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Female representation on boards and CEO performance-induced turnover: Evidence from Russia

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Research Question/Issue: This study examines the influence of female board representation on CEO turnover and firm value. We focus on Russia, a patriarchal country with vast gender differences, where empathy, patience, and supportiveness are considered fundamental qualities of females.

Research Findings/Insights: Using a sample of public firms listed on the Moscow Exchange from 2006 to 2015, we find that female representation on boards is associated with lower CEO turnover–performance sensitivity. Further, female boards appear to add firm value, as we find that CEO retention decisions are associated with improved future firm value when the decision is made by a female board. Furthermore, we identify that female representation on boards is associated with greater diligence (i.e., hold more board meetings) after retaining their underperforming CEOs.

Theoretical/Academic Implications: Our findings suggest that female boards tend to develop a long-term view of CEO performance, and that such boards exercise greater diligence and supportiveness, thereby adding shareholder value. Our results also indicate that patience and collaboration of corporate boards afford opportunities to develop strategic thinking, which is particularly valuable for a firm in times of crisis. Our study contributes to the research on what qualities of a board affect its decision making and effectiveness. Our research also adds to the literature on female board representation. We study Russia, where gender differences are prominent, and female representation occurs by happenstance rather than regulatorily intentionally. Overall, we are able to attribute our findings to female representation on boards.

Practitioner/Policy Implications: Our study contributes to the burgeoning research on corporate governance in Russia. Although the Russian economy has demonstrated unprecedented growth among emerging markets, research on corporate governance in Russia remains scarce. Our study is among the first efforts to understand how female boards perform in a patriarchal country. Our investigation, therefore, offers important insights for policymakers and practitioners.

KEYWORDS

Corporate Governance, Board Composition, Board Task Effectiveness, Russia

INTRODUCTION

Although improving female board representation has been globally advocated as consistent with best corporate governance practices (Deloitte, 2014; Organisation for Economic Co-operation and Development, 2012), recent reviews of the literature show that the average correlation between female board representation and firm performance is small and not statistically significant (Jeong & Harrison, 2017; Pletzer et al., 2015; Post & Byron, 2015; Rhode & Packel, 2014). One credible explanation for the weak effects of women in the boardroom is lack of gender disparity in Anglo-Saxon countries[1] (Ferreira, 2010; Jurkus et al., 2011; Kugler et al., 2017; Post & Byron, 2015). This study focuses on Russia, a country with a well-known history of patriarchy and a large degree of gender disparity (Berdyaev, 1918; Buck, 2012; Engel, 1992; Shubart, 1938; Zdravomyslova, 2012). We investigate the association between female representation on boards and chief executive officer (CEO) performance-induced turnover as well as subsequent firm value in Russian firms.[2]

We study female board representation in Russia for another important reason; that is, regulatory advocacy for women on boards is nonexistent in Russia (Buck, 2012; Catalyst, 2014; Egon Zehnder, 2016; Feifer, 2010). Because there is no gender quota, the effect of women on boards is untainted by quota-induced bias. In other words, female board representation in Russia occurs by happenstance rather than a regulatory outcome. This setting is essential for our research, because quotas for more women on boards may have negative effects if the board already has an optimal level of monitoring (Adams & Ferreira, 2009). Therefore, the Russian setting enables us to study female directors who are more likely to be hired to use their socially ingrained characteristics, likely gender related, to shape board qualities and board decisions.

Russian culture regards women as patronesses and supporters of the societal units with which they affiliate, such as families (Shubart, 1938). Women are perceived as being more empathetic, collaborative, and supportive than Russian males (Ryabov, 2000; Sergeeva, 2006), qualities that are also prevalent among women in top positions such as board directors. In this study, we expect female boards to show more empathy, patience, and support to their CEO in times of crisis (i.e., when a firm reports poor performance). We argue that instead of terminating a CEO's contract, female boards will choose to spend time and investigate the cause of the poor performance—whether the CEO is to blame or the firm performance is due to bad luck such as market turbulence or unexpected business disruptions. Such a board will rely less on reported performance to assess the CEO's effort. We thus predict a lower sensitivity of CEO turnover to reported performance associated with female representation on boards. Patience and supportiveness facilitate productive communication between a board and its CEO, thereby improving board effectiveness and firm performance. We further expect that such CEO retention decision will have a positive effect on future firm value.

Using a sample of public firms listed on the Moscow Exchange from 2006 to 2015, we find that female representation on boards is associated with reduced CEO performance-induced turnover. We also show that such effects are more pronounced in firms in which female directors possess more decision-making power. We next examine the firm value effect of a retention decision made by female boards and find significant firm value improvements after the retention. We further investigate plausible channels through which female directors add value. We find that, following a decision not to replace an underperforming CEO, firms with greater female board representation will hold more board meetings. Board meetings provide a platform for effective communication and a foundation for developing strategic thinking, which is

particularly valuable when a firm is facing adverse situations (Barannik, 2010; Dowell et al., 2011). More frequent meetings signal greater diligence of a board in exercising monitoring and advising roles. The improved firm value we find after a CEO retention decision suggests that a board's efforts to turn performance around are effective and that patience and collaboration associated with female representation on boards is economically significant and meaningful. To address the endogeneity concern (self-selection bias in women on boards), we rely on the Heckman correction model and use the 2008–2009 global financial crisis to generate exogenous variations in female board representation. We run a series of additional tests, including applying alternative estimation methods, considering forced CEO turnover, using alternative measurement for firm performance and female board presentation, and controlling for mean revision of firm performance. We also investigate the robustness of our findings to alternative explanations. In all cases, we obtain consistent results.

Our study makes several important contributions. First, we shed new light on the effects of female board representation. Unlike prior studies examining Anglo-Saxon countries, where the norm of gender equality is socially embedded (Branson, 2006; Niederle et al., 2013), we study Russia, where gender differences are prominent. Hence, we are better able to attribute our findings to gender disparity. We find that reduced CEO turnover–performance sensitivity in firms with female boards is associated with greater board activities and an increase in firm value. Altogether, the results suggest that retaining an underperforming CEO could be a sign of long-term orientation as well as better board monitoring and advising. Further, unlike most studies that attempt to establish a link between female directors and firm performance, our investigation focuses on CEO turnover, among the most consequential decisions boards make (Jenter & Kanaan, 2015; Parrino, 1997; Shleifer & Vishny, 1997). Boards are primarily charged with

management oversight rather than direct responsibility for corporate financial outcomes. Our findings extend the current knowledge on how women in the boardroom affect corporate outcomes that are directly subject to the board.

Relatedly, this study contributes to an ongoing debate about which board qualities matter most in explaining board effectiveness (Adams & Ferreira, 2007; Almazan & Suarez, 2003; Faleye et al., 2011; Schmidt, 2015; Sundaramurthy & Lewis, 2003). Our findings suggest that board qualities such as patience, collaboration, perseverance, and diligence help enhance firm value. Collectively, our results identify economic benefits associated with board activities that aim to facilitate better monitoring and advising of a board.

Moreover, our investigation adds to recent studies that identify factors that reduce CEO turnover–performance sensitivity. Dikolli et al. (2014) document that performance-related CEO turnover declines with CEO tenure, a finding consistent with that of Hermalin and Weisbach (1998), who show that reduced information uncertainty regarding CEO ability explains why boards choose not to react quickly (i.e., removing the CEO) to poor performance. Trust may arise in boards that are patient and supportive of their CEO. We enhance the extant literature by showing that trust-based relationships between boards and CEOs explain why boards rely less on firm performance to gauge a CEO's effort.

Our study also contributes to the burgeoning research on corporate governance in emerging economies. Although the Russian economy has demonstrated unprecedented growth among emerging markets (Brookings Institution, 2017), research on corporate governance in Russia is slim. How effective boards are functioning in Russia remains in a black box. Our study is among the first efforts to address this issue, and our findings extend current understandings of how female boards perform in a patriarchal country.

RELATED LITERATURE AND HYPOTHESIS DEVELOPMENT

Board Qualities and Female Directors in Russia

Compared to female directors in Anglo-Saxon countries, Russian women on boards place greater emphasis on expressing moral support, empathy, and patience for their executives (Gvozdeva & Gerchikov, 2000; Yarushkin & Satonina, 2009), deeply rooted attributes in Russia's patriarchal history (Engel, 1992; Sechiyama, 2014) that remain imbedded in core social norms and guide Russian female directors in the board decision-making process (Buck, 2012; Feifer, 2010; McCarthy & Puffer, 2008).

Russia's geography, which occupies a significant portion of both Europe and Asia, contributes to the formation of a unique type of patriarchy at the core of Russian culture (Ryabov, 2000; Sergeeva, 2006; Shubart, 1938). Russian patriarchy maintains that family values are shaped by women, an attitude that remained unchanged during the era of the Soviet Union and feminist movements in Western countries (Buck, 2012; Engel, 1992; Pushkareva & Zolotukhina, 2017; Ryabov, 2000). Describing the main features of a Russian woman, Ryabov (2000: 2) states that, to them, "the beauty of a Russian woman is not in her looks but is rather in her ability to express empathy." Indeed, according to the World Value Survey (Wave 6, 2010–2014), compared to Russian males, Russian females generally place greater value on showing "tolerance and respect for other people." They also believe that support and respect for authority is an important societal norm.

The general qualities of Russian women also extend to the corporate world. According to a 2017 human resources survey,[3] most Russian women in top positions still perform their own household duties and divide their time equally between work and family. The survey suggests

that Russian business women, including female directors, display traditional characteristics of being empathetic and encouraging when exercising their power in board decisions.[4] Furthermore, academic research shows that Russian women in top positions consider contract-based relationships to be of less importance (Poznyakov & Titova, 2014; Zhuravlev et al., 2008). Instead, providing support to business partners and demonstrating patience, perseverance, and supportiveness are highly value at work (Gvozdeva & Gerchikov, 2000; Ryabov, 2000; Sergeeva, 2006). For example, the World Bank's Russian Federation Gender Assessment issued in 2014 confirmed that Russian female representation in high-powered positions is driven by stereotypes rooted in patriarchal norms that portray a woman as a social partner rather than simply a contract-based partner.[5] Therefore, we expect that those attributes will also shape board qualities and influence board decision making by female directors.

Literature on Board Monitoring and Advising

The literature in economics, finance, accounting, and management has devoted considerable attention to determining which board attributes improve board effectiveness (Berrone & Gomez-Mejia, 2009; Jensen & Meckling, 1976; La Porta et al., 2002). Both control and collaboration approaches are proposed in the corporate governance literature, corresponding to the dual role of corporate boards in monitoring and advising (Sundaramurthy & Lewis, 2003; Westphal, 1999). On the one hand, researchers have argued that, to be effective, boards must acquire strategic information from management, especially in exercising their advising function (Demb & Neubauer, 1992; Smith & Tushman, 2005; Tiwana, 2008). On the other hand, maintaining an arm's-length relationship to top managers and acting quickly to replace a CEO in response to

poor performance are considered effective mechanisms for effective board monitoring (Faleye et al., 2011; Hermalin, 2005).

Intense board monitoring can effectively discipline managerial behavior. Evidence shows that agency costs arise when boards monitor in a loose manner (Fama, 1980; Jensen, 1986; Kosnik, 1987). For example, a board that is overpowered by its CEO will make decisions in favor of the CEO at the expense of shareholders (Abernethy et al., 2015; Boivie et al., 2016; Coles et al., 2014). Studies also show that friendship between CEOs and their directors can jeopardize board independence and have adverse consequences, such as poor financial reporting quality (Bruynseels & Cardinals, 2014; Lisik et al., 2016), excess CEO compensation (Hwang & Kim, 2009), and corporate fraud (Jha, 2017; Khanna et al., 2015). Board monitoring adds value by effectively mitigating managerial opportunism.

However, intensive board monitoring can be costly. Evidence shows that too much board monitoring blocks effective communications between CEOs and their directors (Adams, 2009; Adams & Ferreira, 2007; McAllister, 1995). Boards short of strategic information are less effective (Adams et al., 2010; Ferreira et al., 2011; Song & Thakor, 2006). For example, Faleye et al. (2011) find that intense board monitoring is associated with CEO myopia and poor firm performance in acquisitions and innovation. Conversely, Schmidt (2015) shows that trust and friendship established via social ties between a CEO and the directors add value, especially when there is a great need for the board's advising role.

Another form of intense board monitoring relates to using firm performance as the only indicator for assessing top managers' effort (Sundaramurthy & Lewis, 2003; Westphal, 1999). Current performance can be a noisy indicator of managerial effort given the limitations of accounting and share price-based performance measures—recognition lag of accounting

earnings and market noise in share prices (Banker & Datar, 1989; Bushman & Indjejikian, 1993; Ittner & Larcker, 1998). Evidence shows that poor performance is inevitable in an early stage of innovation, even for projects that eventually turn out to be enormously successful (Christensen, 2016; Drucker, 2006). One stream in the literature proposes using an implicit contract and non-observable information to effectively motivate greater managerial effort (Akerlof & Miyazaki, 1980; Hayes & Schaefer, 2000; Rosen, 1994). However, what remains unclear is how a board can design an effective implicit contract to mitigate agency losses. Our study attempts to explore what board qualities are useful in implementing such a task.

Female Boards, CEO Turnover, and Firm Value in Russia

We expect a female board in Russia to grant its CEO additional time to improve performance when suffering from performance hardship. The reason is two-fold. Firstly, Russian women on boards share the fundamental qualities of the female population in this country in being empathetic and supportive. Boards with greater female representation will show sympathy and grant their CEOs more time to fix the problem. They are also willing to spend time investigating whether poor performance is due to the CEO's action or to bad luck. Secondly, the patience and supportiveness of female directors suggest that the board will not choose to rely on firm performance as much to ascertain the CEO's effort. Instead, "soft" information such as perceived quality of a CEO will be referred to when deciding whether to fire the CEO, in cases of poor performance (Cornelli et al., 2012). As a result, the sensitivity of firm performance and CEO turnover declines. We formally state our hypothesis as follows.

> *Hypothesis 1. CEO turnover–performance sensitivity decreases with an increase in female representation on boards.*

We expect that female board representation adds value to a firm in terms of CEO turnover decisions. Reduced CEO turnover–performance sensitivity mitigates the problem of using current performance to infer a CEO's efforts that have long-term value-creating effects (Bushman & Indjejikian, 1993; Ittner & Larcker, 1998; Krause & Semadeni, 2014). It also allows a board to conduct a more complete assessment of CEO performance, as more information becomes available within a longer evaluation timeframe (Manso, 2011; Tian & Wang, 2014). According to implicit contract theory, this evaluation approach will improve firm value, as there is an economic value to rewarding CEOs for performance that will manifest in the future but is not currently public knowledge (Akerlof & Miyazaki, 1980; Hayes & Schaefer, 2000; Rosen, 1994).

In addition, the patience and supportiveness of female boards may foster trust building between a CEO and her directors (Coles et al., 2014; Kilduff & Tsai, 2003; Tian et al., 2011). Directors' ability to acquire strategic information determines a board's effectiveness in playing monitoring and advising roles (Adams et al., 2010; Faleye et al., 2011; Song & Thakor, 2006). Securing strategic information from CEOs helps promote strategic thinking, which can be particularly beneficial when directors must quickly develop a profound understanding of the cause of a current problem and find solutions (Hermalin & Weisbach, 2003; Shleifer & Vishny, 1997; Weisbach, 1988). Replacing CEOs might not represent the best strategy for improving performance, because such turnover can cause unexpected disturbances and organizational interruptions, causing firm performance to deteriorate (Farrell & Whidbee, 2003; Weisbach, 1995). Collaboration and communications on boards potentially help turn performance around. To summarize, we expect that a female board's decision to not fire an underperforming CEO can predict increased firm value. This yields the following hypothesis.

Hypothesis 2. CEO retention decisions made by female boards after poor performance are associated with improved firm value in the future.

Our second hypothesis is not without tension. Female boards can decrease firm value by lowering CEOs' incentives to work hard because their representation may indicate weak monitoring. That is, CEOs may already know that they will be retained regardless of their performance outcomes (Fama, 1980; Jensen, 1986), a decision that will be detrimental to firm value.

METHODOLOGY

Sample Selection and Data Sources

Our initial sample consists of both active and inactive firms covered by Thomson Reuters' Datastream on the Moscow Exchange, retrieved on August 24, 2017. We identified 207 firms based on information from Datastream, dated December 31, 2016 (the latest fiscal year in our investigation). A sum of their market value accounts for 99.8% of the entire market capitalization on that date. We further include 47 firms that were delisted from the market before the end of our investigation period. Our broad sample thus consists of 254 public companies (2,122 firm–year observations).

We next manually collected information regarding corporate governance and CEO characteristics from firms' quarterly and annual reports. Russian companies prepare quarterly reports in accordance with Russian Accounting Standards (RAS) and annual reports in accordance with RAS or International Financial Reporting Standards (IFRS). We obtained company financial reports from multiple sources. The first source was e-disclosure.ru, since Russian public companies are required to publish reports and financial statements on this Interfax website (Central Bank of Russia's Law on Disclosure Requirements for Public Entities

No. 454-П 2014). We supplemented this information with data from companies' websites and SKRIN, a database that contains the financial statements of Russian public companies. Further, our broad sample was merged with financial variables from Datastream universe and dropped the early years 1999–2005 to minimize data errors. Our final sample consists of 1,562 firm–year observations (233 firms) during 2006 and 2016. Table 1 summarizes the data collection process, and Appendix A details the technical aspect of our data collection.

Regression Models, Measurement, and Descriptive Statistics

To examine whether female directors enhance the effectiveness of board functioning, we focus on joint tests of H1 and H2. Specifically, we first examine whether female boards are associated with reduced CEO turnover–performance sensitivity. Then, we test whether a CEO retention decision made by female boards can predict enhanced firm value in the following year. We estimate a linear probability model to examine the impact of female board representation on performance-induced CEO turnover (H1):[6]

$$CEOTURNOVER_{i,t+1} = \beta_0 + \beta_1 PERF_{i,t} + \beta_2 FEMDIR_{i,t} + \beta_3 PERF_{i,t} \times FEMDIR_{i,t} + \sum_{k=4}^{n} \beta_k CONTROL_{k,i,t} + \varepsilon_{i,t+1} \quad (1)$$

where, with subscripts suppressed, *CEOTURNOVER* is an indicator of CEO turnover in year $t + 1$ (Balsam et al., 2017; Coles et al., 2014; Francis et al., 2015). Figure 1 illustrates the timing sequence in events of CEO turnover. The variable *PERF* measures firm performance in return on assets (ROA), both raw and industry–year adjusted where industries are defined based on a firm's industry classification code in Datastream, for firm *i* in year *t*. We measure firm performance in ROA to be consistent with prior research on female boards (Pletzer et al., 2015; Post & Byron, 2015). The term *FEMDIR* denotes female board representation. We use a set of

measures for female representation, including an indicator variable for the presence of at least one female director on the board (*0/1FemDir*), the number of female directors (*#FemDir*), and the proportion of female directors on the board (*%FemDir*) at the end of year *t*. A significantly positive coefficient of *PERF*×*FEMDIR* (β_3) will be consistent with H1, that female boards are less likely to replace their CEO when firm performance is poor. The term *CONTROL* stands for a group of control variables measured at the end of year *t*, and ε is an error term.

The inclusion of control variables in Model 1 follows the literature. More specifically, we control for firm-level characteristics such as firm size, growth, and risk, and for governance characteristics such as CEO age, CEO tenure, CEO duality, CEO retirement age, the presence of a female CEO on the board, board size, the fraction of independent directors, and director ownership (Adams & Ferreira, 2009; Balsam et al., 2017; Coles et al., 2014; Fich & Shidvasani, 2006; Masulis et al., 2012; Rose et al., 2013). We also include variables that reflect institutional background in Russia. Specifically, we control for state ownership and the political affiliations of board directors, since the literature shows that these two factors significantly influence board decisions in emerging economies (Marquis & Tilcsik, 2013; Tilcsik, 2010). In all models, industry and year indicators are included to control for industry and year fixed effects. Appendix B provides definitions for the variables used in our main analyses.

Next, we examine the effects of female boards retaining a performing CEO on subsequent firm value (H2), where firm value is measured by Tobin's Q in year $t + 2$. We choose not to measure firm performance in accounting to mitigate possible bias due to accounting manipulation surrounding CEO turnover (Murphy & Zimmerman, 1993). We measure future performance in year $t + 2$, as we assume that a female board allows the underperforming CEO at least a full year to fix the situation. We employ the following model:

$$TQ_{i,t+2} = \gamma_0 + \gamma_1 Underperf_{i,t} + \gamma_2 Stay_{i,t+1} + \gamma_3 FEMDIR_{i,t} + \gamma_4 Underperf_{i,t} \times Stay_{i,t+1} + \gamma_5 Stay_{i,t+1} \times FEMDIR_{i,t} + \gamma_6 FEMDIR_{i,t} \times Underperf_{i,t} + \gamma_7 Underperf_{i,t} \times Stay_{i,t+1} \times FEMDIR_{i,t} + \sum_{k=8}^{m} \gamma_k CONTROL_{k,i,t+2} + \acute{\varepsilon}_{i,t+2} \quad (2)$$

In Model 2, the variable *Undererf* indicates whether firm performance is below the sample mean ROA in year *t*. The *FEMDIR* variables are also measured in period *t*. The variable *Stay* equal to one indicates that CEOs are retained in year *t* + 1. We expect the coefficient of *Underperf*×*Stay*×*FEMDIR* (γ_7) to be significantly positive, as we predict in H2 that CEO retention decisions by female boards are associated with improved future firm value. Consistent with the literature, we include control variables such as leverage, accounting returns, cross-listing, and reporting under IFRS/US GAAP (Doidge et al., 2009; Hail & Leuz, 2009) as well as industry and year fixed effects. Controls and firm values are all measured for year *t* + 2. For both regression models, we apply the White–Huber method to adjust for heteroskedasticity in standard errors.

Panel A of Table 2 reports the sample distribution by year, which is consistent with prior work (Catalyst 2014). On average, 58 (28)% of firm–years had at least one (more than one) female director on the board. While we observe an uptrend in women on boards over time, female board representation in Russia is still lower than that it is in the United States and European nations (Adams & Ferreira, 2009; Heidrick & Struggles, 2014; International Finance Corporation, 2015). Panel B indicates that some industries, such as banks and financial services, show higher female representation on boards, which justifies our inclusion of industry fixed effects in our models.

Panel A of Table 3 summarizes descriptive statistics of our main variables. CEO turnover takes place in about 21% of our observations. Overall, women account for 11% of board members. Next, board characteristics are largely consistent with the literature (Basargin & Perevalov, 2000; Iwasaki, 2008; Muravyev, 2017; Puffer & McCarthy, 2003). On average, a Russian board consists of nine directors. CEO duality is rare, given the dominance of the two-tier structure of Russian boards.[7] The percentage of independent directors is low (25%), and CEOs are younger than their peers in the Unites States and European firms (Heidrick & Struggles, 2011; International Finance Corporation, 2015). Moreover, we find that political connections are present in more than 30% of our sample; on average, 16% of a firm's ownership is controlled by the state; 25% of firms are cross-listed overseas, with 17% in London. Overall, firm characteristics are consistent with results in the 2012–2016 PwC surveys of Russian boards as well as in a recent OECD survey of Russian directors.[8]

RESULTS

Univariate Analysis

First, we examine the differences between gender-diverse boards and boards consisting exclusively of male directors. The results in Panel B of Table 3 show significant differences between these two groups of boards. Without controlling for the effects of covariates, female boards have a higher probability of CEO turnover, appoint more directors, and are less independent. Female board representation is associated with a lower Tobin's Q and market-to-book. Further, firms with women on their boards have a younger CEO, are more likely to hire a female CEO, have greater director ownership, are smaller, and are less likely to be cross-listed or report in accordance with IFRS. At the same time, CEO tenure, political connections, state

ownership, leverage, sales growth, and strategic industry affiliation do not significantly differ between the two sub-samples.

Determinants of Female Board Representation

Next, we perform multivariate regression analysis to examine an array of factors that potentially influences the decision to appoint female directors. Table 4 presents the results of a probit model (column 1) and an OLS estimation (columns 2 and 3). We find that larger firms and those with greater board independence have lower female representation on boards. In contrast, firms operating in an industry with greater female board representation and those more heavily in debt, led by a female or dual CEO, or with a larger board, tend to appoint more female directors on boards.

In summary, the results of both univariate and multivariate analyses suggest that male and female boards are statistically different across various dimensions. Hence, it is important to control for these factors in the estimation of CEO turnover and firm performance. Our results also indicate that there is a self-selection bias in studying women on boards. In response, we address the endogeneity concern with a Heckman self-selection correction model in Section 5.

Impact of Female Board Representation on CEO Performance-Induced Turnover (H1)

In H1, we expect the presence of women on boards to be associated with lower CEO turnover–performance sensitivity. Table 5 summarizes the regression results of Model 1. Recall that we measure female director representation with *0/1FemDir*, an indicator for the presence of women on boards; *#FemDir*, the number of female directors; and *%FemDir*, the proportion of board members who are women. Firm performance is measured by raw ROA and industry–year adjusted ROA. Table 5 shows that the main effect on ROA is significantly negative across all

model specifications, suggesting that poor performance relates to CEO turnover (Balsam et al., 2017; Brickley, 2003; Fee et al., 2018; Jenter & Kanaan, 2015; Parrino, 1997). Further, the coefficient on the interaction term *ROA*×*FEMDIR* is significantly positive in all columns, which indicates that female board representation is associated with reduced CEO turnover–performance sensitivity. It is interesting to note that the coefficient on *FEMDIR* is significantly positive when ROA is adjusted for industry performance; this is consistent with our univariate test result that CEO turnover rate is higher for firms with women on boards. Although female directors are willing to offer their CEO more time to show performance improvement, they do not appear to be weak monitors (Adams & Ferreira, 2009).[9]

Turning to our control variables, the results are generally consistent with prior work. We find that, as expected, CEO tenure (reaching retirement age) has a significantly negative (positive) relation with the probability of a CEO's dismissal. Moreover, state ownership is associated with lower CEO turnover, consistent with prior evidence (Marquis & Qian, 2014; Marquis & Tilcsik, 2013). Firms growing fast in sales and those with higher director ownership are also less likely to remove their CEO. To summarize, our results are in support of H1; that is, female boards are associated with reduced performance-induced CEO turnover.

Impact of Female Boards' Decision to Retain an Underperforming CEO on Subsequent Firm Value (H2)

In H2, we predict a positive effect of CEO retention decisions by female boards on subsequent firm value. Table 6 reports the results of Model 2. The coefficient on the three-way interaction term *Underperf*×*Stay*×*FEMDIR* speaks to the impact of female boards on future firm value. In all three columns, we find that the coefficient on *Underperf*×*Stay*×*FEMDIR* is significantly positive, suggesting that the retention decisions made by female boards are indeed associated

with increased firm value in subsequent years. We also note that the coefficient on *Underperf×Stay* is, generally, significantly negative, suggesting that not removing underperforming CEOs in the absence of female board representation predicts subsequent poor performance.

Since we include two-way and three-way interactions and their components in one regression model, we are concerned about multicollinearity. Moderate multicollinearity may not be problematic. However, severe multicollinearity is a problem because it can increase the variance of the coefficient estimates and make the estimates very sensitive to minor changes in the model; as a result, the coefficient estimates are unstable and difficult to interpret (Lennox et al., 2012). To test multicollinearity, prior literature often relies on Variance Inflation Factors (VIFs). However, our two-way and three-way interactions consist of indicator variables and they can easily inflate VIFs even in the absence of severe multicollinearity (Murray et al., 2012). Therefore, we use coefficient variance decomposition test as an alternative method to assess whether multicollinearity is a problem among interaction terms. In this test, we rely on associated eigenvalues. The multicollinearity could be a problem if eigenvalues are greater than 0.5 (Belsley et al., 1980). Our tests show that when female board representation is measured by *0/1FemDir* and *#FemDir*, multicollinearity is not present, while there is moderate multicollinearity in the *%FemDir* specification.[10]

Overall, our results indicate that female boards exercise their empathy wisely in retaining underperforming CEOs and that such board decisions appear to increase future firm value. Our findings are consistent with survey-based evidence that the management style of Russian female directors does not reduce board effectiveness (Chirikova, 2016). To summarize, we find that,

consistent with H2, CEO retention decisions made by female boards are associated with improved firm value in the subsequent period.

ENDOGENEITY

It is unlikely that female directors are randomly appointed, which raises concerns about potential self-selection bias. That is, certain factors that influence the selection of women on boards also affect CEO turnover and firm performance. In our main analysis, we include a host of control variables to capture observable factors. To further address concerns about selection on unobservables (Lennox et al., 2012; Tucker, 2010), we employ a Heckman (1979) two-stage estimation method. In the first stage, we fit a probit model and estimate the likelihood of a firm to place female directors on the board, using all our control variables in the main analysis plus an exclusion instrument, *GFC,* equal to one for CEO retention/dismissal decisions made during and after 2009, and zero otherwise.[11] Variable *GFC* is constructed based on the 2008–2009 global financial crisis (the GFC). We expect that the GFC generates exogenous variations in a demand for women on boards. The global economic downturn adversely affects firm performance worldwide, including those in Russia (Barannik, 2010). Communications and collaboration on boards are particularly valuable in times of crisis (van Essen et al., 2012). Effective monitoring and advising of boards are urgently needed during the economic downturn (Dowell et al., 2011; Erkens et al., 2012). Thus, the GFC can be considered a "natural" shock to female board representation, as boards require a different set of skills to guide management out of a recession. Supportiveness and perseverance are board qualities that are most sought-after during a crisis.

The first stage Heckman selection results are reported in Panel A of Table 7. The coefficient of *GFC* is significantly positive across all three variants of female board representation, suggesting that during and after the GFC, there is a strong desire in Russian firms for women on boards. Next, we follow Lennox et al. (2012) and estimate the inverse Mills ratio (*InverseMills*) using the normal density and cumulative distribution functions from the first-stage model (column 1 of Panel A). We include *InverseMills* as an additional control to the Heckman second-stage regressions of CEO turnover (H1) and future firm value (H2). We report the second stage Heckman results for H1 and H2 in Panels B and C, respectively. After controlling for selection bias with *InverseMills*, we continue to find that women on boards are associated with reduced CEO turnover–firm performance sensitivity (Panel B), and that the CEO retention decisions made by female boards can predict superior future firm performance (Panel C).

In addition to the Heckman correction model, we partition our sample into pre- and post-GFC periods. We then examine the effect of female boards on future Tobin's Q in the two subsamples, respectively (Lins et al., 2017). Panel D shows the results. It appears that the positive relation between CEO retentions by female boards and enhanced Tobin's Q are statistically significant only during and post the GFC. Again, our findings lend support to the notion that female representation on boards is value-adding, in particular, in the cases of exogenous adverse events.

ADDITIONAL TESTS AND ROBUSTNESS CHECKS

Are Female Boards Empathetic or Powerless?

We attribute our results to female boards being empathetic, patient, and supportive. However, an alternative explanation is that female directors are minorities on boards and are powerless to fire a CEO (Post & Byron, 2015). If it is the lack of decision-making power that drives our results, we should find CEO turnover–performance sensitivity to be lower in firms where female directors have less power to influence board decisions. In contrast, if the underlying mechanism to our prior findings is indeed board qualities shaped by women on boards, our results will be more pronounced for boards on which female directors have more power to influence decision making.

Motivated by the extant literature, we partition our sample by state ownership and political connections. Prior research shows that state ownership in emerging markets potentially prevents state-owned firms from adopting effective governance mechanisms (Kogut & Zander, 2000; Marquis & Qian, 2014). Symbolic corporate governance measures might be adopted in state-owned companies in response to stakeholders' demand for strong governance without introducing substantive changes (Meyer & Rowan, 1977). Similarly, a board's political connections indicate the state's influence on board decisions (Hillman, 2005; Marquis & Qian, 2014). As governmental influence increases, firms will find it less attractive to respond to other stakeholders' demand for governance improvement. Female representation on boards is widely considered a progressive governance practice. Female board representation in companies with high state ownership and political affiliations could simply be tokenism. Thus, female directors on those boards are less likely to possess real influence on board decisions.

We rerun Model 1 in the sub-samples; Table 8 reports the results. We find that the association between female boards and reduced CEO performance-induced turnover is generally more pronounced in sub-samples in which female directors arguably have more power (i.e., in the absence of state ownership or political affiliations in a firm). Therefore, our prior finding on CEO turnover–performance sensitivity is less likely to be due to female directors lacking power in firing a CEO. Rather, the effects of female representation on CEO turnover become stronger when female directors have more influence in shaping board decisions.

Board Activities

In this section, we explore a possible mechanism through which female boards increase firm value. Board meetings are the primary channel for directors to stay informed of a firm's operations, business conditions, and managerial decisions so that they can effectively participate in corporate governance (Brick & Chidambaran, 2010; Goergen et al., 2015; Masulis et al., 2012). We thus focus on the number of board meetings as these meetings provide an important platform for directors to influence firm-level decisions and the frequency of meeting signals directors' effort and diligence.

We measure the number of board meetings subsequent to CEO retention decisions. Specifically, we adjust Model 2 by replacing the dependent variable with the natural logarithm of the number of board meetings.[12] Our test variable is a three-way interaction of underperformance, CEO retention, and the presence of women on boards. The results in Table 9 show that the coefficient of *Underperf*×*Stay*×*FEMDIR* is significantly positive in all three columns, suggesting that, after retaining an underperforming CEO, female boards tend to call for more meetings, possibly engaging their CEO with the board to analyze the situation and

make action plans to improve performance. Noticeably, *Underperf*×*Stay* also has a significantly negative coefficient, which suggests reduced board activities of male-run boards that retain an underperforming CEO. Our results are consistent with Adams and Ferreira (2009), who show that male board member attendance improves when boards have female representation and imply that even a small degree of female representation on boards can have a large effect on male-dominant boards.[13]

Further, we follow Brick and Chidambaran (2010) and use number of independent director–meetings days as an alternative measure for board activities. Untabulated results derived from this alternative measure show that female representation is associated with increased board activities. Taken together, our findings suggest that female boards implement effective monitoring of management and, in turn, improve firm value.

Female versus Male Directors

We consider patience and supportiveness to be primary qualities of Russian female directors. We attribute reduced CEO turnover–performance sensitivity with female director representation to these gender-related qualities. However, an alternative explanation is that female directors in Russian firms are simply less independent than male directors. For example, those females might be more likely to be relatives of their CEO. The low level of independence of female directors potentially explains why CEOs are not removed in cases of weak performance. Further, female directors with such familial ties might be more willing to help an underperforming, affiliated CEO to improve firm performance.

We perform additional analysis and compare the demographic features of female and male directors in our sample. Firms listed at the Moscow Exchange are required to disclose

profiles of their board directors in company annual or quarterly reports. We manually collect directors' demographic information from company annual or quarterly reports, including their kinship relationships with management in a current firm. We create an indicator for directors who are family members or relatives of the management in the current firm. We manage to obtain related information for 8,519 director–firm–years, in which 7,114 (1,405) are males (females). We then compare kinship status across male and female directors. Results of mean and median comparisons show that female directors do not have a greater frequency to be family members of the management of their firm (*p*-value = 0.57). Therefore, our results do not indicate that female directors are less independent, and our prior findings are unlikely to be explained by female directors' familial ties.

Alternative Measurement of Firm Performance

In our main analyses, we focus on accounting-based measurement for firm performance (i.e., ROA) when examining CEO turnover. For robustness, we follow Fee et al. (2018) and Jenter and Kanaan (2015) by measuring firm performance with stock returns. In addition, we decompose returns into an industry-induced component and idiosyncratic returns, representing industry performance and abnormal firm performance, respectively. Specifically, we regress a firm's annual returns in year *t* on the concurrent average returns for the firm's industry where the industry is defined as per Datastream. The predicted value from this regression gives industry performance (*IndustryReturns*), while the residual term indicates abnormal firm performance (*AbnormalReturns*). We replicate prior analysis using the new performance measures. Table 10 reports the results. We find that CEOs are dismissed after poor abnormal firm performance, while industry-predicted returns have little explanatory power for CEO

turnover. This finding does not seem to fully support Jenter and Kanaan (2015) but is consistent with Fee et al. (2018).[14] Further, we find a significantly positive coefficient on the interaction between abnormal firm performance and women on boards. In support of H1, our results suggest that female boards are less likely to replace a CEO after poor abnormal stock returns.

Moreover, we follow Jenter and Kanaan (2015) and employ two-year changes in ROA as an alternative measure for performance. We use the change measure to replace the level measure in Model 1. In addition, we decompose it into idiosyncratic and industry performance as explained above. We find that female representation on boards significantly attenuates the association between industry performance and the likelihood of CEO turnover. In combination with our findings on market returns, our results suggest an overall lower CEO turnover–performance sensitivity in the presence of female directors.

Logistic Regression of CEO Departure

Note that our main regressions of CEO turnover are based on a linear probability model. Although it allows for a more meaningful interpretation of interaction term coefficients, our model is subject to the limited dependent variable problem. That is, the estimated coefficients can imply probabilities outside the unit interval. Hence, we re-estimate Model 1 using a logit model and report results in Table 11. The coefficient on *ROA*×*FEMDIR* is significantly positive in all columns, consistent with our prior results. To ease interpretation of the interaction effect in a nonlinear model, we follow Aiken and West (1991) and Dawson (2014) and plot the moderating effect of female board representation, as shown in Figure 2. Clearly, the slope of CEO turnover in relation to both raw ROA and industry-adjusted ROA is flat (steep) for female (male) boards, in line with our prior findings.

Further, we partition our sample by *0/1FemDir* =1 (female boards) versus *0/1FemDir* =0 (male boards). We replicate Model 1 in the subsamples with the interaction term *ROA*×*FEMDIR* removed. The results show that the coefficient on *ROA* is significantly negative in the subsample of male boards, but not in that of female boards (not tabulated). Overall, consistent with H1, our results suggest significant differences in CEO turnover–performance sensitivity across male versus female boards.

Other Robustness Tests

We perform several additional robustness tests (not tabulated). Firstly, we remove voluntary CEO turnover from our sample. In particular, we view turnover of CEOs younger than a retirement age (64 in Russia) as being forced (Baker & Gompers, 2003; Campbell et al., 2011; Coles et al., 2008, 2014; Jenter & Kanaan, 2015; Shen & Cannella, 2002; Weisbach, 1988). We re-run prior analysis with the reduced sample and obtain consistent results. Next, we check the plausible effects of other corporate governance variables—such as board size, percentage of independent directors, CEO tenure, age, duality, and director ownership—on CEO turnover–performance sensitivity. Specifically, we interact these variables with ROA and include them as additional regressors in Model 1. We find that some added interaction terms between ROA and corporate governance variables—including CEO tenure, duality, and female CEO—show statistical significance in explaining the likelihood of CEO turnover. More importantly, the significance of female boards still holds.

Our prior results suggest that firm value improves after female boards retain underperforming CEOs. However, the improvement on firm value could simply be a reversion to the mean following previous underperformance. To account for the possible mean reversion,

we use lagged Tobin's Q as an additional regressor in Model 2. Our results show that, after controlling for mean reversion, our prior finding that female boards add firm value continues to hold. We also refine our measurement of female representation on boards. The sociological literature argues that the psychology of imprinting associated with age potentially affects individuals' decision making (Babayeva & Chirikova, 1996; Gvozdeva & Gerchikov, 2000; Schoar & Zuo, 2017). Evidence shows that Russian women over the age of 40 have a greater tendency to be empathetic and supportive, compared to their younger peers (Chirikova, 1997, 1998, 2003; Gvozdeva & Gerchikov, 2000; Pushkareva & Zolotukhina, 2017). We re-define female board representation based on the critical age of 40 (*FEMDIR40*) and replicate Model 1. Our results show that the coefficient on the interaction term *ROA*×*FEMDIR40* is significantly positive.

In another robustness test, we check the robustness of our findings in the Heckman model, using an alternative exclusion instrument. Specifically, following Huang et al. (2017), we use an annual average of female board representation in a firm's industry as an alternative exclusion instrument, with an assumption that firms are likely to adopt corporate governance practices that are actively followed by their industry peers and the adoption is less likely to be endogenously determined with other board decisions and corporate outcomes (John & Kadyrzhanova, 2008; Knyazeva et al., 2013). We find similar results that support both H1 and H2. Although the efficacy for our exclusion instrument choice is subject to debate, our inferences are based on consistent results using various instruments.

In the cases of consecutive CEO changes, we keep the last CEO change in a series of successions. Relatedly, we remove all interim CEO successions. Further, we employ an alternative approach to benchmark firm ROA upon annual industry median to define

underperforming. We also check the robustness of our findings using an alternative estimation method with standard errors clustered by firms. Our results remain robust in all cases.

CONCLUSION

This study examines whether female boards affect CEO performance-induced turnover. We further test the economic consequences of the decisions made by female boards to retain an underperforming CEO. We focus on Russia, a patriarchal country where empathy, patience, and collaboration are highly valued qualities in core social norms for women. We find that women on boards are associated with lower CEO turnover–performance sensitivity. Our results also suggest that female boards create firm value, as CEO retention decisions by female boards are associated with more board activities and higher Tobin's Q in the following year. Taken together, our results suggest that female boards are not only patient and supportive, but also good monitors. These results should be of interest to both academics and regulators, as we offer a very different view of female representation on boards than prior studies.

The interpretation of our findings is, however, subject to several caveats. First, clearly, "there is no such thing as a random allocation [of treatment assignment]" using observational data (Bertrand & Schoar 2003: 1180; Luft & Shields, 2014). The choice to appoint female directors may relate to various factors that could drive our results. We address this endogeneity concern by including a battery of control variables that can capture some of the observable confounding factors. Further, we rely on a Heckman selection correction procedure to mitigate selection on unobservables. However, the efficacy of our approach is still open to debate. In addition, our findings are potentially subject to representation issues as female directors might possess characteristics different from the female population in Russian society. Further,

although care has been taken to identify forced CEO turnover in our sample, future research is encouraged to improve the identification strategy. Our study focuses on Russia, a country with unique culture and economy; also noticeable is that Russian markets do not have a quota for female director representation, which, however, could influence the generalizability of our findings to other countries. Nevertheless, the research questions we ask are generalizable, as it is equally important to investigate in Anglo-Saxon settings whether certain board qualities, such as being empathetic, patient, and collaborative, could enhance shareholder value. We call for future research to add knowledge to this area.

[1] In the current study, Anglo-Saxon and Western countries are interchangeable terms.

[2] Russian boards generally follow a two-tier structure, which is commonly referred to as a "German" model, although public companies are not restricted in a choice of a board model (unitary versus two-tier). The unitary model implies that directors and executives serve on the same board, and this model is prevalent among Western jurisdictions such as the UK and the US. In the case of a two-tier board structure predominantly adopted within continental Europe, directors and executives serve on two separate boards. The Russian Law on Joint-Stock Companies (No. 208 FZ 1995) states that if a company chooses a two-tier board structure, the participation of the management on the board of directors shall be limited to ¼ of the number of members on the board of directors. In the case of a two-tier model, the board of directors is called a "supervisory board", whereas the executives board is called the "management board", consistent with terminology for two-tier boards adopted in other European jurisdictions (International Finance Corporation 2015). Board directors shall evaluate the CEO's performance based on the financial results for the preceding financial year and make dismissal/retention recommendations, irrespective of the board structure (Corporate Governance Code 2002; 2014). We focus on supervisory boards instead of management boards. Female representation on management boards is thus beyond the scope of our study.

[3] Available at: http://hrdocs.ru/novosti/zhenshhinyi-top-menedzhery/.

[4] As another anecdote, when asked if she thinks that high-powered Russian women have more difficult lives than European women, Tatyana Golikova, Head of the Audit Chamber in Russia, said: "Yes, most likely. We have gotten used to working a huge amount and to taking care of our families seriously. Spending a great deal of time tending to one and the other, we often do not notice that absolutely nothing is left for ourselves" ("Top Female Government Leaders Balance State and Family Obligations," *The Moscow Times*, available at: https://themoscowtimes.com/articles/top-female-government-leaders-balance-state-and-family-obligations-32761).

[5] Available at: https://openknowledge.worldbank.org/handle/10986/21121/.

[6] Because our test variable is an interaction term (*PERF*×*FEMDIR*) and in a nonlinear model the significance levels of the interaction coefficients are less meaningful when the magnitudes and signs of the marginal effects differ across observations (Ai and Norton 2003; Hoetker 2007), we rely on a linear probability model. However, a drawback of our model is that the estimated coefficients can imply probabilities outside the unit interval. Hence, we test the robustness of our findings using a probit model in sub-samples with and without female directors on the board, respectively, and find consistent results. For completeness, we also estimate a logit model including the interaction term. We discuss the results in the section of robustness tests.

[7] Russian law prohibits CEO duality; however, several cases of this practice exist in our sample. Extended investigation reveals that the CEO typically assumed the role of chairperson of the board in the year preceding a major corporate restructuring event.

[8] Available at: https://www.pwc.ru/ru/corporate-governance/assets/russian-boards-survey/russian-boards-survey-2016-eng.pdf.

[9] We also find that female directors on boards do not appear to retain an underperforming CEO when a firm's current year ROA is in the lowest quartile or when ROA is negative. Further, we find that female directors appear to be tolerant of recent underperformance rather than of multiple years of bad performance. In other words, CEO dismissal/retention decisions following poor performance appear conditional on "first offenses." This finding is also consistent with prior research showing that, although female directors will provide a second chance to a poor-performing CEO, they clearly expect the CEO to deliver good results (Chirikova 2016).

[10] Note, traditional methods, such as mean centering and residual centering, that could reduce multicollinearity do not appear to work for our interaction terms with indicator variables. Also note, Lennox et al. (2012, p. 593) suggest that multicollinearity may cause that "the coefficient standard errors are inflated, making it less likely that the coefficient estimates are statistically significant." In this sense, our results are somewhat conservative due to moderate multicollinearity.

[11] Note, we use the cut-off year of 2009 instead of 2008 because CEO retention/dismissal decisions made by boards are based on prior year's firm performance.

[12] Note that the dependent variable is measured in year $t + 2$. Our results are inferentially unaltered when we control for the number of board meetings in year t, which essentially allows us to account for changes in a board's activity after a CEO dismissal/retention decision (made in year $t + 1$). Following the literature, we add two more control variables to capture market-based firm performance (Brick and Chidambaran 2010).

[13] Thus, our findings and those of Adams and Ferreira (2009) could mitigate concerns as to how female attributes could play out on the male-dominant boards.

[14] Jenter and Kanaan (2015) find that CEO dismissals are sensitive to both idiosyncratic stock returns and industry-induced stock returns.

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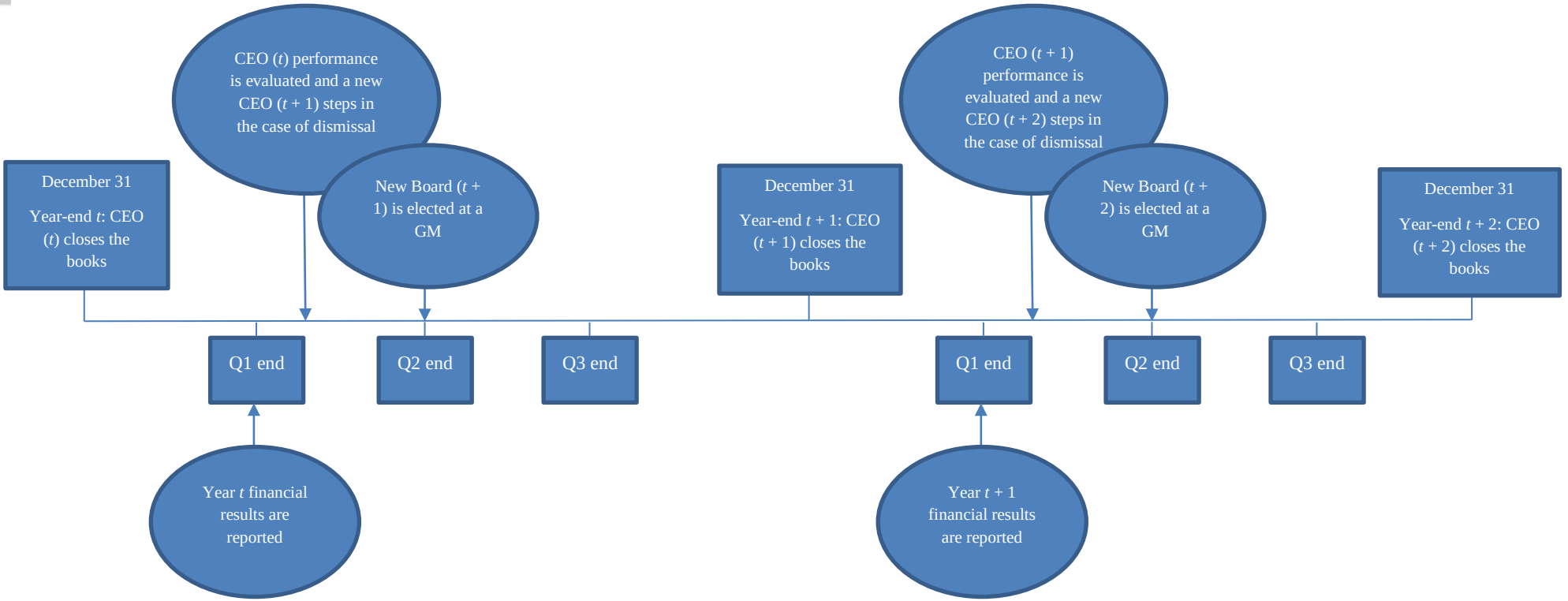
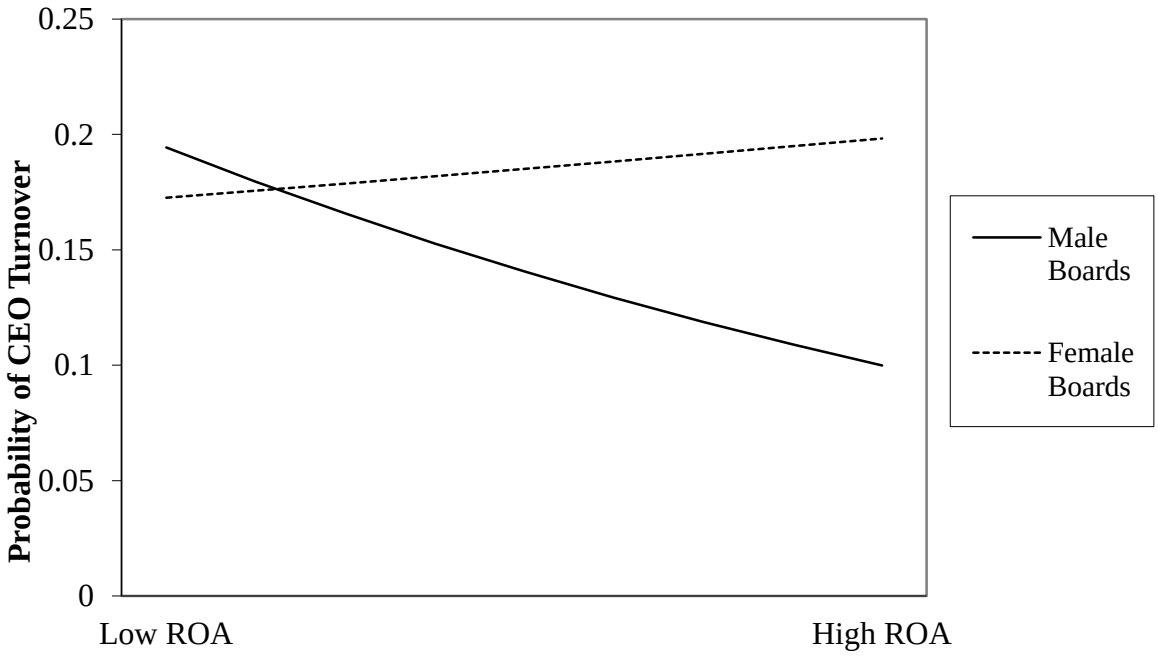
FIGURE 1 Timing sequence



Note. Figure 1 illustrates the timing sequence in our research. Financial reporting period ends on December 31 of year *t*. The financial results for year *t* are reported and filed by March 30, year *t* + 1, which is the Q 1 end. The CEO's performance is evaluated once the results are reported, and the board that was elected in the previous year *t* makes a dismissal/stay recommendation. At Q 2 end (or close), the board is re-elected at the General Meeting (GM) of shareholders. Accordingly, for CEO turnover–performance

sensitivity tests (Table 5 and related tables), the composition of the Board that decides to dismiss/retain a CEO, the performance based on which a CEO is evaluated and related control variables are measured at the end of year *t*. Then, *CEOTurnover* is an indicator variable equal to one if there is a CEO change during year *t* + 1. For future performance tests (Table 7 and related tables), the future performance variables are measured at the end of year *t* + 2, while *FEMDIR* and *Underperf* are measured at year *t*, and *Stay* (inverse of *CEOTurnover*) is measured at year *t* +1.

FIGURE 2 Moderating effect of female board representation on CEO turnover–performance relation



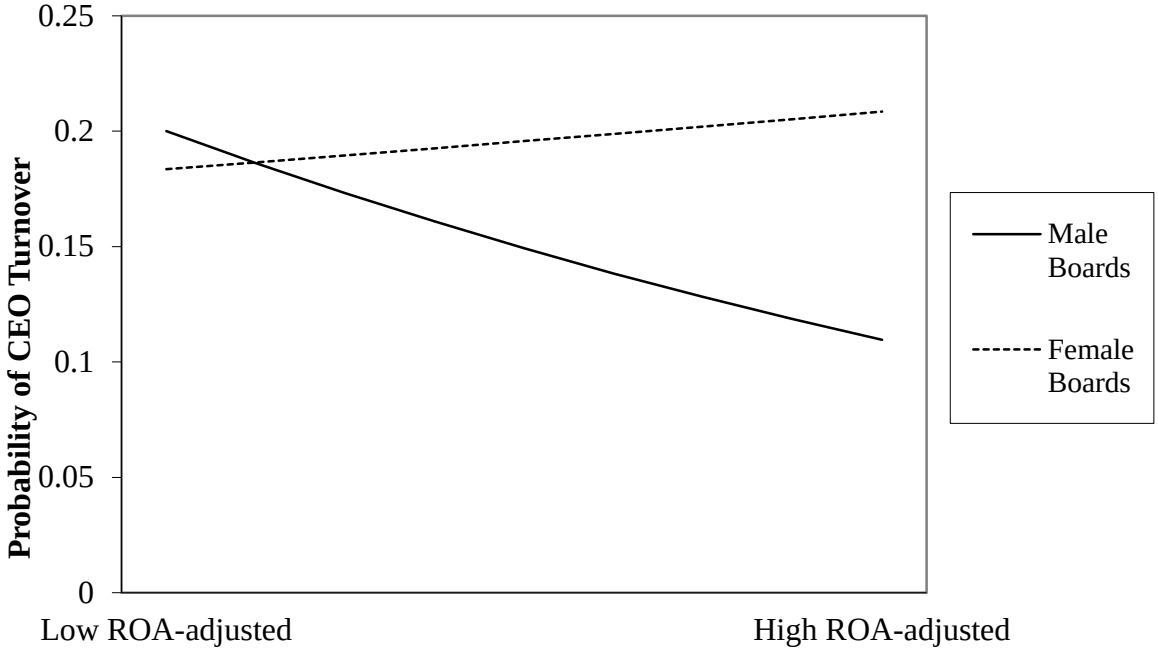


TABLE 1 Description of data collection process

Sample Selection Procedure	Active firms	Delisted firms	Total firms	Total firm–years
Included in the Moscow Exchange common stock list as of cut-off date August 24, 2017	209	190	399	n/a
Financial coverage was available in Datastream through December 31, 2016	207	177	384	n/a
Financial statements were available and governance metrics were collected through December 31, 2016	207	47	254	2,122
Loss due to unavailability of selected financial variables required for empirical tests and due to lagged regressors; excluding observations in years 1999–2005	(18)	(3)	(21)	(560)
Final sample for performance period at *t*, 2006–2015	189	44	233	1,562

Note. Table 1 reports the summary of the data collection process for the performance period *t*. Firms included in the sample are those listed on the RTS and MICEX prior to the merger in 2011 and those listed on the joint Moscow Exchange post-merger.

TABLE 2 Distribution of sampled firms by year and industry

Panel A: Sample distribution by year

Year	# of firms in the sample	# of firms with at least one FemDir	% of firms with at least one FemDir	# of firms with multiple FemDirs	% of firms with multiple FemDirs
2006	74	36	49%	14	19%
2007	114	60	53%	23	20%
2008	154	84	55%	36	23%
2009	175	103	59%	49	28%
2010	183	108	59%	47	26%
2011	191	107	56%	51	27%
2012	186	111	60%	62	33%
2013	175	107	61%	55	31%
2014	157	90	57%	47	30%
2015	153	96	63%	49	32%
Total	**1,562**	**902**	**58%**	**433**	**28%**

Note. Panel A of Table 2 reports the distribution of examined firms by year. The number of firms in the sample and the number (percentage) of firms with at least one and multiple female directors on the board is reported.

Panel B: Sample distribution by industry

Industry	Total number of firm–years	# of firm–years that have at least one FemDir	% of firm–years with at least one FemDir	# of firm–years that have multiple FemDirs	% of firm–years with multiple FemDirs
Aerospace and Defense	36	7	19%	0	0%
Automobiles and Parts	39	19	49%	9	23%
Banks	64	49	77%	29	45%
Beverages	19	4	21%	2	11%
Chemicals	85	48	56%	13	15%
Construction and Materials	27	23	85%	14	52%
Electricity	480	363	76%	187	39%
Financial services	34	32	94%	29	85%
Fixed Line Telecommunications	44	23	52%	16	36%
Food and Drug Retailers	19	1	5%	0	0%
Food Producers	51	23	45%	8	16%
Forestry and Paper	4	4	100%	3	75%
Gas, Water and Multiutilities	26	17	65%	13	50%
General Industrials	7	3	43%	0	0%
General Retailers	19	9	47%	8	42%
Industrial Engineering	56	27	48%	13	23%
Industrial Metals and Mining	166	49	30%	12	7%
Industrial Transportation	48	30	63%	9	19%
Media	11	7	64%	2	18%
Mining	89	50	56%	25	28%
Mobile Telecommunications	23	7	30%	0	0%
Nonlife Insurance	3	0	0%	0	0%
Oil and Gas Producers	118	58	49%	10	8%
Personal Goods	2	0	0%	0	0%
Pharmaceuticals and Biotechnology	29	22	76%	6	21%
Real Estate Investment and Services	18	12	67%	12	67%
Software and Computer Services	10	2	20%	0	0%
Technology Hardware and Equipment	9	9	100%	9	100%
Travel and Leisure	26	4	15%	4	15%
Total	**1,562**	**902**	**58%**	**433**	**28%**

Note. Panel B of Table 2 reports the distribution of examined firms by industry. The number of firms in the sample and the number (percentage) of firms with at least one and multiple female directors on the board is reported.

TABLE 3 Summary statistics and covariate comparisons (N =1,562)

Panel A: Descriptive statistics

Variable	Mean	Std. Dev.	25%	50%	75%
0/1FemDir	0.577	0.494	0.000	1.000	1.000
#FemDir	1.001	1.113	0.000	1.000	2.000
%FemDir	0.114	0.130	0.000	0.091	0.182
CEOTurnover	0.208	0.406	0.000	0.000	0.000
CEOtenure	3.574	3.633	1.000	2.000	5.000
BoardSize	9.101	2.383	7.000	9.000	11.000
CEOFem	0.031	0.174	0.000	0.000	0.000
%IndepDir	0.250	0.278	0.000	0.191	0.429
DirShare	3.725	12.438	0.000	0.000	0.040
CEOAge	47.772	9.091	41.000	47.000	55.000
CEOdual	0.012	0.110	0.000	0.000	0.000
CEOage64	0.048	0.214	0.000	0.000	0.000
Polit	0.297	0.457	0.000	0.000	1.000
IFRS	0.660	0.474	0.000	1.000	1.000
London	0.173	0.378	0.000	0.000	0.000
CL	0.252	0.434	0.000	0.000	1.000
StateOwn	16.195	23.715	0.000	0.000	27.500
ROA	6.673	10.382	1.440	5.160	10.590
ROA-adjusted	0.441	9.926	–4.283	–0.047	4.005
MB	0.006	1.139	–0.693	0.005	0.713
Q	0.024	0.564	–0.264	–0.004	0.290
Size	13.584	2.262	11.898	13.798	14.941
Lev	0.520	0.254	0.318	0.531	0.724
*ChSales^*	0.054	2.091	–0.0001	0.0001	0.0002
StratInd	0.569	0.495	0.000	1.000	1.000

Note. Panel A of Table 3 reports the summary statistics for the key governance and financial variables used in the empirical analyses. Variable definitions are provided in Appendix B. *ChSales^*=*ChSales*/1,000.

Panel B: Covariate comparison

Variable	*0/1FemDir* =0 (N =660)		*0/1FemDir* =1 (N =902)		Difference in mean values
	Mean	Std. Dev.	Mean	Std. Dev.	
CEOTurnover	0.179	0.383	0.229	0.421	0.051**
CEOtenure	3.721	3.659	3.466	3.612	–0.256
BoardSize	8.785	2.197	9.331	2.485	0.547***
CEOFem	0.005	0.067	0.051	0.220	0.046***
%IndepDir	0.267	0.257	0.238	0.292	–0.028**
DirShare	2.757	10.882	4.433	13.425	1.676***
CEOAge	48.739	9.472	47.064	8.739	–1.675***
CEOdual	0.003	0.055	0.019	0.136	0.016***
CEOage64	0.059	0.236	0.040	0.196	–0.019*
Polit	0.305	0.461	0.292	0.455	–0.013
IFRS	0.744	0.437	0.599	0.490	–0.145***
London	0.241	0.428	0.123	0.329	–0.118***
CL	0.348	0.477	0.182	0.386	–0.167***
StateOwn	15.419	25.258	16.763	22.517	1.344
ROA	7.000	10.729	6.434	10.120	–0.566
ROA–adjusted	0.165	9.910	0.642	9.939	0.477
MB	0.080	1.059	–0.048	1.193	–0.128**
Q	0.064	0.589	–0.005	0.542	–0.068**
Size	14.153	2.066	13.167	2.309	–0.987***
Lev	0.512	0.245	0.527	0.260	0.015
*ChSales^*	0.001	0.012	0.092	2.752	0.091
StratInd	0.548	0.498	0.584	0.493	0.036

Note. Panel B of Table 3 reports the summary statistics for the key governance and financial variables used for covariate comparisons. Variable definitions are provided in Appendix B. The *, **, and *** denote statistical significance at 10, 5, and 1 percent levels (two-tailed), respectively. *ChSales^*=*ChSales*/1,000. The significant standard deviation for the *ChSales* variable in the case of the sub sample of firms with female directors on the board is due to one outlier: Lenzoloto (mining sector) in 2015. Our conclusion regarding the comparison of covariates for this variable do not change when we exclude this outlier from the sample.

TABLE 4 Determinants of female board representation

Independent Variable	Dependent Variable		
	0/1FemDir	***#FemDir***	***%FemDir***
	(1)	**(2)**	**(3)**
IndFemDir	0.736***	0.736***	0.080***
	[4.23]	[7.28]	[6.71]
Size	–0.180***	–0.133***	–0.016***
	[–7.65]	[–8.35]	[–8.66]
Lev	0.145	0.257**	0.034***
	[0.91]	[2.43]	[2.64]
*ChSales^*	0.031	–0.002	–0.001
	[0.36]	[–0.82]	[–0.08]
ROA	–0.001	0.001	–0.001
	[–0.26]	[0.07]	[–0.22]
CEOFem	1.764***	1.199***	0.167***
	[4.90]	[6.33]	[6.74]
%IndepDir	–0.419***	–0.339***	–0.043***
	[–2.88]	[–3.37]	[–3.76]
BoardSize	0.148***	0.131***	0.002
	[6.60]	[8.58]	[1.40]
CEOdual	1.309***	0.681***	0.082***
	[3.11]	[3.28]	[3.02]
StratInd	–0.178	0.075	0.004
	[–0.95]	[0.70]	[0.31]
Polit	–0.164	–0.104	–0.006
	[–1.61]	[–1.41]	[–0.79]
StateOwn	–0.003	–0.002	–0.001*
	[–1.24]	[–1.53]	[–1.74]
Year fixed effects	Excluded	Included	Included
Industry fixed effects	Included	Included	Included
N	1,562	1,562	1,562
Pseudo/Adj R-sq	0.20	0.30	0.31

Note. Table 4 reports the results of a probit model (column 1) and an OLS estimation with White standard errors (columns 2 and 3). The *z*/*t*-statistics are reported in brackets. Variable definitions are provided in Appendix B. The *, **, and *** denote statistical significance at 10, 5, and 1 percent levels (two-tailed), respectively. *ChSales^* = *ChSales*/1,000.

TABLE 5 Female board representation and CEO turnover–performance sensitivity.

Independent Variable	Dependent Variable: *CEOTurnover*					
	ROA (raw)			ROA (industry–year adjusted)		
	0/1FemDir	***#FemDir***	***%FemDir***	***0/1FemDir***	***#FemDir***	***%FemDir***
ROA	–0.005***	–0.004***	–0.004***	–0.005***	–0.003***	–0.003***
	[–3.69]	[–3.16]	[–3.13]	[–3.48]	[–2.83]	[–2.58]
FEMDIR	0.004	0.007	0.040	0.046*	0.022*	0.169*
	[0.15]	[0.56]	[0.37]	[1.92]	[1.87]	[1.72]
ROA×FEMDIR	0.007***	0.003***	0.023***	0.006***	0.002***	0.015**
	[3.32]	[3.26]	[3.16]	[3.09]	[2.83]	[2.39]
CEOtenure	–0.007**	–0.007**	–0.007**	–0.007**	–0.007**	–0.007**
	[–2.32]	[–2.26]	[–2.25]	[–2.31]	[–2.24]	[–2.22]
*CEOAge^*	0.119	0.108	0.106	0.097	0.088	0.081
	[0.82]	[0.75]	[0.74]	[0.67]	[0.61]	[0.56]
CEOdual	–0.129	–0.118	–0.116	–0.124	–0.120	–0.119
	[–1.50]	[–1.39]	[–1.36]	[–1.44]	[–1.42]	[–1.40]
CEOage64	1.113*	0.117**	0.116**	0.115*	0.120**	0.120**
	[1.92]	[1.99]	[1.99]	[1.95]	[2.02]	[2.04]
CEOFem	–0.017	–0.029	–0.031	–0.019	–0.030	–0.033
	[–0.27]	[–0.44]	[–0.46]	[–0.31]	[–0.45]	[–0.49]
MB	–0.004	–0.004	–0.003	–0.005	–0.004	–0.004
	[–0.37]	[–0.37]	[–0.33]	[–0.46]	[–0.44]	[–0.40]
Size	–0.006	–0.006	–0.007	–0.007	–0.007	–0.007
	[–1.02]	[–0.95]	[–1.05]	[–1.16]	[–1.14]	[–1.15]
*ChSales^*	–0.001***	–0.001**	–0.001***	–0.001***	–0.001**	–0.001***
	[–3.75]	[–2.49]	[–2.83]	[–3.64]	[–2.47]	[–2.68]
BoardSize	0.001	–0.001	0.002	0.001	0.001	0.003
	[0.02]	[–0.09]	[0.38]	[0.15]	[0.06]	[0.52]
%IndepDir	0.061	0.061	0.062	0.057	0.059	0.058
	[1.36]	[1.37]	[1.39]	[1.29]	[1.31]	[1.29]
DirShare	–0.002***	–0.002***	–0.002***	–0.003***	–0.002***	–0.002***
	[–3.26]	[–3.16]	[–3.25]	[–3.35]	[–3.15]	[–3.29]
StratInd	0.025	0.026	0.026	0.027	0.028	0.027
	[0.49]	[0.51]	[0.50]	[0.51]	[0.55]	[0.53]
Polit	0.035	0.036	0.035	0.035	0.036	0.034
	[0.09]	[1.11]	[1.08]	[1.10]	[0.13]	[1.07]
StateOwn	–0.001**	–0.001**	–0.001**	–0.001**	–0.001**	–0.001**
	[–2.52]	[–2.47]	[–2.46]	[–2.46]	[–2.40]	[–2.36]
Year fixed effects	Included	Included	Included	Included	Included	Included
Industry fixed effects	Included	Included	Included	Included	Included	Included
N	1,562	1,562	1,562	1,562	1,562	1,562
Adj R-sq	0.036	0.035	0.034	0.034	0.033	0.031

Note. Table 5 reports the results from estimating the CEO turnover–performance sensitivity model using a linear probability model with White standard errors. Dependent variable: *CEOTurnover*=1 if a CEO is replaced in year $t + 1$; all independent variables are one year lagged. The *t*-statistics are reported in brackets. Variable definitions are provided in Appendix B. The *, **, and *** denote statistical significance at 10, 5, and 1 percent levels (two-tailed), respectively. *ChSales^* = *ChSales*/1,000; *CEOAge^*=*CEOAge*/100.

TABLE 6 Test of firm value after the decision made by female boards to not dismiss an underperforming CEO

Independent Variable	Dependent Variable: *Q*		
	0/1FemDir	***#FemDir***	***%FemDir***
Underperf	–0.018	–0.060	–0.041
	[–0.24]	[–0.95]	[–0.59]
Stay	0.083	0.047	0.076
	[1.30]	[0.85]	[1.27]
FEMDIR	0.021	–0.001	0.149
	[0.24]	[–0.01]	[0.24]
Underperf×Stay	–0.159*	–0.099	–0.130*
	[–0.91]	[–1.38]	[–1.77]
Stay×FEMDIR	–0.097	–0.021	–0.441
	[–1.04]	[–0.55]	[–0.69]
FEMDIR×Underperf	–0.153	–0.046	–0.581
	[–1.47]	[–1.12]	[–0.89]
Underperf×Stay×FEMDIR	0.268**	0.096**	1.143*
	[2.31]	[1.98]	[1.67]
StratInd	–0.281***	–0.282***	–0.284***
	[–3.73]	[–3.71]	[–3.73]
Size	–0.049***	–0.048***	–0.048***
	[–4.00]	[–3.89]	[–4.09]
*ChSales^*	–0.008***	–0.008***	–0.008***
	[–5.61]	[–5.97]	[–5.93]
Lev	0.787***	0.789***	0.790***
	[13.08]	[13.08]	[13.05]
BoardSize	0.017**	0.015**	0.015**
	[2.41]	[2.10]	[2.18]
CEOAge	–0.002	–0.002	–0.002
	[–1.09]	[–1.12]	[–1.16]
CL	0.043	0.050	0.050
	[1.14]	[1.33]	[1.34]
London	0.178***	0.176***	0.174***
	[3.63]	[3.59]	[3.58]
IFRS	0.050	0.051	0.050
	[1.29]	[1.34]	[1.30]
StateOwn	–0.002***	–0.002***	–0.002***
	[–3.83]	[–3.72]	[–3.68]
DirShare	–0.004***	–0.005***	–0.005***
	[–3.24]	[–3.26]	[–3.22]
CEOdual	–0.059	–0.062	–0.074
	[–0.65]	[–0.64]	[–0.64]
Polit	0.002	0.003	0.004
	[0.06]	[0.10]	[0.13]
ROA	0.010***	0.010**	0.010***
	[4.57]	[4.52]	[4.52]
%IndepDir	0.121**	0.129***	0.127**
	[2.51]	[2.63]	[2.54]
Year fixed effects	Included	Included	Included
Industry fixed effects	Included	Included	Included
N	1,220	1,220	1,220
Adj R-sq	0.33	0.33	0.33

Note. Table 6 reports the results from estimating the impact of female directors' decision not to dismiss a poor performing CEO on future firm value. *Underperf*=1 if a company demonstrated performance below the mean sample *ROA* value. *Stay* is an inverse of *CEOTurnover* and is equal to one if a CEO is not dismissed, and zero otherwise. *Underperf* and *FEMDIR* are measured in year *t*, *Stay* is measured in year *t* + 1, firm value and control variables are measured in year *t* + 2. The model is estimated using OLS with White standard errors. The *t*-statistics are reported in brackets. Variable definitions are provided in Appendix B. The *, **, and *** denote statistical significance at 10, 5, and 1 percent levels (two-tailed), respectively. *ChSales^* = *ChSales*/1,000.

TABLE 7 Heckman correction: Using global financial crisis (GFC) to generate exogenous variation in female representation on boards

Panel A: The determinants of female board representation using GFC as an exclusion instrument.

Independent Variable	Dependent Variable		
	0/1FemDir	***#FemDir***	***%FemDir***
	(1)	**(2)**	**(3)**
GFC	0.287***	0.207***	0.027***
	[3.36]	[3.51]	[4.09]
Size	–0.204***	–0.163***	–0.020***
	[–8.93]	[–10.33]	[–10.49]
Lev	0.071	0.146	0.023*
	[0.46]	[1.34]	[1.70]
*ChSales^*	0.031	–0.001	0.001
	[0.33]	[–0.63]	[0.46]
ROA	0.001	0.001	–0.001
	[1.18]	[0.10]	[–0.22]
CEOFem	1.806***	1.310***	0.179***
	[5.19]	[6.49]	[7.12]
%IndepDir	–0.416***	–0.321***	–0.041***
	[–2.87]	[–3.11]	[–3.48]
BoardSize	0.164***	0.153***	0.005***
	[7.39]	[9.77]	[2.80]
CEOdual	1.360***	0.687***	0.082***
	[3.24]	[3.23]	[2.98]
StratInd	–0.509***	–0.236**	–0.030**
	[–2.94]	[–2.38]	[–2.31]
Polit	–0.167	–0.137*	–0.010
	[–1.64]	[–1.84]	[–1.27]
StateOwn	–0.002	–0.002	–0.001
	[–1.10]	[–1.28]	[–1.49]
Industry fixed effects	Included	Included	Included
N	1,562	1,562	1,562
Pseudo/Adj R-sq	0.20	0.28	0.29

Panel B: Second-stage estimation for H1 with inverse Mills ratio computed based on GFC as an exclusion instrument

Independent Variable	Dependent Variable: ***CEOTurnover***					
	ROA (raw)			**ROA (industry–year adjusted)**		
	0/1FemDir	***#FemDir***	***%FemDir***	***0/1FemDir***	***#FemDir***	***%FemDir***
InverseMills	0.118	0.087	0.091	0.105	0.074	0.072
	[1.02]	[0.75]	[0.78]	[0.90]	[0.63]	[0.62]
ROA	–0.005***	–0.004***	–0.004***	–0.005***	–0.003***	–0.003***
	[–3.75]	[–3.21]	[–3.19]	[–3.51]	[–2.83]	[–2.58]
FEMDIR	0.008	0.008	0.045	0.049**	0.022*	0.173*
	[0.27]	[0.61]	[0.42]	[2.03]	[1.91]	[1.76]
ROA×FEMDIR	0.007***	0.003***	0.023***	0.006***	0.002***	0.015**
	[3.35]	[3.26]	[3.17]	[3.11]	[2.83]	[2.39]
Controls	Included	Included	Included	Included	Included	Included

Year fixed effects	Included	Included	Included	Included	Included	Included
Industry fixed effects	Included	Included	Included	Included	Included	Included
N	1,562	1,562	1,562	1,562	1,562	1,562
Adj R-sq	0.036	0.035	0.034	0.034	0.032	0.031

Panel C: Second-stage estimation for H2 with inverse Mills ratio computed based on GFC as an exclusion instrument

Independent Variable	Dependent Variable: *Q*		
	0/1FemDir	***#FemDir***	***%FemDir***
InverseMills	0.068	0.098	0.092
	[0.79]	[0.13]	[1.08]
Underperf	–0.014	–0.053	–0.036
	[–0.19]	[–0.85]	[–0.51]
Stay	0.082	0.047	0.075
	[1.28]	[0.85]	[1.26]
FEMDIR	0.023	0.001	0.154
	[0.26]	[0.03]	[0.25]
Underperf×Stay	–0.160*	–0.104	–0.133*
	[–1.92]	[–1.45]	[–1.80]
Stay×FEMDIR	–0.091	–0.018	–0.405
	[–1.00]	[–0.46]	[–0.65]
FEMDIR×Underperf	–0.153	–0.046	–0.578
	[–1.47]	[–1.14]	[–0.89]
Underperf×Stay×FEMDIR	0.264**	0.096**	1.140*
	[2.29]	[1.98]	[1.68]
Controls	Included	Included	Included
Year fixed effects	Included	Included	Included
Industry fixed effects	Included	Included	Included
N	1,220	1,220	1,220
Adj R-sq	0.33	0.33	0.33

Panel D: Firm value after the decision not to dismiss a CEO when performance is poor (H2), partitioned by GFC period

Independent Variable	Dependent Variable: *Q*					
	0/1FemDir		***#FemDir***		***%FemDir***	
	***GFC* =0**	***GFC* =1**	***GFC* =0**	***GFC* =1**	***GFC* =0**	***GFC* =1**
Underperf	0.018	–0.042	0.054	–0.112*	0.061	–0.090
	[0.11]	[–0.52]	[0.39]	[–1.68]	[0.43]	[–1.18]
Stay	–0.011	0.090	–0.002	0.049	–0.006	0.083
	[–0.08]	[1.26]	[–0.02]	[0.80]	[–0.06]	[1.22]
FEMDIR	0.021	0.068	0.034	0.019	0.385	0.334
	[0.147]	[0.65]	[0.54]	[0.46]	[0.66]	[0.45]
Underperf×*Stay*	0.005	–0.133	–0.006	–0.062	–0.001	–0.099
	[0.03]	[–1.47]	[–0.03]	[–0.80]	[–0.01]	[–1.22]
Stay×*FEMDIR*	–0.026	–0.141	–0.018	–0.043	–0.119	–0.673
	[–0.17]	[–1.27]	[–0.20]	[–0.94]	[–0.15]	[–0.91]
FEMDIR×*Underperf*	–0.166	–0.210*	–0.112	–0.056	–1.244	–0.669
	[–0.89]	[–1.71]	[–1.49]	[–1.16]	[–1.62]	[–0.87]
Underperf×*Stay*×*FEMDIR*	0.153	0.281**	0.072	0.100*	0.722	1.206
	[0.70]	[2.08]	[0.70]	[1.82]	[0.74]	[1.52]
Controls	Included	Included	Included	Included	Included	Included
Industry fixed effects	Included	Included	Included	Included	Included	Included
N	256	964	256	964	256	964
Adj R-sq	0.14	0.39	0.15	0.39	0.14	0.39

Note. Table 7 reports the results from the additional analysis where we use the global financial crisis (*GFC*) as an exogenous shock to patience in the boardroom. In Panel A, we re-estimate the selection model using *GFC* as an exclusion restriction. In Panels B and C, we report the second-stage results of estimating Models 1 and 2, respectively, controlling for inverse Mills ratio calculated based on the results of column 1 of Panel A. In Panel D, we estimate Model 2 by partitioning the sample based on the pre- and post-GFC period. Variable definitions are provided in Appendix B. Control variables follow Models 1 and 2 specifications. The *, **, and *** denote statistical significance at 10, 5, and 1 percent levels (two-tailed), respectively.

TABLE 8 Cross-sectional tests

Panel A: Partitioned sample analysis based on state ownership

Independent Variable	Dependent Variable: *CEOTurnover*					
	ROA (raw)			ROA (industry–year adjusted)		
	0/1FemDir	*#FemDir*	*%FemDir*	*0/1FemDir*	*#FemDir*	*%FemDir*
***StateOwn*=0**						
ROA	–0.006***	–0.004***	–0.004***	–0.005***	–0.004**	–0.004**
	[–3.22]	[–2.78]	[–2.83]	[–2.95]	[–2.56]	[–2.52]
FEMDIR	0.003	0.002	0.035	0.051	0.015	0.148
	[0.08]	[0.12]	[0.27]	[1.44]	[0.96]	[1.18]
ROA×FEMDIR	0.007***	0.002**	0.021**	0.005**	0.002*	0.012*
	[2.68]	[2.55]	[2.51]	[2.22]	[1.91]	[1.78]
Controls	Included	Included	Included	Included	Included	Included
Year fixed effects	Included	Included	Included	Included	Included	Included
Industry fixed effects	Included	Included	Included	Included	Included	Included
N	806	806	806	806	806	806
Adj R-sq	0.049	0.044	0.045	0.045	0.041	0.041
***StateOwn* >0**						
ROA	–0.004*	–0.004	–0.004	–0.005**	–0.004	–0.003
	[–1.81]	[–1.61]	[–1.48]	[–2.05]	[–1.58]	[–1.20]
FEMDIR	0.034	0.028	0.239	0.063*	0.042**	0.361**
	[0.83]	[1.50]	[1.27]	[1.82]	[2.45]	[2.12]
ROA×FEMDIR	0.005	0.003*	0.022	0.007*	0.003*	0.019
	[1.60]	[1.74]	[1.55]	[1.90]	[1.74]	[1.22]
Controls	Included	Included	Included	Included	Included	Included
Year fixed effects	Included	Included	Included	Included	Included	Included
Industry fixed effects	Included	Included	Included	Included	Included	Included
N	756	756	756	756	756	756
Adj R-sq	0.019	0.024	0.021	0.020	0.024	0.020

Note. Panel A of Table 8 reports the results of partitioned sample analysis, based on State Ownership, of estimating the CEO turnover–performance sensitivity model using a linear probability model with White standard errors. Dependent variable: *CEOTurnover*=1 if a CEO is replaced in year $t + 1$; all independent variables are one year lagged. The *t*-statistics are reported in brackets. Variable definitions are provided in Appendix B. Control variables follow Model 1 specification. The *, **, and *** denote statistical significance at 10, 5, and 1 percent levels (two-tailed), respectively.

Panel B: Partitioned sample analysis based on political connection

Independent Variable	Dependent Variable: *CEOTurnover*					
	ROA (raw)			ROA (industry–year adjusted)		
	0/1FemDir	***#FemDir***	***%FemDir***	***0/1FemDir***	***#FemDir***	***%FemDir***
***Polit* =0**						
ROA	–0.006***	–0.005***	–0.005***	–0.005***	–0.004***	–0.004***
	[–3.57]	[–3.33]	[–3.41]	[–3.38]	[–3.13]	[–3.14]
FEMDIR	0.008	0.005	0.019	0.049	0.019	0.149
	[0.22]	[0.35]	[0.16]	[1.57]	[1.40]	[1.35]
ROA×FEMDIR	0.006***	0.003***	0.024***	0.006**	0.002***	0.017***
	[2.89]	[3.10]	[3.14]	[2.56]	[2.65]	[2.61]
Controls	Included	Included	Included	Included	Included	Included
Year fixed effects	Included	Included	Included	Included	Included	Included
Industry fixed effects	Included	Included	Included	Included	Included	Included
N	1,098	1,098	1,098	1,098	1,098	1,098
Adj R-sq	0.038	0.037	0.037	0.036	0.034	0.034
***Polit* =1**						
ROA	–0.003	–0.002	–0.002	–0.003	–0.001	–0.001
	[–1.03]	[–0.64]	[–0.51]	[–1.04]	[–0.40]	[–0.08]
FEMDIR	–0.002	0.019	0.179	0.051	0.039*	0.348
	[–0.04]	[0.73]	[0.64]	[1.24]	[1.75]	[1.47]
ROA×FEMDIR	0.008	0.003	0.027	0.010*	0.004	0.023
	[1.61]	[1.24]	[0.99]	[1.88]	[1.22]	[0.75]
Controls	Included	Included	Included	Included	Included	Included
Year fixed effects	Included	Included	Included	Included	Included	Included
Industry fixed effects	Included	Included	Included	Included	Included	Included
N	464	464	464	464	464	464
Adj R-sq	0.016	0.018	0.015	0.019	0.019	0.015

Note. Panel B of Table 8 reports the results of partitioned sample analysis, based on Political Connection, of estimating the CEO turnover–performance sensitivity model using a linear probability model with White standard errors. Dependent variable: *CEOTurnover*=1 if a CEO is replaced in year $t + 1$; all independent variables are one year lagged. The *t*-statistics are reported in brackets. Variable definitions are provided in Appendix B. Control variables follow Model 1 specification. The *, **, and *** denote statistical significance at 10, 5, and 1 percent levels (two-tailed), respectively.

TABLE 9 Board meetings after the retention decision

Independent Variable	Dependent Variable: *#Meeting*		
	0/1FemDir	***#FemDir***	***%FemDir***
Underperf	0.280*	0.201*	0.228*
	[1.95]	[1.71]	[1.92]
Stay	–0.035	–0.034	–0.010
	[–0.30]	[–0.35]	[–0.10]
FEMDIR	0.255**	0.141***	1.558***
	[1.96]	[2.65]	[2.81]
Underperf×Stay	–0.314**	–0.211	–0.268**
	[–2.00]	[–1.61]	[–2.05]
Stay×FEMDIR	0.024	0.014	–0.259
	[0.16]	[0.23]	[–0.42]
FEMDIR×Underperf	–0.474***	–0.190***	–2.136***
	[–2.76]	[–2.91]	[–3.19]
Underperf×Stay×FEMDIR	0.406**	0.135*	1.973**
	[2.07]	[1.71]	[2.54]
StratInd	0.166	0.175	0.183
	[1.35]	[1.40]	[1.46]
Size	0.142***	0.146***	0.146***
	[7.44]	[7.68]	[7.62]
*ChSales^*	–0.001***	–0.001***	–0.001***
	[–3.47]	[–3.49]	[–3.33]
Lev	0.236**	0.239**	0.236**
	[2.23]	[2.30]	[2.25]
BoardSize	–0.029**	–0.030**	–0.020
	[–2.05]	[–2.14]	[–1.50]
CEOAge	0.009***	0.009***	0.010***
	[3.41]	[3.44]	[3.53]
CL	0.035	0.035	0.026
	[0.47]	[0.46]	[0.35]
London	–0.163*	–0.173*	–0.169*
	[–1.81]	[–1.91]	[–1.87]
IFRS	–0.032	–0.036	–0.033
	[–0.52]	[–0.57]	[–0.53]
StateOwn	0.001	0.002	0.002*
	[1.42]	[1.56]	[1.75]
DirShare	–0.005**	–0.004**	–0.005**
	[–2.48]	[–2.10]	[–2.23]
CEOdual	–0.186	–0.232*	–0.263**
	[–1.31]	[–1.85]	[–2.17]
Polit	–0.058	–0.060	–0.063
	[–0.98]	[–1.00]	[–1.05]
ROA	0.005**	0.005*	0.005*
	[1.99]	[1.92]	[1.93]
%IndepDir	–0.076	–0.071	–0.071
	[–1.05]	[–0.98]	[–0.98]
Returns	0.009	0.012	0.010
	[0.39]	[0.52]	[0.39]
MB	–0.042*	–0.046*	–0.046**
	[–1.76]	[–1.92]	[–1.96]
Year fixed effects	Included	Included	Included

Independent Variable	Dependent Variable: *#Meeting*		
	0/1FemDir	***#FemDir***	***%FemDir***
Industry fixed effects	Included	Included	Included
N	865	865	865
Adj R–sq	0.24	0.24	0.25

Note. Table 9 reports the results from estimating the number board meetings after CEO retention decisions. *Underperf*=1 if a company demonstrated performance below the mean sample *ROA* value. *Stay* is an inverse of *CEOTurnover* and is equal to one if a CEO is not dismissed, and zero otherwise. *Underperf* and *FEMDIR* are measured in year *t*, *Stay* is measured in year *t* + 1, the number of board meetings and control variables are measured in year *t* + 2. The model is estimated using OLS with White standard errors. The *t*-statistics are reported in brackets. Variable definitions are provided in Appendix B. The *, **, and *** denote statistical significance at 10, 5, and 1 percent levels (two-tailed), respectively. *ChSales^* = *ChSale*s/1,000.

TABLE 10 CEO turnover–performance sensitivity estimation using stock returns as alternative measures of firm performance

Independent Variable	Dependent Variable: *CEOTurnover*		
	0/1FemDir	***#FemiDir***	***%FemDir***
FEMDIR	0.045*	0.013	0.094
	[1.71]	[1.09]	[0.89]
IndustryReturns	0.003	–0.013	–0.013
	[0.14]	[–0.59]	[–0.58]
IndustryReturns × *FEMDIR*	0.002	0.018	0.158
	[0.71]	[1.08]	[1.09]
AbnormalReturns	–0.043***	–0.035**	–0.035***
	[–2.85]	[–2.55]	[–2.65]
AbnormalReturns ×*FEMDIR*	0.042**	0.018*	0.154*
	[2.10]	[1.65]	[1.71]
Controls	Included	Included	Included
Year fixed effects	Included	Included	Included
Industry fixed effects	Included	Included	Included
N	1,435	1,435	1,435
Adj R-sq	0.022	0.021	0.022

Note. Table 10 reports the results from estimating the CEO turnover–performance sensitivity model using a linear probability model with White standard errors. Dependent variable: *CEOTurnover*=1 if a CEO is replaced in year $t + 1$; all independent variables are one year lagged. The *t*-statistics are reported in brackets. *AbnormalReturns* is the residual from a sample wide regression predicting a firm's stock returns against an industry return measure, while *IndustryReturns* is the predicted value from this regression (Fee et al. 2018). Other variable definitions are provided in Appendix B. Control variables follow Model 1 specification. The *, **, and *** denote statistical significance at 10, 5, and 1 percent levels (two-tailed), respectively.

TABLE 11 Logistic regression of CEO turnover

Independent Variable	Dependent Variable: *CEOTurnover*					
	ROA (raw)			ROA (industry–year adjusted)		
	0/1FemDir	***#FemDir***	***%FemDir***	***0/1FemDir***	***#FemDir***	***%FemDir***
ROA	–0.037***	–0.027***	–0.027***	–0.036***	–0.023**	–0.021**
	[–3.27]	[–2.84]	[–2.83]	[–3.03]	[–2.45]	[–2.28]
FEMDIR	0.024	0.026	0.135	0.307**	0.119*	0.960*
	[0.14]	[0.35]	[0.21]	[2.01]	[1.78]	[1.66]
ROA×FEMDIR	0.046***	0.017***	0.144***	0.044***	0.013**	0.099**
	[3.33]	[2.80]	[2.80]	[3.04]	[2.36]	[2.16]
Controls	Included	Included	Included	Included	Included	Included
Year fixed effects	Included	Included	Included	Included	Included	Included
Industry fixed effects	Included	Included	Included	Included	Included	Included
N	1,562	1,562	1,562	1,562	1,562	1,562
Pseudo R-sq	0.064	0.062	0.062	0.064	0.060	0.059

Note. Table 11 reports the results from estimating the CEO turnover–performance sensitivity model using a logistic regression model. Dependent variable: *CEOTurnover*=1 if a CEO is replaced in year $t + 1$; all independent variables are one year lagged. The *z*-statistics are reported in brackets. Variable definitions are provided in Appendix B. Control variables follow Model 1 specification. The *, **, and *** denote statistical significance at 10, 5, and 1 percent levels (two-tailed), respectively.

APPENDIX A: Technical detail of data collection

Our initial sample consists of 207 active and 47 inactive firms covered by Thomson Reuters' Datastream on the Moscow Exchange on August 24, 2017. Datastream's methodology regarding the composition of equity lists for the Russian market is rather complex. The primary list of stocks, MICEX-RTS, includes all companies that were listed on MICEX prior to its merger with RTS in 2011 and all firms listed on the joint Moscow Exchange after the merger. The RTS list consists of public companies that were listed on RTS Classica, RTS Standard, and RTS order-driven platforms prior to 2011 and stocks registered with the RTS Board prior to and after the merger. The RTS Classica-listed firms were Russian market blue chips and were dual listed on both RTS and MICEX prior to the merger. After the merger, these companies' RTS trading codes were dropped but their MICEX codes were retained and are already included in Datastream's main MICEX-RTS (Moscow Exchange) list. Firms that were listed on RTS Standard and/or RTS order-driven platforms were either dual listed on MICEX (and followed the same pattern as RTS Classica's firms) or gradually migrated from RTS to the joint MICEX–RTS (Moscow Exchange) after the merger. Importantly, RTS board-traded firms are not considered public companies (Civil Law of the Russian Federation article 66.3 2014; Federal Law on the Securities Issuance Process 1996 with amendments) and we therefore omit them from the study. A total of 25% of Russian public firms were either missing from or had a misspecified status in Datastream before August 24, 2017; the discrepancy was resolved by August 24, 2017.

Moscow Exchange records showed 211 actively traded companies on December 31, 2016. Four micro firms had short-lived listings and were never picked up by Datastream. Finally, four companies that are controlled by Russian residents and are widely known as Russian businesses are excluded from our sample (and Datastream's Russian equities list) because they are incorporated and have a primary listing overseas, namely, Rusal (Hong Kong), Promsvyazbank and Polymetal (United Kingdom), and Yandex (United States). Since 2015, such companies have been classified as foreign-controlled entities rather than Russian companies (Federal Laws No. 150-ФЗ, 2015, and No. 32-ФЗ, 2016). The company Lenzoloto generated an outlier value in changes of sales in 2015 due to a major corporate event. We checked the robustness of our findings by removing this observation and obtained consistent results.

We manually collected information regarding corporate governance and CEO characteristics from both quarterly and annual reports. The quarterly statements are exclusively in the Russian language, but the annual reports can be found in English if a company chose to provide a translation. Although IFRS became mandatory in 2012, a significant portion of our sample firms voluntarily adopted these standards, as well as US Generally Accepted Accounting Principles (US GAAP), prior to this date. US GAAP reporting entities were not numerous and gradually switched to IFRS by 2015.

By Central Bank of Russia's Law on Disclosure Requirements for Public Entities No. 454-П 2014, Russian public companies are required to publish reports and financial statements on www.e-disclosure.ru. This was an initiative of the Central Bank of Russia, the main financial regulator, which endorses the public disclosure of information by public firms is relatively recent. Financial statements and reports prior to 2011 are largely missing from this website, while Russian companies' listings in Datastream date back to 1997.

The early year observations represent only 4.8% of our broad sample and are more likely subject to data errors. These early years often contained outliers of financial variables and were characterized as volatile data. Additionally, these early years represent the formation of market economy in Russia, when major privatization processes were finalized. It is likely that at least some public firms' CEOs were appointed by inertia, on the basis of their prior leadership position during the command system, as opposed to on the basis of their performance evaluation (McCarthy and Puffer 2008). In support of this argument, we find that in the early years 1999–2005, CEO tenures were excessively long and, in some cases, originated from the Soviet era. Lastly, the first official corporate governance code was adopted in 2002 in Russia, which further justifies exclusion of early years from our investigation period.

APPENDIX B: Variable definitions

Panel A: Corporate governance variable (Source: quarterly, annual reports and financial statements available from SKRIN)

Variable	Description
FEMDIR	An indicator variable equal to one if a firm has at least one female director on the board, and zero otherwise (*0/1FemDir*); the number of female directors on the board (*#FemDir*); the fraction of female directors on the board (*%FemDir*)
IndFemDir	The average female board representation in a firm's industry in each year, with industries identified following Thomson Reuters Business Classification (TRBC)
BoardSize	The total number of directors on the board of directors
CEOFem	An indicator variable equal to one if a company has a female CEO, and zero otherwise
%IndepDir	The fraction of independent directors on the board
DirShare	The percentage ownership in a company held by all the directors of the board
CEOTurnover	An indicator variable equal to one if a CEO changed between years *t* and *t*+1, and zero otherwise.
CEOtenure	A number of full years an individual served as a CEO; a partial year in the case of the first-year appointment.
Stay	The inverse of *CEOturnover*: An indicator variable equal to one if a CEO was not dismissed, and zero otherwise.
CEOAge	The age of a company's CEO
CEOdual	An indicator variable equal to one if a company's CEO is also a board chairman, and zero otherwise
CEOage64	An indicator variable if a CEO's age is 64 or above.
Polit	An indicator variable equal to one if there is at least one director on the board who has political (governmental) affiliations, and zero otherwise
IFRS	An indicator variable equal to one if a company reports under IFRS or US GAAP, and zero otherwise
London	An indicator variable equal to one if a company is cross-listed in London, and zero otherwise
CL	An indicator variable equal to one if a company is cross-listed overseas on any market, and zero otherwise
StateOwn	A state's ownership in a company
#Meeting	The natural logarithm of the number of board meetings held during the year

Panel B: Other variables (Source: Datastream)

Variable	Description
ROA	Return on assets computed as the net income divided by average total assets
ROA-adjusted	Return on assets adjusted by annual industry mean ROA
MB	The natural logarithm of a market-to-book value of equity
Q	The natural logarithm of {[Total assets + Market value of equity – Book value of equity]/Total assets}
Size	The natural logarithm of total assets
Lev	Leverage, computed as total debt divided by total assets
ChSales	A growth proxy, computed as a percentage change in net sales over the most recent two years
Underperf	An indicator variable equal to one if a company's performance is below the mean *ROA* of the full sample, and zero otherwise
Industry	A set of indicator variables created for each industry according to Datastream: aerospace and defence, automobiles and parts, banks, beverages, chemicals, construction and materials, electricity, financial services and non-life insurance, fixed line and mobile telecommunications, food and drug retailers, food producers, forestry and paper, gas, water and multi utilities, general industrials and retailers, industrial engineering and transportation, industrial metals and mining, leisure goods, media, mining, oil and gas producers, personal goods, pharmaceuticals, real estate, software and computers, technology hardware and equipment, travel and leisure.
Year	A set of indicator variables created for each year (2006–2015).
StratInd	An indicator variable equal to one if a company operates in one of the strategic (regulated) industries (aerospace and defense, electricity, oil and gas producers, gas, water and multi utilities, mining, industrial transportation, industrial engineering), and zero otherwise