawson (2006), using a sample of UK firms suffering performance declines for the period between 1994 and 2003, finds a positive relationship between board independence and the propensity to announce layoffs. Furthermore, Jung (2015), using a sample of US firms for the period between 1981 and 2006, also finds that

³ In addition to the increase in the proportion of outside directors, board independence in Japan has advanced through the separation of the roles of board chair and CEO, as well as the adoption of committee-based governance structures (e.g., Company with Three Committees and Company with an Audit and Supervisory Committee)—both of which strengthen the objective monitoring function of the board.

firms with highly independent boards are more likely to engage in employee downsizing. These findings imply that monitoring by independent boards may thus lead managers to become increasingly focused on profit maximization, which in turn may induce them to implement employee downsizing.

3 METHODS

3.1 Data and sample

We draw on publicly traded firms listed in Japan between 2002 and 2024 as our sampling frame. The year 2002 was selected as the starting point because the role of an outside director was legally defined for the first time in Japan's commercial law in 2001, which took effect in 2002. Consequently, our data track outside director appointments at Japanese listed firms from the inception of this legal framework. We obtain firm financial, employment, and corporate governance data from *Nikkei NEEDS* and *QUICK Workstation Astra Manager*. Our data on voluntary retirement programs are taken from a database compiled by *Tokyo Shoko Research (TSR)*. The database collects firms' announcements on voluntary retirement offers, which are made public via timely disclosures as required by stock exchanges (e.g., TSE). Since timely disclosure rules require firms to publicly disclose information critical to investors' decisions (e.g., M&As and the occurrence of extraordinary losses) through the stock exchanges, voluntary retirement programs included in this data are expected to target a significant number of employees for each firm. We merge this data with the firm financial, employment, and corporate governance data, and construct a firm-year panel dataset. The final sample includes 72,877 firm-year observations across 5,982 firms between 2002 and 2024.

3.2 Voluntary retirement offer

Our dependent variable is *voluntary retirement offer*, which is measured as a dummy variable that

equals 1 when a firm offers a voluntary retirement program and 0 otherwise. Although TSR also compiles data on the number of employees targeted for voluntary retirement programs, the data includes some missing values (94 cases are missing among 1,145 voluntary retirement offers in our sample). Therefore, we operationalize voluntary retirement offer as a dummy variable in our main analysis and use the number of target employees—the number of employees targeted for the voluntary retirement program—and the percentage of target employees—the percentage of employees targeted for the voluntary retirement program relative to total employees—as part of robustness checks.

Panel A of Table 1 shows the frequency with which firms offered voluntary retirement programs during our sample period. Of the 5,314 firms in the sample, 818 firms offered voluntary retirement programs. Most of these firms (603 firms) experienced this once, but some experienced it two or more times in different periods. Panel B of Table 1 shows the size of voluntary retirement programs in terms of the number of employees targeted for the voluntary retirement program and its percentage relative to total employees. The mean number and percentage of target employees are 199.1 and 11.0%, respectively, suggesting that a significant number of employees are targeted for voluntary retirement programs.

---Insert Table 1 about here---

Additionally, Figure 1 shows the historical trend of the number of firms that offered voluntary retirement programs and the number of employees targeted for the program in our sample. Unsurprisingly, the number increased during major economic downturns, such as the period of corporate restructuring driven by the disposal of non-performing loans in the early 2000s following the late-1990s banking crisis, the Great Recession in the late 2000s, and the COVID-19 recession in 2020.

---Insert Figure 1 about here---

Although the announcement of a voluntary retirement program through timely disclosure indicates a firm's intention to downsize, it does not necessarily mean that the firm will actually implement the downsizing. A firm may announce a voluntary retirement program but not implement it, which does not lead to a change in the number of employees. Therefore, we investigate whether or not announcing a voluntary retirement program results in an actual decrease in the number of employees at these firms. Specifically, we conducted a t-test of firm employment growth comparing firms that announced a voluntary retirement program with those that did not. We measure firm employment growth through both the absolute year-on-year change in employee count and an industry-adjusted measure. While the unadjusted measure captures the firm's total workforce adjustment, the industry-adjusted value (derived by subtracting the industry mean change from the focal firm's change) allows us to isolate firm-specific decisions from common economic shocks affecting the industry as a whole.

Panel A of Table 2 reports that there is an 8.42% decrease in *firm employment growth* for firms that offer a voluntary retirement program and a 3.12% increase for firms that do not. Similarly, they show that there is a 10.09% decrease in *firm employment growth (industry adjusted)* for firms that announce a voluntary retirement program and a 0.16% increase for firms that do not. These results suggest that the announcement of a voluntary retirement program has a significant impact on reducing the number of employees. Furthermore, Panel B of Table 2 reports the temporal dynamics of employment growth for firms announcing voluntary retirement programs, tracking performance from two years before ($t-2$) to two years after ($t+2$) the event year (t). Announcing firms show signs of employment decrease starting at $t-1$, which dramatically accelerates in the event year t , reaching a mean (median) of -8.42% (-7.13%). While this effect persists into $t+1$,

it substantially tapers off by $t+2$. A consistent pattern emerges when adjusting for industry benchmarks: industry-adjusted employment growth reaches a mean (median) of -10.09% (-8.54%) in year t .

---Insert Table 2 about here---

3.2 Board independence

The main predictor variable is *board independence*, measured as the percentage of outside directors relative to the total number of directors on the board. Figure 2 displays the percentage of firms that do not appoint outside directors and the average board independence among listed Japanese firms between 2002 and 2024. As mentioned in the previous section, while some firms appointed outside directors immediately after the 2001 revision of the Commercial Code, many others did not. However, in the mid-2010s, many firms began to appoint outside directors. Consequently, almost all firms appoint at least one outside director by 2024, and the average board independence among Japanese firms increased tenfold, from just 4% in 2002 to over 40% in 2024.⁴

---Insert Figure 2 about here---

3.4 Empirical models

Our data includes firm-year observations from 2002 to 2024, with each firm having multiple observations that are not independent, resulting in within-firm correlation. Although fixed-effects logit models are typically preferred as they do not require independence between firm-specific effects and predictors, they are not suitable for our analysis because over 80% of the sample firms did not offer a voluntary retirement program. Using fixed-effects models would exclude these

⁴ The 2019 Companies Act requires listed and large firms to appoint outside directors, which took effect in 2021. However, there are a very small number of firms that have not appointed outside directors due to exceptional circumstances, such as temporary vacancies resulting from accidents or sudden resignations.

firms due to a lack of within-firm variation in the dependent variable, thereby restricting the analysis to only firms that offered a voluntary retirement program and introducing a sample-selection bias. Consequently, we employ population-averaged logistic regression models and treat the data as a panel (i.e., firms as the cross-sectional unit and years as the temporal unit) by using generalized estimating equations (GEE) to account for within-firm correlation over time. We also use robust standard errors clustered by firm to adjust for unobserved within-cluster dependence.⁵

To investigate the effect of board independence on the likelihood of a voluntary retirement offer in the subsequent year, we run the following model:

$$\ln\left(\frac{P_{it+1}}{1 - P_{it+1}}\right) = \beta_0 + \beta_1 \text{Board independence}_{it} + \sum \beta_k \text{Controls}_{it} + \varepsilon_{it} \quad (1)$$

We expect that independent boards compel managers to make difficult decisions that can contribute to shareholder value but may not be desirable for managers. Thus, a positive and significant β_1 will provide evidence consistent with our arguments.

As a further analysis, we examine how the effect of *board independence* on *voluntary retirement offer* is moderated by firm's two internal context. Specifically, we estimate the following model:

⁵ While our primary specification employs a GEE model to improve estimation efficiency by explicitly accounting for within-firm correlation, we also re-estimated our main models using a pooled logistic regression with standard errors clustered by firm. The main results remain essentially unchanged.

$$\begin{aligned}
& \ln\left(\frac{P_{t+1}}{1 - P_{t+1}}\right) \\
&= \beta_0 + \beta_1 \text{Board independence}_{it} + \beta_2 \text{employee tenure}_{it} \\
&+ \beta_3 \text{Firm performance}_{it} + \beta_4 (\text{Board independence}_{it} \times \text{Employee tenure}_{it}) \\
&+ \beta_5 (\text{Board independence}_{it} \times \text{Firm performance}_{it}) \\
&+ \beta_6 (\text{Employee tenure}_{it} \times \text{Firm performance}_{it}) \\
&+ \beta_7 (\text{Board independence}_{it} \times \text{Employee tenure}_{it} \times \text{Firm performance}_{it}) \\
&+ \Sigma \beta_k \text{Controls}_{it} + \varepsilon_{it} \tag{2}
\end{aligned}$$

Employee tenure is measured as the average tenure of employees⁶. *Firm performance* is measured as the industry-adjusted return on assets (ROA)—the ratio of net income to total assets—calculated by subtracting the industry mean ROA from the focal firm’s ROA to isolate firm-specific performance from industry-wide economic trends. We classify firms into 33 industry groups following the TSE 33 Industry Sector classification, defined by the Japan Exchange Group. The classification is roughly equivalent to the two-digit level of SIC codes.

To illustrate the distribution of our sample across our independent and moderating variables, Table 3 presents the number of voluntary retirement offers and firm-year observations (in parentheses) for each subsample based on these variables. For this cross-tabulation, we dichotomize employee tenure into short and long groups, denoting cases with an average employee tenure below and above the sample mean of 12.58 years, respectively. Likewise, firm performance is divided into high and low categories: high (low) performance indicates that the firm's ROA exceeds (is equal to or below) the industry average. Furthermore, board independence is

⁶ Unlike most financial variables in our dataset that are measured on a consolidated basis, the data for this variable is based on non-consolidated figures

categorized into three groups: 0%, 1–33%, and more than 33%.⁷ As shown in the table, the presence of voluntary retirement offers across all these subsamples provides a solid empirical basis for exploring the three-way interaction effects among board independence, employee tenure, and firm performance.

---Insert Table 3 about here---

Although Equation (2) includes four interaction terms in total to ensure proper model specification, we focus specifically on the three interaction terms involving *board independence* and expect their impacts as follows. First, although employees accumulate firm-specific human capital as tenure increases, the marginal accumulation of this capital tends to diminish over time (Gagliardi *et al.* 2023; Ng and Feldman 2010). Conversely, under traditional compensation structures, wages generally continue to rise with age and seniority (Conrad 2009). This divergence creates an imbalance where the rising labor costs eventually surpass the marginal productivity of long-tenured employees, shifting the workforce from a strategic asset to a financial burden. While managers tend to hesitate to address this imbalance to mitigate internal friction arising from the implicit contract of long-term employment (Bertrand and Mullainathan 2003; Ikeda *et al.* 2018), independent directors can fulfill their monitoring role primarily by enforcing workforce downsizing to maximize shareholder value. Therefore, the positive impact of board independence on the likelihood of downsizing should be more pronounced in firms with longer employee tenure, where this structural imbalance is more severe. Thus, a positive and significant β_4 will provide

⁷ The 33% (one-third) threshold is based on the revisions of Japan's Corporate Governance Code. While the 2018 revision introduced a conditional guideline stating that listed firms that consider it necessary should appoint at least one-third of their board members as outside directors, the 2021 revision strengthened this standard by explicitly requiring firms, particularly those listed on the Prime Market, to have outside directors constitute at least one-third of the board.

evidence consistent with our arguments.

Second, high firm performance often tempts managers to maintain the status quo, hindering them from making changes (Audia *et al.* 2000; Greve 2003). In this context, independent directors can enforce pre-emptive restructuring, including voluntary retirement offers, to drive continuous improvement and achieve even better performance. Conversely, when a firm performs poorly, managers have limited options and the firm may be forced to offer voluntary retirement programs, even in the absence of monitoring by independent boards if circumstances demand it. Consequently, independent boards exert a stronger positive effect on downsizing decisions when firm performance is high than when it is low. Consequently, the positive impact of independent boards on downsizing decisions is maximized when both employee tenure and firm performance are high. Thus, a positive and significant β_5 will provide evidence consistent with our arguments.

Finally, it is important to consider that these two moderating factors can reinforce one another. When firms have long-tenured employees and perform well, managers naturally procrastinate on painful restructuring due to the implicit contract of long-term employment and the comfort of the status quo. In this context, independent boards can monitor managers and compel pre-emptive downsizing, which managers would otherwise defer. Conversely, when firms have short-tenured employees and perform poorly, managers have limited options and inevitably offer voluntary retirement programs on their own judgment out of necessity, even in the absence of monitoring by independent boards. Thus, a positive and significant β_7 will provide evidence consistent with our arguments.

In addition to these variables, our models control for firm, governance and industry characteristics that may affect both the main predictor variable and the dependent variable. In terms of firm characteristics, we control for *firm size*, measured as the number of employees (in

thousands), since larger firms, may have more employees to be downsized compared to their smaller counterparts. Since firms facing financial difficulties may be under pressure to reduce their workforces, we include *debt to equity ratio*, calculated by dividing total liabilities by stockholders' equity, and *low interest coverage*, a dummy variable equal to 1 if the interest coverage ratio (operating income divided by interest expenses) is below 1 and 0 otherwise. We also include *diversification*, measured as one minus the Herfindahl index of segmental sales, since diversified firms tend to experience restructuring resulting from control problems associated with managing multiple businesses (Hoskisson *et al.* 1994). Additionally, firms can flexibly restructure their business when they are organized as holding companies (Shimotani 2012), and such structural realignments can lead to concurrent workforce reductions. Meanwhile, firms may not have such flexibility in downsizing when their enterprise unions resist (Noda and Hirano 2013; Noda and Hirano 2024). Thus, we also control for *holding company*, which indicates 1 if a firm is structured as a holding company and 0 otherwise, and *enterprise union*, which indicates 1 if a firm has an enterprise union and 0 otherwise.

To capture governance characteristics, we include *domestic institutional ownership*, which is the percentage of shares held by domestic institutional investors in a firm's total outstanding shares, and *foreign ownership*, which is the percentage of shares held by foreign investors in a firm's total outstanding shares. While domestic institutional investors tend to have good relationships with their portfolio firms and are less likely to interfere with management, foreign investors are more likely to compel downsizing to increase profits and shareholder value (Ahmadjian and Robbins 2005). We also control for *board size*, measured as the total number of directors, since larger boards may be less effective decision-making units due to collective action problems (Uchida 2023).

Furthermore, a firm's downsizing actions can be influenced by peers' downsizing actions because of imitation among industry peers (Ahmadjian and Robinson 2001). Therefore, we include *industry downsizing*, measured as the proportion of firms in each industry that announce voluntary retirement offers relative to the total number of firms in that industry (based on the TSE 33 Industry Sector classification). Finally, our models control for year and industry fixed effects (based on the TSE 33 Industry Sector classification) that could also impact firm-level downsizing decisions. We winsorise our continuous independent variables at the 1st and 99th percentiles in order to eliminate outliers. Descriptive statistics of our variables are presented in Table 4.

---Insert Table 4 about here---

4 RESULTS

4.1 Main regressions

Table 5 reports the results of main analysis. Model 1 includes control and moderating variables, and Model 2 includes the main effect of board independence. In Models 3 and 4, we successively add interaction terms to arrive at Model 5, which includes all interaction terms. Following recommendations by Aguinis et al. (2017), we mean-center independent and moderating variables to facilitate the interpretation of lower-order coefficients and interpret first-order effects based on full models including the predictor, moderator, and interaction terms (Model 5) to avoid misleading conclusions drawn from partial models (Models 1–4).

---Insert Table 5 about here---

First, we find a positive association between *board independence* and *voluntary retirement offer*. The coefficient for *board independence* is positive and significant ($\beta = 0.893$, $se = 0.244$, $p < 0.001$), and its marginal effect is 0.007 ($z = 3.75$, $p < 0.001$). Considering the control and moderating variables, the coefficients on *firm size*, *debt to equity ratio*, *interest coverage*,

foreign ownership, *industry downsizing*, and *employee tenure* are significantly positive, suggesting that larger firm size, financial difficulties, higher foreign ownership, peer announcements of voluntary retirement programs, and long-tenured employees, exhibit higher likelihood of a firm's offering voluntary retirement program. In contrast, the coefficient for *firm performance* is significantly negative, indicating that poor firm performance exhibit higher likelihood of a firm's offering voluntary retirement program.

Second, we find positive moderating effect of *employee tenure*. Its coefficient is positive and significant ($\beta = 0.095$, $se = 0.036$, $p = 0.009$). We calculate the marginal effects of *board independence* at differing levels of *employee tenure*—defined as low at one standard deviation below the mean and high at one standard deviation above the mean. Its marginal effect for firms with long-tenured employees is significantly positive ($b = 0.015$, $z = 4.84$, $p = 0.009$), and that for firms with short-tenured employees is not significant ($b = 0.003$, $z = 1.20$, $p = 0.232$). Figure 3, where the vertical axis measures the predicted probability of a voluntary retirement offer, illustrates how the effect of *board independence* on *voluntary retirement offer* is contingent on employee tenure, showing a steeper relationship slope for firms with long-tenured employees compared to those with short-tenured employees. Furthermore, we confirm that the difference between these marginal effects is statistically significant ($\chi^2 = 13.27$, $p < 0.001$).

---Insert Figure 3 about here---

Third, we find positive moderating effect of firm performance. Its coefficient is positive and significant ($\beta = 10.700$, $se = 2.247$, $p < 0.001$). We calculate the marginal effects of *board independence* at differing levels of *firm performance*—defined as low at one standard deviation below the mean and high at one standard deviation above the mean. Its marginal effect for firms with high firm performance is significantly positive ($b = 0.008$, $z = 5.15$, $p < 0.001$), and that for

firms with low firm performance is not significant ($b = 0.002, z = 0.60, p = 0.548$). Figure 4 illustrates how the effect of *board independence* on *voluntary retirement offer* is contingent on firm performance, showing a steeper relationship slope for firms with high firm performance compared to those with low firm performance. We also confirm that the difference between these marginal effects is statistically significant ($\chi^2 = 5.14, p = 0.023$).

---Insert Figure 4 about here---

Forth, we find positive three-way interaction between *board independence*, *employee tenure*, and *firm performance*. The coefficient for the interaction term is positive and significant ($\beta = 1.368, se = 0.340, p < 0.001$). We also calculate its marginal effects when moderating variables take different values. When firm performance is low, its marginal effect is not statistically significant both for short-tenured employees ($b = 0.001, z = 0.52, p = 0.603$) and long-tenured employees ($b = 0.002, z = 0.45, p = 0.653$). In contrast, when firm performance is high, its marginal effect is not statistically significant for firms with short-tenured employees ($b = 0.003, z = 1.51, p = 0.132$) but statistically significant for firms with long-tenured employees ($b = 0.015, z = 5.86, p < 0.001$). Figure 5 depicts the relationships, in which the slope difference between firms with long-tenured employees and those with short-tenured employees is larger when firm performance is high. We confirm that the difference is statistically significant ($\chi^2 = 3.30, p = 0.069$).

---Insert Figure 5 about here---

4.2 Tobit regressions

To check robustness of results of our analysis, we use alternative measures of voluntary retirement offer (i.e., *number of target employees* and *percentage to total employees*). Since the number of employees targeted for voluntary retirement program is only observed when firms

offered it, we use tobit regressions to deal with the problem of truncated observations. Table 6 reports the results of analysis. Dependent variable is *number of target employees* in Models 1 to 3 and *percentage of target employees* in Models 4 to 6. These results are essentially consistent with results reported in Table 5.

---Insert Table 6 about here---

4.3 Accounting for endogeneity

Our analysis so far has provided evidence that board independence is significantly and positively associated with voluntary retirement offers. However, one important concern about the results is that endogeneity issues are not fully addressed. We see two sources of endogeneity that may affect our regressions: omitted variables (i.e., the likelihood that an unobserved or uncontrolled factor is associated with both board independence and the propensity to offer voluntary retirement programs) and simultaneity or reverse causality driven by managerial anticipation (i.e., the likelihood that managers plan future voluntary retirement offers and proactively increase the number of outside directors as a steppingstone). We took several steps to address the related concerns arising from these sources of endogeneity.

To tackle the first source of endogeneity and quantify how robust our primary findings are to unobserved confounders, we perform a sensitivity analysis using the *konfound* command in Stata (Frank *et al.* 2023). Because our dependent variable is binary, we evaluate the Robustness of Inference to Replacement (RIR) with the non-linear option. The RIR analysis shows that 23.66% of the observations (17,243 out of 72,877) would need to be replaced with cases where the effect is zero to invalidate our inference at the 5% significance level. This indicates a moderate-to-high level of robustness, suggesting that an omitted variable would need to affect a substantial portion of the sample to alter our main conclusions.

Given that our primary estimations rely on non-linear models, we employ a two-stage residual inclusion (2SRI) approach to address potential simultaneity (Terza *et al.* 2008; Wooldridge 2010). It is similar to linear two-stage least squares, except that endogenous variables are not replaced by first-stage predictions; rather, the first-stage residual is included as an additional regressor in the second stage. In the first-stage model, the dependent variable is *board independence* (i.e., the potentially endogenous regressor), and we include all moderating and control variables used in our main analysis along with the chosen instrumental variable as a predictor. The first-stage model must include at least one independent variable (i.e., an instrument) that is associated with the dependent variable in the first-stage model (relevance condition) but not related to the dependent variable in the second-stage model (exclusion restriction).

Our chosen instrumental variable is *corporate governance codes*, which is coded as 1 for firms listed in the TSE First and Second Sections since 2015 and 0 otherwise. The Japan's Corporate Governance Code, published in 2015, has required firms listed on the TSE First and Second Sections to appoint two or more outside directors, which pressures firms to improve their board independence. However, it is unlikely to directly related to firm's offering voluntary retirement programs. Therefore, on a conceptual level, our instrument variable meets both the exclusion restriction and relevance criteria: the effect of *board independence* on *voluntary retirement offer* works through the publication of the Japan's Corporate Governance Code. We included the residuals estimated from the first-stage model in the second-stage regressions.

Table 7 reports both the first- and second-stage results of 2SRI models, which parallel the models in Table 5. Model 1 shows the first-stage regression results, in which dependent variable is *board independence*. As expected, in Model 1, the first-stage results show that *corporate governance codes* is a strong predictor of *board independence* ($\beta = 0.110$, $se = 0.002$, $p < 0.001$).

To address potential concerns regarding weak instruments, we check that while the F-statistic for the excluded instrument is 3808.42, which significantly exceeds the conventional threshold of 10. We also perform the Anderson–Rubin test to address potential weak instrument concerns. The test statistics are statistically significant ($\chi^2 = 10.80, p = 0.001$).

---Insert Table 7 about here---

Given these results, we include the *first-stage residual* from Model 1 as an additional control variable in the second stage. Furthermore, to properly correct for endogeneity in models with interaction terms, we include not only the main term of the first-stage residual but also its interaction terms with the moderating variables. In Models 2 through 5 of Table 7, the coefficients of the *first-stage residual* and its interaction terms with the moderating variables are negative and statistically significant, confirming the presence of endogeneity bias. Importantly, even after correcting for this endogeneity bias, the core results remain fully consistent with Table 5, suggesting that our findings are robust to potential endogeneity concerns.

4.4 Additional test for the role of enterprise unions

To ensure the robustness of our findings and deepen our understanding of the institutional context, we conduct an additional analysis focusing on the role of enterprise unions. In the traditional Japanese employment system, enterprise unions have historically functioned as a crucial buffer for employment relations by safeguarding job security. Therefore, the presence of an enterprise union could increase the internal friction associated with workforce downsizing, potentially countervailing the pressures from independent directors who seek to optimize labor costs (Noda and Hirano 2013; Noda and Hirano 2024; Noda and Hirano 2026). To explore the role of enterprise unions, we split our sample into two groups based on the presence of an enterprise union and re-estimate our primary models. We then conduct a series of Z-tests to statistically compare the

coefficients across the two split-sample models for variables involving board independence.

However, as reported in Table 8, the statistical comparisons reveal no significant differences between the non-unionized and unionized samples. Specifically, we find no statistically significant difference in the main effect of *board independence* ($Z = -0.998, p = 0.318$), in its two-way interactions with *employee tenure* ($Z = 0.317, p = 0.751$) and *firm performance* ($Z = -0.059, p = 0.953$), and in the three-way interaction term ($Z = -0.318, p = 0.750$). These results indicate that independent boards operate regardless of union presence. This implies that, at least within the context of voluntary retirement offers, the role of enterprise unions as a countervailing power against independent boards is not observed, and independent boards effectively overcome the internal friction associated with voluntary retirement offers regardless of union presence.

---Insert Table 8 about here---

5 DISCUSSIONS

This study examines how board reforms influence employment relations. Drawing on a panel dataset of Japanese listed firms from 2002 to 2024, we empirically investigate the impact of independent boards on the likelihood of voluntary retirement offers. Our findings demonstrate that board independence significantly increases the propensity of firms to offer voluntary retirement programs. Furthermore, this effect is highly contingent upon internal firm conditions: independent boards exert a significantly stronger push for voluntary retirement offers in firms with longer employee tenure—where seniority-based compensation causes labor costs to exceed marginal productivity—and in high-performing firms—where independent directors compel pre-emptive restructuring to overcome status quo among managers. Notably, our results reveal a three-way interaction showing that independent boards most strongly spur voluntary retirement offers when high performance aligns with long employee tenure. These findings remain robust across

alternative model specifications, including tobit models and instrumental variable regressions, and hold consistently regardless of the presence of an enterprise union.

This study provides several key contributions to the literature at the intersection of employment relations and corporate governance. First, while prior studies on board independence and employee downsizing have focused predominantly on LMEs, such as the US and the UK (Jung 2015; Perry and Shivdasani 2005; Yawson 2006), this study provides important empirical evidence from Japan, a representative CME. We demonstrate that Anglo-American governance norms centered on shareholder primacy can actively erode traditional commitments to long-term employment, even within institutional contexts characterized by strong employment protections, and (Ahmadjian and Robbins 2005; Kang and Shivdasani 1997; Noda and Hirano 2013) clarify how the diffusion of independent boards has altered managerial decision-making regarding employment commitment in Japan.

In addition, this study elucidates the mechanisms of board monitoring by identifying employee tenure and firm performance as key contextual moderators. Crucially, independent directors fulfill their monitoring role precisely in contexts where voluntary retirement would not ordinarily be solicited (e.g., longer employee tenure and high firm performance), acting as critical catalysts that compel management to undertake painful, pre-emptive workforce rationalization to maximize shareholder value. These findings provide a compelling theoretical explanation for the recent surge in downsizing often called “*kuroji risutora*” (in-the-black restructuring) in Japan, where profitable firms streamline their workforces with the aim of business portfolio restructuring and workforce renewal (Nikkei Business 2025). Demonstrating that independent boards spur strategic workforce optimization rather than reactive crisis management, our results illuminate how independent directors play a pivotal role in mitigating internal friction arising from the

implicit contract of long-term employment.

These findings also carry important implications for policymakers while contributing to the literature on the impact of board reforms. Although previous research has examined how board independence affects firm performance and behavior in Japan (Desender *et al.* 2016; Miyajima *et al.* 2018; Uchida 2023), empirical studies focusing primarily on the period since the mid-2010s—when the adoption of outside directors became widespread among Japanese firms—remain limited (with Morikawa 2020 as a notable exception). By addressing this temporal gap, our study directly contributes to broader debates on whether board reforms, epitomized by enhanced board independence, induce substantive changes or merely symbolic compliance. Specifically, we show that regulatory initiatives to enhance board independence convert voluntary retirement offers from a measure of last resort during severe financial distress into an increasingly routine tool for strategic organizational optimization. For future policy design, these insights underscore that changes in corporate governance practices likely spill over into employment practices, highlighting the need for an integrated approach that aligns corporate governance reforms with labor market flexibility and social safety nets.

This study has several limitations that offer opportunities for future research. First, while our empirical analysis identifies the antecedents of voluntary retirement offers, we do not directly examine its consequences. Specifically, whether these voluntary retirement offers ultimately enhance long-term firm value, labor productivity, and strategic renewal, or conversely impair competitiveness by eroding firm-specific human capital, remains an open empirical question. Second, although voluntary retirement offers represent one of employment adjustment measures in Japan's institutional context, they capture a part of relations between firms and employees. Thus, future studies could explore whether independent boards exert a similar influence on other facets

of firm-employee relations, such as non-regular worker reductions, hiring freezes, or reforms to seniority-based pay systems.

6 CONCLUSIONS

Our study demonstrates that independent boards within CME actively drive employee downsizing, increasing the likelihood of voluntary retirement offers in Japanese listed firms. This relationship is particularly salient in high-performing firms with long employee tenure, where independent directors operate without psychological debt toward long-tenured staff to overcome managerial status quo. By transforming voluntary retirement programs from reactive crisis measures into proactive measures for pre-emptive labor cost optimization, these governance dynamics systematically erode traditional lifetime employment even under stringent legal job protections. We hope this study advances the literature on employment relations and corporate governance by illuminating how independent boards redefines foundational employment security norms within changing institutional contexts.

REFERENCES

- Abegglen, J. C. (1958). *The Japanese factory: Aspects of its social organization*. Cambridge, MA: MIT press.
- Aguilera, R. V., Filatotchev, I., Gospel, H. and Jackson, G. (2008). 'An organizational approach to comparative corporate governance: Costs, contingencies, and complementarities'. *Organization Science*. 19 (3): 475–92.
- and Jackson, G. (2003). 'The cross-national diversity of corporate governance: Dimensions and determinants'. *Academy of Management Review*. 28 (3): 447–65.
- Aguinis, H., Edwards, J. R. and Bradley, K. J. (2017). 'Improving our understanding of moderation and mediation in strategic management research'. *Organizational Research Methods*. 20 (4): 665–85.
- Ahmadjian, C. L. and Robbins, G. E. (2005). 'A clash of capitalisms: Foreign shareholders and corporate restructuring in 1990s Japan'. *American Sociological Review*. 70 (3): 451–71.
- and Robinson, P. (2001). 'Safety in numbers: Downsizing and the deinstitutionalization of permanent employment in Japan'. *Administrative Science Quarterly*. 46 (4): 622–54.
- Aoki, M. (2001). *Toward a comparative institutional analysis*. Cambridge, MA.: MIT press.
- , Jackson, G. and Miyajima, H. (2007). *Corporate governance in Japan: Institutional change and organizational diversity*. New York: Oxford University Press.
- Audia, P. G., Locke, E. A. and Smith, K. G. (2000). 'The paradox of success: An archival and a laboratory study of strategic persistence following radical environmental change'. *Academy of Management Journal*. 43 (5): 837–53.
- Bamber, G. J., Cooke, F. L., Doellgast, V. and Wright, C. F. (2021). *International and comparative employment relations: Global crises and institutional responses, 7th edition*. London, UK: Sage.
- Baumol, W. J., Blinder, A. S. and Wolff, E. N. (2003). *Downsizing in America: Reality, causes, and consequences*. New York: Russell Sage.
- Bertrand, M. and Mullainathan, S. (2003). 'Enjoying the quiet life? Corporate governance and managerial preferences'. *Journal of Political Economy*. 111 (5): 1043–75.
- Bidwell, M., Briscoe, F., Fernandez-Mateo, I. and Sterling, A. (2013). 'The employment relationship and inequality: How and why changes in employment practices are reshaping rewards in organizations'. *Academy of Management Annals*. 7 (1) pp.61–121.
- Bidwell, M. J. (2013). 'What happened to long-term employment? The role of worker power and environmental turbulence in explaining declines in worker tenure'. *Organization Science*. 24 (4): 1061–82.
- Budros, A. (1997). 'The new capitalism and organizational rationality: The adoption of downsizing programs, 1979–1994'. *Social Forces*. 76 (1): 229–49.
- Conrad, H. (2009). 'From seniority to performance principle: The evolution of pay practices in Japanese firms since the 1990s'. *Social Science Japan Journal*. 13 (1): 115–35.
- Cuomo, F., Mallin, C. and Zattoni, A. (2016). 'Corporate governance codes: A review and research agenda'. *Corporate Governance: An International Review*. 24 (3): 222–41.
- Dalton, D. R., Hitt, M. A., Certo, S. T. and Dalton, C. M. (2007). 'The fundamental agency problem and its mitigation'. *Academy of Management Annals*. 1 (1): 1–64.
- Datta, D. K., Guthrie, J. P., Basuil, Dynah. and Pandey, Alankrita. (2010). 'Causes and effects of employee downsizing: A review and synthesis'. *Journal of Management*. 36 (1): 281–348.
- Desender, K. A., Aguilera, R. V, L pezPuertas-Lamy, M. and Crespi, R. (2016). 'A clash of

- governance logics: Foreign ownership and board monitoring'. *Strategic Management Journal*. 37 (2): 349–69.
- Dore, R. P. (1973). *British factory – Japanese factory: The origins of national diversity in industrial relations*. Berkeley, CA: University of California Press.
- Fama, E. F. and Jensen, M. C. (1983). 'Separation of ownership and control'. *Journal of Law and Economics*. 26 (2): 301–25.
- Fauver, L., Hung, M., Li, X. and Taboada, A. G. (2017). 'Board reforms and firm value: Worldwide evidence'. *Journal of Financial Economics*. 125 (1): 120–42.
- Fligstein, N. and Shin, T. (2007). 'Shareholder value and the transformation of the U.S. economy, 1984–2000'. *Sociological Forum*. 22 (4): 399–424.
- Frank, K. A., Lin, Q., Xu, R., Maroulis, S. and Mueller, A. (2023). 'Quantifying the robustness of causal inferences: Sensitivity analysis for pragmatic social science'. *Social Science Research*. 110.
- Gagliardi, N., Grinza, E. and Rycx, F. (2023). 'Workers' tenure and firm productivity: New evidence from matched employer-employee panel data'. *Industrial Relations*. 62 (1): 3–33.
- Greve, H. R. (1998). 'Performance, aspirations, and risky organizational change'. *Administrative Science Quarterly*. 43 (1): 58–86.
- Hall, P. A. and Soskice, D. (2001). *Varieties of capitalism: The institutional foundations of comparative advantage*. New York: Oxford University Press.
- Hamaaki, J., Hori, M., Maeda, S. and Murata, K. (2012). 'Changes in the Japanese Employment System in the Two Lost Decades'. *ILR Review*. 65 (4): 810–46.
- Hoskisson, R. E., Johnson, R. A. and Moesel, D. D. (1994). 'Corporate divestiture intensity in restructuring firms: Effects of governance, strategy, and performance'. *Academy of Management Journal*. 37 (5): 1207–51.
- Ikeda, N., Inoue, K. and Watanabe, S. (2018). 'Enjoying the quiet life: Corporate decision-making by entrenched managers'. *Journal of the Japanese and International Economies*. 47: 55–69.
- Jackson, G., Kuruvilla, S. and Frege, C. (2013). 'Across boundaries: The global challenges facing workers and employment research'. *British Journal of Industrial Relations*. 51 (3): 425–39.
- Jung, J. (2015). 'Shareholder value and workforce downsizing, 1981–2006'. *Social Forces*. 93 (4): 1335–68.
- , Mun, E. and Ono, H. (2026). 'Dualization of corporate control: lifetimers, external appointees, and CEO succession in Japan'. *Social Forces*. (105): 120–44.
- Kambayashi, R. and Kato, T. (2017). 'Long-term employment and job security over the past 25 years: A comparative study of Japan and the United States'. *Industrial and Labor Relations Review*. 70 (2): 359–94.
- Kang, J.-K. and Shivdasani, A. (1997). 'Corporate restructuring during performance declines in Japan'. *Journal of Financial Economics*. 46 (1): 29–65.
- Kato, T. (2001). 'The end of lifetime employment in Japan?: Evidence from national surveys and field research'. *Journal of the Japanese and International Economies*. 15 (4): 489–514.
- Koike, K. (1988). *Understanding industrial relations in modern Japan*. London: Macmillan Press.
- Lund, D. S. and Pollman, E. (2021). 'The corporate governance machine'. *Columbia Law Review*. (121): 2563.
- Miyajima, H. and Arikawa, Y. (2025). *The evolution of corporate governance in Japan: Regulatory changes, global financialization, and corporate performance*. Oxford: Routledge.
- , Ogawa, R. and Saito, T. (2018). 'Changes in corporate governance and top executive turnover: The evidence from Japan'. *Journal of the Japanese and International Economies*.

- 47: 17–31.
- Moriguchi, C. and Ono, H. (2006). ‘Japanese lifetime employment: A century’s perspective’. In: M. Blomström and S. La Croix (eds.). *Institutional change in Japan*. London, UK: Routledge, pp. 152–76.
- Morikawa, M. (2020). ‘Effects of outside directors on firms’ investments and performance: Evidence from a quasi-natural experiment in Japan’. *Journal of the Japanese and International Economies*. 56.
- Morris, J., Delbridge, R. and Endo, T. (2018). ‘The layering of meso-level institutional effects on employment systems in Japan’. *British Journal of Industrial Relations*. 56 (3): 603–30.
- Mroczkowski, T. and Hanaoka, M. (1997). ‘Effective rightsizing strategies in Japan and America: Is there a convergence of employment practices?’ *Academy of Management Executive*. 11 (2): 57–67.
- Neville, F., Byron, K., Post, C. and Ward, A. (2019). ‘Board independence and corporate misconduct: A cross-national meta-analysis’. *Journal of Management*. 45 (6): 2538–69.
- Ng, T. W. H. and Feldman, D. C. (2010). ‘Organizational tenure and job performance’. *Journal of Management*. 36 (5): 1220–50.
- Nikkei Business (2025). ‘Special feature: Reducing headcount even when profitable (Tokushuu: Kuroji demo hito wo herasu)’. *Nikkei Business* (20 October 2025). 8–29.
- Noda, T. (2013). ‘Determinants of the timing of downsizing among large Japanese firms: Long-term employment practices and corporate governance’. *Japanese Economic Review*. 64 (3): 363–98.
- and Hirano, D. (2013). ‘Enterprise unions and downsizing in Japan before and after 1997’. *Journal of the Japanese and International Economies*. 28: 91–118.
- and ——— (2024). ‘The effect of enterprise unions on employment adjustment speed in Japanese firms’. *British Journal of Industrial Relations*. 62 (3): 645–69.
- and ——— (2026). ‘The effect of insider governance on the job security for regular employees in Japanese firms’. *Journal of the Japanese and International Economies*.
- OECD (2026). *OECD employment outlook 2026: Geographic disparities in jobs and incomes*. Paris: OECD Publishing.
- Ono, H. (2010). ‘Lifetime employment in Japan: Concepts and measurements’. *Journal of the Japanese and International Economies*. 24 (1): 1–27.
- Pendleton, A. and Gospel, H. (2013). ‘Corporate governance and labor’. In: M. Wright, D. S. Siegel, K. Keasey, and I. Filatotchev (eds.). *The Oxford Handbook of Corporate Governance*. Oxford University Press, pp. 634–57.
- Perry, T. and Shivdasani, A. (2005). ‘Do boards affect performance? Evidence from corporate restructuring’. *Journal of Business*. 78 (4): 1403–32.
- Shimotani, M. (2012). ‘Japanese holding companies’. *Japanese Research in Business History*. 29: 11–28.
- Terza, J. V., Basu, A. and Rathouz, P. J. (2008). ‘Two-stage residual inclusion estimation: Addressing endogeneity in health econometric modeling’. *Journal of Health Economics*. 27 (3): 531–43.
- Tokyo Stock Exchange (2015). *Japan’s corporate governance code: Seeking sustainable corporate growth and increased corporate value over the mid- to long-term*.
- Uchida, D. (2021). ‘The consequence of differences: How heterogeneity in practice adaptations affects the diffusion process’. *Asia Pacific Journal of Management*. 38 (1): 209–30.
- (2023). ‘The wheel comes full circle? An integrated view of organizational responses to

- institutional pressures'. *Journal of Management*. 49 (2): 771–807.
- Wiersema, M. F., Clark, C. E. and Koo, H. (2026). 'Boards and management under pressure: Navigating the new dynamics of shareholder and stakeholder demands'. *Academy of Management Perspectives*. <http://journals.aom.org/doi/full/10.5465/amp.2024.0170>.
- Witt, M. A., Fainshmidt, S. and Aguilera, R. V. (2022). 'Our board, our rules: Nonconformity to global corporate governance norms'. *Administrative Science Quarterly*. 67 (1): 131–66.
- Wooldridge, J. M. (2010). *Econometric analysis of cross section and panel data, second edition*. Cambridge, MA: MIT Press.
- Yawson, A. (2006). 'Evaluating the characteristics of corporate boards associated with layoff decisions'. *Corporate Governance: An International Review*. 14 (2): 75–84.

Figure 1. Voluntary retirement offers among Japanese firms, 2002-2024

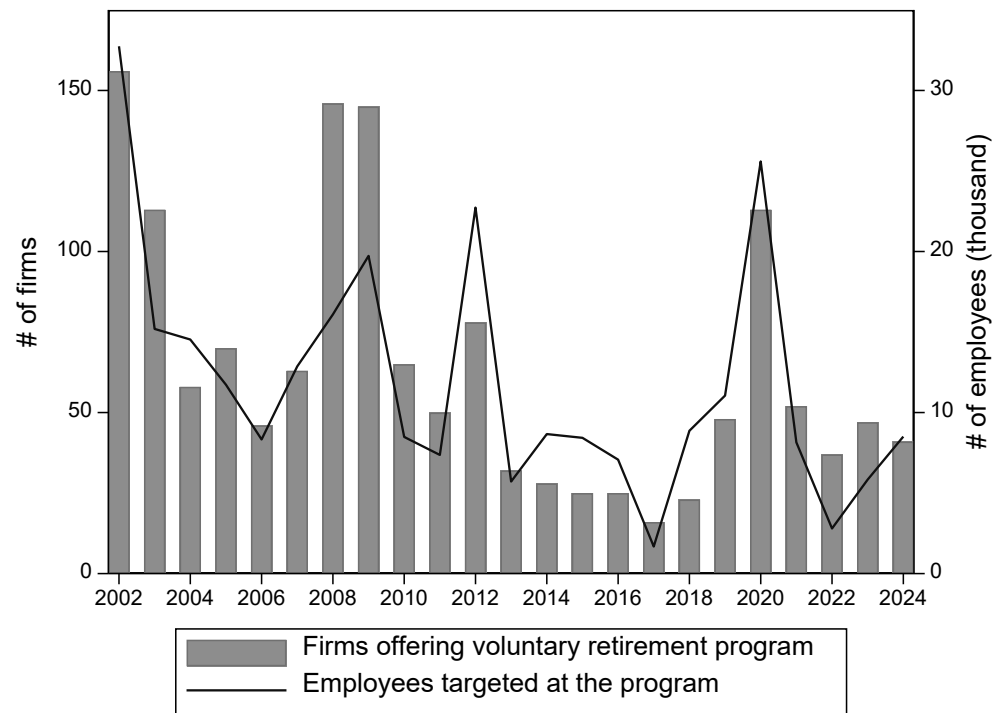


Figure 2. Board independence among Japanese firms, 2002-2024

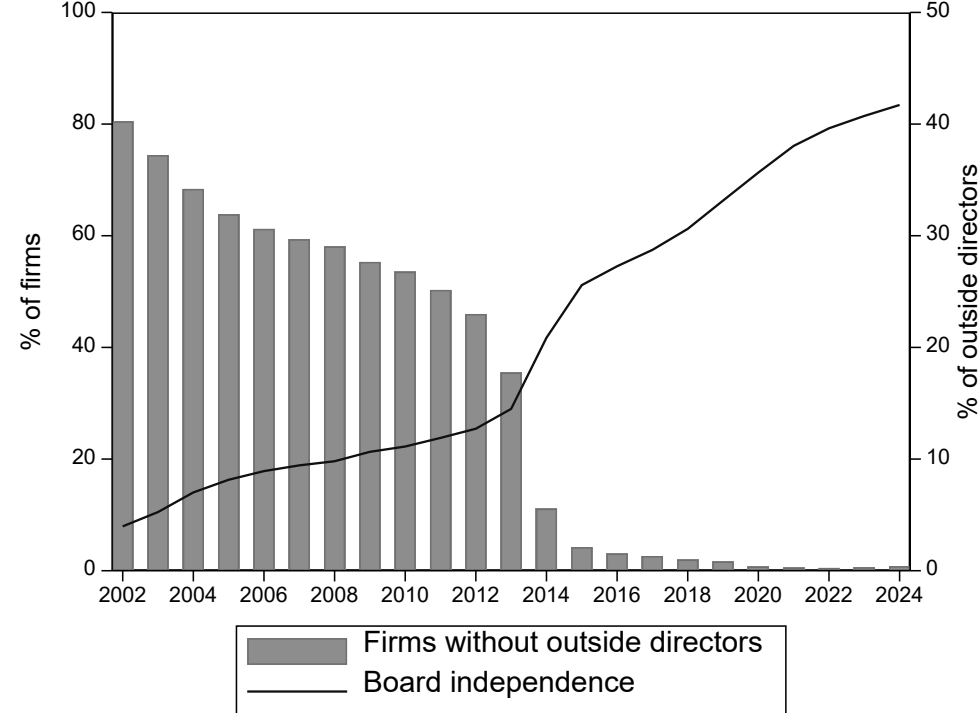


Figure 3. Interaction of board independence and employee tenure in predicting voluntary retirement offer

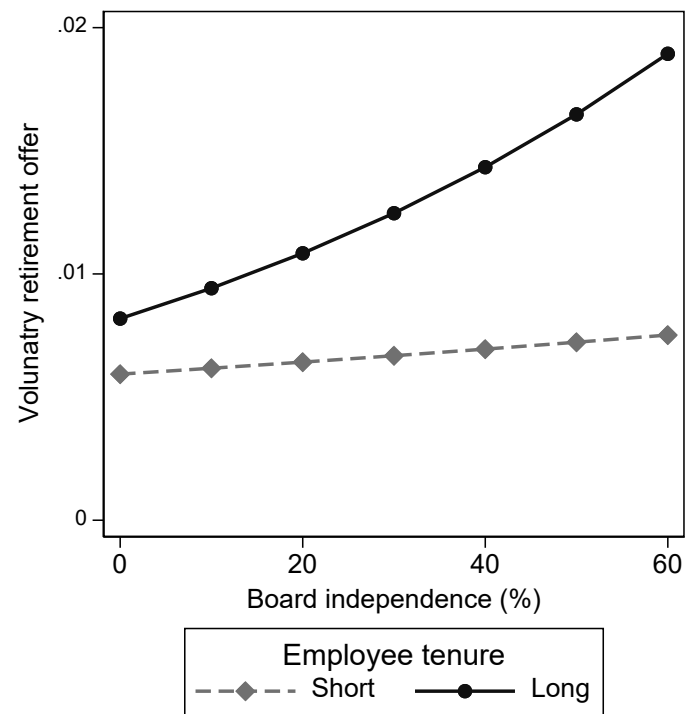


Figure 4. Interaction of board independence and firm performance in predicting voluntary retirement offer

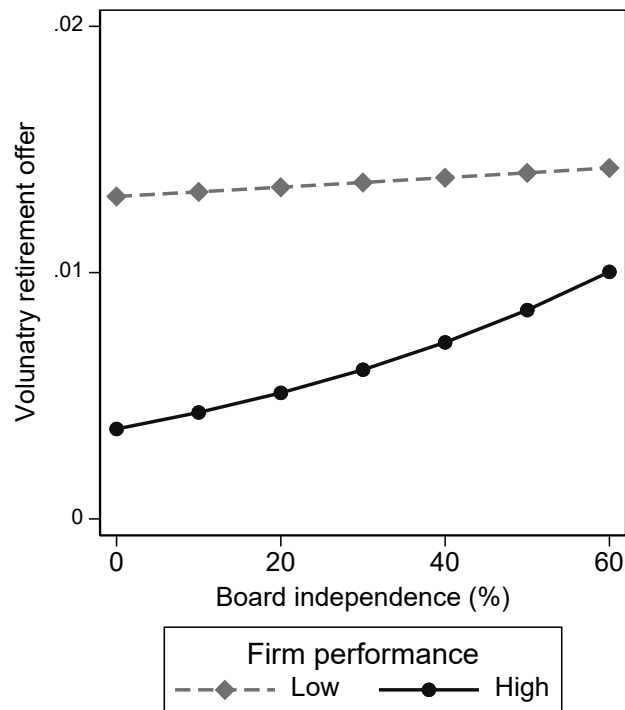


Figure 5. Three-way interaction effect of board independence, employee tenure, and firm performance in predicting voluntary retirement offer

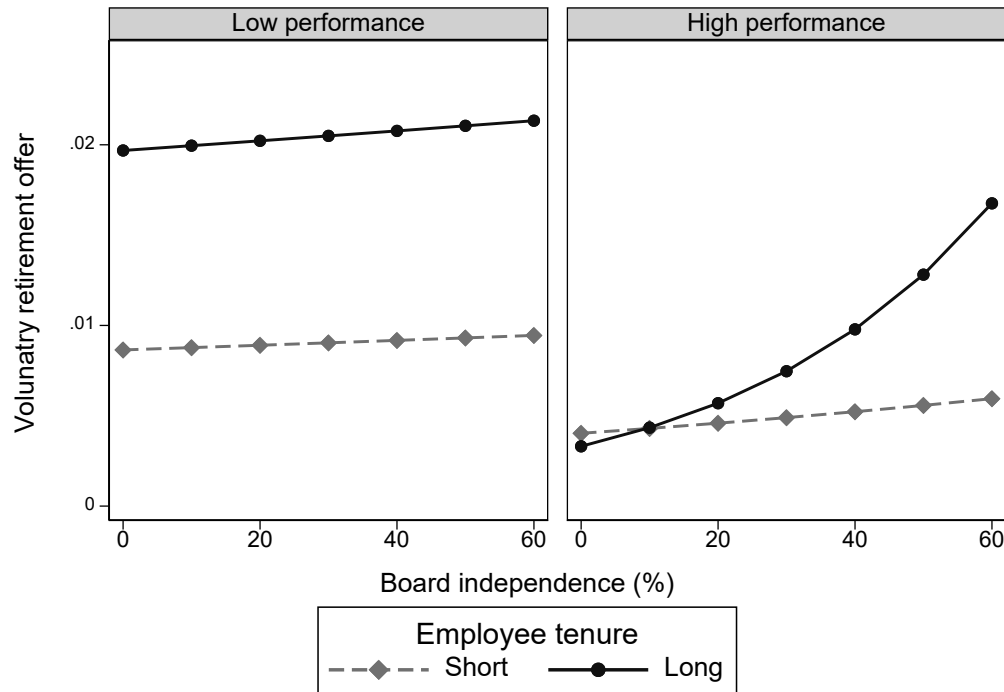


Table 1. Frequency and size of voluntary retirement programs

<i>Panel A: Frequency of voluntary retirement programs (N=1145)</i>		
Frequency	# of firms	% of firms
0	4,496	84.61%
1	603	11.35%
2	134	2.52%
3	57	1.07%
4	19	0.36%
5	3	0.06%
6	2	0.04%
Total	5,314	100%

<i>Panel B: Size of voluntary retirement programs (N=1051)</i>		
Percentiles	# of target employees	% of target employees
1%	7	0.3%
25%	35	3.4%
50%	75	7.6%
75%	200	14.2%
99%	2300	51.3%
Mean	199.1	11.0
SD	462.6	11.2

Table 2. Firm employment growth around the announcement of voluntary retirement offers

<i>Panel A: Differences in employment growth between firms that announce voluntary retirement offers and those that do not</i>							
	Voluntary retirement offer	N	Median	Mean	SD	diff	<i>t</i>
Firm employment growth	0	70,725	1.20%	3.12%	12.50	11.54%	30.47 ***
	1	1,118	-7.13%	-8.42%	15.53	(0.38)	
Firm employment growth (industry adjusted)	0	70,725	-1.19%	0.16%	12.31	10.25%	27.50 ***
	1	1,118	-8.54%	-10.09%	15.58	(0.37)	

<i>Panel B: Temporal dynamics of employment growth for firms that announce voluntary retirement offers</i>						
		t-2	t-1	t	t+1	t+2
Firm employment growth	Median	0.00%	-1.03%	-7.13%	-4.73%	-1.33%
	Mean	2.32%	-0.74%	-8.42%	-5.77%	-1.31%
Firm employment growth (industry adjusted)	Median	-2.33%	-3.02%	-8.54%	-6.61%	-2.96%
	Mean	-0.58%	-3.09%	-10.09%	-7.56%	-3.26%

Firm employment growth = (No. of employees at *t* - No. of employees at *t*-1) / No. of employees at *t*-1. Industry-adjusted values are calculated by subtracting the industry mean employment growth from the firm's growth rate. *t*-*k* and *t*+*k* denote *k* years before and after the announcement year, respectively. Standard errors are reported in parentheses. Statistical significance † at the 0.10 level; * at the 0.05 level; ** at the 0.01 level; *** at the 0.001 level

Table 3. Distribution of voluntary retirement offers across board independence, employee tenure, and firm performance subsamples

	Short employee tenure			Long employee tenure		
	Low performance	High performance	Total	Low performance	High performance	Total
Board independence	86	22	108	225	39	264
	(4,828)	(5,256)	(10,084)	(6,991)	(5,071)	(12,062)
	92	36	128	216	47	263
1 – 33%	(5,303)	(5,885)	(11,188)	(9,669)	(7,373)	(17,042)
	102	22	124	189	69	258
	(5,232)	(5,643)	(10,875)	(6,166)	(5,460)	(11,626)
More than 33%	280	80	360	630	155	785
	(15,363)	(16,784)	(32,147)	(22,826)	(17,904)	(40,730)
Total						

This table presents the number of voluntary retirement offers and the number of firm-year observations (in parentheses) for each subsample. Short and long employee tenure denote cases with an average employee tenure below and above the sample mean of 12.58 years, respectively. High (low) performance indicates that the firm's ROA exceeds (is equal to or below) the industry average.

Table 4. Descriptive statistics and correlations

	Mean	S.D.	Min	Max	(1)	(2)	(3)	(4)	(5)	(6)
(1) Voluntary retirement offer	0.02	0.12	0	1						
(2) Number of target employees	2.87	60.42	0	8000	0.39					
(3) Percentage of target employees	0.00	0.02	0.00	0.85	0.70	0.24				
(4) Board independence	0.19	0.18	0.00	0.67	0.00	0.01	-0.01			
(5) Firm performance	0.00	0.07	-0.28	0.22	-0.08	-0.02	-0.09	0.00		
(6) Employee tenure	12.58	5.48	1.6	23.2	0.04	0.03	-0.00	-0.08	-0.04	
(7) Firm size	4.11	16.26	0	384.59	0.03	0.08	-0.01	0.08	0.02	0.16
(8) Debt to equity ratio	2.06	3.67	0.07	23.89	0.02	0.02	0.03	-0.02	-0.13	0.08
(9) Low interest coverage	0.11	0.31	0	1	0.12	0.03	0.11	-0.01	-0.49	-0.06
(10) Diversification	0.53	0.26	0	4.86	0.00	-0.01	0.01	0.04	0.00	-0.12
(11) Holding company	0.07	0.26	0	1	-0.00	0.00	-0.02	0.12	-0.00	-0.03
(12) Enterprise union	0.50	0.50	0	1	0.03	0.03	-0.00	-0.09	-0.02	0.59
(13) Domestic institutional ownership	0.17	0.13	0	0.53	0.00	0.02	-0.03	-0.05	0.15	0.46
(14) Foreign ownership	0.10	0.11	0	0.52	0.02	0.03	-0.01	0.21	0.21	0.08
(15) Board size	8.08	3.01	3	18	-0.00	0.02	-0.02	-0.01	0.07	0.33
(16) Industry downsizing	0.02	0.02	0	0.11	0.07	0.03	0.05	-0.13	0.02	0.09
	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
(8) Debt to equity ratio	0.02									
(9) Low interest coverage	-0.04	0.08								
(10) Diversification	-0.10	-0.26	0.05							
(11) Holding company	0.14	0.08	-0.01	-0.07						
(12) Enterprise union	0.15	0.09	-0.04	-0.11	-0.11					
(13) Domestic institutional ownership	0.25	0.17	-0.16	-0.21	0.08	0.43				
(14) Foreign ownership	0.32	-0.04	-0.11	-0.06	0.14	0.11	0.38			
(15) Board size	0.24	0.11	-0.12	-0.14	0.03	0.28	0.44	0.26		
(16) Industry downsizing	0.03	-0.06	0.12	0.04	-0.03	0.09	0.04	-0.01	-0.02	

N=72877. Correlation coefficients larger than |0.005| indicate statistical significance at $p < 0.05$.

Table 5. Results of main regressions

Dependent variable	(1)	(2)	(3)	(4)	(5)
	Voluntary retirement offer				
Board independence		0.565*	0.527*	0.973***	0.893***
		(0.220)	(0.221)	(0.240)	(0.244)
Board independence # Employee tenure			0.053†		0.095**
			(0.031)		(0.036)
Board independence # Firm performance				8.239***	10.700***
				(1.989)	(2.247)
Employee tenure # Firm performance					-0.403***
					(0.084)
Board independence # Employee tenure # Firm performance					1.368***
					(0.340)
Employee tenure	0.073***	0.073***	0.073***	0.073***	0.048***
	(0.009)	(0.009)	(0.009)	(0.009)	(0.010)
Firm performance	-5.311***	-5.258***	-5.337***	-5.640***	-6.860***
	(0.590)	(0.590)	(0.591)	(0.583)	(0.674)
Firm size	0.003*	0.003†	0.003†	0.002†	0.002†
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Debt to equity ratio	0.046***	0.045***	0.045***	0.046***	0.048***
	(0.008)	(0.008)	(0.008)	(0.008)	(0.009)
Low interest coverage	1.132***	1.134***	1.131***	1.102***	0.988***
	(0.095)	(0.095)	(0.095)	(0.095)	(0.098)
Diversification	-0.088	-0.087	-0.076	-0.080	-0.068
	(0.141)	(0.141)	(0.140)	(0.140)	(0.142)
Holding company	0.007	-0.007	-0.008	-0.015	-0.006
	(0.145)	(0.145)	(0.145)	(0.144)	(0.143)
Enterprise union	0.108	0.101	0.101	0.094	0.105
	(0.096)	(0.096)	(0.096)	(0.096)	(0.097)
Domestic institutional ownership	-0.205	-0.144	-0.121	-0.137	0.010
	(0.337)	(0.336)	(0.336)	(0.336)	(0.336)
Foreign ownership	1.844***	1.681***	1.655***	1.624***	1.680***
	(0.291)	(0.296)	(0.296)	(0.293)	(0.297)
Board size	0.004	0.004	0.006	0.009	0.013
	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)
Industry downsizing	4.948**	5.144**	5.104**	5.231**	5.508**
	(1.698)	(1.709)	(1.708)	(1.715)	(1.728)
Constant	-5.520***	-5.540***	-5.559***	-5.597***	-5.679***
	(0.208)	(0.208)	(0.208)	(0.209)	(0.209)
Wald chi-square	1589.0	1617.6	1612.7	1624.9	1638.7
Number of observations	72877	72877	72877	72877	72877
Year fixed effects	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes

Each column reports the coefficients and robust standard errors (in parentheses). Statistical significance † at the 0.10 level; * at the 0.05 level; ** at the 0.01 level; *** at the 0.001 level.

Table 6. Results of tobit regressions

Dependent variable	(1)	(2)	(3)	(4)	(5)	(6)
	Number of target employees			Percentage of target employees		
Board independence		0.194** (0.071)	0.261*** (0.077)		0.064* (0.027)	0.102*** (0.027)
Board independence # Employee tenure			0.031** (0.011)			0.012** (0.004)
Board independence # Firm performance			3.050*** (0.736)			1.447*** (0.280)
Employee tenure # Firm performance			−0.155*** (0.027)			−0.065*** (0.009)
Board independence # Employee tenure # Firm performance			0.404*** (0.113)			0.185*** (0.044)
Employee tenure	0.020*** (0.003)	0.021*** (0.003)	0.013*** (0.003)	0.008*** (0.001)	0.008*** (0.001)	0.005*** (0.001)
Firm performance	−1.625*** (0.240)	−1.604*** (0.238)	−2.270*** (0.297)	−0.722*** (0.076)	−0.715*** (0.076)	−1.004*** (0.084)
Firm size	0.002*** (0.000)	0.002*** (0.000)	0.002*** (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)
Debt to equity ratio	0.017*** (0.003)	0.016*** (0.003)	0.017*** (0.003)	0.006*** (0.001)	0.006*** (0.001)	0.006*** (0.001)
Low interest coverage	0.337*** (0.050)	0.339*** (0.050)	0.287*** (0.047)	0.135*** (0.012)	0.136*** (0.012)	0.113*** (0.012)
Diversification	−0.015 (0.039)	−0.015 (0.039)	−0.002 (0.038)	−0.002 (0.015)	−0.002 (0.015)	0.003 (0.015)
Holding company	−0.027 (0.040)	−0.033 (0.040)	−0.034 (0.040)	−0.020 (0.015)	−0.022 (0.015)	−0.022 (0.015)
Enterprise union	0.046† (0.026)	0.044† (0.026)	0.047† (0.026)	0.011 (0.010)	0.011 (0.010)	0.012 (0.010)
Domestic institutional ownership	−0.100 (0.096)	−0.081 (0.096)	−0.033 (0.097)	−0.069† (0.037)	−0.063† (0.037)	−0.043 (0.037)
Foreign ownership	0.630*** (0.102)	0.570*** (0.100)	0.592*** (0.101)	0.222*** (0.034)	0.203*** (0.035)	0.210*** (0.034)
Board size	0.003 (0.004)	0.003 (0.004)	0.006 (0.004)	0.000 (0.001)	0.000 (0.001)	0.001 (0.001)
Industry downsizing	1.612** (0.542)	1.677** (0.546)	1.806** (0.551)	0.675** (0.212)	0.695** (0.213)	0.749*** (0.212)
Constant	−1.984*** (0.236)	−1.989*** (0.237)	−2.044*** (0.242)	−0.770*** (0.033)	−0.772*** (0.033)	−0.790*** (0.033)
Log-likelihood	−4296.3	−4292.1	−4257.4	−3432.7	−3429.8	−3387.0
Number of observations	72783	72783	72783	72783	72783	72783
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes

Each column reports the coefficients and robust standard errors (in parentheses). Statistical significance † at the 0.10 level; * at the 0.05 level; ** at the 0.01 level; *** at the 0.001 level.

Table 7. Results of 2SRI regressions

Dependent variable	(1)	(2)	(3)	(4)	(5)
	Board independence	Voluntary retirement offer			
Board independence		3.386** (1.137)	2.774* (1.200)	3.087** (1.134)	2.944* (1.193)
Board independence # Employee tenure			0.095 (0.058)		0.166** (0.063)
Board independence # Firm performance				14.907*** (4.036)	16.033*** (4.081)
Employee tenure # Firm performance					-0.418*** (0.086)
Board independence # Employee tenure # Firm performance					2.614*** (0.627)
Employee tenure	-0.001*** (0.000)	0.076*** (0.009)	0.077*** (0.009)	0.076*** (0.009)	0.052*** (0.010)
Firm performance	-0.102*** (0.009)	-5.067*** (0.590)	-5.206*** (0.593)	-5.668*** (0.590)	-6.942*** (0.702)
Firm size	0.001*** (0.000)	0.001 (0.001)	0.001 (0.001)	0.001 (0.001)	0.001 (0.002)
Debt to equity ratio	0.002*** (0.000)	0.041*** (0.009)	0.042*** (0.009)	0.044*** (0.009)	0.046*** (0.009)
Low interest coverage	-0.003† (0.002)	1.139*** (0.095)	1.132*** (0.095)	1.079*** (0.095)	0.954*** (0.100)
Diversification	0.008*** (0.002)	-0.105 (0.141)	-0.081 (0.141)	-0.090 (0.141)	-0.076 (0.142)
Holding company	0.021*** (0.002)	-0.079 (0.145)	-0.064 (0.144)	-0.068 (0.144)	-0.050 (0.143)
Enterprise union	0.005*** (0.001)	0.075 (0.096)	0.080 (0.096)	0.075 (0.097)	0.082 (0.097)
Domestic institutional ownership	-0.110*** (0.005)	0.123 (0.363)	0.116 (0.364)	0.030 (0.365)	0.185 (0.366)
Foreign ownership	0.234*** (0.005)	0.956* (0.404)	1.066* (0.416)	1.171** (0.414)	1.207** (0.420)
Board size	-0.003*** (0.000)	0.014 (0.013)	0.014 (0.013)	0.016 (0.013)	0.021 (0.014)
Industry downsizing	-0.412*** (0.034)	6.579*** (1.780)	6.252*** (1.792)	6.246*** (1.783)	6.620*** (1.814)
Corporate governance codes	0.110*** (0.002)				
First-stage residual		-2.949* (1.161)	-2.329† (1.225)	-2.408* (1.162)	-2.241† (1.222)
First-stage residual # Employee tenure			-0.086 (0.069)		-0.140† (0.080)
First-stage residual # Firm performance				-10.584* (4.927)	-10.121† (5.264)
First-stage residual # Employee tenure # Firm performance					-2.089** (0.806)
Constant	0.208*** (0.003)	-5.705*** (0.225)	-5.703*** (0.225)	-5.700*** (0.224)	-5.785*** (0.225)
Wald chi-square		1611.2	1605.1	1640.5	1623.1
Number of observations	72877	72877	72877	72877	72877
Year fixed effects	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes

Each column reports the coefficients and robust standard errors (in parentheses). Statistical significance † at the 0.10 level; * at the 0.05 level; ** at the 0.01 level; *** at the 0.001 level.

Table 8. Additional analysis for

	(1)	(2)	(3)	(4)
Dependent variable	Voluntary retirement offer			
Enterprise union	No		Yes	
Board independence		0.623 (0.420)		1.212** (0.414)
Board independence # Employee tenure		0.043 (0.061)		0.014 (0.068)
Board independence # Firm performance		8.444* (4.180)		8.802* (4.439)
Employee tenure # Firm performance		-0.417** (0.134)		-0.447* (0.180)
Board independence # Employee tenure # Firm performance		1.087† (0.589)		1.389† (0.744)
Employee tenure	0.048*** (0.013)	0.021 (0.015)	0.069*** (0.014)	0.051*** (0.015)
Firm performance	-5.417*** (0.770)	-7.782*** (1.128)	-7.548*** (1.115)	-6.925*** (1.216)
Firm size	0.011** (0.004)	0.011** (0.004)	0.003† (0.001)	0.002 (0.001)
Debt to equity ratio	0.021† (0.013)	0.023† (0.013)	0.043*** (0.011)	0.045*** (0.011)
Low interest coverage	0.931*** (0.152)	0.833*** (0.151)	1.157*** (0.133)	1.066*** (0.136)
Diversification	-0.200 (0.203)	-0.198 (0.208)	0.236 (0.191)	0.214 (0.188)
Holding company	-0.353 (0.217)	-0.373† (0.213)	0.228 (0.194)	0.215 (0.193)
Domestic institutional ownership	-0.471 (0.661)	-0.141 (0.657)	-0.201 (0.412)	-0.061 (0.411)
Foreign ownership	1.093* (0.427)	1.040* (0.433)	2.454*** (0.404)	2.099*** (0.412)
Board size	0.056** (0.020)	0.063** (0.020)	-0.025 (0.017)	-0.017 (0.017)
Industry downsizing	6.658* (3.010)	6.890* (3.020)	7.659*** (2.312)	8.329*** (2.344)
Constant	-5.994*** (0.313)	-6.213*** (0.315)	-5.727*** (0.279)	-5.778*** (0.280)
Wald chi-square	803.1	803.8	851.5	951.7
Number of observations	36715	36715	36162	36162
Year fixed effects	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes

Each column reports the coefficients and robust standard errors (in parentheses). Statistical significance † at the 0.10 level; * at the 0.05 level; ** at the 0.01 level; *** at the 0.001 level.