Employment Protection, Corporate Governance, and Labor Productivity around the World

Guangzhong Li
Business School, Sun Yat-sen University
liguangzhong@mail.sysu.edu.cn

Keishi Fujiyama
Research Institute for Economics and Business Administration, Kobe University
fujiyama@rieb.kobe-u.ac.jp

Cen Wu*
Management School, Jinan University
tina_wu@jnu.edu.cn

Ying Zheng*
Business School, Sun Yat-sen University
zhengy26@mail.sysu.edu.cn

March 5, 2023

*Corresponding authors, please address correspondences via emails:
zhengy26@mail.sysu.edu.cn; tina_wu@jnu.edu.cn.

We wish to thank Wenrui Zhang (discussant) and participants at the 2020 FMA Virtual Conference. Guangzhong Li and Ying Zheng acknowledge the financial support from the National Natural Science Foundation of China (Grant No. 71772190, U1811462). Cen Wu acknowledges the financial support from the National Natural Science Foundation of China (Grant No. 71802095), and the China Postdoctoral Science Foundation (Grant No. 2019T120796, and 2018M640888).
Declarations of interest: none

Employment Protection, Corporate Governance, and Labor Productivity around the World

Abstract: Consistent with the existing evidence from a single country study, our differences-in-differences estimation finds a negative effect of employment protection legislation (EPL) provisions on labor productivity in a sample of OECD countries. Our study is distinct, however, in that we provide empirical evidence on why EPL reduces labor productivity, which has different practical implications. While the negative effect is more pronounced among firms domiciled in countries with weaker investor protection, less developed takeover markets, and weaker employee incentives to work hard, in industries with less intense competition, and in firms suffering from more severe agency problems and firms with lower pay-for-performance sensitives, our results suggest that the firm-employee agency conflict is the channel through which employment protection legislation hurts labor productivity.

Keywords: Employment protection legislation; Labor productivity; Firm-employee agency conflicts; Corporate governance

Employment Protection, Corporate Governance, and Labor Productivity around the World

1. Introduction

Recent research has shown that employment protection legislation (EPL) influences firms' corporate decision making, including capital structure (Matsa, 2010; Serfling, 2016; Simintzi, Vig, and Volpin, 2015), restructuring activities (Atanassov and Kim, 2009), merge and acquisitions activities (Alimov, 2015; John, Knyazeva, and Knyazeva, 2015), innovation (Acharya, Baghai, and Subramanian, 2013), and privatization (Subramanian and Megginson, 2018).[1] Following this line of research, we investigate the effect of EPL on labor productivity, a critical aspect of firms' efficiency. To this end, we explore the international setting to observe a variety of degrees of employee protection and assess *how and more importantly why* EPL affects firms' labor productivity.

The existing literature predicts both the positive and negative effects of EPL on labor productivity. On one hand, EPL may enhance labor productivity by more stringently screening new hires or by increasing employees' efforts and incentives to invest in firm-specific human capital due to increased job security (Bassanini and Garnero, 2013; Belot, Boone, and Van Ours, 2007; Cingano, Leonardi, Messina, and Pica, 2016). On the other hand, EPL may cause a decline in labor productivity by limiting firms' ability to monitor employees who exhibit laziness or shirking (Shapiro and Stiglitz, 1984; Rajan and Zingales, 1998, 2000; Ichino and Riphahn, 2005; Riphahn, 2004), which predicts that the threat of firing acts as a device for disciplining workers (the firm-employee agency conflicts channel); or by limiting firms' flexibility to retain

or lay off personel based on employees' productivity (the labor market flexibility channel) (Bjuggren, 2018).

In this study, following Simintzi, Vig, and Volpin (2015) and Dessaint, Golubov, and Volpin (2017), we begin with an investigation of the causal effect of EPL on labor productivity. Specifically, we run a differences-in-differences (DID) regression of labor productivity on EPL for 20 OECD countries from 1990 to 2007.[2] The results show that EPL reduces labor productivity, suggesting that the negative effect dominates the positive effect of EPL on labor productivity in our international sample. Our results are robust to different measures of employment protection and labor productivity and a sample excluding U.S. firms.

Our paper is not the first to document a negative effect of EPL on labor productivity. Several studies using a single country as sample have found this result for the United States, India, Italy, and Sweden (see Autor, Kerr, and Kugler, 2007; Besley and Burgess, 2004; Cingano, Leonardi, Messina, and Pica, 2016; Bjuggren, 2018). Our study is distinct, however, in that we aim to answer why EPL reduces labor productivity. As different explanations have different practical implications, and therefore, it is important to directly examine *why* the effect of EPL on labor productivity is negative.

If the the firm-employee agency conflicts channel is the dominant explanantion for the negative correlation, it suggests that policy makers should strength the corporate law in terms of corporate governance when they improve the employement protection and strengthen various corporate governance mechanisams may reduce the potential detrimental effect of employment protection on labor productivity.[3] In contrast, if the labor market flexibility channel is the dominant explanantion for the negative correlation, it suggest that the policy makers should improve the legal provisions which give employers more flexibility to hire/fire employers under the stringent labor

protection. In addition, exploring why EPL reduces labor productivity help us better understand the substantial variations that have been documented in the macroeconomic consequence of EPL.[4]

To explore the firm-employee agency conflicts channel through which EPL reduces labor productivity, we examine how the relationship between employment protection and labor productivity varies with the different corporate governance environments that firms face. Specifically, we identify the country-, industry-, and firm-level factors related to the monitoring mechanisms that help discipline *employees*: country-level investor protection (Atanassov and Kim, 2009), takeover market activity (Glendening, Khurana, and Wang, 2016; Lel and Miller, 2015), industry-level competition (Giroud and Mueller, 2011), firms' dividend payout (Guttman, Kadan, and Kandel, 2010; Kim, Lee, and Lie, 2017), firms' agency costs proxied by the SG&A ratio and asset turnover ratio (Ang, Cole, and Lin, 2000; Denis and Osobov, 2008; Singh and Davidson III, 2003) and employees' pay for performance sensitivity (e.g., Core and Guay, 2002; Kim and Ouimet, 2014). If the negative relation between employment protection and labor productivity is due to the employee agency costs of employment protection, we expect that better corporate governance helps to mitigate the negative effect.

Besides using formal institutions as the proxies for corporate monitoring mechanisms, we also look into the moderating role of national culture since it determines employee behavior in workplaces (Hofstede, 2001). We predict that the negative effect of employment protection will be stronger in countries with cultures that discourage employees from working hard. We employ two cultural factors to measure employees' working incentives: in-group collectivism (*Ingroup_co*) and performance orientation (*Perfor_ori*).

Consistent with the firm-employee conflicts of interest hindering labor productivity, our results show that the negative effect of EPL is less pronounced among firms domiciled in countries with better investor protection and more developed takeover markets, in industries with more intense competition, and in firms that pay more cash dividends, have a lower SG&A ratio, have a higher asset turnover, and have a higher pay-for-performance sensitivity.

We also find that among low in-group collectivism countries, EPL is negatively associated with labor productivity, but this is not the case for countries with high in-group collectivism. The effect of employment protection on labor productivity is only negative and statistically significant among countries with low-performance orientation culture. Overall, our findings for formal and informal institutions are consistent with the notion that labor regulation adversely affects labor productivity by worsening firm-employee agency conflicts.

The negative correlation between employment protection and labor productivity can also be explained by the increase in labor redundancy caused by the reduction of labor market flexibility induced by EPL (Bjuggren, 2018). Utilizing Swedish last-in-first-out rules as an exogenous shock to labor market flexibility, Bjuggren (2018) finds that an increase in labor market flexibility stemming from the relaxation of the rules increases labor productivity. To explore this possibility, we examine whether employment protection affects labor market flexibility in terms of labor investment efficiency (e.g., Jung, Lee, and Weber, 2014). We find no significant association between employment protection and labor investment efficiency. We then conclude that the increase in firm-employee agency conflicts from the EPL is the main driving force for the negative impact of EPL on labor productivity in our research setting.

Our study contributes to the literature on agency conflicts between firms and employees. While prior studies focus on one particular country and suggest that labor mobility is a key channel between labor regulation and productivity (Autor, Kerr, and Kugler, 2007; Bjuggren, 2018; Cingano, Leonardi, Messina, and Pica, 2016), those studies pay little attention to the agency problems of employees under stringent labor protection (Ichino and Riphahn, 2005). Given that imperfections in labor and financial markets limit employees' ability to insure themselves against the risk of dismissal (Berk, Stanton, and Zechner, 2010; Pissarides, 2010), labor regulation aiming to protect employees from unfair treatment by their employers can significantly affect employees' incentives to increase their productivity in the workplace. Our study provides supportive evidence that employees' agency problem represents an important channel through which labor regulation has an adverse impact on labor productivity. Our study also help to better understand why stringent labo regulation is associated with low economic growth(Bassanini and Garnero, 2013; Besley and Burgess, 2004 ; Botero, Djankov, La Porta, Lopez-de-Silanes, and Shleifer, 2004; Caballero, Cowan, Engel, and Micco, 2013) by showing that stringent labor regulation impedes individual firms' labor productivity.

Our paper also contributes to the stream of literature examining how labor unions affect firm performance. Labor unions arise from asymmetries in contracts between individual workers and employers regarding both access to information and bargaining power (Marshall, 1890). While the existing literature tends to suggest that the presence of labor unions has statistically and economically significant positive effects on firm productivity (see Addison and Hirsch, 1989; Hirsch, 1991; Lu, Tao, and Wang, 2010; Machin, 1991; Machin and Stewart, 1990; Morikawa, 2010), our paper finds that unlike

labor protection accomplished through Coasean bargaining, formal and mandated employment regulation rules may have a negative effect on labor productivity.

The remainder of this paper is organized as follows. Section 2 provides a brief review of the current research on labor regulation and presents the theoretical background that links labor regulation and labor productivity. Section 3 introduces the model specification and data sources. Sections 4 and 5 summarize our main estimation results regarding the relationship between the degree of employment protection and firms' labor productivity. Further analysis of labor market flexibility is presented in Section 6, and Section 7 provides the conclusion.

2. Literature Review and Hypothesis Development

Labor productivity is mainly determined by employees' human capital and the firm–employee agency problem (Schmitz, 2005). The prior literature suggests that EPL has both positive and negative effects on these labor productivity determinants.

As for the positive aspects, stringent employment protection may increase labor productivity for the following reasons. First, labor regulation increases job security for existing employees because it increases the costs of firing employees and reduces the probability that employees will be fired in response to small fluctuations in demand. When EPL creates a stronger bond between firms and their employees, employees will better align their behavior with their employers' objectives (Bassanini and Garnero, 2013), be more incentivized to invest in firm-specific human capital (Bapna, Langer, Mehra, Gopal, and Gupta, 2013; Belot, Boone, and Van Ours, 2007; Bjuggren, 2018), and more likely engage in innovative activities (Griffith and Macartney, 2014) that in turn increase labor productivity. Second, EPL may lead firms to increase their investment in employee-related human capital. Koeniger (2005) suggests that layoff

regulations may spur incumbent firms to make productivity-enhancing investments to avoid downsizing. Third, EPL may reduce employee turnover and increase the share of senior workers with extensive firm-specific human capital (Cingano, Leonardi, Messina, and Pica, 2016). Finally, EPL creates a strong incentive to screen new hires more stringently, leading to a favorable compositional shift in labor productivity (Cingano, Leonardi, Messina, and Pica, 2016).

To provide systematic evidence in support of the above prediction, we propose and test our first hypothesis, alternatively stated as follows:

H1a: *All else being equal, the degree of EPL is positively associated with labor productivity.*

EPL may also lead to a reduction in labor productivity if employment protection increases firm–employee conflicts. The reason is that employees who are less threatened by layoff risks seek to maximize their utility by reducing their work/monitoring efforts and their incentive to invest in firm-specific skills.

In this regard, some studies have shown that in strong employment protection regimes, the threat of layoff is less likely to inhibit poor work performance or absenteeism (see Bassanini and Garnero, 2013; Ichino and Riphahn, 2005; Riphahn, 2004). The preference for leisure induces employees to reduce their work effort and optimally choose to be lazy when they know that firms face high costs to fire them, leading to severe agency conflicts between firms and employees (Alchian and Demsetz, 1972; Holmstrom and Milgrom, 1994). Moreover, employees may find it more costly and hence less beneficial to invest in firm-specific skills under stringent employment protection, which leads to a deterioration in firm performance (Martins, 2009).

Another way in which stringent employment protection may negatively affect labor productivity is through a reduction in the speed of workforce adjustment. While labor

market inflexibility increases employees' investments in firm-specific skills, it also reduces the speed of workforce adjustment (Autor, Kerr, and Kugler, 2007; Bassanini, Nunziata, and Venn, 2009; Okudaira, Takizawa, and Tsuru, 2013). Thus, slow workforce adjustment may decrease labor productivity in the face of changes in competitive environments, especially in the case of increased competition. Bjuggren (2018) explicitly shows that the relaxation of employment protection rules for small firms in Sweden increases labor productivity.

The discussion above leads us to propose and test the following hypothesis, stated in an alternative form as follows:

H1b: *All else being equal, the degree of EPL is negatively associated with labor productivity.*

3. Research Design

3.1 Data and sample

We obtain the data for this study from the Worldscope database, and our sample period is from 1990 to 2007 because the data for EPL is not available after 2007. Similar to Leuz, Nanda, and Wysocki (2003), we exclude firms in the utilities and financial industries by using Fama and French's 48 industry classification. Firm-year observations with sales or asset growth rates that are higher than or equal to 200% in one year are excluded. Firm-year observations with negative sales or assets are also excluded. In addition, firms with leverage that is either higher than one or lower than zero are excluded. To ensure that our results are not driven by small firms with few employees, we exclude firms with fewer than 100 employees. Countries with at least 300 firm-year observations are included in the regression. To control for the influence of extreme values, we winsorize firm-level continuous variables by setting values that

exceed the 99th percentile or fall below the 1st percentile to the 99th and 1st percentile values, respectively. Our final sample consists of 106,504 firm years from 20 OECD countries.

[Insert Table 1 About Here]

Panels A and B of Table 1 report the sample distribution by country and year, respectively. In our sample, the U.S. market has the largest number of observations in total (37,683), followed by Japan (22,664) and the United Kingdom (13,574). While there are more observations in 2001 than in the other calendar years, the pattern is the same as the original data obtained from Worldscope.

3.2 EPL measures

To examine the causal effect of employment protection on labor productivity, we use the EPL indicator to measure employment protection; the data on this variable are only available for 20 OECD countries over the period 1990 to 2007. A potential benefit of using this sample is that the labor market reforms in these years are not systematically preceded by deteriorating macroeconomic fundamentals but experience significant changes in the statutory regulation of employees (Dessaint, Golubov, and Volpin, 2017). Following Simintzi, Vig, and Volpin (2015), we construct the indicator EPL^R to capture the major labor reforms in OECD countries. $EPL^R_{k,t} = EPL^R_{k,t-1}+R_{k,t}$, where R_t is an indicator that takes the value of +1 if EPL increased in country k in year t and takes the value of −1 if EPL decreased in country k in year t; otherwise, the variable takes the value of 0, starting with $EPL^R = 0$ in 1989.[5]

3.3 Labor productivity measure and the control variables

Our primary measure of labor productivity, *LnProd*, is defined as the logarithm of a firm's output per employee. The firm output is defined as sales plus the change in inventory. In the robustness analyses, we use two measures of total factor productivity (TFP) to measure labor productivity (*TFP_OP* and *TFP_LP*). Following Chemmanur, Cheng, and Zhang (2013), the another measure of labor productivity used in this study is the logarithm of sales per employee (*LnProd1*).

We control for a number of variables that potentially influence firms' labor productivity and convert all the non-ratio variables into U.S. dollars using the exchange rate of the corresponding fiscal year-end. Firm-level controls include firm leverage (*Lev*), measured as the ratio of debt to total assets; firm size (*Size*), measured as the logarithm of total assets; growth opportunities (*Growth*), measured as the annual sales growth rate; operating leverage (*Operating_lev*), measured as net property, plant, and equipment divided by total assets; firm profitability (*Profit*), measured as net income before the extra items/preferred dividends divided by total assets; and firm age (*LnAge*), measured as the logarithm of years that a firm has been included in the Worldscope database. We also control for one industry-level variable, the Herfindahl–Hirschman Index (*HHI*), which is calculated based on Fama and French's 48 industry classification.

To account for differences in macroeconomic factors across countries and over time, we control for several country-level variables including *GDP_growth* (annual GDP growth rate), *GDP_per_capita* (GDP per capita measured in U.S. dollars, in thousands), and *Cap_GDP* (market capitalization of listed domestic companies, measured as a percentage of GDP). We provide a detailed description of the variables in Appendix A.

4. EPL and Labor Productivity: the Empirical Results

4.1 Descriptive analysis

Panel A of Table 2 presents the descriptive statistics of the main variables. The mean for *LnProd* is 12.296, and the median is 12.213. The minimum (maximum) value of *LnProd* is 10.236 (14.781), indicating a significant variance. The mean for *Lev* is 0.260, which is similar to Kale, Ryan, and Wang's (2015) result of 0.235. The mean (median) for *Profit* is 0.017 (0.028). The mean (median) for *HHI* is 0.221 (0.124), which indicates a reasonably competitive product market.

[Insert Table 2 About Here]

Panel B of Table 2 reports the correlations among the variables in the regressions. Consistent with Hypothesis H1b, the employment protection indicator ($EPL_{t\text{-}1}$) is negatively related to labor productivity ($LnProd_t$). As shown in Panel B of Table 2, labor productivity is significantly and positively related to leverage, firm size, firm profitability, and firm age, and it is significantly and negatively related to growth opportunities and operating leverage. In addition, labor productivity is significantly related to the country-level variables, including economic development and capital market development.

4.2 The Ddifferences-in-Ddifferences test

To reduce endogeneity concerns and provide evidence of the causal effect, we perform a DID test of EPL on labor productivity. Following prior research (e.g., Dessaint, Golubov, Volpin, 2017; Simintzi, Vig, and Volpin, 2015), we construct a measure of labor regulation (EPL^R) that varies across countries and over time for OECD countries over the period 1990 to 2007. The model to conduct a DID estimation is specified as follows:

$$y_{i,j,k,t} = \delta \cdot EPL_{k,t\text{-}1}{}^{R} + \beta \cdot X_{i,j,k,t\text{-}1} + \lambda_i + \alpha_j * \gamma_t + \epsilon_{i,j,k,t}, \quad (1)$$

Where, *i* denotes a firm, *t* denotes a year, *j* denotes an industry, and *k* denotes a country. The dependent variable is one of our measures of labor productivity: *LnProd*, *TFP_OP*, *TFP_LP*, or *LnProd1*. X is the vector of control variables and includes firm-level variables (*Lev*, *Size*, *Growth*, *Intensity*, *Profit*, *LnAge*, and *HHI)* and macroeconomic variables (*GDP_growth*, *GDP_percapita*, and *Cap_GDP)*. λ_i, α_j, and γ_t measure firm, industry, and year fixed effects, respectively. We cluster the standard error at the country level, following Simintzi, Vig, and Volpin (2015).

[Insert Table 3 About Here]

Table 3 reports the DID estimation results using a sample of 20 OECD countries over the period 1990 to 2007. Labor productivity, as our primary dependent variable, is defined as *LnProd.* We use three measures (EPL_t^R, $EPL_t^{negative}$, and $EPL_t^{positive}$) as the proxies for employment protection changes. EPL_t^R is our primary explanatory variable, designed to capture significant, long-run changes in EPL over time, and is not comparable across countries. Following Dessaint, Golubov, Volpin (2017), we also use two other indices, $EPL_t^{positive}$ and $EPL_t^{negative}$, to separately test if positive and negative changes of employment protection lead to asymmetric effects on labor productivity. $EPL_t^{positive}$ ($EPL_t^{negative}$) is incremented by one if a reform that increases (decreases) labor protection is adopted in country *k* in year *t*, starting with $EPL_t^{positive}$ ($EPL_t^{negative}$) = 0 in 1989.

In Table 3, we first control for country-level control variables in Column (1), and then we control for all control variables in Column (2). As shown in Columns (1) and (2) in Table 3, the coefficients of $EPL_{t\text{-}1}{}^{R}$ are significantly negative, suggesting that stricter employment protection leads to a reduction in labor productivity. We then use

$EPL_{t-1}^{positive}$ and $EPL_{t-1}^{negative}$ as our explanatory variables. The results in Column (3) show that only positive changes in employment protection significantly affect labor productivity, indicating that strengthening labor protection decreases labor productivity, but deregulating it does not increase labor productivity.

As for the control variables, we find that operating leverage is negatively related to labor productivity, which is consistent with Kale, Ryan, and Wang (2015). Firm size, growth opportunities, firm performance, industry-fitted HHI, GDP per capita, and market capitalization are positively related to labor productivity.

4.3 Identification issues

4.3.1 Parallel trends check

We assess if the assumption of our differences-in-differences is valid. In particular, our DID research design relies on the parallel trend assumption that the change in employee productivity does not happen in a random year. To perform the parallel trends check, we include pseudo-variables in our regression model, which is presented in Table 4. In Column (1), we add two pseudo-variables (EPL_t^R and EPL_{t-2}^R), and in Column (2), we add four pseudo-variables (EPL_{t+1}^R, EPL_t^R, EPL_{t-2}^R, and EPL_{t-3}^R). After adding those pseudo-variables the coefficient on EPL_{t-1}^R is still significantly negative, and the coefficients on four pseudo-variables are all insignificant, consistent with the parallel trend assumption. This result suggests that our findings are not driven by pre-event trend heterogeneity in employment protection.

[Insert Table 4 About Here]

4.3.2 Potential endogeneity

Although we exploit labor protection law as a quasi-experiment and employ DID tests in Table 3, our research might have potential endogeneity issues. It is possible that countries with low-productivity firms are more likely to implement less stringent employee protection laws (i.e., reverse causality). It is also possible that both employment protection laws and labor productivity are determined by a country's legal and political system (i.e., omitted variable problem).

To address the potential endogeneity by reverse causality, we reestimate the model by including the future EPL(EPL_{t+3}^{R}, EPL_{t+2}^{R}, $EPL_{t+1}^{R,}$ and EPL_{t}^{R}). The results are presented in Panel A, Table 5. The coefficients on future EPL are insignificant, which indicates that firms' labor productivity is not a driving factor of EPL change.

To mitigate the omitted variable problem, we need to control for some possible omitted variables that may lead to potential confounding effects biasing our findings. Simintzi, Vig, and Volpin (2015) study the determinants of changes in EPL and find that two variables, i.e. union density and income inequality, are the only variables that are statistically significant determinants of changes in EPL. We therefore add two vairables in our regressions and check the robustness of our findings. The results presented in Panel B of Table 5 show that coefficients on the EPL indicator are still significantly negative in both columns, after controlling for these two variables. To summarize, our results suggest that the significant negative relation between EPL and labor productivity still holds after controlling for the the effect of the potential confounding variables.

[Insert Table 5 About Here]

4.4 Robustness Tests: Different measures and different samples

We conduct a series of robustness checks. To ensure the robustness of our main results, we first check the results by using an alternative measure of EPL, e.g., EPL_t^{index}, which measures the stringency of labor market regulations in many aspects, including hiring regulations and minimum wage, hiring and firing regulations, centralized collective bargaining, hours regulations, mandated cost of worker dismissal, and conscription. The index goes from 1 (weakly regulated labor market) to 10 (strongly regulated labor market). Second, we check the results using alternative measures of labor productivity. Following Chemmanur, Cheng, and Zhang (2013), we measure labor productivity as the logarithm of sales per employee (*LnProd1*). We also use two measures of total factor productivity, *TFP_OP*, which is proposed by Olley and Pakes (1996), and *TFP_LP*, which is proposed by Levinsohn and Petrin (2003), to proxy for labor productivity. Third, as U.S. firms contribute to the most significant proportion of observations, we check the robustness of the results by excluding U.S. firms from our sample. The detailed empirical results are presented in Table 6. Using different measures of EPL and labor productivity and different samples, we find that the effect of EPL remains significantly negative in Table 6, suggesting that stricter employment protection leads to a reduction in labor productivity.

[Insert Table 6 About Here]

5. Why does EPL adversely affect labor productivity?

In the hypothesis development, we discussed two channels through which EPL negatively affects labor productivity: firm-employee agency conflicts and workforce adjustment flexibility. In this section, we focus on the first channel by examining the moderating role of country-, industry-, and firm-level factors that are related to the firm–employee agency conflicts in shaping the EPL-labor productivity relationship.

As Rajan and Zingales (1998, 2000) note, shareholders and employees may have different objective functions that may create agency conflicts between firms and employees. While shareholders are concerned with their equity value, employees seek only to maximize their private utility, which mainly comes from wages and other pecuniary benefits, job security, and reduced work effort (John, Knyazeva, and Knyazeva, 2015). As the residual claimants and monitors of a firm (Alchian and Demsetz, 1972), shareholders hire managers to monitor other stakeholders including employees. However, managers are also opportunistic and may align with either shareholders or employees to retain their own jobs (Atanassov and Kim, 2009).

If the firm-employee agency cost of EPL is the main driving force of the negative effect of EPL on labor productivity, we expect that the negative impact of EPL can be reduced in circumstances in which: i) external and internal corporate governance mechanisms are in place to discipline managers; and ii) a country's culture encourages employees to work hard. In this study, several country-, industry-, and firm-level corporate governance mechanisms that may potentially mitigate firm–employee agency conflicts include investor protection, M&A laws, industry competition, dividend payout, operational efficiency, and firm pay-for-performance sensitivity. We expect that the negative effect of EPL on labor productivity will be less pronounced when external or internal corporate governance mechanisms are stronger.

To examine the moderating role of informal institutions that mitigate employees agency costs from a shrink, we employ two cultural indices to measure employees' working incentives, in-group collectivism (*Ingroup_co*), and performance orientation (*Perfor_ori*), which were obtained from the GLOBE study (House, Hanges, Javidan, Dorfman, and Gupta, 2004). Based on the explanations of the two indices provided in the following subsection, we expect that employees' agency costs will be less affected

by stricter EPL in countries with higher levels of both in-group collectivist societal values and performance-oriented societal values.

5.1 The moderating role of country-level corporate governance

5.1.1 The role of investor protection

The first external corporate governance mechanism aligning the interests of shareholders and managers is investor protection as better investor protection increases the risk of resignation and litigation for managers. In this regard, La Porta, Lopez-de-Silanes, Shleifer, and Vishny (2000) argue that legal protection for outside investors can protect investors against expropriation by insiders (managers and controlling shareholders). Defond and Hung (2004) find that strong law enforcement institutions that are capable of protecting shareholders' property rights increase the probability of CEO turnover in the face of poor firm performance. Huang, Elkinawy, and Jain (2013) show that a reduction in agency costs obtained through strong investor protection plays a role in a firm's decision on how much cash to hold. Atanassov and Kim (2009) also find that managers are opportunistic and ally with employees when labor regulation is secure, and investor protection is weak, resulting in value-reducing asset sales in the face of firm distress. Thus, we expect that agency conflicts between firms and employees are higher in countries with weak investor protection, and as a result, the adverse impact of labor regulation on labor productivity will be more pronounced.

Three indicators are used to measure investor protection. The variable *Financier* is used in Atanassov and Kim (2009) to measure legal protection for investors. The variable *Secreg* is used in Hail and Leuz (2006) to measure the strength of securities regulation that mandates and enforces disclosures. The variable *Class_action* is used in La Porta, Lopez-de-Silanes, and Shleifer (2006) to determine whether class action

lawsuits are allowed for prospectus liability cases in a given country. These three indicators are measured at the country level and are time-invariant, so we classify firms based on the median value of each country-level indicator. Following Cleary (1999), Lagakos, Moll, Porzio, Qian, and Schoellman (2018), and Gong, Li, and Yin (2019), we estimate Equation (1) separately for observations in high and low investor protection groups and perform the one-tailed Fisher's permutation test on the coefficient difference between the two groups.

Table 7 presents the results using three country-level indicators of investor protection that proxy for the stringency of investor protection in a specific country. Columns (1) and (2) present the empirical results for *Financier*, Columns (3) and (4) present those for *Secreg*, and Columns (5) and (6) present those for *Class_action*. The estimated coefficient of EPL_{t-1}^{R} is negative and statistically significant at the 10% level in Column (2) of "*Financier*<=Median" but insignificant in Column (1) of "*Financier*>Median." The one-tailed Fisher's permutation test shows a statistically significant difference between group coefficients. Those results indicate that labor regulation reduces labor productivity only in countries with low investor protection. The results in Columns (3)-(6) are similar to those in Columns (1) and (2) employing different country-level investor protection measures. To summarize, Table 7 provides evidence that weak investor protection may cause the adverse impact of labor regulation on labor productivity.

[Insert Table 7 About Here]

5.1.2 The role of the takeover market

The second country-level external corporate governance mechanism examined in this study is the mergers and acquisitions market institutions. Market forces can

discipline managers in regimes with a well-developed M&A market (John, Li, and Pang, 2017; Lel and Miller, 2015). When markets for corporate control are weak, managers are less likely to be exposed to the risk of resignation. Thus, managers are expected to exert less effort to resolve agency conflicts between firms and employees in countries with underdeveloped takeover markets. Therefore, we expect that the firm–employee agency conflicts will be more severe in regimes without M&A laws.

Following Glendening, Khurana, and Wang (2016) and Lel and Miller (2015), we use *Takeover_law* to measure the development of the takeover market. *Takeover_law* is a dummy variable that equals the value of one for firms in countries in the post-M&A law periods and the value of zero for firms in countries in the pre-M&A law periods. As Lel and Miller (2015) suggest, the threat of takeover disciplines managers through incentives that the market for corporate control provides to boards to monitor managers, resulting in fewer agency conflicts between firms and employees. We expect that stronger EPL is more negatively associated with labor productivity for firms domiciled in countries without M&A laws and firms in countries before they enacted these laws.

[Insert Table 8 About Here]

Similar to the test conducted in Table 7, we estimate Equation (1) separately for firm-year observations in countries that have enacted M&A law (*Takeover_law*=1) and for those in the pre-M&A law period (*Takeover_law*=0). Columns (1) and (2) of Table 8 present the results of the subsample based on *Takeover_law*. The estimated coefficient of EPL_{t-1}^{R} is positive but not statistically significant in Column (1) and negative and significant at the 1% level in Column (2), suggesting that labor legislation negatively affects labor productivity only in countries in the pre-M&A law period. The permutation test reports that the difference between the coefficients of the two groups

is statistically significant at the 1% level. The findings in Table 8 suggest that the negative effect of EPL on labor productivity will be less pronounced in countries with well-developed takeover markets where managers are better disciplined.

5.1.3 The role of national culture

National culture plays a vital role in employees' incentives to work hard. We employ the two GLOBE cultural factors to measure employees' working incentives: in-group collectivism (*Ingroup_co*) and performance orientation (*Perfor_ori*). These two factors are measured using data on societal values obtained from the GLOBE study (House, Hanges, Javidan, Dorfman, and Gupta, 2004), representing individuals' views of how society (or an organization) should behave; these data are reported using a 7-point scale (from low to high).[6] The societal value, in-group collectivism, represents the degree to which individuals express pride, loyalty, and cohesiveness in their organizations or families, and performance orientation represents the degree to which an organization encourages and rewards its members for performance improvement and excellence. In countries with a lower level of in-group collectivism or performance orientation, employees are less likely to be motivated to work hard. In this case, an increase in employee protection legislation will cause more severe firm–employee agency problems.

[Insert Table 9 About Here]

Table 9 presents the results for observations in high and low work incentive groups using in-group collectivism (*Ingroup_co*) and performance orientation (*Perfor_ori*). The estimated coefficient of EPL_{t-1} is insignificant in Column (1) and is negative and significant at the 1% level in Column (2), suggesting that labor regulation negatively

affects labor productivity only for countries with low in-group collectivism values. We find similar results when we use performance orientation as a culture proxy. In addition, the permutation tests show that differences in the coefficients between groups with high and low societal values are statistically significant at the 1% level. Our empirical results show that the estimated coefficients of $EPL_{t\text{-}1}{}^{R}$ are negative and statistically significant only for countries with work cultures that do not necessarily encourage employees to work hard. For countries with cultures that strongly encourage employees to work hard, we do not observe any effect of EPL on labor productivity.

5.2 The moderating role of industry-level corporate governance

Similar to corporate control, competition within an industry can also incentivize managers' efforts to reduce agency conflicts between firms and employees. In industries with high levels of competition, if managers do not make efforts to reduce the agency conflicts, then firm performance will deteriorate more easily, which, in turn, may result in management turnovers. Therefore, we expect that agency conflicts will be less severe in industries with more competition.

We first calculate the degree of industry competition using the HHI and then identify industries with a high level of competition if the HHI of a firm's industry is higher than the median value of its country. To the extent that industry competition acts as an external mechanism that mitigates agency problems within firms (Karuna, 2007), we expect that labor regulation is more negatively associated with labor productivity in industries with weak competition (*HHI*>=Median).

[Insert Table 10 About Here]

We estimate Equation (1) separately for observations in industries with low competition (*HHI* >= Median) and high competition (*HHI* < Median). Table 10 shows that the estimated coefficient of EPL_{t-1}^{R} is positive but not significant in Column (1) and negative and statistically significant at the 5% level in Column (2), supporting the argument that industry competition acts as an external mechanism that mitigates agency problems within firms and is consistent with the firm-employee agency conflicts explanation.

5.3 Firm-level corporate governance

Finally, we study whether firm-level corporate governance affects the relation between EPL and labor productivity. Due to data limitations on firm-level corporate governance in the international setting,[7] our firm-level corporate governance indicators are output-based measures including dividend payout, operational efficiency, and pay-for-performance sensitivity.

First, as suggested by DeAngelo, DeAngelo, and Stulz (2006) and Denis and Osobov (2008), firms may optimally pay out the excess funds to mitigate the possibility that free cash flows would be wasted. In addition, dividend payout is sticky as its change plays a signaling role (Guttman, Kadan, and Kandel, 2010; Kim, Lee, and Lie, 2017). For firms that pay significant dividends, managers are under pressure to meet a dividend threshold. Therefore, firms that pay higher levels of dividends face less severe agency conflicts. We use cash dividends paid divided by sales (*Payout*) as the measure of dividend payout policy.

Second, we use two measures of agency costs that capture managerial resource utilization (Ang, Cole, and Lin, 2000; Singh and Davidson III, 2003). The first measure is the ratio of selling, general, and administrative (SG&A) expenses to total sales

(*Expense*). SG&A expenses include excessive benefits flowing to managers and perquisite consumption that reflects managerial discretion in spending company resources (Singh and Davidson III, 2003). Therefore, higher SG&A expenses are associated with more severe agency conflicts. The second measure is the asset turnover ratio (*Turnover*). A high turnover ratio is associated with better resource utilization and less severe agency conflicts since low investment efficiency and insufficient managerial effort that harm productivity often results from agency conflicts (Ang, Cole, and Lin, 2000).

Third, we use pay-for-performance sensitivity at the labor level to measure employees' incentive to work hard and the alignment of the interests between employees and shareholders. Extant studies show that the use of equity compensation ties the compensation of rank and file employees to firm performance, which should result in increased productivity and a greater focus on those activities that increase firm value (Core and Guay, 2002; Kim and Ouimet, 2014). Following this logic, if employees can get compensated when a firm performs better, they are more likely to work hard and align their interests with the shareholder. Since there is a lot of missing values in labor cost in Worldscope, we calculate the mean value of pay-for-performance sensitivity of each country-year and use this value to proxy for the pay-for-performance sensitivity of that country.

Table 11 summarizes the results of the subsamples based on firm-level corporate governance indicators. Firms with *payout* and *Turnover* above the upper third quantile for each year-country are classified as firms with less agency cost. Similarly, firms with *Expense* below the lower third quantile for each year-country are classified as firms with less agency cost, and firms are classified as with high pay-for-performance sensitivity if the mean value of PPS_{t-1} of that country is above the upper third year

quantile. As shown in Columns (1) and (2) in Table 11, the estimated coefficients of EPL_{t-1}^{R} are negative and significant for observations with both higher and lower levels of payout. However, the absolute value of the coefficient of EPL_{t-1} in the "Lower tertile" group is much larger, suggesting that firms paying more dividends are less likely to be affected by EPL. The results in Columns (3) to (6) show that the coefficients of EPL_{t-1}^{R} are negative and significant for observations with a higher level of agency cost and insignificant for observations with a lower level of agency cost. The results in Columns (7) and (8) show that the coefficients of EPL_{t-1}^{R} are only significant and negative for low pay-for-performance sensitivity firms instead of high PPS firms. These findings in Table 11 are consistent with the firm-employee agency conflicts explanation of the negative effect of EPL on labor productivity.

[Insert Table 11 About Here]

6. Further Analysis on Labor Market Flexibility Channel

We so far provide the evidence on the employee agency cost channel through which more stringent employment protection may reduce labor productivity. The other plausible explanation for the negative relationship between employment protection and labor productivity is the labor market flexibility channel.

Specifically, the existing theories predict that labor market flexibility allows companies to make efficient adjustments to their labor force, such as collective dismissals in response to market changes and to help boost labor productivity (Mortensen and Pissarides 1994; Lazear 1990; Saint-Paul 1997; Hopenhayn and Rogerson 1993). If stringent EPL increases firms' firing costs and therefore reduces labor market flexibility, which may also negatively affect labor productivity (Autor, Kerr, and Kugler, 2007; Bassanini, Nunziata, and Venn, 2009; Okudaira, Takizawa,

and Tsuru, 2013). Using a reform of employment protection rules in 2001 in Sweden as an exogenous shock to labor market flexibility, Bjuggren (2018) find that increased labor market flexibility will lead to higher labor productivity.

As the labor market flexibility is more important for firms operating in industries with a high level of competition, we expect that the negative impact of EPL on labor productivity is more pronounced for those firms. However, we only find a negative effect on firms operating in industries with a low level of competition, as shown in Table 10. It tends to suggest that the labor market flexibility channel is unlikely to be a valid explanation for our results in the international setting.

In this section, we conduct a direct test to address the labor market flexibility channel by examining the empirical relationship between EPL and the potential consequences of changes in labor market flexibility, e.g., labor investment efficiency. If the labor market flexibility can explain our results, we expect that EPL should have a significant impact on labor investment efficiency.

Labor market flexibility enhances firms' capability to hire employees in expansion periods and fire redundant employees in downturn periods, which is the crucial reason that labor market flexibility has an impact on labor productivity. Following Jung, Lee, and Weber (2014), we measure the labor investment efficiency as the absolute value of the difference between the actual change in a firm's labor force and the expected change ($|Lab\_inef|$), which is a proxy for the deviation of firms' capability in hiring and firing from the optimal level. The optimal level of hiring is modeled as a function of firm characteristics, as suggested by Pinnuck and Lillis (2007).

The results in Column (1) of Table 12 show no significant effect of employment regulation on the overall labor investment efficiency ($|Lab\_inef|_t$). We then examine overinvestment and underinvestment separately by creating subsamples based on the

sign of abnormal net hiring (*Lab_inef*). The results in Columns (2) and (3) also show insignificant coefficients of EPL_{t-1}^{R}. Thus, we find no evidence supporting the notion that employment regulation affects labor investment efficiency. It suggests that labor market flexibility may not be the driving force for the negative effect of EPL on labor productivity. While increased labor market flexibility increases labor productivity, a decrease in labor market flexibility induced by more stringent employee protection is unlikely to affect the labor investment efficiency.

[Insert Table 12 About Here]

7. Conclusion

Prior studies provide conflicting theoretical predictions on the influence of EPL on labor productivity. Using an international sample, we examine how employee protection affects labor productivity and document an adverse effect of EPL on labor productivity. We also find that the negative effect can only be observed in countries with less investor protection, in countries with less developed takeover markets, in countries with cultures that weakly encourage employees to work hard, in industries with less competition and in firms with more agency problems. Moreover, this negative relation is more pronounced in firms suffering from more severe agency conflicts. All these results suggest that the degree of labor regulation stringency increases firm-employee agency conflicts and leads to lower labor productivity.

This study emphasizes the fact that employees' behavioral responses to labor regulation are non-negligible when analyzing the influence of EPL on labor productivity. The effects of a specific type of labor regulation could vary across countries and industries, and corporate governance mechanisms can play an essential role in the efficacy of labor regulation. As we fail to find a significant positive effect of

EPL on labor productivity in our cross-sectional analyses, future studies on the effects of labor regulations might consider how the unintended adverse effect of EPL on incentives and behaviors of employees can be altered by specific corporate governance mechanisms .

Appendix A: Variable definitions

Variable	Definition
Firm-level variables	
LnProd	The natural logarithm of firm output to the number of employees. The firm output is measured as sales plus changes in inventory.
LnProd	The natural logarithm of EBITDA (operating income before depreciation and amortization) per employee.
TFP_OP	Productivity measure proposed by Olley and Pakes (1996).
TFP_LP	Productivity measure proposed by Levinsohn and Petrin (2003).
Lev	Total debt divided by total assets.
Size	The natural logarithm of total assets.
Growth	Annual sales growth rate.
Operating_lev	Operating leverage, measured as net property, plant, and equipment (PPE) divided by total assets.
Profit	Net income before extra items/preferred dividends divided by total assets.
LnAge	The natural logarithm of firm age, which is the number of years a firm has been in the Worldscope database.
HHI	Industry-fitted HHI, which is based on Fama and French's 48 industry classification.
Payout	Cash dividends paid divided by sales.
Expense	Selling, general, and administrative expenses divided by sales.
Turnover	Sales divided by total assets.
PPS	Pay-for-performance sensitivity, calculated as the change in staff cost from year t-1 to year t divided by the change in market capitalization from year t-1 to year t
Emp	The natural logarithm of employees.
Kl_ratio	The natural logarithm of net PPE divided by the number of employees.

Lab_inef	The residuals as a firm-specific proxy for deviations from the expected percentage change in the number of employees (Jung, Lee, and Weber, 2014), with positive residuals indicating overinvestment in labor and negative residuals indicating underinvestment in labor.
|*Lab_inef*|	The absolute value of *Lab_inef.*
Country-level variables	
EPL^R	$EPL_{k,t}^R = EPL_{k,t\text{-}1}^R + R_{k,t}$, where R_t is an indicator that takes the value of +1 if a reform that increases labor regulation is adopted in country k in year t and takes the value of −1 if a reform that decreases labor regulation is adopted in country k in year t; otherwise, the variable takes the value of 0, starting with $EPL_k^R = 0$ in 1989. This variable is defined recursively as in Simintzi, Vig, and Volpin (2015).
$EPL^{positive}$	Indicator variable that increments by one if a reform that increases labor regulation is adopted in country k in year t, starting with $EPL^{positive}_t = 0$ in 1989.
$EPL^{negative}$	Indicator variable that increments by one if a reform that decreases labor regulation is adopted in country k in year t, starting with $EPL^{negative}_t = 0$ in 1989.
Density	The ratio of union membership divided by employment from the OECD (%).
Gini	The Gini indicator of income inequality from the Estimated Household Income Inequality Data Set (EHII).
EPL^{index}	Indicator variable that measures the stringency of labor market regulations in many aspects, including hiring regulations and minimum wage, hiring and firing regulations, centralized collective bargaining, hours regulations, mandated cost of worker dismissal, and conscription. The index goes from 1 (weakly regulated labor market) to 10 (strongly regulated labor market). This index is from Economic Freedom of the World.
GDP_growth	The annual GDP growth rate from the IMF.
GDP_per_capita	The natural logarithm of GDP per capita measured in U.S. dollars from the IMF.
Cap_GDP	The market capitalization of listed domestic companies (% of GDP) from the World Bank.
Financier	The sum of the normalized values of the anti-director rights index, the anti-self-dealing index, and law and order (International Country Risk Guide), which is measured at the country level and is expressed in 1993 to 2004 yearly means. This index is defined in Atanassov and Kim (2009).

Secreg	The strength of securities regulation that mandates and enforces disclosures (Hail and Leuz, 2006).
Class_action	Dummy variable that takes the value of 1 if class action lawsuits are allowed for prospectus liability cases in a given country and 0 otherwise (La Porta, Lopez-de-Silanes, and Shleifer, 2006).
Takeover_law	Dummy variable that takes the value of 1 for firms in countries in the post-M&A law period and 0 for firms in countries in the pre-M&A law period. The post-M&A law period is defined as the years following the enactment of takeover laws, including the year of the enactment. This variable is based on data on takeover laws as of the end of 2003 for each country. This index is obtained from Glendening, Khurana, and Wang (2016) and Lel and Miller (2015).
In-group_co	As measured by GLOBE, in-group collectivist societal values represent the degree to which individuals express pride, loyalty, and cohesiveness in their organizations or families (House, Hanges, Javidan, Dorfman, and Gupta, 2004).
Perfor_ori	As measured by GLOBE, performance orientation societal values represent the degree to which a collective encourages and rewards group members for performance improvement and excellence (House, Hanges, Javidan, Dorfman, and Gupta, 2004).

Appendix B: Country-level indicators

Country	*Financier*	*Secreg*	*Class_action*	*Takeover law year*	*In-group collectivism*	*Performance orientation*
Australia	2.46	0.77	1	1975	5.75	5.89
Austria	1.63	0.18	0	1998	5.27	6.10
Belgium	1.73	0.34	0	1989	n/a	n/a
Canada	1.49	0.39	1	n/a	5.97	6.15
Denmark	2.32	0.91	1	1966	5.50	5.61
Finland	2.13	0.5	0	2000	5.42	6.11
France	2.14	0.5	0	n/a	5.42	5.65
Germany	2.04	0.49	0	1989	5.22	6.09
Greece	1.72	0.58	1	n/a	5.46	5.81
Ireland	1.62	0.21	0	2002	5.74	5.98
Italy	1.09	0.38	0	n/a	5.72	6.07
Japan	2.61	0.81	0	1975	5.26	5.17
Netherlands	2.05	0.75	1	1997	5.17	5.49
Norway	2.45	0.49	0	1997	n/a	n/a
Portugal	2.22	0.65	1	n/a	5.94	6.40
Spain	1.74	0.46	0	1992	5.79	5.80
Sweden	1.97	0.47	0	n/a	6.04	5.80
Switzerland	1.82	0.55	0	n/a	4.94	5.82
United Kingdom	2.3	0.78	1	1998	5.55	5.90
United States	1.04	0.35	0	n/a	5.77	6.14

Employment protection legislation in this paper refers to the rules governing the initiation and termination of employment, which constitute an important element of formal labor market institutions around the world.

[2] These major shocks to employment protection are identified in Simintzi, Vig, and Volpin (2015). See Appendix B in Simintzi, Vig, and Volpin (2015) for a detailed description of the reforms in the OECD countries under study.

[3] Rajan and Zingales (1998, 2000) also note that in the new millennium, corporate governance should focus on the potential agency conflicts between firms and employees.

[4] Several studies have provided mixed evidence on the macroeconomic consequence of EPL. While most studies document negative effects of EPL on economic consequences (e.g., Besley and Burgess, 2004; Botero, Djankov, La Porta, Lopez-De-Silanes, and Shleifer, 2004), several studies show insignificant or positive or nonlinear effects of EPL on economic growth, for example, Bassanini, Nunziata, and Venn (2009) find that although mandatory dismissal regulations have a depressing impact on productivity growth, there is no evidence of a productivity effect from temporary contracts, Nickell and Layard (1999) document a weak positive relationship between EPL strictness and TFP growth, and Belot, Boone, and Van Ours (2007) find an inverse U-shape relationship between EPL and economic growth.

[5] Simintzi, Vig, and Volpin (2015) define EPL^R as zero in 1985; we define EPL^R as zero in 1989 because our sample period starts in 1990. Our results remain similar if we define EPL^R as zero in 1985.

[6] The use of GLOBE measures is widely accepted in cross-cultural research (Li, Brodbeck, Shenkar, Ponzi, and Fisch, 2017; Peretz, Fried, and Levi, 2018; Young and Makhija, 2014).

[7] ISS corporate governance data is widely used in the international studies. However, the information for non-U.S. companies is only available starting in 2003. Since our sample period is from 1990 to 2007, we do not use the ISS data.

References

Addison, J. T., Hirsch, B. T. Union effects on productivity, profits, and growth: Has the long run arrived? *Journal of Labor Economics*, 1989, 7(1): 72-105.

Alchian, A. A., Demsetz, H. Production, information costs, and economic organization. *American Economic Review*, 1972, 62(5): 777-795.

Alimov, A. Labor market regulations and cross-border mergers and acquisitions. *Journal of International Business Studies*, 2015, 6(8), 984-1009.

Acharya, V. V., Baghai, R. P., Subramanian, K. V. Labor laws and innovation. *Journal of Law and Economics*, 2013, 56(4): 997-1037.

Ang, J. S., Cole, R. A., Lin, J. W. Agency costs and ownership structure. *Journal of Finance*, 2000, 55(1): 81-106.

Atanassov, J., Kim, E. Labor and corporate governance: International evidence from restructuring decisions. *Journal of Finance*, 2009, 64(1): 341-374.

Autor, D. H., Kerr, W. R., Kugler, A. D. Does employment protection reduce productivity? Evidence from .S.U.S. states. *Economic Journal*, 2007, 117(521): 189-217.

Bapna, R., Langer, N., Mehra, A., Gopal, R., Gupta, A. Human capital investments and employee performance: an analysis of .T.I.T. services industry. *Management Science*. 2013, 59(3):641-58.

Bassanini, A., Garnero, A. Dismissal protection and worker flows in OECD countries: Evidence from cross-country/cross-industry data. *Labour Economics*, 2013, 21: 25-41.

Bassanini, A., Nunziata, L., Venn, D. Job protection legislation and productivity growth in OECD countries. *Economic policy*, 2009, 24(58): 349-402.

Belot, M., Boone, J., Van Ours, J. Welfare‐improving employment protection. *Economica*, 2007, 74(295): 381-396.

Berk, J. B., Stanton, R., Zechner, J. Human capital, bankruptcy, and capital structure. *The Journal of Finance*, 2010, 65(3): 891-926.

Besley, T., Burgess, R. Can labor regulation hinder economic performance? Evidence from India. *Quarterly Journal of Economics*, 2004, 119(1): 91-134.

Bjuggren, C. M. Employment protection and labor productivity. *Journal of Public Economics*, 2018, 157, 138-157.

Botero, J. C., Djankov, S., La Porta, R., Lopez-De-Silanes, F., Shleifer, A. The regulation of labor. *Quarterly Journal of Economics*, 2004, 119(4):1339-1382.

Caballero, R. J., Cowan, K. N., Engel, E., Micco, A. Effective labor regulation and microeconomic flexibility. *Journal of Development Economics*, 2013, 101: 92-104.

Chemmanur, T. J., Cheng, Y., Zhang, T. Human capital, capital structure, and employee pay: An empirical analysis. *Journal of Financial Economics*, 2013, 110(2):478–502.

Cingano, F., Leonardi, M., Messina, J, Pica, J. Employee protection legislation, capital investment and access to credit: evidence from Italy. *Economic Journal*, 2016, 126(595): 1798-1822.

Cleary, S. The relationship between firm investment and financial status. *Journal of Finance*, 1999, 54(2): 673-692.

Core, J., Guay, W. Estimating the value of employee stock option portfolios and their sensitivities to price and volatility. *Journal of Accounting research*, 2002, 40(3): 613-630.

DeAngelo, H., DeAngelo, L., Stulz, R. M. Dividend policy and the earned/contributed capital mix: a test of the life-cycle theory. *Journal of Financial Economics*, 2006, 81(2): 227-254.

Defond, M. L., Hung, M. Investor protection and corporate governance: Evidence from worldwide CEO turnover. *Journal of Accounting Research*, 2004, 42(2): 269-312.

Denis, D. J., Osobov, I. Why do firms pay dividends? International evidence on the determinants of dividend policy. *Journal of Financial Economics*, 2008, 89(1): 62-82.

Dessaint, O., Golubov, A., Volpin, P. Employment protection and takeovers. *Journal of Financial Economics*, 2017, 125(2): 369-388.

Giroud, X., Mueller, H. M. Corporate governance, product market competition, and equity prices. *The Journal of Finance*, 2011, 66(2): 563-600.

Glendening, M., Khurana, I. K., Wang, W. The market for corporate control and dividend policies: Cross-country evidence from M&A laws. *Journal of International Business Studies*, 2016, 47(9): 1106-1134.

Gong, G., Li, L. Y., Yin, H. Relative performance evaluation and the timing of earnings release. *Journal of Accounting and Economics*, 2019, 67: 358-386.

Griffith, R., Macartney, G. Employee protection legislation, multinational firms, and innovation. *Review of Economics and Statistics*, 2014, 96(1): 135-150.

Guttman, I., Kadan, O., Kandel, E. Dividend stickiness and strategic pooling. *The Review of Financial Studies*, 2010, 23(12): 4455-4495.

Hail, L., Leuz, C. International differences in the cost of equity capital: Do legal institutions and securities regulation matter? *Journal of Accounting Research*, 2006, 44(3): 485-531.

Hirsch, B. T. Union coverage and profitability among .S.U.S. firms. *Review of Economics and Statistics*, 1991, 73(1): 69-77.

Hofstede, G. Culture's consequences: Comparing values, behaviors, institutions and organizations across nations. Sage publications, 2001.

Holmstrom, B., Milgrom, P. The firm as an incentive system. *American economic review*, 1994, 84(4):972-991.

Hopenhayn, H., Rogerson, R. Job turnover and policy evaluation: a general equilibrium analysis. *Journal of Political Economy*, 1993, 101 (5): 915–938.

House, R. J., Hanges, P. J., Javidan, M., Dorfman, P. W., Gupta, V.. Culture, leadership, and organizations: The GLOBE study of 62 societies. 2004.Sage publications.

Huang, Y., Elkinawy, S., Jain, P. K. Investor protection and cash holdings: Evidence from .S.U.S. cross-listing. *Journal of Banking and Finance*, 2013, 37 (3), 937-951.

Ichino, A., Riphahn, R. T. The effect of employment protection on worker effort: Absenteeism during and after probation. *Journal of the European Economic Association*, 2005, 3(1): 120-143.

John, K., Li, Y., Pang, J. Does corporate governance matter more for high financial slack firms? *Management Science*, 2017, 63(6):1872-91.

John, K., Knyazeva, A., Knyazeva, D. Employee rights and acquisitions. *Journal of Financial Economics*, 2015, 118(1):49-69.

Jung, B., Lee, W. J., Weber, D. P. Financial reporting quality and labor investment efficiency. *Contemporary Accounting Research*, 2014, 31(4): 1047-1076.

Kale, J. R., Ryan, H. E., Wang, L. Outside Employment Opportunities, Employee Productivity, and Debt Discipline. Journal of Corporate Finance, 2016, 59: 142-161.

Karuna, C. Industry product market competition and managerial incentives. *Journal of Accounting and Economics*, 2007, 43(2-3): 275-297.

Kim, J., Lee, K. H., Lie, E. Dividend stickiness, debt covenants, and earnings management. *Contemporary Accounting Research*, 2017, 34(4): 2022-2050.

Kim, E. H., Ouimet, P. Broad-based employee stock ownership: Motives and outcomes. *The Journal of Finance*, 2014, 69(3): 1273-1319.

Koeniger, W. Dismissal costs and innovation. *Economics Letters*, 2005, 88(1): 79-84.

La Porta, R., Lopez-de-Silanes, F., Shleifer, A, Vishny, R. Investor protection and corporate governance. *Journal of Financial Economics*, 2000, 58(1): 3-27.

La Porta, R., Lopez-de-Silanes, F., Shleifer, A. 2006. What works in securities laws? *Journal of Finance* ,61, 1-32.

Lagakos, D., Moll, B., Porzio, T., Qian, N., Schoellman, T. Life cycle wage growth across countries. *Journal of Political Economy*, 2018, 126(2): 797-849.

Lazear, E. P. Job security provisions and employment. *Quarterly Journal of Economics*, 1990, 105(3): 699-726.

Lel, U., Miller, D. P. Does takeover activity cause managerial discipline? Evidence from international M&A laws. *Review of Financial Studies*, 2015, 28(6): 1588-1622.

Leuz, C., Nanda, D., Wysocki, P. D. Earnings management and investor protection: an international comparison. *Journal of Financial Economics*, 2003, 69(3):505-527.

Levinsohn, J., Petrin, A. Estimating production functions using inputs to control for unobservables. *Review of Economic Studies*, 2003, 70(2): 317-341.

Li, C., Brodbeck, F. C, Shenkar, O, Ponzi, L. J., Fisch, J. H. Embracing the foreign: Cultural attractiveness and international strategy. *Strategic Management Journal*, 2017, 38(4): 950-971.

Lu, Y., Tao, Z., Wang, Y. Union effects on performance and employment relations: Evidence from China. *China Economic Review*, 2010, 21(1): 202-210.

Mortensen, D.T., Pissarides, C.A. Job creation and job destruction in the theory of unemployment. *Review of Economic Studies*, 1994, 61 (3): 397–415.

Machin, S. J. The productivity effects of unionization and firm size in British engineering firms. *Economica*, 1991, 58(232):479-490.

Machin, S. J, Stewart, M. B. Unions and the financial performance of British private sector establishments. *Journal of Applied Econometrics*, 1990, 5(4): 327-350.

Marshall, A. Principles of Economics. 1890. London: Macmillan.

Martins, P. S. Dismissals for cause: The difference that just eight paragraphs can make. *Journal of Labor Economics*, 2009, 27(2): 257-279.

Matsa, D. Capital structure as a strategic variable: evidence from collective bargaining. *Journal of Finance*, 2010, 65(3:1197-1232.

Morikawa, M. Labor unions and productivity: An empirical analysis using Japanese firm-level data. *Labour Economics*, 2010, 17(6): 1030-1037.

Nickell, S., Layard, R. Labor market institutions and economic performance, in O. Ashenfelter and D. Card (eds.), *Handbook of Labor Economics*, 1999, 3: 3029-3084.

Okudaira, H., Takizawa, M., Tsuru, K. Employment protection and productivity: evidence from firm-level panel data in Japan. *Applied Economics*, 2013, 45(15): 2091-2105.

Olley, G. S., Pakes, A. The dynamics of productivity in the telecommunications equipment industry. *Econometrica*, 1996, 64(6): 1263-1297.

Peretz, H., Fried, Y., Levi, A. Flexible work arrangements, national culture, organizational characteristics, and organizational outcomes: A study across 21 countries. *Human Resource Management Journal*, 2018, 28(1): 182-200.

Pissarides, C. A. Why do firms offer 'employment protection'? *Economica*, 2010, 77(308): 613-636.

Pinnuck, M., Lillis, A.. Profits versus losses: Does reporting an accounting loss act as a heuristic trigger to exercise the abandonment option and divest employees? The Accounting Review, 2007, 82 (4): 1031–53.

Rajan, R. G., Zingales, L. Power in a theory of the firm. *Quarterly Journal of Economics*, 1998, 113 (2):387-432.

Rajan, R. G., Zingales, L. The governance of the new enterprise. Working Paper. 2000. The National Bureau of Economic Research.

Riphahn, R. T. Employment protection and effort among German employees. *Economics Letters*, 2004, 85(3): 353-357.

Saint-Paul, G. Is labor rigidity harming Europe's competitiveness? The effect of job protection on the pattern of trade and welfare. *European Economic Review*, 1997, 41(3-5), 499–506.

Schmitz, J. A. Jr. What determines productivity? Lessons from the dramatic recovery of the U.S. and Canadian iron ore industries following their early 1980s crisis. *Journal of Political Economy*, 2005, 113(3):582-625.

Shapiro, C., Stiglitz, J. E. Equilibrium unemployment as a worker discipline device. *American Economic Review*, 1984, 74(3): 433-444.

Serfling, M. Firing costs and capital structure decisions. *Journal of Finance*, 2016, 71(5):2239-2286.

Simintzi, E., Vig, V., Volpin, P. Labor protection and leverage. *Review of Financial Studies*, 2015, 28(2):561-591.

Singh, M., Davidson, W. N. Agency costs, ownership structure and corporate governance mechanisms. *Journal of Banking & Finance*, 2003, 27(5): 793-816.

Subramanian, K., Megginson, W. L. Employment protection laws and privatization. Journal of Law and Economics, 2018, forthcoming.

Young, S. L., Makhija, M. V. Firms' corporate social responsibility behavior: An integration of institutional and profit maximization approaches. *Journal of International Business Studies*, 2014, 45(6): 670-698.

Table 1 Sample distribution

This table presents the sample distribution across country and year.

Panel A: Sample distribution by country		Panel B: Sample distribution by year	
Country	**Number of observations**	**Year**	**Number of observations**
Australia	1,434	1990	4,024
Austria	806	1991	4,736
Belgium	1,105	1992	4,959
Canada	2,273	1993	5,176
Denmark	1,450	1994	5,903
Finland	1,330	1995	5,932
France	7,093	1996	6,036
Germany	6,236	1997	6,606
Greece	566	1998	6,757
Ireland	434	1999	7,096
Italy	1,135	2000	7,053
Japan	22,664	2001	7,531
Netherlands	2,044	2002	7,492
Norway	1,144	2003	5,558
Portugal	358	2004	5,525
Spain	1,372	2005	6,983
Sweden	1,726	2006	4,783
Switzerland	2,077	2007	4,354
United Kingdom	13,574	Total	106,504
United States	37,683		
Total	106,504		

Table 2 Descriptive statistics and Pearson correlation matrix

Panel A Descriptive statistics

This table reports the descriptive statistics for the main variables used in the regression. Appendix A provides detailed descriptions of the variable definitions.

Variable	N	Mean	SD	Min	10th percentile	Median	90th percentile	Max
$LnProd_t$	106,504	12.296	0.841	10.236	11.345	12.213	13.420	14.781
$LnProd_t$	92,204	9.954	1.062	6.823	8.678	9.959	11.253	12.857
TFP_O_t	94,638	9.900	0.710	5.096	9.086	9.858	10.760	14.808
TFP_L_t	104,017	10.882	0.752	6.084	9.999	10.843	11.815	15.953
Lev_{t-1}	106,504	0.260	0.176	0.002	0.039	0.242	0.502	0.762
$Size_{t-1}$	106,504	19.745	1.779	16.075	17.476	19.651	22.150	24.281
$Growth_{t-1}$	106,504	0.089	0.219	-0.451	-0.115	0.057	0.324	1.032
$Operating\_lev_{t-1}$	106,504	0.316	0.201	0.017	0.081	0.283	0.603	0.885
$Profit_{t-1}$	106,504	0.017	0.100	-0.524	-0.059	0.028	0.099	0.213
$LnAge_{t-1}$	106,504	2.258	0.570	1.099	1.386	2.303	2.996	3.258
HHI_{t-1}	106,504	0.221	0.229	0.018	0.039	0.124	0.522	1.000
GDP_growth_{t-1}	106,504	2.481	1.633	-5.914	0.171	2.726	4.450	10.863
$GDP\_per\_capita_{t-1}$	106,504	10.325	0.259	9.275	9.989	10.360	10.634	11.213
Cap_GDP_{t-1}	106,504	91.037	42.012	1.194	42.012	84.002	142.176	291.658
$Density_{t-1}$	106,229	23.608	14.941	7.906	11.960	21.451	38.897	87.427
$Gini_{t-1}$	97,952	38.873	2.894	29.306	35.620	39.289	42.261	45.359
$Payout_{t-1}$	105,640	0.011	0.018	0.000	0.000	0.005	0.030	0.106
$Expense_{t-1}$	82,154	0.236	0.184	0.020	0.065	0.193	0.443	1.159
$Turnover_{t-1}$	106,504	1.249	0.711	0.170	0.515	1.110	2.129	4.080
PPS_{t-1}	29,736	0.038	1.461	-7.419	-0.532	0.021	0.632	7.762
Lab_ineff_t	106,237	0.003	0.223	-0.502	-0.167	-0.027	0.168	1.263

Panel B Pearson Correlation Matrix

This table provides the Pearson correlation matrix of the main variables in our sample. Detailed descriptions of the variable definitions are provided in Appendix A.

	$LnProd_t$	EPL_{t-1}	Lev_{t-1}	$Size_{t-1}$	$Growth_{t-1}$	$Intensity_{t-1}$	$Profit_{t-1}$	$LnAge_{t-1}$	HHI_{t-1}	GDP_growth_{t-1}	$GDP\_per\_capita_{t-1}$	Cap_GDP_{t-1}
$LnProd_t$	1											
EPL_{t-1}	-0.036***	1										
Lev_{t-1}	0.081***	-0.022***	1									
$Size_{t-1}$	0.308***	-0.008***	0.159***	1								
$Growth_{t-1}$	-0.007**	-0.005	-0.055***	-0.014***	1							
$Operating\_lev_{t-1}$	*-0.130***	-0.101***	0.228***	0.125***	-0.029***	1						
$Profit_{t-1}$	0.065***	0.006*	-0.182***	0.174***	0.209***	0.055***	1					
$LnAge_{t-1}$	0.125***	-0.030***	0.010***	0.472***	-0.133***	0.044***	0.091***	1				
HHI_{t-1}	-0.123***	-0.001	-0.020***	-0.028***	0.017***	0.043***	0.053***	-0.013***	1			
GDP_growth_{t-1}	-0.114***	-0.042***	-0.039***	-0.016***	0.190***	-0.011***	0.059***	0.005*	0.016***	1		
$GDP\_per\_capita_{t-1}$	0.262***	-0.039***	0.064***	0.098***	-0.047***	-0.087***	-0.083***	0.201***	-0.257***	-0.009***	1	
Cap_GDP_{t-1}	-0.095***	0.018***	-0.037***	-0.033***	0.091***	0.018***	-0.003	0.095***	-0.127***	0.388***	0.307***	1

Table 3 Employee protection and labor productivity: differences-in-differences test

This table presents the regression results for the effect EPL on firm-level labor productivity across countries employing the differences-in-differences methodology. Our sample includes twenty countries and covers the year 1990 to 2007. The firm-level control variables include *Lev*, *Size*, *Growth*, *Operating_lev, Profit*, *LnAge*, and *HHI.* The country-level control variables include *GDP_growth*, *GDP_per_capita*, and *Cap_GDP.* Firm fixed effects and industry-year fixed effects are included. t-values appear in parentheses and are based on robust standard errors double-clustered at country and year level. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively. The definitions and data sources for the variables are provided in Appendix A.

	(1) Full sample	**(2)** Full sample	**(3)** Full sample
	LnProd$_t$	***LnProd$_t$***	***LnProd$_t$***
EPL_{t-1}^{R}	-0.055***	-0.052***	
	(-3.38)	(-3.11)	
$EPL_{t-1}^{negative}$			0.047
			(1.12)
$EPL_{t-1}^{positive}$			-0.060*
			(-2.03)
Lev_{t-1}		0.031	0.031
		(1.42)	(1.44)
$Size_{t-1}$		0.015*	0.015*
		(1.93)	(1.91)
$Growth_{t-1}$		0.133***	0.133***
		(7.92)	(7.67)
$Operating\_lev_{t-1}$		-0.450***	-0.450***
		(-5.43)	(-5.47)
$Profit_{t-1}$		0.127***	0.128***
		(3.33)	(3.25)
$LnAge_{t-1}$		0.004	0.005
		(0.11)	(0.13)
HHI_{t-1}		0.069*	0.069*
		(1.79)	(1.82)
GDP_growth_{t-1}	-0.005	-0.009	-0.009
	(-0.43)	(-0.77)	(-0.78)
$GDP\_per\_capita_{t-1}$	0.568***	0.554***	0.552***
	(4.89)	(5.02)	(4.76)
Cap_GDP_{t-1}	0.002**	0.002**	0.002***
	(2.80)	(2.78)	(2.94)
Firm Effects	Yes	Yes	Yes
Industry*Year Effects	Yes	Yes	Yes
N	106,504	106,504	106,504
R^2	0.908	0.910	0.910

Table 4 Parallel trends

This table presents the results of parallel trend tests. EPL_{t+1} is *EPL* in country k in year t+1, and so on. To mitigate potential confounding effects, observations for which the next reform or the previous reform was adopted in fewer than two years are excluded from this test. Our sample includes twenty countries and covers the years 1990 to 2007. The firm-level control variables include *Lev*, *Size*, *Growth*, *Operating_lev, Profit*, *LnAge*, and *HHI.* The country-level control variables include *GDP_growth*, *GDP_per_capita*, and *Cap_GDP.* Firm fixed effects and industry-year fixed effects are included. t-values appear in parentheses and are based on robust standard errors double-clustered at country and year level. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively. The definitions and data sources for the variables are provided in Appendix A.

	(1)	**(2)**
	Full sample	Full sample
	LnProd$_t$	***LnProd$_t$***
EPL_{t+1}^R		0.014
		(1.05)
EPL_t^R	0.052	0.047
	(1.72)	(1.39)
EPL_{t-1}^R	-0.086**	-0.085**
	(-2.22)	(-2.22)
EPL_{t-2}^R	-0.015	0.014
	(-0.77)	(0.52)
EPL_{t-3}^R		-0.037
		(-1.20)
Control variables	Yes	Yes
Firm Effects	Yes	Yes
Industry*Year Effects	Yes	Yes
N	106,032	106,032
R^2	0.910	0.910

Table 5 Potential endogeneity

This Table presents the results controlling for potential endogeneity—Panel A test for reverse causality issue and Panel B test for the omitted variable issue. In Panel A, EPL_{t+3} is *EPL* in country k in year t+3, and so on. To mitigate potential confounding effects, observations for which the next reform or the previous reform was adopted in fewer than two years are excluded from this test. In Panel B, we add two additional variables as two possible omitted variables. *Density* is the ratio of union density, and *Gini* is the Gini indicator of income inequality.

Our sample includes twenty countries and covers the years 1990 to 2007. The firm-level control variables include *Lev*, *Size*, *Growth*, *Operating_lev, Profit*, *LnAge*, and *HHI.* The country-level control variables include *GDP_growth*, *GDP_per_capita*, and *Cap_GDP*. Firm fixed effects and industry-year fixed effects are included. t-values appear in parentheses and are based on robust standard errors double-clustered at country and year level. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively. The definitions and data sources for the variables are provided in Appendix A.

Panel A: testing for reverse causality

	(1) Full sample
	LnProd$_t$
EPL_{t+3}^R	0.016
	(1.54)
EPL_{t+2}^R	-0.013
	(-1.18)
EPL_{t+1}^R	0.017
	(1.07)
EPL_t^R	0.042
	(1.34)
EPL_{t-1}^R	-0.098**
	(-2.56)
Control variables	Yes
Firm Effects	Yes
Industry*Year Effects	Yes
N	106,035
R^2	0.910

Panel B Controlling for potential omitted variables

	(1) Full sample	(2) Full sample
	LnProd$_t$	***LnProd$_t$***
EPL_{t-1}^{R}	-0.049***	-0.042*
	(-2.96)	(-1.91)
$Density_{t-1}$	-0.002	
	(-0.69)	
$Gini_{t-1}$		-0.028***
		(-3.00)
Control variables	Yes	Yes
Firm Effects	Yes	Yes
Industry*Year Effects	Yes	Yes
N	106,229	97,952
R^2	0.910	0.913

Table 6 Robustness tests: different measures and different sample

This table presents the robustness results. Column (1) presents the regression results using EPL^{index}_{t-1} to measure the stringency of labor market regulations. The dependent variable in Columns (2) to (4) are ***LnProd1***, ***TFP_OP***, and ***TFP_LP***, respectively. Column (5) presents the regression results based on subsample excluding U.S. observations. Our sample includes twenty countries and covers the year 1990 to 2007. The firm-level control variables include *Lev*, *Size*, *Growth*, *Operating_lev, Profit*, *LnAge*, and *HHI.* The country-level control variables include *GDP_growth*, *GDP_per_capita*, and *Cap_GDP.* Firm fixed effects and industry-year fixed effects are included. t-values appear in parentheses and are based on robust standard errors double-clustered at country and year level. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively. The definitions and data sources for the variables are provided in Appendix A.

	(1) Full sample	**(2)** Full sample	**(3)** Full sample	**(4)** Full sample	**(5)** excluding U.S. observations
	LnProd$_t$	***LnProd1$_t$***	***TFP_OP$_t$***	***TFP_LP$_t$***	***LnProd$_t$***
EPL_{t-1}^{R}		-0.061***	-0.040***	-0.044***	-0.055***
		(-3.49)	(-3.63)	(-3.97)	(-2.94)
EPL_{t-1}^{index}	-0.068**				
	(-2.58)				
Control variables	Yes	Yes	Yes	Yes	Yes
Firm Effects	Yes	Yes	Yes	Yes	Yes
Industry*Year Effects	Yes	Yes	Yes	Yes	Yes
N	104,675	92,204	94,638	104,017	68,821
R^2	0.921	0.785	0.919	0.929	0.928

Table 7 Cross-sectional tests: country-level indicators of investor protection

This table presents the regression results for the effect of country-level indicators of investor protection on the impact of EPL. The country-level indicators include *Financier*, *Secreg*, and *Class_action*. Our sample includes twenty countries and covers the year 1990 to 2007. The firm-level control variables include *Lev*, *Size*, *Growth*, *Operating_lev, Profit*, *LnAge*, and *HHI.* The country-level control variables include *GDP_growth*, *GDP_per_capita*, and *Cap_GDP.* Firm fixed effects and industry-year fixed effects are included. t-values appear in parentheses and are based on robust standard errors double-clustered at country and year level. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively. The definitions and data sources for the variables are provided in Appendix A. *p*-values for the coefficient difference in EPL_{t-1}^{R} across subsamples are based on Fisher's permutation test.

	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
	Financier> Median	*Financier*< =Median	*Secreg*> Median	*Secreg*<= Median	*Class_action*=1	*Class_action*=0
	$\boldsymbol{LnProd_t}$	$\boldsymbol{LnProd_t}$	$\boldsymbol{LnProd_t}$	$\boldsymbol{LnProd_t}$	$\boldsymbol{LnProd_t}$	$\boldsymbol{LnProd_t}$
EPL_{t-1}^{R}	0.032	-0.022*	-0.017	-0.083*	-0.022	-0.079*
	(0.48)	(-2.17)	(-0.76)	(-2.10)	(-0.90)	(-2.07)
Permutation test	p<0.01		p<0.01		p<0.01	
Control variables	Yes	Yes	Yes	Yes	Yes	Yes
Firm Effects	Yes	Yes	Yes	Yes	Yes	Yes
Industry *Year Effects	Yes	Yes	Yes	Yes	Yes	Yes
N	83,358	23,146	67,281	39,223	65,831	40,673
R^2	0.915	0.898	0.900	0.907	0.901	0.907

Table 8 cross-sectional tests: the effect of takeover law

This table presents the regression results for the effect of *Takeover_law* on the impact of EPL. The country-level indicator is takeover_law. Our sample includes twenty countries and covers the year 1990 to 2007. The firm-level control variables include *Lev*, *Size*, *Growth*, *Operating_lev, Profit*, *LnAge*, and *HHI.* The country-level control variables include *GDP_growth*, *GDP_per_capita*, and *Cap_GDP.* Firm fixed effects and industry-year fixed effects are included. t-values appear in parentheses and are based on robust standard errors double-clustered at country and year level. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively. The definitions and data sources for the variables are provided in Appendix A. *p*-values for the coefficient difference in EPL_{t-1}^{R} across subsamples are based on Fisher's permutation test.

	(1)		**(2)**
	Takeover_law=1		*Takeover_law*=0
	***LnProd*$_t$**		***LnProd*$_t$**
EPL_{t-1}^{R}	0.025		-0.080***
	(0.84)		(-3.94)
Permutation test		$p<0.01$	
Control variables	Yes		Yes
Firm Effects	Yes		Yes
Industry*Year Effects	Yes		Yes
N	50,318		34,541
R^2	0.906		0.926

Table 9 Cross-sectional tests: nation's culture

This table presents the regression results of country-level culture indicators on the impact of EPL. The country-level indicators include *Ingroup_co* and *Perfor_ori*. Our sample includes twenty countries and covers the year 1990 to 2007. The firm-level control variables include *Lev*, *Size*, *Growth*, *Operating_lev, Profit*, *LnAge*, and *HHI.* The country-level control variables include *GDP_growth*, *GDP_per_capita*, and *Cap_GDP.* Firm fixed effects and industry-year fixed effects are included. t-values appear in parentheses and are based on robust standard errors double-clustered at country and year level. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively. The definitions and data sources for the variables are provided in Appendix A. *p*-values for the coefficient difference in EPL_{t-1}^{R} across subsamples are based on Fisher's permutation test.

	(1) *Ingroup_co*>Median	**(2)** *Ingroup_co* <= Median	**(3)** *Perfor_ori*>Median	**(4)** *Perfor_ori*<=Median
	***LnProd*$_t$**	***LnProd*$_t$**	***LnProd*$_t$**	***LnProd*$_t$**
EPL_{t-1}^{R}	0.006	-0.096***	0.030	-0.080***
	(0.31)	(-4.51)	(1.00)	(-5.52)
Permutation test	p<0.01		p<0.01	
Control variables	Yes	Yes	Yes	Yes
Firm Effects	Yes	Yes	Yes	Yes
Industry*Year Effects	Yes	Yes	Yes	Yes
N	62,238	44,266	66,078	40,426
R^2	0.900	0.915	0.901	0.914

Table 10 cross-sectional tests: the effect of industry competition

This table presents the regression results for the effect of *HHI* on the impact of EPL. Our sample includes twenty countries and covers the year 1990 to 2007. The firm-level control variables include *Lev*, *Size*, *Growth*, *Operating_lev, Profit*, *LnAge*, and *HHI*. The country-level control variables include *GDP_growth*, *GDP_per_capita*, and *Cap_GDP*. Firm fixed effects and industry-year fixed effects are included. t-values appear in parentheses and are based on robust standard errors double-clustered at country and year level. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively. The definitions and data sources for the variables are provided in Appendix A. *p*-values for the coefficient difference in EPL_{t-1}^{R} across subsamples are based on Fisher's permutation test.

	(1) *HHI*<Median	**(2)** *HHI*>=Median
	***LnProd*$_t$**	***LnProd*$_t$**
EPL_{t-1}^{R}	-0.014	-0.027**
	(-0.37)	(-2.23)
Permutation test	*p*=0.04	
Control variables	Yes	Yes
Firm Effects	Yes	Yes
Industry*Year Effects	Yes	Yes
N	33,069	73,435
R^2	0.923	0.918

Table 11 Cross-sectional tests: firm-level corporate governance

This table presents the regression results for the effect of firm-level indicators of corporate governance on the impact of EPL. The firm-level indicators include *Payout*, *Expense*, *Turnover*, and *PPS*. In columns (1) to (6), observations are classified into the 'Upper tertile' group if the corporate governance indicator is above the upper third year-country quantile, and into the 'Lower tertile' group if the corporate governance indicator is below the lower third year-country quantile. In columns (7) and (8), observations are classified into the 'Upper tertile' group if the mean value of PPS_{t-1} of that country is above the upper third quantile, and into the 'Lower tertile' group if the mean value is below the lower third quantile. Our sample includes twenty countries and covers the year 1990 to 2007. The firm-level control variables include *Lev*, *Size*, *Growth*, *Operating_lev, Profit*, *LnAge*, and *HHI.* The country-level control variables include *GDP_growth*, *GDP_per_capita*, and *Cap_GDP.* Firm fixed effects and industry-year fixed effects are included. t-values appear in parentheses and are based on robust standard errors double-clustered at country and year level. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively. The definitions and data sources for the variables are provided in Appendix A. *p*-values for the coefficient difference in EPL_{t-1}^{R} across subsamples are based on Fisher's permutation test.

	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**
Indicators	$Payout_{t-1}$		$Expense_{t-1}$		$Turnover_{t-1}$		PPS_{t-1}	
	Upper tertile	Lower tertile	Upper tertile	Lower tertile	Upper tertile	Lower tertile	Upper tertile	Lower tertile
	$\boldsymbol{LnProd_t}$	$\boldsymbol{LnProd_t}$	$\boldsymbol{LnProd_t}$	$\boldsymbol{LnProd_t}$	$\boldsymbol{LnProd_t}$	$\boldsymbol{LnProd_t}$	$\boldsymbol{LnProd_t}$	$\boldsymbol{LnProd_t}$
EPL_{t-1}^{R}	-0.043*	-0.070***	-0.067**	-0.031	-0.018	-0.055***	0.012	-0.051***
	(-2.06)	(-3.75)	(-2.67)	(-0.61)	(-1.11)	(-2.88)	(0.43)	(-3.67)
Permutation test	p<0.01		p=0.09		p<0.01		p<0.01	
Control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry*Year Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	35,208	35,117	27,391	27,278	35,499	35,403	28,623	28,618
R^2	0.924	0.932	0.906	0.949	0.945	0.899	0.928	0.950

Table 12 Alternative mechanism: labor market flexibility

This table presents the results of tests for the alternative mechanism. The dependent variable in Columns (1) is an overall measure of labor investment efficiency measured by |*Lab_inef*|. Columns (2) and (3) present the regression results for the underinvestment (*Lab_inef*<0) and overinvestment (*Lab_inef*>0) in labor subsamples, respectively. Our sample includes twenty countries and covers the year 1990 to 2007. The firm-level control variables include *Lev*, *Size*, *Growth*, *Operating_lev*, *Profit*, *LnAge*, and *HHI*. The country-level control variables include *GDP_growth*, *GDP_per_capita*, and *Cap_GDP*. Firm fixed effects and industry-year fixed effects are included. t-values appear in parentheses and are based on robust standard errors double-clustered at country and year level. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively. The definitions and data sources for the variables are provided in Appendix A.

	(1) Full sample	(2) *Lab_ineff<0*	(3) *Lab_ineff>0*
	$\|Lab\_inef\|_t$	$\|Lab\_inef\|_t$	$\|Lab\_inef\|_t$
EPL_{t-1}^{R}	0.001	-0.003	0.003
	(0.05)	(-0.61)	(0.11)
Control variables	Yes	Yes	Yes
Firm Effects	Yes	Yes	Yes
Industry*Year Effects	Yes	Yes	Yes
N	106,237	67,095	39,142
R^2	0.274	0.411	0.472