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Firm Value around the World**

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Say on Pay Laws, Executive Compensation, Pay Slice, and Firm Value around the World

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Abstract

Using a sample of about 90,000 observations from 38 countries over the 2001-2012 period, we provide three novel findings regarding say on pay (SoP) laws. First, we find robust evidence that SoP laws reduce CEO pay growth rates at firms. Second, such laws decrease the portion of total top management pay captured by CEOs. Firm values are higher following SoP laws in part because of this reduction in managerial pay inequality. Third, mandatory SoP laws only affect the CEO pay growth rates whereas advisory SoP laws influence various aspects of executive pay policies. These results are robust to instrumental variable estimation and nearest neighbor matching methods.

JEL Classification Codes: G15, G34, G38, M12

Keywords: Executive compensation, binding and advisory say on pay laws, regulations, CEO pay slice, firm valuation, international.

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Say on Pay Laws, Executive Compensation, Pay Slice, and Firm Value around the World

In order to facilitate a closer alignment of shareholders' interests with those of corporate directors and managers, eleven developed countries passed laws to give shareholders direct influence on executive compensation policies (i.e., say on pay –SoP– laws), and several countries are either contemplating or in the process of adopting such laws (e.g., Switzerland and France). While the adoption of SoP laws is becoming widespread across the globe, several important issues about them remain unanswered. First, it is highly debated how effective such laws are in aligning executive pay practices with shareholders' interests. Although one of the main stated purposes of these laws is to curb the seemingly high levels of CEO pay, existing studies find that SoP laws do not rein in CEO pay (e.g., Ferri and Maber (2013)), leading to the conclusion that these laws are ineffective. However, difficulties in determining an accurate counterfactual within the country of analysis could render any generalizations inappropriate in such single-country studies. Second, the analysis of SoP laws is limited to changes in CEO pay and pay for performance sensitivity, firm value, and voting outcomes. However, there can be unintended effects of such laws on executive pay policies and consequently on firm value.

Another major issue with SoP laws is whether a country should allow shareholders' votes on executive compensation to be binding (as required by Norway and Sweden) or advisory (as in the United States and Australia) for the board of directors in setting pay policies. The debate surrounding the choice between mandatory and advisory SoP laws gained greater momentum when the United Kingdom recently announced its plans to convert from advisory to mandatory SoP laws. Further, the advisory feature of SoP laws has drawn criticism from several activist shareholders in the United States

in the form of lawsuits.² However, as Larcker, McCall, Ormazabal, and Tayan (2012) note, there is no evidence on which of these approaches provides the best response to compensation related problems and what effects they may have on firm value. In this paper, we add to the debate on SoP laws by addressing these questions.

First, we re-examine the effects of SoP laws on CEO pay policies using a large holdout sample of firms from countries without SoP laws and with similar pre-law characteristics to control for any confounding effects of contemporaneous firm and country shocks. We find strong evidence that SoP laws decrease the growth of CEO pay at firms, which is manifested as lower CEO compensation levels compared to the control group of firms in our regression analysis. While the average predicted CEO pay increases by 5.52% for countries that pass SoP laws during the sample period, it increases by 8.03% for the control group. Thus, in contrast to existing single-country studies of SoP laws, we are able to detect this adverse effect of SoP laws on CEO pay growth patterns once a large counterfactual sample is constructed.

Second, we analyze the effects of SoP laws on the share of total managerial pay captured by the CEO and its impact on firm value as unintended consequences of these laws. We find that firms subject to SoP laws reduce the CEO's portion of total top management pay, suggesting that managerial pay inequality decreases within the firm's management team following the adoption of SoP laws. We also test how this quasi-exogenous change in managerial pay gap affects firm value. Managerial pay gap can be an outcome of tournament incentives provided by the board of directors to

² For example, the first set of votes on SoP in the United States were set in 2011 and shareholders in approximately 40 companies failed to garner a majority for the SoP proposals. In 32% of these cases, the companies faced lawsuits brought by shareholders (e.g., Romanchek and Meyer (2013)).

non-CEO executives to induce greater effort (Lazear and Rosen (1981)), or by the dominant position of the CEO within the firm to extract higher pay (e.g., Bebchuk, Cremers, and Peyer (2011)). Our results show that the overall firm value increases following SoP laws and this increase is partly explained by declines in the managerial pay gap around the adoption of SoP laws, consistent with the management entrenchment argument in Bebchuck et al. (2011).

Third, we exploit the cross-country nature of our sample to formally examine the effects of mandatory and advisory SoP laws separately. The most important difference in SoP laws across countries is whether the board of directors has to address shareholder disapproval of executive pay (i.e., mandatory) or not (i.e., advisory). Our results show that the growth of CEO pay declines for both mandatory and advisory SoP laws but the average effect is significantly greater for mandatory laws. Firm values are higher following both types of laws. However, this effect is robust to all alternative estimations and subsamples only for advisory SoP laws. Further, advisory laws have the advantage of decreasing pay growth rates only in poorly performing firms, a greater alignment of pay to realized firm performance, and lower managerial pay inequality that is related to greater firm valuations.

We conduct several robustness tests to ensure the consistency of our results. The adoption of SoP laws may be related to variables that determine executive pay policies. Thus, even when SoP laws have no influence on CEO compensation and firm valuation, we may erroneously attribute differential changes in CEO pay policies and firm valuation between firms subject to SoP laws and the control group of firms to the passage of SoP laws. To overcome this concern, we instrument the passage of SoP laws by distributing the likelihood of SoP law passage quasi-randomly across countries with similar political environments. Studies that analyze the determinants of regulatory changes find that the partisan composition of the ruling government is associated with the likelihood of reforms (e.g., Kroszner and Strahan (1999)). In addition, we undertake a nearest neighbor matching strategy where

we match the firms subject to SoP laws with other firms in terms of industry-adjusted firm performance, CEO compensation levels, firm size, and English legal origin as of the year prior to the adoption of SoP laws. Such an alternative control sample ensures our results are not driven by time-varying differences in the pre-law period between the firms subject to and not subject to SoP laws. Our results are robust to these tests as well as to various additional checks.

Our paper contributes in several important ways to the evidence on the impact of SoP laws on compensation policies and firm valuation, and in general to the literature on executive compensation and regulatory changes. We provide the first empirical evidence on the managerial pay inequality and related firm valuation effects of SoP laws. This analysis also contributes to the strand of literature on managerial pay gap. Our analysis exploits the staggered adoption of SoP laws as a quasi-exogenous shock to identify the effects of managerial pay gaps on firm valuation. Our findings imply that CEO pay gap partially reflects management entrenchment, consistent with the findings of Bebchuk et al. (2011). Further, we expand the literature on the effects of SoP laws to a cross-country setting, which also allows us to exploit differences across countries in characteristics of the SoP laws. While there is a big debate on the mandatory versus advisory features of SoP laws, there is no evidence on which of these laws are the more effective or desirable. We show that, unlike advisory SoP votes in the United States, mandatory SoP laws are not associated with an improved relation between pay and realized firm performance. Indeed, advisory SoP laws that do not dictate one-size-for-all policies appear to have far reaching effects on executive pay policies and firm valuations relative to the mandatory laws.

In addition, the evidence on the impact of SoP laws on CEO pay, which are limited to individual countries, is thus far inconclusive (e.g., Ferri and Maber (2013)). Unlike previous studies, our dataset allows tests for the effects of SoP laws on executive pay and firm value using plausible counterfactuals formed from countries that have not implemented SoP laws as well as the SoP firms in the pre-law

period. In this aspect, the study that is the most closely related to our paper is by Iliev and Vitanova (2013) who employ a regression discontinuity design to examine changes in CEO pay in U.S. firms around the enactment of SoP laws in the United States. They make use small firms with a public float below \$75 million that were exempted from SoP laws for 2 years in their analysis. While such an identification strategy can also reduce endogeneity concerns, it has three major drawbacks. First, it focuses on small firms for which CEO pay may not be a problem to begin with.³ Thus, the results of the study cannot be generalized to the average firm or to firms with large CEO pay where compensation-related problems are likely more relevant. Second, firms exempted from SoP laws had to adopt them at the end of the second year, causing the stock market reaction and potential changes in executive pay policies to be confounded for the exempted firms compared to non-exempted firms. Finally, regression analyses based on a single country cannot filter out potentially confounding effects of global economic shocks on the decision to pass SoP laws.

Our paper also adds to the rich literature on the relation between shareholder influence and executive compensation, as SoP laws are shareholder empowerment mechanisms that can better align the interests of managers and shareholders. Consistent with the evidence that executive pay is related to the governance environment of firms (e.g., Shivdasani and Yermack (1999), Core, Holthausen, and Larcker (1999), and Bebchuk (2003)), we find that SoP laws reduce the CEO pay growth rates, tighten the link between executive pay and realized firm performance and reduce managerial pay gap. Unlike studies on the effectiveness of firm-level measures of shareholder influence such as shareholder proposals and the associated voting outcomes on governance provisions (e.g., Cai, Garner, and

³ Many studies indeed find that the most important determinant of CEO pay is firm size (e.g., Fernandes, Ferreira, Matos, and Murphy (2013)).

Walkling (2009), Ertimur, Ferri, and Muslu (2011)), we use a country-level change in the ability of shareholders to directly influence managerial compensation policies. Thus, concerns about the impact of selection biases on empirical analysis are mitigated in our study of a country-level change on shareholders' ability to influence compensation policies. Finally, our paper contributes to the nascent group of cross-country studies on executive compensation (e.g., Fernandes et al. (2013), Burns, Minnick, and Starks (2013)).

The rest of the paper is organized as follows. Section 1 provides background information on SoP laws and the related literature. Section 2 presents sample construction and descriptive statistics. Section 3 outlines the main empirical specification and presents results on the effects of SoP laws on CEO compensation policies. Section 4 analyzes changes in managerial pay inequality in relation to SoP laws and Section 5 focuses on firm valuation effects of SoP laws. Section 6 examines the differential effects of mandatory and advisory SoP laws and Section 7 provides robustness checks including instrumental variable and nearest neighbor matching methods. Section 8 concludes.

1. Background on Say on Pay Laws

Say on pay laws provide shareholders with the ability to vote on their firms' compensation policies on a periodical basis. Eleven countries around the world adopted SoP laws with the United Kingdom being the first country to enact them in 2003.⁴ In addition, Switzerland is in the process of adopting binding SoP laws and several other countries are considering whether to adopt SoP laws (e.g.,

⁴ Its initial version was advisory but since October 2013, the Enterprise and Regulatory Reform Act requires forward-looking compensation policies of firms to be subject to a binding vote every 3 years or when the policy changes.

France).⁵ Under the mandatory SoP laws, shareholders' votes on executive pay policies become binding while under advisory SoP laws, firms do not have to revise their pay policies in response to shareholder votes. Of the 11 countries with SoP laws, 6 have advisory SoP laws. The main stated purposes of these laws are to limit the seemingly excessive levels of CEO pay, tighten the link between firm performance and CEO pay, and improve disclosure on executive compensation.

Why do countries adopt such laws on executive pay? Giving shareholders a say on compensation can empower and incentivize boards of directors in their negotiations with CEOs, potentially increasing accountability, linking firm performance to pay more strongly, and reducing pay levels (e.g., Coates (2009), Bebchuk, Friedman, and Friedman (2007), Davis (2007), Bebchuk and Fried (2003, 2005)). Thus, such laws facilitate a closer alignment of shareholders' interests with those of the directors and managers (i.e., a complementary governance mechanism), which is a central tenet of corporate governance thereby providing a disciplining mechanism (e.g., see Yermack (2010)). For example, a Spencer Stuart governance survey in 2013 suggests that the most common topics between firms and their large institutional investors in the United States are say on pay (31%) and CEO compensation (19%). The evidence that CEOs have significant influence over board composition and that the monitoring of the management matters for CEO compensation is consistent with potential benefits of SoP laws (e.g., Shivdasani and Yermack (1999), Bebchuk (2003), Cai et al. (2009), Coles, Daniel, and Naveen (2007), Core et al. (1999)).

⁵ In March 2013, Switzerland voted in favor of the Minder Initiative. The Swiss Federal Council has the task of implementing the constitutional amendments by way of an implementing ordinance within one year. Recently, the Swiss Federal Council announced that the implementing ordinance will come into force 1 January 2014. The new say on pay rules will be integrated into the corporate governance rules of the pending Swiss corporation law. The French government has considered introducing legislation on executive pay. For the French initiatives on SoP regulation, see "French companies adopt 'say on pay' to avert legislation," *Financial Times*, June 16, 2013.

In contrast, SoP laws may lead to suboptimal pay practices (e.g., Bainbridge (2008), Kaplan (2007)).⁶ SoP laws can result in the homogenization of CEO pay packages, forcing boards of directors to adopt one-size-for-all policies that are perceived as best practices by proxy advisors (e.g., Gordon (2009)). Further, corporate boards are likely to have better information on the qualities of the CEO and on the firm's needs and operating environment. Such adverse effects of SoP laws are more likely to occur for mandatory SoP laws where the board of directors has to address shareholder disapproval of executive pay rather than advisory ones that do not impose such legal restrictions. Thus, SoP laws can cause deviation from the optimal executive compensation policies due to shareholder pressure and accordingly reduce firm value.

To date, some limited evidence, mostly focused on the United States and the United Kingdom, shows that shareholders rarely disagree with executive compensation plans presented at annual meetings of firms. For example, Kimbro and Xu (2013) find that in 2012 only 2.7% of the 2,307 firms included in the Russell 3000 index had a majority rejection vote on SoP and 12.1% of firms had a rejection vote greater than 25%. While these low rejection rates might imply that SoP votes are irrelevant to investors, they can be explained by the improved communication between the board of directors and shareholders as a result of SoP laws (e.g., Alissa (2009), Ferri and Maber (2013)). According to the Spencer Stuart governance report in 2013, 58% of S&P 500 firms proactively reached out to large institutional investors with the most common topics being say on pay (31%) and CEO compensation (19%).⁷ Further, some of the effects of SoP laws may come from the strong

⁶ Kaplan (2007) and Gordon (2009) argue that additional shareholder involvement through SoP votes can hinder the effectiveness of the board of directors as some shareholders are not sophisticated enough to evaluate executive compensation policies.

⁷ See http://www.spencerstuart.com/~media/PDF_Files/Research_and_Insight_PDFs/SSBI-2013_01Nov2013.pdf (p. 32).

tendency of corporate boards to avoid negative voting outcomes to minimize damages to their personal reputations and firms' public image, and to reduce lawsuit exposure. Even small differences in director votes can indirectly influence CEO compensation policies through their effect on corporate policies (e.g., Cunat et al. (2012)). These arguments highlight that low rejection rates on SoP votes do not necessarily indicate inattention of shareholders to SoP votes.

How effective are SoP laws in aligning executive pay practices with shareholders' interests? The empirical evidence so far suggests that SoP laws do not have any impact on the level or growth of CEO pay (e.g., Ferri and Maber (2013) and Iliev and Vintanova (2013)), and mixed effects on firm valuation (Cai and Walkling (2011), Larcker, Ormazabal, and Taylor (2011), and Ferri and Maber (2013)).⁸ In this paper, we add to the debate on SoP laws by analyzing the effects of SoP laws on the share of total managerial pay captured by the CEO and their consequence on firm valuation. We also examine the differential effects of binding and advisory SoP laws on CEO pay policies and firm valuation. Further, we re-examine the findings of previous single-country studies in an international context by using a holdout sample of firms not subject to SoP laws and with similar pre-law characteristics to control for any confounding effects of contemporaneous firm and country shocks.

2. Sample construction and variable definitions

We use the S&P's Capital IQ (CIQ) to obtain data on executive compensation around the world.⁹ The CIQ database includes detailed historical data on compensation for senior managers and directors

⁸ See Ferri (2013) for a review of evidence on SoP laws' effects.

⁹ There are two main sources of managerial compensation data for cross-country studies: S&P's Capital IQ (CIQ) and BoardEx. Several studies such as Fernandes et al. (2013) and Ferri and Maber (2013) focus on BoardEx, and others like Balsam, Gordon, Li, and Runesson (2013) and Burns et al. (2013) use CIQ. Our comparison of the two datasets results in favor of CIQ in terms of coverage outside the US and the UK.

for 119 countries. It reports information on total pay as well as a breakdown of its components such as salary, bonus, and equity pay, which is further broken down between restricted stock awards, stock grants, and long term incentive plans in local currency at the individual executive level. We use the end of year exchange rates from the World Development to convert foreign compensation data into \$US. CIQ also provides information on the career tracks of managers, from which firm governance characteristics such as board size and independence, and manager characteristics such as the title, committee membership, and the number of directorships can be identified.

There are about 1.5 million unique observations with non-missing total compensation data for managers and directors between 2001 and 2012 in the CIQ dataset. Since we are interested in the effects of SoP laws on CEO compensation and firm value, we only keep around 205,000 observations with non-missing compensation data where the top executive of the firm is identifiable.¹⁰ We then merge this dataset with Worldscope using CIQ and Thomson Reuters mapping databases that provide links among commonly used firm identifiers. Worldscope is the main source for firm-specific financial characteristics in our tests, and this matching strategy results in around 155,000 observations. However, missing information on variables such as net sales, stock returns, and governance characteristics, and excluding firms with assets less than \$1 million and countries with fewer than 30 observations leads to a regression sample of around 90,000 firm-year observations. Panel A of Table 1 displays the distribution of our regression sample by country and information on the SoP law status of each country. There are 17,609 firms from 38 countries in the final sample.

We construct several variables using CIQ in our analysis. The first one is total CEO pay, defined as

¹⁰ If there is no manager with a title of chief executive officer or CEO, we look for managers with titles such as president, managing director, and general manager in the database. For joint CEOs, we take the average of the respective variables across both managers.

total annual compensation of the CEO, which includes salaries, bonuses, restricted stock and option awards, long-term incentive plans, changes in pension plans, and all other compensation measured in US\$. We also compute two measures of how much of total management pay among the five highest-paid executives is captured by the CEO. The first variable is CEO pay slice (CPS) defined as the percent of total annual compensation of the five highest-paid managers claimed by the CEO as in Bebchuk et al. (2011). A similar measure is pay gap, which is the difference between total CEO pay and the median value of annual compensation of the five highest-paid managers (e.g., Kale, Reis, and Venkateswaran (2009), Burns et al. (2013)). In calculating these variables, we impose the restriction in our dataset that we have total pay figures for at least two executives excluding the CEO. Alternative measures of managerial pay inequality including the entire management teams and the board of directors produce similar results.

Panel B of Table 1 provides summary statistics for our CEO compensation and control variables used in the regression analysis. The average total CEO pay is \$1.09 million, which is lower than the \$2 million average reported in Burns et al. (2013) and \$4.2 million Fernandes et al. (2013). The lower average CEO pay in our sample is mostly due to the larger sample size and a higher proportion of smaller firms than in other studies.¹¹ The average CEO pay in countries that pass SoP laws is \$1.28 million whereas it is \$0.69 million in other countries. Excluding U.S. firms from the SoP country

¹¹ For example, the average sales in our sample are \$1,250 million compared to \$2,662 million in the overall sample of Burns et al. (2013). If we restrict the sample to firms with sales greater than \$100 million, the average CEO pay in our sample goes up to \$1.87 million, which is similar to the average of \$2 million in Burns et al. (2013). Similarly, if we restrict the sample to firms with sales greater than \$800 million, our statistics on CEO pay and firm sales become more comparable to that in Fernandes et al. (2013): The average sales (CEO pay) figures are \$5.8 billion and \$5.7 billion (\$3.3 million and \$4.2 million) in this subsample of our sample and the Fernandes et al. (2013) sample, respectively.

subsample reduces the average CEO pay to \$0.81 million.¹² The average CPS is 48% (which is larger than the average CPS of 35.7% in Bebchuk et al. (2011) for U.S. firms) and the average CEO pay gap is \$0.735 million (which is lower than the weighted average of \$0.859 million in Burns et al. (2013)).

3. Say on Pay Laws and CEO Compensation

In this section we analyze the effects of SoP laws on top executive pay policies. In settings where the CEO is powerful enough to extract rents in the form of compensation and directors are ineffective, SoP laws can empower the board of directors to negotiate better terms with the CEO through the use of explicit shareholder support as leverage (e.g., Bebchuk et al. (2007), Coates (2009)). Further, SoP votes can improve communication between the board of directors and shareholders, and better incentivize directors to act on shareholders' interests due to the increased threat to their (and their firms') reputation from SoP vote failures (e.g., Grundfest (1993), Davis (2007), Alissa (2009), and Ferri and Maber (2013)).

3.1. Empirical approach

In order to examine the impact of SoP laws on CEO compensation policies, we estimate the following panel data regression with firm fixed effects between 2001 and 2012 for 38 countries:

$$\begin{aligned}
 \text{Log}(\text{Total CEO pay})_{it} &= a + \beta * \text{SoP}_{it} + \gamma * \text{Firm performance}_{it-1} + \lambda * \text{SoP}_{it} * \text{Firm performance}_{it-1} \\
 &+ \delta * \text{SoP}_{country_i} * \text{Firm performance}_{it-1} + \delta * \text{firm controls}_{it-1} + \eta * \text{country and industry controls}_{it-1} + \theta * \text{CEO controls}_{it-1} \\
 &+ \mu * \text{year controls}_{it-1} + \varepsilon_{it}
 \end{aligned} \tag{1}$$

¹² CEOs of U.S. firms are paid significantly higher than those in countries (\$1.86 million versus \$0.74 million, respectively). Our results throughout the paper are robust to excluding US firms.

where the dependent variable is the natural logarithm of total CEO pay for firm i in year t , SoP is a dummy variable that equals one for the time period following the staggered passage of SoP laws, if any, and zero otherwise. $SoPcountry$ denotes countries that pass SoP laws during the sample period. $Firm\ performance$ is the industry-adjusted realized stock returns in year $t-1$, $firm\ characteristics$ measure firms' other financial and governance conditions in year $t-1$, $country$ and $industry\ characteristics$ are factors related to the macro economic conditions of the country and the sectoral growth opportunities worldwide measured as of $t-1$. We use the industry-adjusted stock returns as our main measure of firm performance but we also report results using alternative performance measures for robustness. All continuous variables are winsorized at the 1% level. The firm fixed effects specification allows us to fully exploit the panel nature of our dataset and to control for unobserved heterogeneity that is not captured by the time-varying firm characteristics in the empirical specification. The coefficient estimates on β and λ are the difference-in-difference estimators of the impact of SoP laws on the level of pay and the sensitivity of pay to realized firm performance, respectively. The staggered adoption of SoP laws allows us to use the firms from SoP countries in the pre-law period as well as firms from non-SoP countries as the control sample. While the firm characteristics may be different between our treatment and control samples, we later use the nearest neighbor matching method to have firms with similar characteristics and also instrument the SoP law enactment for robustness in Section 7 and find similar results. We compute robust standard errors by clustering at the firm level.

In examining the relation between SoP laws and CEO compensation, we control for other variables that are documented by prior literature to influence CEO compensation. The firm-specific financial variables are leverage and stock return volatility that are used to proxy for firm risk. We include percentage of shares owned by corporate insiders and institutional investors in eq. (1) to control for the firm's ownership structure (e.g., Boone, Field, Karpoff, and Charu (2004) and Hartzell

and Starks (2003)). We also include board independence to proxy for the board of directors' ability to monitor managers (e.g., Dahya, Dimitrov, and McConnell (2008) and Core et al. (1999)). Finally, we control for whether the CEO serves as the chairman of the board (dual CEO dummy) and the number of directorships a CEO holds as a proxy for the entrenchment and ability of the CEO, respectively (e.g., Ferris, Jagannathan, and Pritchard (2003)). GDP growth and the median global industry market-to-book ratio are used to control for the macro economic conditions of the country and sectoral growth opportunities worldwide.

Because we examine the change in CEO compensation before and after SoP law enactment between the firms in countries with and without SoP laws and we consider the within-firm variation in CEO compensation while controlling for year effects, the regression specification in equation (1) does not control for CEO characteristics such as CEO education, age, and tenure. To the extent that such characteristics change substantially between the pre and post periods within each sample firm in excess of firm and year fixed effects, our coefficient estimates on SoP-related variables may be biased. We run regressions where we control for (in Table 2 in the Appendix) and find that our results are robust to these additional controls.

3.2. Results

Results from estimating the regression specification in equation (1) are reported in Table 2. The first column shows that SoP dummy has a negative coefficient that is statistically significant at the one percent level (-0.043, $t = -3.21$), suggesting that SoP laws are associated with lower CEO compensation compared to the control group of the pre-SoP period in countries that pass SoP laws and of firms in countries that never pass such laws during the sample period. This result differs from the prior country-specific studies that find no change in the level of CEO pay around the adoption of

SoP laws (e.g., see Ferri and Maber (2013) for the United Kingdom and Iliev and Vitanova (2013) for the United States). The main difference between our paper and these studies is that we control for any confounding effects of contemporaneous unobserved firm shocks using a large holdout sample of countries that did not implement SoP laws. The coefficient estimate of -0.043 reflects a decrease of 4.2% relative decrease in CEO pay, which translates into \$45,919 decline in average CEO compensation. We also more explicitly analyze the effects of SoP laws on CEO pay for firms with high versus low pay to understand their differential effects on pay. We find that SoP laws reduce CEO pay not for the average firm but for those with relatively high CEO pay in the pre-law period (untabulated).¹³

The coefficient on the interaction term between SoP and realized firm performance is positive and statistically significant (0.049, $t = 5.95$), suggesting that the link between CEO pay and realized performance tightens following the enactment of SoP laws.¹⁴ The positive and significant coefficient on the interaction term also suggests that CEO compensation in firms with poor performance is more severely affected by the passage of SoP laws. For example, for firms in the bottom quartile of industry-adjusted stock returns, total CEO compensation decreases by 7.87% after the passage of SoP laws versus a decrease of 1.52% for firms not subject to SoP laws. On the other hand, SoP laws do not have meaningful effects for firms with strong performance. For firms in the top quartile of industry-adjusted stock returns, total CEO compensation increases by 2.14% after the passage of SoP

¹³ When the SoP observations only include firms in the top quartile of CEO pay in the pre-law period, the coefficient on SoP dummy becomes -0.352 ($t = -15.27$), which corresponds to a 29.5% decrease in pay. When the SoP observations only include firms in the bottom quartile of CEO pay in the pre-law period, the coefficient is 0.310 ($t = 11.82$). These results are consistent with the view that SoP laws are more important in restraining pay levels in firms with relatively high CEO pay.

¹⁴ While it would also be interesting to analyze if the pay for performance changes around the staggered passage of SoP laws, the unavailability of data on CEO equity ownership prevents us from calculating the pay for performance sensitivities in our analysis.

laws compared to 2.26% for firms not subject to SoP laws. This finding is consistent with Ferri and Maber (2013) who document a stronger link between CEO pay and firm performance following the passage of SoP laws in the UK. In the next two columns we use industry-adjusted market-to-book ratio and industry-adjusted ROA as alternative measures of realized firm performance, and continue to find that SoP laws influence CEO compensation in a similar way. In addition, we consider regressions where we include both the current and one-year lagged values of firm performance and their interaction terms with SoP to control for the pre-law environment, and find positive and statistically significant coefficients on all four variables (reported in Table 3 in the Appendix).

When we run separate regressions for the countries that pass SoP laws, we still find a greater sensitivity of CEO pay to firm performance in the post-law period. However, we cannot detect any change in the level of CEO pay associated with SoP laws. In fact, when we estimate equation (1) separately for each country, the pay levels increase in some countries. For example, the coefficient on SoP is 0.408 ($t = 7.18$) in the US. This finding shows that it is crucial to fully control for variation in pay and firm characteristics across countries with and without SoP laws when analyzing the effectiveness of SoP laws on compensation policies. Further, it implies that even though CEO compensation has increased in several SoP countries including the United States and the United Kingdom, the growth in CEO pay is higher in countries that have not passed SoP laws. This effect of SoP laws is shown in figure 1, where we plot the estimated growth in CEO pay in our sample separately for countries with and without SoP laws for every year after we control for firm, industry, and country characteristics.¹⁵ In particular, the growth in CEO pay is much higher for the control group of firms not subject to SoP laws. The average predicted CEO pay increases by 5.52% for countries that pass SoP laws during the

¹⁵ It presents the estimated CEO pay levels over time for SoP and non-SoP observations for a hypothetical firm with \$1 billion in sales and average values of other variables based on the regression specification in column (1) of Table 2.

sample period whereas the increase is 8.03% for the control sample during the same time period. Thus, SoP laws appear to be associated with lower compensation growth, which in turn drives the negative and statistically significant coefficient on SoP reported in Table 2.

Most of our control variables have coefficient estimates consistent with prior research. For example, Table 2 displays positive and statistically significant coefficients on firm performance and firm size consistent with prior research that larger and more profitable firms pay their CEOs more.¹⁶ Overall, Table 2 provides strong empirical evidence that SoP laws are associated with lower CEO pay growth and a greater link between CEO pay and firm performance. These findings are echoed in SEC Commissioner Luis Aguilar's June 2013 speech that firms are addressing issues like eliminating company subsidies for certain tax liabilities of executives and excessive severance packages, and improving performance-based compensation plans. Our findings are in line with the stated objective of SoP laws under the presumption that some CEOs were paid abnormally and relatively disconnected to realized firm performance prior to the enactment of these laws. We examine the firm valuation implications of SoP laws to test this presumption in Section 5.

4. SoP laws and CEO pay inequality

Do the effects of SoP laws extend beyond CEO pay policy? This section tests a specific effect of SoP laws, the pay inequality among top managers. In particular, we examine if SoP laws influence the

¹⁶ Stock return volatility is negatively related to CEO pay as in Fernandes et al. (2013), who argue that such negative correlation can result from the noise induced by CEO's effect on firm performance and thus lower expected pay. A higher percentage of institutional ownership is related to higher CEO pay levels (e.g., Hartzell and Starks (2003)). A greater independent director percentage is positively related to CEO pay, consistent with Core et al. (1999)). CEO pay is lower for top executives who also serve as the chairman of the board but larger for those with a greater number of directorships. The latter finding is consistent with the notion that multiple directorships are indications of superior managerial talent (e.g., Ferris et al. (2003)). GDP growth and industry opportunities are positively related to CEO compensation.

portion of total top management pay captured by the CEO. The descriptive statistics in Panel B of Table 1 show that there is a large pay differential between the pay granted to the CEO and to other 4 senior executives with highest pay. The average CEO captures 48% of total pay of five executives with the highest pay. Several studies show that the CPS has been going up in the United States (Bebchuk and Grinstein (2005)), and we also observe a similar positive trend for most countries in our sample.

The literature suggests that the pay gap amongst the CEO and other senior managers can be due to tournament incentives or CEO power. In the former group of studies, the pay gap is set by the board of directors to provide incentives to non-CEO executives to induce greater effort. In addition, such pay gaps can reflect relative value creation of the CEO and other managers, or the premium for talent (e.g., Lazear and Rosen (1981)). In the latter group, the dominant position of the CEO allows him to extract higher pay at the cost of shareholder wealth (e.g., Bebchuk et al. (2011)). Such pay inequality can influence firm value (e.g., Kale et al. (2009), Bebchuk et al. (2011), Burns et al. (2013)), which we analyze in the next section in conjunction with SoP laws.

To examine the potential effects of SoP laws on the managerial pay differentials, we estimate the following specification with firm fixed effects:

$$\begin{aligned} \text{Log}(\text{CEO pay gap})_{it} = & a' + \beta' * \text{SoP}_{it} + \delta' * \text{firm controls}_{it-1} + \eta' * \text{country and industry controls}_{it-1} + \\ & \theta' * \text{CEO controls}_{it-1} + \mu' * \text{year controls}_{it-1} + \varepsilon'_{it} \end{aligned} \quad (2)$$

where CEO pay gap is the difference between CEO pay and the median value of total annual compensation of the other top four managers. The specification includes the same control variables as in equation (1) and several additional variables that are shown by prior studies to influence the pay differentials among top managers.

These tests employ the pay on senior managers as a control sample in analyzing CEO pay and are thus less subject to any potential endogeneity concerns. They are akin to triple difference estimates, as the firm effects on the CEO pay level are perfectly controlled for: they capture the impact of SoP laws on the difference between CEO compensation and other top managerial compensation before and after the SoP laws and between the countries with and without such laws. However, sample size decreases substantially, as we add the constraint that compensation information on at least two other senior executives is available for each firm.

The results from equation (2) are reported in Table 3. The first column shows that SoP laws are associated with lower pay gap, as the coefficient on SoP is negative and statistically significant at the five percent level (-0.008 , $t = -2.05$). While the pay inequality is not among the stated objectives of SoP laws, this column shows that SoP laws effectively result in lower portion of total management pay being awarded to the CEO. In the next two column, we use the CEO pay slice as an alternative measure of the pay differential among the top managers, defined as the portion of total annual compensation of the five highest-paid managers captured by the CEO. Results from this measure show that the CEO pay inequality narrows following the passage of SoP laws in the subsample of countries that pass such laws. The coefficient on SoP is -0.124 and is highly statistically significant ($t = -4.64$). We also find that the decrease in pay differential is explained by lower CEO pay and no significant change in median senior management pay (untabulated). Further, we estimate equation (2) using Tobit for the CEO pay slice as a robustness check, because it is bounded between 0 and 1, and find similar effects of SoP laws on the CEO pay inequality.

These findings point to an unintended consequence of SoP laws: the pay gap among executives shrinks following the passage of SoP laws that provide shareholders with a stronger voice in executive compensation. A natural question that follows is whether this decrease in pay inequality due to SoP

laws is for good reasons (i.e., reducing entrenched managers' ability to expropriate wealth from shareholders as higher compensation as in Bebchuk et al. (2011)) or for bad reasons (i.e., denying premium for highly-talented CEOs thereby dis-incentivizing them). We analyze this question in the next section along with additional analysis of SoP laws on firm valuation. Our unique experiment of the use of SoP laws to analyze the effects of exogenous changes in CEO pay gap on firm valuation is less likely to suffer from endogeneity concerns pronounced in previous studies of managerial pay gap.

5. SoP laws and Firm Valuation

Accordingly, we test whether SoP laws are associated with changes in firm value around the world where we have a counterfactual control sample and also include a triple interaction effect with respect to CEO pay inequality and the level of CEO pay in the pre-law period. In particular, we estimate the following specification with firm fixed effects:

$$\begin{aligned}
 \text{Log(Industry-adjusted Tobin's } Q)_{it} = & a'' + \beta'' * SoP_{it} + \lambda'' * SoP_{it} * \text{High CEO pay slice}_i + \tau'' * SoP_{it} \\
 & * \text{High CEO pay}_i + \delta'' * \text{firm controls}_{it-1} + \eta'' * \text{country and industry controls}_{it-1} + \theta'' * \text{CEO controls}_{it-1} \\
 & + \mu'' * \text{year controls}_{it-1} + \varepsilon''_{it}
 \end{aligned} \tag{3}$$

where high CEO pay slice is an indicator variable that takes on the value of one for firms whose abnormal CEO pay slice values are greater than the country median values in the period prior to the enactment of SoP laws, and zero otherwise. Abnormal CEO pay slice values are defined as the difference between actual levels of pay slices and their estimated values obtained from fitting the regression specification in column (3) of Table 3. This approach is similar to the classification of firms with relatively high and low CEO pay by Cai and Walking (2011), who find higher firm values within three days surrounding the passage of SoP legislation in the United States for firms with abnormally

high CEO compensation. Similarly, we create an indicator variable to represent firms with abnormal CEO pay in the pre-law period, where abnormal pay is defined as the difference between actual levels of pay and their estimated values obtained from fitting the regression specification in column (1) of Table 2.¹⁷

In general, SoP laws can increase firm value directly by reducing abnormal levels of CEO pay, linking CEO pay to firm performance more strongly, shrinking the pay inequality among top managers, and indirectly through providing a greater dialogue between directors and shareholders and enhanced disclosure on executive compensation. SoP laws can empower boards to more effectively negotiate executive compensation terms using the SoP votes. However, corporate boards are likely to have better information on the abilities of the CEO and on the firm's needs, operating environment, and objectives. Further, SoP laws can lead to the homogenization of CEO pay packages, forcing boards of directors to adopt one-size-for-all suboptimal policies that are perceived as best practices by proxy advisors (e.g., Gordon (2009)). Thus, an alternative hypothesis is that any deviation from the optimal executive compensation policies due to shareholder pressure can reduce firm value.

Having these competing hypotheses in the background, we analyze changes in firm value around the time SoP laws are adopted. We exclude firms in the financial and regulated industries because of their unique business structure, and use the industry-adjusted natural logarithm of Tobin's Q as our proxy for firm value. Table 4 shows results from these regressions. The first column reports a positive and significant coefficient on the SoP law dummy (0.029, $t = 5.37$), suggesting a 2.9% increase firm

¹⁷ Using the country's top quartile instead of the median to identify the high CPS and high CEO pay firms produces similar findings.

value following the adoption of SoP laws. This result is consistent with the findings of several studies on the valuation consequences of SoP laws in the United States (e.g., Cai and Walking (2011)).

The increased alignment of CEO pay to realized firm performance that we document in Table 2 is potentially one of the channels through which SoP laws increase firm value. The decrease in CEO pay, which could be value-increasing under the assumption that CEO pay prior to SoP laws was abnormal, is too small to justify the 2.9% change in Tobin's Q alone. We hypothesize that the decrease in CPS can be an additional way for SoP laws to enhance firm value.

In particular, several studies show that higher pay differentials amongst senior managers are related to lower firm values (e.g., Siegel and Hambrick (2005), Bebchuk et al. (2011)). For example, Bebchuk et al. (2011) document a significant relation between a higher CPS and corporate outcomes such as bad acquisition decisions and lower CEO turnover rates. However, the literature on tournament incentives suggests that reductions in CEO pay gap can reduce firm value (e.g., Kale et al. (2009) and Burns et al. (2013)). We test the valuation implications of CEO pay gap using the staggered adoption of SoP laws across countries as a natural experiment.

The way we test this hypothesis is by identifying firms with relatively high levels of CPS in the pre-SoP period (high CEO pay slice dummy) and to compare changes in firm value around SoP laws between this subsample of firms and the rest with an interaction term between high CEO pay slice and SoP dummies. Consistent with the first set of studies described above, the second column in Table 4 shows a positive and statistically significant coefficient on the interaction term *SoP * high CEO pay slice* (0.023, $t = 2.22$), suggesting that firms with higher levels of CPS prior to the SoP laws experience a larger increase in firm value following the enactment of the laws. Taken together with our previous finding that SoP laws reduce CPS, these results imply that the increase in firm value is partly related to

changes in CPS around the adoption of SoP laws, and that pay inequality among the top management team partially reflects management entrenchment, consistent with Bebchuk et al. (2011).

In equation (3) we also include an interaction term between high CEO pay and SoP dummies to test whether firms with abnormal CEO pay reduce their pay levels following SoP laws' passage. Firms should experience higher valuations following SoP laws to the extent that abnormal pay was due to poor monitoring. The coefficient estimate on this interaction term has no explanatory power, implying that the increase in firm value is not likely due to reductions in abnormal pay. The SoP dummy still has a positive and statistically significant coefficient, suggesting that there are additional channels at work for the SoP laws' positive effect on firm value, which likely reflect the enhanced communication between directors and shareholders and disclosure standards among other factors (e.g., Cunat et al. (2012)).

6. Binding versus Advisory SoP Laws

While 11 countries have passed SoP laws to date, the content of such laws differ substantially across countries. The most important difference in SoP laws in terms of the criticism received by shareholders and the public is whether the board of directors has to address shareholder disapproval on executive pay (binding SoP votes) or not (advisory SoP laws), even though companies are required in both cases to put the compensation policy up for voting on a periodical basis. The inability of shareholders to force the firm to change its executive compensation plans following failed SoP votes has led to shareholder lawsuits. It also caused some shareholders to threaten the re-election of members of boards' compensation committees who have not taken corrective action following failed

SoP votes.¹⁸ Further, the United Kingdom recently announced its plans to make its advisory SoP laws mandatory, and the European Commissioner Michel Barnier recently proposed that the European Union members adopt binding SoP laws. However, there is no evidence on whether the binding or advisory SoP laws provide the best response to compensation related problems, or what differential effects they may have on the firm.

In this section, we provide an empirical comparison between binding and advisory SoP laws in terms of their effect on CEO pay, CEO pay gap, and firm value. For these tests, we replace the SoP dummy with the binding and advisory SoP law dummy variables and re-estimate our relevant specifications in previous tables. The results from these estimations are reported in Table 5. In the first column, we find that while both types of SoP laws reduce total CEO pay, only the non-mandatory laws improve the sensitivity of CEO pay to realized pay. Binding SoP laws appear to target pay reduction for almost every firm whereas the advisory laws have more adverse effects on CEO pay when firm performance is low, which is better aligned with shareholder interests. The joint Wald test of whether the effects of binding and advisory SoP laws are different on CEO pay has a p-value of less than 0.01, suggesting that binding SoP laws reduce CEO pay growth rates significantly more than advisory SoP laws.¹⁹ The second column shows that the CEO pay gap decreases only when advisory laws are passed, as shown by the negative and significant coefficient on *advisory SoP law* (-0.135, $t = -4.84$), and the p-value of 0.019 for the joint Wald test. In the third column we find that both types of SoP laws increase firm value but the overall effect on firm valuation is not statistically different as shown by the joint Wald test statistics. Firms with relatively higher levels of managerial pay inequality in the pre-SoP

¹⁸ See “Calpers to awaken zombie boards,” *Financial Times*, April 7, 2013.

¹⁹ A test of difference in the sensitivity of SoP laws to realized firm performance is also statistically different between binding and advisory SoP laws (p-value<0.01).

period experience a larger increase in firm value only in the case of advisory SoP laws (0.025, $t = 2.14$).

Overall, results in Table 5 show that while both types of laws improve firm value and reduce CEO pay growth rates, binding SoP laws have a larger impact on CEO pay growth whereas only advisory SoP laws tighten the link between firm pay and realized performance and reduce the managerial pay gap. Further, firm valuations are higher for firms that had high managerial pay gaps prior to the enactment of only advisory SoP laws. The statistically insignificant difference in firm valuation between binding and advisory SoP laws suggests that mandatory SoP laws are not more influential than advisory ones in their effect on firm valuation. In fact, some of our additional tests in the next section indicate that the positive valuation impact of mandatory SoP laws is not robust.

7. Robustness Tests

7.1. Say on Pay Laws as an Outcome of the Political Environment

In this section we examine the robustness of our results shown in Tables 2 through 5 on CEO pay, pay slice, and firm value to potential endogeneity, omitted variables, and various subsamples. An important concern with our estimators is that the adoption of SoP laws may not be random and instead related to variables that determine CEO pay policies. Thus, even when SoP laws have no influence on CEO pay, our estimator might erroneously attribute differential changes in CEO pay policies between firms subject to SoP laws and the control group of firms to the passage of SoP laws.

To overcome this concern, we instrument the passage of SoP laws by distributing the likelihood of SoP law passage quasi-randomly across countries with similar political environments. The political environment variables capture the sentiment in the country toward pay differentials and the ability of

the current government in power (i.e., voting power) and its leaning towards passing economic regulations.²⁰ In general, political economy variables are shown to be linked to regulatory changes (e.g., Krozner and Strahan (1999)) and there is a growing literature on the relationship between political choices in democracies and financial structures and outcomes across countries (e.g., Perotti (2013)).

Our first-stage regressions show that countries are more likely to pass SoP laws when the political party in power is either right or left wing compared to other parties and when the main opposition party has a greater voting power. The diagnostic tests for our instrumental variables reported at the bottom of Table 6 show that these variables are jointly different from zero (p -value for the F test < 0.001) suggesting that our instruments satisfy the relevance condition. The under-identification test shows that the political environment variables are correlated with the enactment of SoP laws. We also find that these political environment variables are strong instruments in the econometric sense that we reject the null hypothesis of our instruments being weakly correlated to the enactment of SoP laws. For example, the weak identification test has a p -value of less than 0.001. Thus, our instruments are relevant and do not appear to suffer from biases that may arise in presence of weak instruments. Finally, the Sargan-Hansen over-identification test is not statistically significant for any columns except for column (3), suggesting that our instruments are appropriately uncorrelated with the error term from the estimation for most columns in Table 6.

²⁰ These variables are dummy variables that denote if the party orientation with respect to economic policy is right or left leaning, and the largest opposition party's voting share. The political variables are obtained from the World Bank's database on Political Institutions 2012 (see Beck, Clarke, Groff, Keefer, and Walsh (2001)). We also use alternative instrumental variables that employ the interaction terms between these time-varying political environment variables and time-invariant cultural variables such as the degree to which people in a society consider differences in income to be fair based on differences in more efficiency, reliability, and speed resulting in differences in pay, and obtain similar results.

The results from this instrumental variable estimation with firm fixed effects are reported in Panel A of Table 6. The sample size is smaller than in previous tables due to missing information on the political environment for some countries and years in the main sample. We continue to find that SoP laws are associated with lower CEO pay levels, a greater link between realized firm performance and CEO pay, lower managerial pay gap, and higher firm valuations. The advisory SoP laws are more economically significant than mandatory laws as shown by the magnitudes of the coefficient estimates. Similar to the previous table, only advisory laws influence the sensitivity of realized firm performance to CEO pay and the managerial pay gap. These findings suggest that our results are not exclusively driven by the potentially non-random nature of the decision by countries to enact SoP laws.

7.2. Alternative Samples and Specifications

We also examine the robustness of our results to various subsamples and report the results in Table 7. We only report the key coefficient estimates for brevity but all columns include the corresponding control variables from the previous Tables 2 through 5.

To ensure our results are not driven by other regulatory changes and reforms around the enactment of SoP laws, we include various country-level variables as additional controls in our main specifications and report the results in Panel A. The country-level regulations and reforms we identify are corporate governance laws (e.g., Dahya, McConnell, and Travlos (2002)), insider trading laws (e.g., Denis and Xu (2013)), country-wide IFRS adoption that may affect compensation through earnings management activities (e.g., Ozkan, Singer, and You (2013)), EU transparency Act of 2004, short selling laws that may influence CEO pay through their effects on the governance environment of firms and additional laws that can directly affect compensation policies at the same time as SoP laws as

approved by United States and Netherlands.²¹ We also include a dummy variable to denote the global financial crisis years of 2007-2009 in addition to GDP growth in our regressions. In our tests, we include these variables and their interaction term with firm performance. Panel B1 shows that SoP laws continue to influence top executive compensation policies and firm value in a similar way with the exception that mandatory SoP laws no longer increase firm value once we control for various country-level developments.

We next test the robustness of our results to excluding U.S. firms, which make up one quarter of our sample. Results from these regressions are reported in Panel B, which again show similar results except that mandatory SoP laws no longer increase firm value. In the next panel, we recognize that not all countries mandate their firms to disclose CEO pay, and this cross-country variation in disclosure regulations can create a potential selection bias in our tests. Thus, we limit our sample to countries with such a mandated disclosure. There are 14 such countries in our sample, as indicated by Fernandes et al. (2013). We also undertake a test where we control for potentially omitted time-varying variables at the industry level to ensure that our results are not driven by changes at the industry level in the post-law period. We do so by introducing industry*year fixed effects in the regression specifications and report

²¹ The sources for these variables are as follows. Regulations on short selling are obtained from Jain, Jain, McNish, McKenzie (2013). Following their study, we create a variable called restriction, which equals 0 when there are no restrictions on short selling in the home country and 3 when there is a total ban, and incorporates prohibitions on naked short selling, up-tick rules, and total bans on short selling. Second, we obtain the list of countries that pass a corporate governance reform either on a mandatory or comply-or-explain basis during our sample period from Kim and Lu (2013). We create an indicator variable to represent the adoption of such codes from the year of its passage on. Third, we include a dummy variable that equals one if insider trading laws are enforced in the country of origin, zero otherwise. This variable is from Bhattacharya and Daouk (2002). Fourth, we include an indicator variable to represent mandatory IFRS adoption, from http://www.pwc.com/en_US/us/issues/ifrs-reporting/publications/assets/pwc-ifrs-by-country-apr-2013.pdf. The information on the EU Transparency Act of 2004 and compensation-related laws in the United States and Netherlands are obtained from various sources. The Dodd-Frank Act of 2010 also mandates an independent compensation committee for listed firms and requires the disclosure of executive compensation through proxy statements before annual meetings. In the Netherlands, changes to Book 2 of the Dutch Civil Code that introduced SoP laws also give rights to large shareholders to submit items to annual shareholders meeting agendas, which was given the right to appoint and dismiss supervisory board members for the first time.

the results in Panel D. We next exclude firms that experience a turnover of the CEO in the year of enactment of the SoP law in Panel E, as the compensation package for the incumbent and new CEOs can be unusual due to severance packages and signing bonuses. Finally, we control for potentially omitted time-varying variables at the country level by introducing country*year fixed effects in the regression specifications and clustering error terms by country in Panel F. The country*year fixed effects capture most of the effects of SoP laws on the pay gap.

Overall, Table 7 suggests that the previous finding of a positive impact of mandatory SoP laws on firm value is not robust to some additional controls whereas other results remain similar to those in Tables 2 through 5.

7.3. Results from the Matched Sample

Ideally, we would like to compare changes in CEO pay policies and firm valuation around the adoption of SoP laws for firms with similar characteristics except for the treatment of being subject to SoP laws (Angrist and Pischke, (2009)). We include firm fixed effects throughout our analysis to control for unobserved firm heterogeneity. However, to the extent that other firm characteristics are different between SoP and non-SoP firms in the period prior to the enactment of SoP laws, our estimates could reflect such pre-law differences among firms rather than capturing the effects of SoP laws. A remedy for such problems is to construct a matched sample of firms with observable characteristics similar to the firms subject to SoP laws in the pre-law period. In this section, we undertake this approach using the nearest neighbor matching procedure with the Mahalanobis metric as the weighting criterion to construct a control sample.

Specifically, we construct a matched sample of treated and control firms starting from the universe of firms used in the estimations discussed in the previous sections. We match each firm in the treatment group (subject to SoP laws) to one firm in the control group (no SoP law is passed in the sample period) with replacement using the following characteristics as of $t-1$: total CEO compensation, the natural logarithm of total assets, industry-adjusted ROA, and the legal origin of the country, where t is year SoP laws are introduced in the country. We use a nearest neighbor matching procedure with the Mahalanobis metric as our weighting criterion (Abadie, Herr, Imbens, and Drukker (2004)). The match is done separately for U.S. firms non-U.S. firms. The relative size of U.S. firms and their CEO compensations levels distorts the matching procedure for the overall sample.

Figure 2 plots the natural logarithm of CEO pay between our treatment and control groups around the time SoP laws are enacted. It shows that the trends for both groups are almost identical prior to the passage of the SoP laws. These trends start differing roughly the year after the law is implemented. This graphical evidence suggests that the sample of control firms represents a valid counterfactual to test for the effect of SoP laws on CEO compensation. However, we take a step further and test whether the means for the relevant matching variables for the treated and control groups differ the year before the SoP laws are passed.

Table 7 presents the results from this comparison. Panel A splits the sample between the international and U.S. firms. As noted above, the group of control firms is smaller than the group of treated firms, as a firm in the control group can be matched to multiple firms in the treated group. There are two important facts to gather from the table. First, the mean of total compensation for U.S. firms is much larger than the same measure for the international firms. This finding supports our strategy of splitting the sample between the two groups. Second, the means for our main matching variables are not significantly different for the treated and control groups in most cases. The only

exception is for the log of assets for U.S. firms. However, for these U.S. firms we are able to find firms in the control group that have very similar total CEO compensation. These results confirm the trends observed in Figure 2, namely, that the firms in the control and treated groups appear to have very similar trends in CEO compensation prior to the adoption of the SoP laws. In panel B, we further divide the international sample between countries that adopted advisory and binding SoP laws. As with the tests for the full sample, our matching strategy yields a sample of control firms that are similar in compensation, size, and profitability to the firms in the countries that adopted SoP laws.

We use this set of firms to estimate our main specifications which are reported in Table 9. It shows that SoP laws continue to decrease the CEO pay growth rates, improve the sensitivity of CEO pay to realized firm performance, and increase firm value. An interesting finding reported in column (5) is that once we employ a matched sample, the higher firm value following the SoP law enactment is related to both high CEO pay gap and high CEO pay in the pre-law period. Column (6) also shows that we are able to explain a greater portion of the increase in firm valuation following advisory laws. Firm value in such countries increases only for firms with high CEO pay gap and high CEO pay relative to other firms in the pre-law period whereas the coefficient on advisory SoP laws is not statistically significant. In Table 4 in the Appendix we also investigate how consistent the results in Table 9 are to instrumental variable estimation and the additional tests covered in Table 7 for the full sample, and find that they are robust to such additional checks. These results suggest that our previously reported results on the effects of binding and advisory SoP laws on CEO pay policies and firm valuation are not influenced by potential differences between our treatment and control sample firms in the pre-law period.

8. Conclusion

Executive pay is one of the most heavily debated features of corporate governance. Historically, regulatory changes have had a major influence on patterns in executive compensation.²² In this paper, we examine changes in CEO compensation policies, the CEO pay slice, and firm value after SoP laws are adopted using a cross-country sample. SoP laws are unique in the sense that they do not focus on narrow aspects of CEO pay like many previous regulations on compensation. Rather they allow shareholders to publicly evaluate the compensation policies in their entirety.

Our analysis documents three important findings. First, the level of CEO pay growth is lower in the period following the adoption of SoP laws compared to various control groups. Thus, SoP laws appear to seize the upward trend in CEO pay. The link between CEO pay and firm performance becomes stronger. Second, the pay gap between the CEO and other top executives shrinks after SoP laws are passed. Firm value increases for firms subject to SoP laws compared to the control group, and this increase is linked to the incidence of high CEO pay slice in the pre-SoP period. Finally, our results imply that binding laws may be preferred if the main concern in the country is the high levels of pay, as we find a greater impact of binding laws on pay growth rates. If the concern is the disconnect between pay and performance, advisory laws may be more preferable. This type of laws has the advantage of decreasing pay growth rates only in poorly performing firms, and that they are not one-size-fits-all regulations.

²² See Murphy (2013) for a detailed review of the effects of regulations on CEO pay policies.

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Figure 1. This figure shows the estimated average CEO pay over time for SoP and non-SoP observations for a firm with \$1 billion in sales and average values of other variables based on the regression specification in column (1) of Table 2. SoP observations include firms in countries that pass a SoP law for the post-law period. The rest of the sample constitutes the non-SoP observations. The starting year is 2003 because the first year for the SoP subsample is 2003.

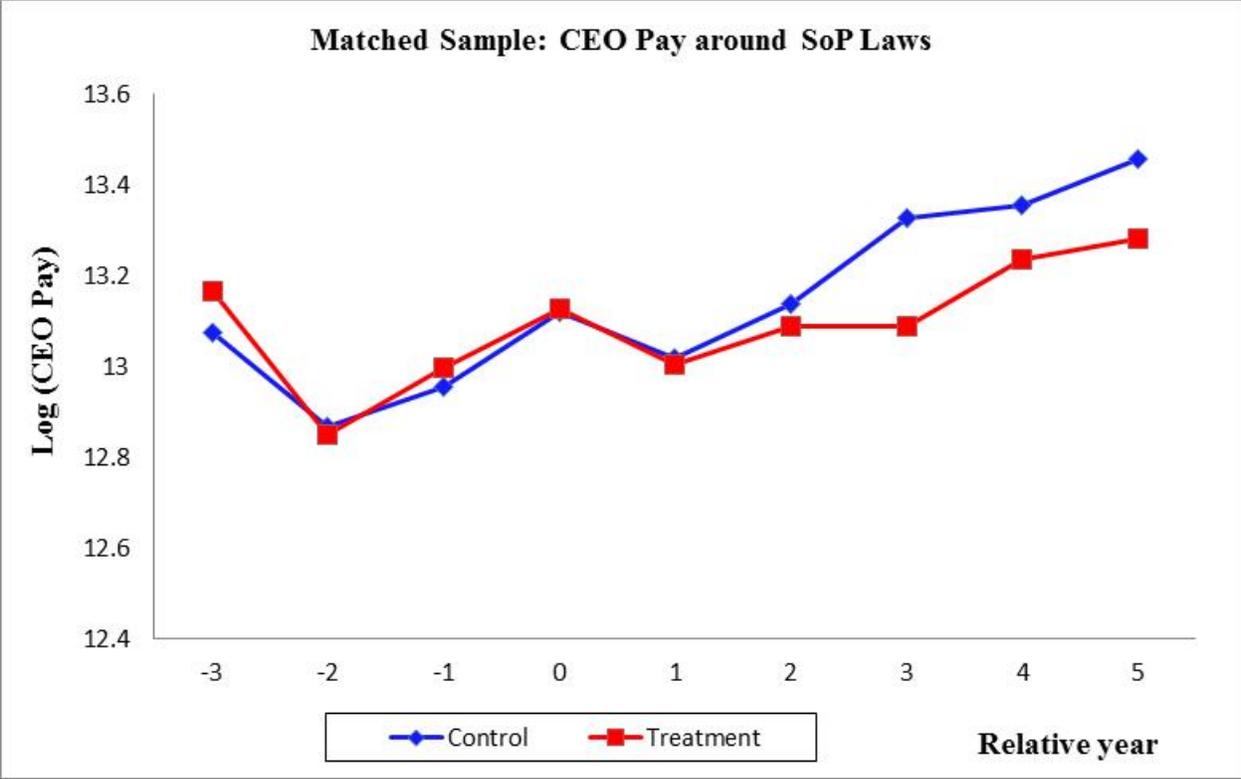


Figure 2. This figure shows the average natural logarithm of CEO pay around the time SoP laws are passed for the treatment and control firms. The treatment group consists of firms that are subject to SoP laws. The control group includes firms not subject to SoP laws and matching to the treatment group of firms is done as of year t-1 using one-year lagged total CEO compensation, industry-adjusted ROA, the natural logarithm of total assets, common law, and year. Year 0 is defined as the year immediately following the passage of SoP laws and the nearest neighbor matching procedure with the Mahalanobis metric as the weighting criterion is used for matching purposes.

Table 1. Descriptive Statistics

This table presents the distribution of the regression sample by country and descriptive statistics for the main variables. Panel A displays the number of observations, firms, and SoP status. Information about the worldwide adoption of SoP laws from several sources starting with Larcker et al. (2012), and supplementing it with several additional studies such as Murphy (2013) and Factiva searches. In column (4) under the heading of SoP law year, (A) refers to advisory SoP laws and (B) refers to binding SoP laws as of end-2012. Panel B shows univariate statistics for the sample used in the analysis. Table 1 in the Appendix provides variable definitions and data sources. We winsorize all continuous variables at the one percent level and use one-year lagged values of time-varying independent variables.

Panel A. Sample Distribution by Country

Country	# Obs.	# Firms	SoP Law Year	Country	# Obs.	# Firms	SoP Law Year
Australia	10,590	1,943	2005 (A)	Luxembourg	64	15	-
Austria	97	23	-	Malaysia	416	110	-
Belgium	260	71	2012 (A)	Netherlands	837	157	2004 (B)
Bermuda	186	45	-	New Zealand	357	92	-
Canada	14,108	2,746	-	Norway	750	175	2008 (B)
Chile	61	16	-	Oman	96	28	-
China	1,560	444	-	Pakistan	205	82	-
Denmark	117	30	2007 (B)	Philippines	108	28	-
Finland	460	105	-	Poland	138	51	-
France	1,448	259	-	Portugal	84	31	2010 (A)
Germany	1,503	352	-	Singapore	296	80	-
Hong Kong	6,287	983	-	South Africa	2,034	358	2011 (B)
Iceland	40	10	-	Spain	206	48	-
India	7,944	1,767	-	Sweden	1,100	235	2006 (B)
Ireland	446	74	-	Switzerland	834	200	-
Israel	200	53	-	Taiwan	84	38	-
Italy	926	240	2011 (A)	Thailand	887	221	-
Japan	79	56	-	United Kingdom	11,048	2,126	2003 (A)
Jordan	35	13	-	United States	23,443	4,309	2011 (A)
Total	89,315	17,609					

Panel B. Firm, CEO, and Country Characteristics

Variables	# Obs	Mean	Median	Standard deviation
SoP dummy	89,334	0.267	0.000	0.442
Total CEO pay (in 2005 \$US)	89,334	1,091,028	364,451	8,289,593
Equity CEO pay / total CEO pay	83,739	0.133	0.000	0.255
CEO pay slice	55,348	0.476	0.446	0.204
Pay gap (in 2005 \$US)	54,805	735,017	224,327	1,506,900
High CEO pay slice dummy	89,334	0.197	0.000	0.398
High CEO pay dummy	89,334	0.234	0.000	0.423
Industry-adjusted stock returns	89,334	0.195	0.009	0.938
Industry-adjusted log (Q)	88,143	0.107	-0.002	0.449
Industry-adjusted ROA	89,077	-0.087	0.003	0.677
Annualized stock return volatility	89,334	0.058	0.058	0.020
Net sales (\$US millions)	89,334	1,250	71.6	4,230
Total assets (\$US millions)	89,334	3,050	131	12,800
Leverage	89,334	0.134	0.053	0.190
Cash / total assets	89,334	0.090	0.024	0.154
Capex / total assets	89,334	0.497	0.224	0.763
Inside ownership (%)	89,334	0.300	0.255	0.272
Total institutional ownership (%)	89,334	0.130	0.009	0.219
Independent director %	89,334	0.572	0.600	0.600
Dual CEO dummy	89,334	0.139	0.000	0.346
Number of directorships	89,334	1.977	1.000	1.839
CEO age	74,995	52.822	53.000	8.509
CEO tenure	81,449	8.941	7.000	7.804
ADR dummy	89,334	0.087	0.000	0.281
Industry mkbk ratio	89,334	1.658	1.570	0.543
GDP growth (%)	89,334	2.732	2.653	3.042

Table 2. Say on Pay Laws' Impact on CEO Pay

This table presents estimates of the impact of SoP laws on the level of CEO pay and the sensitivity of CEO pay to realized firm performance. The dependent variable is the natural logarithm of total annual CEO compensation. Firm and year fixed effects are included in all columns. Table 1 in the Appendix provides variable definitions and data sources. We winsorize all continuous variables at the one percent level and use one-year lagged values of time-varying independent variables. The t-statistics appear in brackets below parameter estimates. Robust standard errors are estimated by clustering at the firm level. Asterisks ***, **, and * indicate significance at the 1%, 5%, and 10% level, respectively.

Variables	Firm performance is industry-adjusted stock returns	Firm performance is industry-adjusted ROA
	(1)	(2)
<i>SoP</i>	-0.043*** [-3.215]	-0.036*** [-2.750]
<i>SoP</i> * Firm performance	0.049*** [5.950]	0.059*** [2.881]
<i>SoP</i> country*Firm performance	-0.002 [-0.303]	-0.072*** [-4.278]
Firm performance	0.033*** [7.519]	0.076*** [5.899]
Log (sales)	0.023*** [11.727]	0.022*** [11.631]
Leverage	-0.033 [-0.949]	-0.014 [-0.413]
Stock return volatility	-2.422*** [-7.787]	-2.010*** [-6.841]
Inside ownership (%)	-0.022 [-1.015]	-0.022 [-1.026]
Total institutional ownership (%)	0.217*** [9.469]	0.227*** [10.171]
Independent director %	0.074** [2.506]	0.076*** [2.612]
Dual CEO dummy	-0.028** [-2.316]	-0.025** [-2.053]
Log (number of directorships)	0.069*** [3.049]	0.070*** [3.138]
Industry mkbk ratio	0.036** [2.384]	0.030** [2.003]
GDP growth	0.009*** [4.514]	0.011*** [5.498]
Constant	12.675*** [240.113]	12.679*** [249.577]
Firm and Year F.E.	Yes	Yes
Observations	89,334	93,211
R-squared	0.138	0.136

Table 3. Say on Pay Laws' Impact on CEO Pay Inequality

This table presents estimates of the impact of SoP laws on managerial pay inequality. The dependent variable is the natural logarithm of the difference between CEO pay and the median value of total annual pay among the top five managers in the first column and the portion of total annual compensation of the top five highest-paid managers captured by the CEO in the last column. Firm and year fixed effects are included in all columns. Table 1 in the Appendix provides variable definitions and data sources. We winsorize all continuous variables at the one percent level and use one-year lagged values of time-varying independent variables. The t-statistics appear in brackets below parameter estimates. Robust standard errors are estimated by clustering at the firm level. Asterisks ***, **, and * indicate significance at the 1%, 5%, and 10% level, respectively.

Variables	Log(CEO pay gap) (1)	CEO pay slice (3)
<i>SoP</i>	-0.126*** [-4.709]	-0.007** [-2.115]
Log (net sales)	0.028*** [6.285]	-0.003*** [-8.275]
Leverage	-0.153* [-1.676]	-0.005 [-0.763]
Stock return volatility	-2.404*** [-3.422]	-0.184*** [-2.834]
Cash / total assets	-0.085 [-1.146]	0.001 [0.161]
Industry-adjusted ROA	0.037** [2.070]	0.001 [0.533]
ADR dummy	-0.061 [-1.110]	-0.0001 [-0.062]
Inside ownership (%)	-0.109** [-2.207]	0.003 [0.527]
Total institutional ownership (%)	0.123*** [3.310]	-0.024*** [-5.070]
Independent director %	0.150** [2.381]	0.076*** [12.328]
Dual CEO dummy	-0.061** [-2.129]	-0.014*** [-4.600]
Log (number of directorships)	0.061 [1.497]	-0.004 [-0.907]
Industry mkbk ratio	-0.003 [-0.092]	0.461*** [42.111]
GDP growth	0.009 [1.397]	-0.024*** [-5.070]
Constant	12.408*** [100.659]	0.076*** [12.328]
Firm and Year F.E.	Yes	Yes
Observations	50,760	57,039
R-squared	0.089	0.014

Table 4. Say on Pay Laws' Impact on Firm Values

This table presents estimates of the impact of SoP laws and the CEO pay slice on firm value. The dependent variable is the industry-adjusted natural logarithm of Tobin's Q. Financial and regulated utility industries are excluded. Firm and year fixed effects are included in all columns. Table 1 in the Appendix provides variable definitions and data sources. We winsorize all continuous variables at the one percent level and use one-year lagged values of time-varying independent variables. The t-statistics appear in brackets below parameter estimates. Robust standard errors are estimated by clustering at the firm level. Asterisks ***, **, and * indicate significance at the 1%, 5%, and 10% level, respectively.

Variables	(1)	(2)
<i>SoP</i>	0.028*** [5.300]	0.022*** [2.716]
<i>SoP</i> * High CEO pay slice		0.022** [2.178]
<i>SoP</i> * High CEO pay		-0.003 [-0.343]
Log (assets)	-0.097*** [-28.772]	-0.097*** [-28.764]
Leverage	0.085*** [5.606]	0.085*** [5.622]
Stock return volatility	0.787*** [6.971]	0.786*** [6.963]
Cash / total assets	0.093*** [5.637]	0.092*** [5.624]
Industry-adjusted ROA	-0.010* [-1.740]	-0.010* [-1.738]
ADR dummy	0.030*** [3.501]	0.031*** [3.515]
Capex / total assets	0.002 [0.842]	0.002 [0.828]
Inside ownership (%)	0.016 [0.763]	0.017 [0.781]
Inside ownership squared (%)	0.019 [0.716]	0.018 [0.695]
Total institutional ownership (%)	0.041*** [5.188]	0.041*** [5.196]
Independent director %	-0.043*** [-3.764]	-0.044*** [-3.794]
Dual CEO dummy	0.011** [2.098]	0.011** [2.108]
GDP growth	0.003*** [4.469]	0.003*** [4.442]
Constant	2.687*** [39.693]	2.687*** [39.675]
Firm and Year F.E.	Yes	Yes
Observations	83,975	83,975
R-squared	0.133	0.133

Table 5. Binding versus Advisory Say on Pay Laws

This table presents estimates of the impact of binding and advisory SoP laws on the level of CEO pay, the sensitivity of CEO pay to realized firm performance, and firm valuation. The dependent variable is the natural logarithm of total annual CEO compensation (CEO pay) in the first column, the natural logarithm of the difference between CEO pay and the median value of total annual pay among the top five managers in the second column, and the industry-adjusted natural logarithm of Tobin's Q in the final two columns. Binding (advisory) SoP laws require that the board of directors has to (does not have to) address shareholder disapproval of executive pay. Firm performance is measured by industry-adjusted stock returns. Firm fixed effects along with year dummy variables are used in the estimations. We only report the key coefficient estimates for brevity but all columns include the corresponding control variables from the previous Tables 2 through 4. The H_0 provides p-values of the joint Wald test that the sum of coefficients on binding SoP laws equal the sum of coefficients on advisory SoP laws. Table 1 in the Appendix provides variable definitions and data sources. We winsorize all continuous variables at the one percent level and use one-year lagged values of time-varying independent variables. The t-statistics appear in brackets below parameter estimates. Robust standard errors are estimated by clustering at the firm level. Asterisks ***, **, and * indicate significance at the 1%, 5%, and 10% level, respectively.

Variables	Log	Log	Industry-adjusted Log	
	(CEO pay)	(CEO pay gap)	(Tobin's Q)	
	(1)	(2)	(3)	(4)
Binding <i>SoP</i>	-0.063*	0.039	0.035***	0.028***
	[-1.805]	[0.562]	[7.355]	[3.669]
Advisory <i>SoP</i>	-0.037***	-0.135***	0.027***	0.021**
	[-2.684]	[-4.842]	[4.480]	[2.265]
Binding <i>SoP</i> * Firm performance	-0.032			
	[-1.242]			
Advisory <i>SoP</i> * Firm performance	0.053***			
	[6.431]			
Binding <i>SoP</i> * High CEO pay slice				0.007
				[0.807]
Advisory <i>SoP</i> * High CEO pay slice				0.025**
				[2.141]
Binding <i>SoP</i> * High CEO pay				-0.006
				[-0.564]
Advisory <i>SoP</i> * High CEO pay				0.01
				[1.256]
Firm, industry, and country controls	Yes	Yes	Yes	Yes
Firm and year F.E.	Yes	Yes	Yes	Yes
H_0 : Binding SoP = Advisory SoP	0.004	0.019	0.273	0.228
Observations	89,334	50,760	83,975	83,975
R-squared	0.138	0.089	0.133	0.133

Table 6. Instrumenting SoP Laws with Political Environment

This table presents estimates from an instrumental variable firm fixed effect specification on the impact of SoP laws on CEO pay, CEO pay gap, and firm valuation. The instrumental variables for the passage of SoP laws are dummy variables that denote if the party orientation with respect to economic policy is right or left leaning, the largest opposition party's voting share, and the margin of majority. Results from diagnostic tests for the instrumental variables are reported at the bottom for each estimation. Firm performance is measured by industry-adjusted stock returns. Table 1 in the Appendix provides variable definitions and data sources. We winsorize all continuous variables at the one percent level and use one-year lagged values of time-varying independent variables. T-statistics appear in brackets below parameter estimates. Robust standard errors are estimated by clustering at the firm level. Asterisks ***, **, and * indicate significance at the 1%, 5%, and 10% level, respectively.

Variables	Log (CEO pay)		Log(CEO pay gap)		Ind-adj Log(Tobin's Q)	
	(1)	(2)	(3)	(4)	(5)	(6)
<i>SoP</i>	-0.510*** [-5.031]		-0.833*** [-3.487]		0.235*** [10.441]	
<i>SoP</i> * Firm performance	0.063*** [6.401]					
<i>Advisory SoP</i>		-0.556*** [-5.069]		-0.839*** [-3.483]		0.272*** [10.404]
<i>Binding SoP</i>		-0.328** [-2.067]		-0.715 [-1.163]		0.139*** [3.384]
<i>Advisory SoP</i> * Firm performance		0.068*** [6.774]				
<i>Binding SoP</i> * Firm performance		-0.011 [-0.398]				
<i>SoP</i> country * Firm performance	-0.009 [-1.085]	-0.007 [-0.887]				
Firm performance	0.029*** [5.788]	0.029*** [5.736]				
Log (net sales)	0.020*** [8.979]	0.020*** [8.998]	0.024*** [4.940]	0.024*** [4.932]		
Leverage	0.022 [0.563]	0.022 [0.569]	-0.068 [-0.565]	-0.068 [-0.569]	0.066*** [5.745]	0.065*** [5.656]
Stock return volatility	-0.896** [-2.433]	-0.833** [-2.253]	0.364 [0.399]	0.39 [0.428]	0.374*** [3.211]	0.323*** [2.732]
Inside ownership (%)	-0.044* [-1.663]	-0.044* [-1.687]	-0.067 [-1.136]	-0.068 [-1.146]	0.024 [1.039]	0.026 [1.159]
Inside ownership (%) squared					0.007 [0.248]	0.004 [0.135]
Total institutional ownership (%)	0.396*** [11.495]	0.393*** [11.462]	0.306*** [4.881]	0.306*** [4.891]	0.068*** [5.894]	0.070*** [6.096]
Independent director %	0.067* [1.888]	0.065* [1.833]	0.029 [0.368]	0.029 [0.370]	-0.012 [-1.182]	-0.012 [-1.105]
Dual CEO dummy	-0.046*** [-3.042]	-0.046*** [-3.055]	-0.113*** [-2.964]	-0.113*** [-2.963]	0.010* [1.786]	0.010* [1.892]
Log (number of directorships)	0.068*** [2.800]	0.067*** [2.766]	0.082* [1.780]	0.080* [1.701]		
Industry mkbk ratio	0.033* [1.924]	0.034** [1.991]	-0.017 [-0.459]	-0.017 [-0.454]		
GDP growth	0.013*** [5.317]	0.012*** [5.162]	0.01 [1.424]	0.01 [1.418]	0.012*** [12.710]	0.012*** [12.922]
Cash / total assets			-0.066 [-0.723]	-0.065 [-0.703]	0.095*** [8.922]	0.095*** [8.885]
Industry-adjusted ROA			0.052** [2.496]	0.052** [2.497]	0.004 [1.291]	0.004 [1.391]
ADR dummy			-0.057 [-0.891]	-0.06 [-0.876]	0.004 [0.440]	0.008 [0.782]
Log (total assets)					-0.102*** [-47.336]	-0.103*** [-47.298]
Capex / total assets					0.005** [2.201]	0.005** [2.114]
Firm and Year F.E.	Yes	Yes	Yes	Yes	Yes	Yes
Under-identification test (p-value)	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Weak identification test (p-value)	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Over-identification test (p-value)	0.335	0.409	0.698	0.504	0.125	0.818
Observations	68,096	68,096	36,709	36,709	58,419	58,419
R-squared	0.103	0.104	0.060	0.061	0.130	0.128

Table 7. Additional Robustness Tests

This table presents firm fixed effect estimates of the impact of SoP laws on CEO pay, CEO pay gap, and firm valuation under different subsamples and various controls. FP refers to industry-adjusted total stock returns. In Panel A we control for country-level regulations and reforms, which include corporate governance laws, insider trading laws, country-wide IFRS adoption, EU transparency Act of 2004, short selling laws, a dummy variable to denote the global financial crisis years of 2007-2009, and additional laws that can directly affect compensation policies at the same time as SoP laws approved in the US and Netherlands. We include these variables and their interaction term with firm performance in Panel A. Panel B excludes U.S. firms. Panel C reports results for the subsample of countries that mandate the disclosure of CEO pay. Panel D controls for industry and time varying effects through industry*year fixed effects, and panel E excludes firms that experience a turnover of the CEO in the year of the turnover. Panel F reports results using country*year fixed effects in addition to industry fixed effects and clustering of standard errors by country. We only report the key coefficient estimates for brevity but all columns include the corresponding control variables from the previous Tables 2 through 5. Table 1 in the Appendix provides variable definitions and data sources. We winsorize all continuous variables at the one percent level and use one-year lagged values of time-varying independent variables. The t-statistics appear in brackets below parameter estimates. Robust standard errors are estimated by clustering at the firm level. Asterisks ***, **, and * indicate significance at the 1%, 5%, and 10% level, respectively.

Dependent variable	# obs.	SoP	SoP*FP	R ²	Advisory SoP	Binding SoP	Advisory SoP*FP	Binding SoP*FP	R ²
<u>A. Country-level developments</u>									
Log (total CEO pay)	65,851	-0.062*** [-3.976]	0.035*** [4.442]	0.130	-0.038** [-2.100]	-0.116*** [-4.091]	0.039*** [4.862]	-0.059** [-2.029]	0.131
Log (CEO pay gap)	33,124	-0.140*** [-3.276]		0.068	-0.154*** [-3.164]	-0.098 [-1.229]			0.068
Industry-adjusted Log(Tobin's Q)	61,836	0.047*** [7.911]		0.131	0.060*** [8.806]	0.010 [0.853]			0.132
<u>B. US firms excluded</u>									
Log (total CEO pay)	65,891	-0.071*** [-4.521]	0.044*** [6.408]	0.128	-0.062*** [-3.458]	-0.085*** [-3.041]	0.049*** [6.965]	-0.035 [-1.405]	0.128
Log (CEO pay gap)	33,151	-0.147*** [-3.463]		0.067	-0.170*** [-3.506]	-0.082 [-1.042]			0.067
Industry-adjusted Log(Tobin's Q)	61,870	0.044*** [7.493]		0.130	0.054*** [7.996]	0.017 [1.484]			0.130
<u>C. Mandated disclosure</u>									
Log (total CEO pay)	67,795	-0.057*** [-4.730]	0.043*** [6.585]	0.157	-0.049*** [-3.804]	-0.092*** [-3.218]	0.048*** [7.190]	-0.040* [-1.696]	0.158
Log (CEO pay gap)	42,651	-0.145*** [-5.297]		0.107	-0.149*** [-5.224]	-0.108 [-1.427]			0.108
Industry-adjusted Log(Tobin's Q)	63,779	0.043*** [7.647]		0.162	0.045*** [7.499]	0.032** [2.291]			0.162
<u>D. Industry*year FE</u>									
Log (total CEO pay)	89,334	-0.031*** [-2.588]	0.042*** [6.721]	0.156	-0.029** [-2.285]	-0.03 [-1.112]	0.046*** [7.235]	-0.031 [-1.288]	0.156
Log (CEO pay gap)	50,760	-0.093*** [-3.242]		0.101	-0.100*** [-3.329]	-0.038 [-0.522]			0.100
Industry-adjusted Log(Tobin's Q)	83,975	0.027*** [5.676]		0.156	0.025*** [4.877]	0.039*** [3.446]			0.157
<u>E. CEO turnover years excluded</u>									
Log (total CEO pay)	79,969	-0.027** [-2.359]	0.047*** [7.414]	0.167	-0.021* [-1.725]	-0.052* [-1.906]	0.051*** [7.864]	-0.025 [-0.988]	0.168
Log (CEO pay gap)	45,727	-0.105*** [-3.720]		0.098	-0.110*** [-3.739]	-0.061 [-0.807]			0.098
Industry-adjusted Log(Tobin's Q)	75,283	0.029*** [5.933]		0.133	0.028*** [5.400]	0.035*** [2.882]			0.133
<u>F. Country*Year FE and clustering</u>									
Log (total CEO pay)	89,334	-6.058*** [-9.474]	0.090*** [5.200]	0.472	-6.029*** [-9.549]	-1.683*** [-4.827]	0.083*** [4.711]	-0.005 [-0.203]	0.472
Log (CEO pay gap)	50,760	-0.004 [-0.054]		0.323	-0.718 [-0.599]	0.007 [0.121]			0.323
Industry-adjusted Log(Tobin's Q)	83,975	8.151*** [17.262]		0.314	8.151*** [17.262]	4.145*** [15.618]			0.314

Table 8. Matched Sample

This table presents univariate statistics for the treatment and matched control sample. The treatment group consists of firms that are subject to SoP laws and the control group includes firms not subject to SoP laws. Matching is established using the nearest neighbor matching procedure with the Mahalanobis metric as the weighting criterion and as of the year prior to the enactment of SoP laws using one-year lagged total CEO compensation, industry-adjusted ROA, the natural logarithm of total assets, common law, and year. Table 1 in the Appendix provides variable definitions and data sources. We winsorize all continuous variables at the one percent level and use one-year lagged values of time-varying independent variables. The t-statistics appear in brackets below parameter estimates. Robust standard errors are estimated by clustering at the firm level. Asterisks ***, **, and * indicate significance at the 1%, 5%, and 10% level, respectively.

Panel A: Matching non-US and U.S. samples

	International sample				U.S. sample			
	Treated	Control	Difference	p-value	Treated	Control	Difference	p-value
Total CEO compensation	709,531	675,018	34,512	0.36	1,459,386	1,315,725	143,660	0.23
Log (total assets)	21.20	21.27	-0.07	0.43	22.07	21.86	0.21	0.05
Industry-adjusted ROA	-0.025	-0.018	-0.007	0.44	0.002	0.002	-0.001	0.92
Observations	1859	1233			694	521		

Panel B: Advisory and Binding SoP laws

	Advisory				Binding			
	Treated	Control	Difference	p-value	Treated	Control	Difference	p-value
Total CEO compensation	666,675	646,244	20,431	0.66	805,958.6	795,580.4	-10,378	0.88
Log (total assets)	20.87	20.93	-0.07	0.55	21.95	21.94	0.02	0.89
Industry-adjusted ROA	-0.049	-0.044	-0.004	0.72	0.029	0.029	0.000	0.989
Observations	1287	794			572	482		

Table 9. Matched Sample Regression Results

This table presents firm fixed effect estimates of the impact of SoP laws on CEO pay, CEO pay gap, and firm valuation in a matched sample. Matching is established using the nearest neighbor matching procedure with the Mahalanobis metric as the weighting criterion and as of the year prior to the enactment of SoP laws using one-year lagged total CEO compensation, industry-adjusted ROA, the natural logarithm of total assets, common law, and year. Firm performance is measured by industry-adjusted stock returns. Table 1 in the Appendix provides variable definitions and data sources. We winsorize all continuous variables at the one percent level and use one-year lagged values of time-varying independent variables. The t-statistics appear in brackets below parameter estimates. Robust standard errors are estimated by clustering at the firm level. Asterisks ***, **, and * indicate significance at the 1%, 5%, and 10% level, respectively.

Variables	Log (CEO pay)		Log (CEO pay gap)		Ind-adj Log(Tobin's Q)	
	(1)	(2)	(3)	(4)	(5)	(6)
<i>SoP</i>	-0.059***		-0.071*		0.019**	
	[-2.832]		[-1.779]		[2.267]	
<i>SoP</i> * Firm performance	0.044***					
	[3.231]					
SoP * High CEO pay slice					0.041***	
					[3.588]	
SoP * High CEO pay					0.025**	
					[2.344]	
<i>Advisory SoP</i>		-0.044**		-0.077*		0.015
		[-2.267]		[-1.740]		[1.558]
<i>Binding SoP</i>		-0.095***		-0.051		0.039**
		[-3.152]		[-0.665]		[2.141]
<i>Advisory SoP</i> * Firm performance		0.054***				
		[4.559]				
<i>Binding SoP</i> * Firm performance		-0.034				
		[-1.139]				
<i>Advisory SoP</i> * High CEO pay slice						0.050***
						[3.867]
<i>Binding SoP</i> * High CEO pay slice						0.006
						[0.234]
<i>Advisory SoP</i> * High CEO pay						0.033***
						[2.610]
<i>Binding SoP</i> * High CEO pay						0.002
						[0.100]
Industry-adjusted stock returns	0.032***	0.032***				
	[4.309]	[5.412]				
Industry-adjusted ROA			0.106***	0.107***	-0.023***	-0.023***
			[3.387]	[3.389]	[-4.013]	[-3.995]
Log (sales)	0.034***	0.034***	0.039***	0.039***		
	[6.615]	[15.676]	[7.326]	[7.329]		
Leverage	-0.069	-0.068	0.039	0.038	0.003	0.003
	[-0.817]	[-1.580]	[0.390]	[0.384]	[0.197]	[0.171]
Stock return volatility	-1.789***	-1.822***	-0.584	-0.568	0.238	0.231
	[-2.992]	[-4.281]	[-0.598]	[-0.580]	[1.523]	[1.476]
Inside ownership (%)	0.003	0.005	-0.044	-0.045	-0.013	-0.012
	[0.083]	[0.170]	[-0.652]	[-0.658]	[-0.446]	[-0.429]
Inside ownership (%) squared					0.004	0.003
					[0.115]	[0.084]
Total institutional ownership (%)	0.206***	0.210***	0.087	0.086	0.009	0.01
	[4.706]	[6.225]	[1.239]	[1.218]	[0.708]	[0.748]
Independent director %	0.061	0.062	0.054	0.054	-0.012	-0.012
	[1.189]	[1.641]	[0.586]	[0.588]	[-0.842]	[-0.838]
Dual CEO dummy	-0.038	-0.038*	-0.054	-0.054	0.022***	0.021***
	[-1.574]	[-1.874]	[-1.180]	[-1.179]	[2.907]	[2.883]
Log (number of directorships)	0.02	0.021	0.181***	0.180***		
	[0.553]	[0.798]	[2.727]	[2.716]		

Table 9, continued

Cash / total assets			-0.017	-0.016	0.150***	0.150***
			[-0.167]	[-0.160]	[9.493]	[9.486]
ADR dummy			-0.106*	-0.107*	0.016	0.017*
			[-1.726]	[-1.737]	[1.585]	[1.668]
Log (total assets)					-0.085***	-0.085***
					[-26.603]	[-26.642]
Capex / total assets					0.008***	0.008***
					[2.705]	[2.717]
Industry mkbk ratio	0.009	0.009	-0.018	-0.018		
	[0.337]	[0.421]	[-0.358]	[-0.360]		
GDP growth	0.011***	0.011***	0.011	0.011	0.006***	0.006***
	[3.000]	[3.353]	[1.353]	[1.353]	[5.053]	[5.044]
Constant	11.667***	12.849***	10.918***	10.918***	2.395***	2.398***
	[81.093]	[176.474]	[42.722]	[42.718]	[38.698]	[38.718]
Firm and Year F.E.	Yes	Yes	Yes	Yes	Yes	Yes
Observations	23,140	23,140	14,286	14,286	21,056	21,056
R-squared	0.176	0.177	0.101	0.101	0.145	0.145

Appendix

Table 1. Variable Definitions and Data Sources

This table provides a detailed description of the variables and their data sources used in the analysis. We use one-year lagged values of time-varying variables except for dependent variables, and winsorize continuous variables at the 1% level.

Variables	Definition (source)
Total CEO pay	Total annual compensation of the top executive, including salaries, bonuses, restricted stock and option awards, long-term incentive plans, changes in pension plans and all other compensation measured in 2005 \$US (Capital IQ).
CEO pay slice	The portion of total annual compensation of the top five managers captured by the CEO (Capital IQ).
CEO pay gap	The difference between CEO pay and the median value of total annual compensation of the other top four managers, measured in 2005 \$US (Capital IQ).
High CEO pay slice	This variable equals one for firms whose abnormal CEO pay slice values are greater than the country median values in the period prior to the enactment of SoP laws, zero otherwise. Abnormal CEO pay slice values are defined as the difference between actual levels of pay slices and their estimated values obtained from fitting the regression specification in column (1) of Table 3.
High CEO pay	This variable equals one for firms with abnormal CEO pay in the pre-law period, where abnormal pay is defined as the difference between actual levels of pay and their estimated values obtained from fitting the regression specification in column (1) of Table 2.
Industry-adjusted stock returns	The total investment returns in \$US from holding the firm's stock in excess of its corresponding global industry median value in a given year at the level of 2-digit SIC code.
Industry-adjusted Tobin's Q	The firm's Tobin's Q in excess of its corresponding global industry median value in a given year at the level of 2-digit SIC code, where Tobin's Q is the ratio of total assets plus market value of equity minus book value of equity to total assets (Worldscope).
Industry-adjusted ROA	The return on assets of the firm in excess of its corresponding global industry median value in a given year at the level of 2-digit SIC code (Worldscope).
Annualized stock return volatility	Annualized standard deviation of weekly stock returns in \$US (Datastream).
Net sales	Net sales of firms in \$US in a given year (Worldscope).
Total assets	Total assets of firms in \$US in a given year (Worldscope).
Leverage	Long term debt divided by the book value of total assets (Worldscope).
Cash / total assets	The ratio of cash assets to total assets (Worldscope).
Capex / total assets	The ratio of capital expenditures to total assets (Worldscope).
Inside ownership (%)	The percentage of a firm's shares that are closely held, where closely held is defined as those owned by shareholders such as officers and directors and immediate families, other corporations, or individuals (Worldscope).
Total institutional ownership (%)	The percentage of a firm's shares owned by institutional investors (Global Share Ownership database).
Independent director %	The percentage of independent directors on the board of directors of firms (Capital IQ).
Dual CEO dummy	A dummy variable that equals one if the CEO is also the chairman of the board of directors, zero otherwise (Capital IQ).
Number of directorships	The number of directorships of the CEO (Capital IQ).
CEO tenure	The number of years the CEO is with the firm (Capital IQ).
ADR dummy	A dummy variable that equals one if the firm's shares are cross-listed on a US exchange, zero otherwise (JP Morgan ADR database).
Industry mkbk ratio	The global industry median value in a given year of firms' market-to-book ratios at the level of 2-digit SIC code, where market-to-book is defined as the ratio of the market value of equity to its book value (DataStream).
GDP growth (%)	Annual GDP growth (World Development Indicators database).

Table 2. Controlling for CEO Age and Tenure

This table presents firm fixed effect estimates of the impact of SoP laws on CEO pay, CEO pay gap, and firm valuation controlling for CEO age and tenure. Firm performance is measured by industry-adjusted stock returns. We only report the key coefficient estimates for brevity but all columns include the corresponding control variables from the previous Tables 2 through 5. Table 1 in the Appendix provides variable definitions and data sources. We winsorize all continuous variables at the one percent level and use one-year lagged values of time-varying independent variables. The t-statistics appear in brackets below parameter estimates. Robust standard errors are estimated by clustering at the firm level. Asterisks ***, **, and * indicate significance at the 1%, 5%, and 10% level, respectively.

Variables	Log (CEO pay)		Log (CEO pay gap)		Industry-adjusted Log(Tobin's Q)	
	(1)	(2)	(3)	(4)	(5)	(6)
<i>SoP</i>	-0.034***		-0.070**		0.025***	
	[-2.634]		[-2.412]		[4.902]	
<i>SoP</i> * Firm performance	0.042***					
	[5.789]					
<i>Advisory SoP</i>		-0.026*		-0.073**		0.023***
		[-1.928]		[-2.406]		[4.106]
<i>Binding SoP</i>		-0.061**		-0.045		0.043***
		[-2.075]		[-0.610]		[3.351]
<i>Advisory SoP</i> * Firm performance		0.049***				
		[6.457]				
<i>Binding SoP</i> * Firm performance		-0.042*				
		[-1.645]				
CEO Age	-0.004***	-0.004***	0.010***	0.010***	-0.001	-0.001
	[-5.774]	[-5.771]	[6.072]	[6.075]	[-0.270]	[-0.255]
CEO Tenure	0.002***	0.002***	0.002	0.002	<0.001	<0.001
	[2.851]	[2.848]	[0.890]	[0.888]	[1.444]	[1.453]
Firm, industry, and country controls	Yes	Yes	Yes	Yes	Yes	Yes
Firm and Year F.E.	Yes	Yes	Yes	Yes	Yes	Yes
Observations	69,544	69,544	42,542	42,542	65,008	65,008
R-squared	0.146	0.146	0.096	0.096	0.142	0.142

Table 3. Controlling for Present and Past Firm Performance

This table presents firm fixed effect estimates of the impact of SoP laws on CEO pay and the sensitivity of CEO pay to firm performance after controlling for both one-year lagged and current firm performance where firm performance is measured by industry-adjusted stock returns. We only report the key coefficient estimates for brevity but all columns include the corresponding control variables from Table 2. Table 1 in the Appendix provides variable definitions and data sources. We winsorize all continuous variables at the one percent level and use one-year lagged values of time-varying independent variables. The t-statistics appear in brackets below parameter estimates. Robust standard errors are estimated by clustering at the firm level. Asterisks ***, **, and * indicate significance at the 1%, 5%, and 10% level, respectively.

Variables	Log (CEO Pay)	
	(1)	(2)
<i>SoP</i>	-0.035*** [-2.949]	
<i>SoP</i> * Firm performance	0.052*** [8.082]	
<i>SoP</i> * Current firm performance	0.043*** [6.505]	
<i>Advisory SoP</i>		-0.029** [-2.292]
<i>Binding SoP</i>		-0.054* [-1.955]
<i>Advisory SoP</i> * Firm performance		0.056*** [8.610]
<i>Binding SoP</i> * Firm performance		-0.027 [-1.122]
<i>Advisory SoP</i> * Current firm performance		0.044*** [6.479]
<i>Binding SoP</i> * Current firm performance		0.032 [1.220]
Firm performance	0.035*** [11.373]	0.035*** [11.351]
Current firm performance	0.019*** [5.833]	0.019*** [5.797]
Firm, industry, and country controls	Yes	Yes
Firm and Year F.E.	Yes	Yes
Observations	83,831	83,831
R-squared	0.139	0.139

Table 4. Instrumental Variable Estimation and Other Robustness Tests Using the Matched Sample

This table presents robustness tests for the matched sample in Table 9. Panel A presents estimates from an instrumental variable firm fixed effect specification on the impact of SoP laws on CEO pay, CEO pay gap, and firm valuation. The instrumental variables for the passage of SoP laws are dummy variables that denote if the party orientation with respect to economic policy is right or left leaning, the largest opposition party's voting share, and the margin of majority. Results from diagnostic tests for the instrumental variables are reported at the bottom for each estimation. Panel B presents firm fixed effect estimates of the impact of SoP laws on CEO pay, CEO pay gap, and firm valuation under different subsamples and various controls. FP refers to industry-adjusted total stock returns. In Panel B1 we control for country-level regulations and reforms, which include corporate governance laws, insider trading laws, country-wide IFRS adoption, EU transparency Act of 2004, short selling laws, a dummy variable to denote the global financial crisis years of 2007-2009, and additional laws that can directly affect compensation policies at the same time as SoP laws approved in the US and Netherlands. We include these variables and their interaction term with firm performance in Panel B1. Panel B2 excludes U.S. firms. Panel B3 reports results for the subsample of countries that mandate the disclosure of CEO pay. Panel B4 controls for industry and time varying effects through industry*year fixed effects, and panel B5 excludes firms that experience a turnover of the CEO in the year of the turnover. Panel B6 reports results using country*year fixed effects in addition to industry fixed effects and clustering of standard errors by country. We only report the key coefficient estimates for brevity but all columns include the corresponding control variables from the previous Tables 2 through 5. Table 1 in the Appendix provides variable definitions and data sources. We winsorize all continuous variables at the one percent level and use one-year lagged values of time-varying independent variables. The t-statistics appear in brackets below parameter estimates. Robust standard errors are estimated by clustering at the firm level. Asterisks ***, **, and * indicate significance at the 1%, 5%, and 10% level, respectively.

Panel A: Instrumental Variable Estimation

Variables	Log (CEO pay)		Log (CEO pay gap)		Industry-adjusted Log(Tobin's Q)	
	(1)	(2)	(3)	(4)	(5)	(6)
<i>SoP</i>	-0.235** [-2.457]		-0.474* [-1.935]		0.209*** [6.216]	
<i>SoP</i> * Firm performance	0.055*** [3.658]					
<i>Advisory SoP</i>		-0.239*** [-3.952]		-0.453* [-1.883]		0.212*** [6.249]
<i>Binding SoP</i>		0.120 [1.270]		0.484 [0.974]		0.079** [2.313]
<i>Advisory SoP</i> * Firm performance		0.065*** [4.946]				
<i>Binding SoP</i> * Firm performance		-0.050 [-1.586]				
Firm and Year F.E.	Yes	Yes	Yes	Yes	Yes	Yes
<i>Diagnostics for IV estimation</i>						
Under-identification test (p-value)	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Weak identification test (p-value)	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Over-identification test (p-value)	<0.010	<0.010	0.149	0.121	0.917	0.968
Observations	19,230	19,230	11,273	11,273	17,551	17,551
R-squared	0.163	0.164	0.089	0.089	0.114	0.122

Panel B: Additional Robustness Tests

Dependent variable	# obs.	SoP	SoP*FP	R²	Advisory SoP	Binding SoP	Advisory SoP*FP	Binding SoP*FP	R²
<u>B1. Country-level developments</u>									
Log (total CEO pay)	20,045	-0.091***	0.035***	0.185	-0.060***	-0.145***	0.043***	-0.037	0.185
		[-4.797]	[2.660]		[-2.597]	[-4.654]	[3.170]	[-1.145]	
Log (CEO pay gap)	11,892	-0.093*		0.105	-0.091	-0.096			0.105
		[-1.935]			[-1.594]	[-1.198]			
Industry-adjusted Log(Tobin's Q)	18,230	0.044***		0.139	0.047***	0.038***			0.139
		[6.088]			[5.455]	[3.070]			
<u>B2. US firms excluded</u>									
Log (total CEO pay)	20,055	-0.082***	0.038***	0.168	-0.069***	-0.099***	0.048***	-0.042	0.169
		[-4.083]	[3.439]		[-2.835]	[-3.078]	[3.717]	[-1.324]	
Log (CEO pay gap)	11,900	-0.086*		0.101	-0.095*	-0.068			0.101
		[-1.788]			[-1.654]	[-0.848]			
Industry-adjusted Log(Tobin's Q)	18,240	0.045***		0.139	0.047***	0.039***			0.139
		[6.175]			[5.484]	[3.248]			
<u>B3. Mandated disclosure</u>									
Log (total CEO pay)	19,305	-0.065***	0.039***	0.169	-0.044**	-0.112***	0.051***	-0.056*	0.169
		[-3.428]	[3.315]		[-2.060]	[-3.333]	[3.904]	[-1.779]	
Log (CEO pay gap)	12,450	-0.067		0.103	-0.072	-0.049			0.103
		[-1.617]			[-1.576]	[-0.601]			
Industry-adjusted Log(Tobin's Q)	17,534	0.052***		0.168	0.057***	0.035***			0.169
		[7.060]			[6.977]	[2.600]			
<u>B4. Industry*year FE</u>									
Log (total CEO pay)	23,140	-0.051***	0.036***	0.196	-0.042**	-0.068**	0.046***	-0.041	0.196
		[-2.794]	[3.447]		[-2.000]	[-2.123]	[3.750]	[-1.328]	
Log (CEO pay gap)	14,286	-0.055		0.129	-0.056	-0.055			0.129
		[-1.343]			[-1.207]	[-0.702]			
Industry-adjusted Log(Tobin's Q)	21,145	0.042***		0.176	0.040***	0.047***			0.176
		[6.424]			[5.417]	[3.975]			
<u>B5. CEO turnover years excluded</u>									
Log (total CEO pay)	20,750	-0.039**	0.031***	0.201	-0.021	-0.087***	0.038***	-0.031	0.202
		[-2.220]	[2.994]		[-1.036]	[-2.732]	[3.105]	[-0.921]	
Log (CEO pay gap)	12,871	-0.056		0.11	-0.060	-0.043			0.11
		[-1.370]			[-1.324]	[-0.546]			
Industry-adjusted Log(Tobin's Q)	18,968	0.044***		0.141	0.045***	0.042***			0.141
		[6.586]			[6.020]	[3.273]			

Panel B, continued

B6. Country*Year FE and clustering

Log (total CEO pay)	23,145	0.604*** [3.115]	0.085*** [3.476]	0.403	0.598*** [3.071]	1.297*** [7.274]	0.096*** [4.868]	-0.015 [-0.282]	0.403
Log (CEO pay gap)	14,319	0.035 [0.346]		0.244	-0.005 [-0.041]	0.048 [0.474]			0.244
Industry-adjusted Log(Tobin's Q)	21,154	0.577*** [10.596]		0.292	0.601*** [10.677]	0.589*** [9.062]			0.292