Labor Protection, Debt and Access to Finance

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Abstract

This paper examines the effect of labor regulation on firms' ability to access external finance. We exploit inter-temporal variations in employment protection laws across 21 OECD countries and find that labor friendly reforms are associated with a reduction in firms' debt. We also find that the negative effect of labor protection on leverage is more pronounced in firms that rely more on labor, are subject to more frequent hiring and firing, and have lower liquidation value. In addition, increases in employment protection impact negatively firms' profitability, investment and growth. These findings indicate that the enactment of employment friendly legislation reduces the supply of credit or, put differently, stronger labor protection restricts firms' ability to raise external capital.

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I Introduction

The recent financial crisis and the subsequent global recession have once again brought the contentious topic of employment protection at the forefront of the policy debate. Policymakers around the world are contemplating how to reform the rules that govern the relationship between labor and capital. While some countries, such as the US and the UK, are moving towards more labor protection, Continental European countries are discussing how to amend their current labor laws in order to reduce labor market rigidity.[1]

Whether the benefits of employment protection outweigh its costs is unclear. On the one hand, the critics of labor-friendly legislation argue that legal restrictions on labor contracts impair the efficiency of labor markets and have a debilitating effect on job creation and employment. This provides a rationale for reducing employment protection. On the other hand, the proponents of labor protection claim that lay-offs generate significant negative externalities that firms fail to internalize. Consequently, labor laws provide a way of ensuring that firms internalize these externalities and avoid negative spillover effects in times of crises.This paper provides evidence in support for the critical view and shows that stronger labor protection restricts firms' access to external capital and growth.

Our theoretical argument builds on the idea that pro-labor regulation implicitly makes labor claims rigid and difficult to restructure. The greater rigidity of labor costs brought about by labor friendly laws affects firms' ability to access external finance and generates a crowding out effect: stronger labor protection causes labor to crowd out finance and investment. We develop a simple and tractable model to capture this idea and motivate our empirical analysis. The main building block of the model is that employment protection

[1] As a response to the threat associated with private equity, in 2007 the U.K. government proposed a bill to introduce greater employment protection for employees who work in businesses that are changing ownership by share transfer. Similarly, in the US the recent crisis has led to renewed demand for employment protection. The concern among some commentators and policymakers is that the flexible labor laws in the U.S. may have exacerbated the crisis, as the U.S. may have become a dumping ground for multinational firms unemployment.

reduces firms' ability to restructure their labor force when faced with a technology shock that makes the skill set of existing workers obsolete and thus requires firms to replace existing workers with new ones. In the presence of such a "creative destruction" shock, rigidity in employment contracts reduces firms' ability to adapt to the changing economic environment. This, in turn, leads to the inefficient liquidation of assets (when the labor force cannot be replaced), which reduces firms' cash flows and firms' borrowing capacity.

We test the model's implications using firm-level data from 21 countries over the 1985-2004 period. Specifically, we exploit inter-temporal variations in employment protection laws across countries and adopt a difference-in-differences (DID) research design to investigate the impact of labor reforms on firms' external financing.[2] We find that a one-unit increase in labor protection, as proxied by Employment Protection Legislation, is associated with a reduction of debt by 4% (in absolute terms) or of 14% (relative to the mean). Another way of interpreting this finding is that going from a country like Canada to a country like Italy (with an increase in EPL of 2) leverage should decrease by 8% (in absolute terms) or 29% (in relative terms). These results are robust across a variety of empirical specifications and indicate that labor protection increases the cost of debt financing and crowds out external finance.

Consistent with our proposed explanation, we find that the negative relation between employment protection and leverage is more pronounced in labor-intensive industries. It is also more pronounced where "creative destruction" is more common - that is, in sectors that engage more frequently in hiring and firing.

Furthermore, we examine the differential effect of labor protection on leverage depending on the liquidation value of firms' assets. It is natural to expect (and is also consistent with our theoretical model) that rigidity of labor claims is associated with lower efficiency losses

[2]These changes in regulation represent a near-ideal setting since they are exogenous to the individual firm.

in firms with higher liquidation values and thus lower recovery losses. Consistent with this prediction, we find that labor-friendly laws reduce leverage more in industries with less tangible assets and in countries with weaker creditor protection, which we use as proxies for low liquidation value of the assets.

These cross-sectional heterogeneity results have also the benefit that they mitigate concerns about omitted variables. While our identification strategy (DID) alleviates some of the concerns, it is possible that our results may be due to other contemporaneous reforms (such as changes in taxation or corporate governance reforms). If this were the case, we would incorrectly attribute the changes in leverage to changes in labor laws. Exploiting cross-sectional heterogeneity is useful since such effects would be differenced out in our specifications. Also, in such a setup we can control for interacted year and country fixed effects, therefore controlling for any differences in the regulatory environment over time and across countries.

One further concern could be that our findings are due to some pre-treatment trends or business cycle effects, or even to the endogeneity of labor laws themselves (political economy of these reforms), and not due to changes in labor protection. For this purpose, we examine the dynamics of leverage around the passage of these laws. We find no statistically significant change in leverage prior to the passage of these laws but we find a change in leverage one and two years after the passage of the laws. This finding alleviates the concerns of reverse causality and/or pre-treatment trends that may confound the analysis.

So far, we have emphasized the supply channel through which employment legislation affects firms' access to external finance. Alternatively, it is possible that a demand channel generates similar results. For example, consistent with the argument in Besley and Burgess (2004), employment protection may reduce the demand for finance by decreasing entrepreneurs' incentives to invest. To rule out this explanation, we study the effect of changes in EPL on growth of sales and capital expenditure across firms that differ in their

dependence on external finance. A direct implication of our supply-side story is that firms which rely more on external financing should witness a bigger drop in growth and investment when EPL increases. Consistent with this explanation but not with the demand channel, we find that the reduction in sales' growth and capital expenditure associated with an increase in EPL is more pronounced in firms that are more dependent on external capital.

If labor regulations impose an extra cost on firms, it is likely that firms may respond in a Coasian manner to undo some of these effects. A plausible way to achieve this would be by relying more on short-term debt and trade credit. These are by nature more short term, and therefore, they are less likely to be affected by the losses associated with rigid labor contracts. Indeed, we find evidence of an increase in trade credit and short-term debt following an increase in EPL, although the effect on short-term debt is not statistically significant.

This paper connects several strands of literature, starting with the recent literature on labor regulations and economic growth. Using industry level data from India, Besley and Burgess (2004) find that more pro-worker regulation is associated with lower investment and economic growth. Botero et al. (2004) show that more stringent labor regulation is associated with lower labor force participation and higher unemployment. Contrarian evidence is offered by Acharya, Baghai and Subramanian (2009), who find that pro-labor laws can have an ex-ante positive effect on firms' innovation. This paper revisits the link between labor regulation and growth using micro-level evidence and identifies the mechanism through which labor stifles growth, namely labor crowds out external finance.

This paper also builds on the literature on labor bargaining and firm financing and real activity. Ruback and Zimmerman (1984), Abowd (1989) and Hirsch (1991) document that labor union coverage has a negative association with US firms earnings' and market values. Lee and Mas (2009) study the impact of firm-level union elections on firm performance and

find that union wins are associated with stock price losses, decreases in firm profitability and growth. Chen, Kacperczyk and Molina (2011) document that the cost of equity is higher in more unionized industries. Atanassov and Kim (2009) provide international evidence that strong unions play an important role in firms' financial and economic restructuring. Benmelech, Bergman and Enriquez (2009) show that companies in financial distress extract surplus from workers by achieving substantial wage concessions.

In addition, the paper relates to the stream of the literature which studies the bargaining role of debt (Perotti and Spier (1993), Bronars and Deere (1991), Dasgupta and Sengupta (1993), Matsa (2010)). This literature has argued that firms use debt to lower the surplus workers can extract when bargaining with unions. While this paper does not directly look at unions per se, labor laws can affect the bargaining between firms and workers as it changes the outside option of the workers. Furthermore, unions may operate through a similar mechanism as EPL - they make labor contracts more rigid. To the extent that unions introduce the same rigidity, there may be a countervailing force on financial structure that may come from the supply side as documented in this paper. This countervailing force - namely, the fact that an increase in labor bargaining power may lead to a reduction in firms' debt capacity - could explain why the CFOs surveyed by Graham and Harvey (2001) do not believe that strategic arguments are an important determinant of capital structure.

Finally, the paper contributes to a broader literature which argues that firms' input markets and product markets are important factors interacting with firms' capital structure decisions. Mackay and Phillips (2005) find that firms' position within their industries determine their financial structure. Leary and Roberts (2010) show that firms make decisions on their leverage responding to capital structure decisions by their peers. Kim (2011) shows that human capital specificity impacts negatively firms' debt. Agrawal and Matsa (2011) find that lower labor unemployment risk is associated with increases in firms' debt.

The remainder of the paper is organized as follows. Section II presents the model.

Section III describes the sample and the variables. In Section IV and V we present the empirical methodology and the main results. Section VI reports robustness checks, auxiliary tests and other results, while Section VII concludes.

II Model

We develop a simple, stylized model to structure our theoretical arguments and develop empirical predictions that are tested in the rest of the paper. The model's key result is that an increase in labor market rigidity, brought about by an increase in EPL, crowds out financing and generates negative real effects.

II.1 Technology

Consider an economy inhabited by risk-neutral individuals, where the risk-free interest rate and the labor cost are normalized to 0.

At $t = 0$, an entrepreneur with wealth A raises capital K and hires labor W to invest in a Leontief production technology with constant returns to scale. If labor and capital are a good match (which happens with probability $1 - \phi$), the output produced at $t = 1$ and at $t = 2$ is $Y_1 = Y_2 = \eta \min\{K, W\}$, where $\eta > 0$. Without loss of generality, as in any Leontief production function, we restrict attention to points on the efficient production frontier where $W = K$ and thus $\min\{K, W\} = K$. If labor and capital are a bad match (which happens with probability ϕ), output is $Y_1 = Y_2 = 0$. The parameter ϕ captures creative destruction, that is, the need for flexibility in hiring and firing.

At $t = 1$, first period output is produced. In the good state of the world (that is, when labor and capital are a good match), the output is $Y_1 = \eta K$. In the bad state of the world (that is, when labor and capital are a bad match), the firm produces no output and will produce no output at $t = 2$ as well (if there is no restructuring). Restructuring involves liquidating a fraction $l \in [0, 1]$ of the capital for $\lambda > 0$ per unit of capital and

replacing a fraction $f \in [0, 1-\rho]$ of the current workforce with new employees. The parameter $\rho \in [0,1]$ captures labor market rigidity: the higher the employment protection, the smaller the number of workers that can be replaced. The newly hired workers (who are fK), who are paid the competitive wage 0, produce output $Y_2 = \eta \min\{(1-l)K, fK\}$ at $t = 2$. The parameter λ measures the liquidation value of the assets. We assume that $\eta > \lambda$ so that restructuring is more efficient than liquidating.

At $t = 2$, second period output is produced. If the firm is not restructured at $t = 1$, $Y_2 = Y_1$. If instead the firm is restructured at $t = 1$, then $Y_2 = \eta \min\{(1-l)K, fK\}$. Capital has no liquidation value at this stage.

The timeline of the model is presented in Figure 1.

II.2 Financing

The capital invested at $t = 0$ can come from the entrepreneur's own wealth (inside equity) and/or external capital raised from competitive financial markets. Without loss of generality, we assume that the entrepreneur can try to raise debt D at a (gross) promised payment R due at $t = 1$ and/or to sell equity $(1-a)E$ to dispersed shareholders, where a is the stake retained by the entrepreneur and E is the market value of equity.[3]

We make four important assumptions:

Assumption 1: Output is not verifiable and there is a positive but negligible probability that output $Y_2 = 0$. Hence, the entrepreneur cannot write contracts contingent on output and can always claim that output is 0. This is a standard assumption in the incomplete contract literature (see Hart and Moore (1998)).

Assumption 2: $\eta < 1$, that is, the marginal return from investment that is pledgeable to investors is smaller than 1 (even in the case in which employment protection is $\rho = 0$).

[3]The combination of debt and equity spans any generic security with promised payments c_1 and c_2 paid at $t = 1$ and $t = 2$, respectively.

Otherwise, the firm would be able to borrow an infinite amount of capital.

Assumption 3: $3(1-\phi)\eta/2+\phi\lambda \geq 1$, that is, the marginal return of investment from the view point of the entrepreneur (inclusive of the non-pledgeable component) is greater than 1 even with the greatest degree of employment protection ($\rho = 1$). This ensures that the entrepreneur's participation constraint is met. Otherwise, there would be no investment.

Assumption 4: Debt is a hard claim. If the promised payment RD is not made, creditors take over and can manage the firm. As shown in Bolton and Scharfstein (1996), this rules out strategic default. Outside equity instead is in the hands of atomistic shareholders and thus control is never transferred to outside shareholders. In other words, at $t = 0$ the firm cannot be sold to a different controlling shareholder than the entrepreneur herself.

II.3 Financing Capacity

In this section we will first show that, as in the incomplete contract literature, in our model the optimal financial contract is debt. Intuitively, because cash flows are not verifiable, the firm cannot raise outside equity. We will then show that the debt capacity is a decreasing function of employment protection ρ. In the next section, we solve for the optimal investment and leverage decision.

The entrepreneur cannot pledge the second period output Y_2 to outside financiers. The reason is that output is not verifiable. Hence, the party in control (the entrepreneur herself or any other manager) can claim that output is 0 and pay nothing to outside financiers.

Whether the first-period output Y_1 can be pledged to outside financiers depends on the type of financial contract. Being diffused, outside equity yields no threat of termination. In that case, the entrepreneur does not repay outside shareholders, and thus no outside equity can be raised: $a^* = 1$. Consider instead the case of debt. Because the threat of termination is credible, the entrepreneur repays creditors, provided that her incentive compatibility

constraint is met.

To find the firm's debt capacity, we need to consider the value of the firm in the case of a poor match between labor and capital. At that stage, the party in control chooses $l \in [0,1]$ and $f \in [0, 1-\rho]$ to maximize her expected utility: she receives the entire Y_2 output, $\eta \min\{(1-l)K, fW\}$ and the proceeds from any liquidation of capital done at $t=1$, $l\lambda K$. Hence, she chooses

$$\max_{(f,l)\in[0,1-\rho]\times[0,1]} \eta \min\{(1-l)K, fK\} + l\lambda K$$

The solution is $(f^*, l^*) = (1-\rho, \rho)$. Thus, the continuation payoff in the bad state of the world is $[\lambda + (1-\rho)(\eta - \lambda)]K$.

Consider next the incentive compatibility condition of the entrepreneur when $Y_1 = \eta K$. If the entrepreneur does not pay RD, creditors take over and receive $\lambda K + (1-\rho)(\eta-\lambda)K$, while the entrepreneur consumes $Y_1 = \eta K$. If the entrepreneur pays RD to creditors, she is left with $\eta K - RD$ in the first period and the entire ηK in the second period. Hence, the incentive compatibility constraint is $RD \leq \eta K$, which is also the solvency constraint.

Given that the riskless rate is 0 and creditors are competitive and risk-neutral, the cost of debt R must be such that

$$(1-\phi)RD + \phi[\lambda + (1-\rho)(\eta-\lambda)]K = D,$$

Since the IC constraint must be satisfied, the entrepreneur can raise external finance D up to the debt capacity

$$\overline{D} \equiv (1-\phi)\eta K + \phi[\lambda + (1-\rho)(\eta-\lambda)]K$$

at a promised interest rate

$$R = \max\left\{\frac{D - \phi\lambda K - \phi(1-\rho)(\eta-\lambda)K}{(1-\phi)D}, 1\right\}$$

Intuitively, the debt capacity is decreasing in employment protection. This happens because employment protection restricts firm's ability to restructure labor claims.

II.4 Investment and leverage choice

At date 0, the entrepreneur chooses investment K and debt D to maximize the net present value from the investment:

$$U^* \equiv \max_{(D,K)} 2(1-\phi)\eta K + \phi[\lambda + (1-\rho)(\eta - \lambda)]K - K \tag{1}$$

subject to the budget constraint

$$K \geq A + D \tag{2}$$

and the debt capacity constraint

$$D \leq (1-\phi)\eta K + \phi[\lambda + (1-\rho)(\eta - \lambda)]K \tag{3}$$

Because of Assumption 3, the entrepreneur wants to maximize the size of the firm. This is done by maximizing D. Hence, $D^* = \overline{D}$ and combining equation (3) with the budget constraint (2), which will be met with equality, one obtains that:

Proposition. The optimal investment is

$$K^* = \frac{A}{1 - (1-\phi)\eta - \phi[\rho\lambda + (1-\rho)\eta]}$$

and the optimal leverage is

$$\frac{D^*}{K^*} = (1-\phi)\eta + \phi[\rho\lambda + (1-\rho)\eta]$$

Notice also that the participation constraint of the entrepreneur is met, as $U^* \geq A$ whenever $3(1-\phi)\eta/2 + \phi[\rho\lambda + (1-\rho)\eta] \geq 1$, which is satisfied for all values of ρ because of Assumption 3.

II.5 Empirical Predictions

The model presented delivers several empirical predictions which are tested in this paper.

First, an increase in labor protection ρ reduces leverage:

$$\frac{d\left(D^*/K^*\right)}{d\rho} = -\phi\left(\eta - \lambda\right) < 0. \tag{4}$$

Intuitively, stronger employment protection reduces firms' ability to restructure and thus leads to efficiency losses in case of a poor match. By affecting negatively firms' value in the bad state of the world, employment protection reduces debt capacity and thus firms' leverage. This is our first testable prediction:

Prediction 1: Leverage is strictly decreasing in labor protection ρ.

Second, the negative effect of an increase in labor protection is greater in firms that are more likely to need employment restructuring (that is, in firms with a greater probability of a negative shock ϕ):

$$\frac{d^2\left(D^*/K^*\right)}{d\rho d\phi} = -\left(\eta - \lambda\right) < 0. \tag{5}$$

Hence:

Prediction 2: The negative relation between leverage and labor protection should become greater in magnitude in firms that are more prone to "creative destruction".

Third, the negative effect of an increase in labor protection is smaller in firms with greater liquidation value λ

$$\frac{d^2\left(D^*/K^*\right)}{d\rho d\lambda} = \phi > 0. \tag{6}$$

This follows from the fact that firms with a greater liquidation value, on the margin, stand to gain less from restructuring because the option to liquidate is more valuable compared to restructuring. Thus:

Prediction 3: The negative relation between leverage and labor protection should become smaller in magnitude in firms that have a greater liquidation value.

Fourth, it is also interesting to notice that an increase in labor protection ρ reduces

firm's size:

$$\frac{dK^*}{d\rho} = -\frac{\phi\,(\eta - \lambda)\,A}{\left[1 - (1 - \rho\phi)\eta - \phi\rho\lambda\right]^2} < 0 \tag{7}$$

Hence:

Prediction 4: Firm growth is strictly decreasing in labor protection ρ.

Fifth, one can compare firms with different degrees of dependence on external capital. The idea is to look at a country like the US where employment protection is low ($\rho = 0$) and compute the degree of dependence on external capital of different firms. If $\rho = 0$, dependence on external capital is given by:

$$\frac{K^* - A}{K^*} = \eta$$

Thus, the effect of employment protection on the sensitivity of firm growth with respect to dependence on external capital is:

$$\frac{d^2K^*}{d\rho d\eta} = -\frac{2(1 - \rho\phi)\,(\eta - \lambda) + \left[1 - (1 - \rho\phi)\eta - \phi\rho\lambda\right]}{\left[1 - (1 - \rho\phi)\eta - \phi\rho\lambda\right]^3}\phi A < 0 \tag{8}$$

Hence:

Prediction 5: The negative relation between firm growth and labor protection is more pronounced in firms that are more dependent on external capital.

The model also has predictions for capital expenditures undertaken by the firm. In our simple framework, we have assumed labor and capital to be complements.[4] Given this, an increase in the cost of labor would result in lower capital expenditure. But labor and capital can be substitutes, in which case an increase in labor cost would increase capital expenditure. The effect on capital expenditure is thus ambiguous and depends on the degree of complementarity between labor and capital.

While the effect on capital expenditure is ambiguous, the cross-partial of capital expenditure with EPL and financial dependence is negative. To see this, consider the case

[4]It is important to note that Predictions 1 through 5 do not depend on the choice of production function. The Leontief function is simply chosen out of convenience.

in which labor and capital are complements. In this case, one would expect capital expenditure to go down more for firms that are more dependent on external finance due to the crowding out effect discussed above. On the other hand, if labor and capital were substitutes, one would expect capital expenditure to go up less for firms that are more dependent on external finance, again due to the same crowding out effect. This leads us to our sixth prediction.

Prediction 6: An increase in EPL should have a disproportionately negative effect on capital expenditures in firms that are more dependent on external financing.

To deliver these six predictions, we have used a simple theoretical model where the results were driven by a particular friction - labor claims introduce rigidity that leads to inefficient liquidation and lowers debt capacity. It is likely that some other frictions may generate a similar effect: for instance, labor protection may *de facto* increase the seniority of labor claims in bankruptcy. While some of our cross-sectional results (such as the prediction on labor hiring and firing) are specific to our model, others are also consistent with alternative interpretations. We would like to stress here that we are not wedded to a particular friction, but rather the objective is to identify a channel (the finance channel) through which labor stifles growth.

III Data

We combine three sets of variables: (i) yearly, country-level data on labor regulation; (ii) yearly, firm-level financial data; and (iii) industry-level and country-level control variables. In Table I, we present the definition, source, number of observations, mean, median and standard deviation of the main variables used in the analysis.

III.1 Labor Regulation Indicators

As our indicator of labor regulation, we use the Employment Protection Legislation (EPL) Indicator. EPL covers 21 aspects of employment protection legislation grouped into three broad categories: (1) laws protecting workers with regular contracts (Regular Contracts), (2) those affecting workers with fixed-term (temporary) contracts or contracts with temporary work agencies (Temporary Contracts), and (3) regulations applying to collective dismissals (Collective Dismissals). The Regular Contracts indicator focuses on the procedural requirements that need to be followed when firing an employee with a regular employment contract, the notice and severance pay requirements, and the prevailing standards of (and penalties for) "unfair" dismissals. The Temporary Contracts indicator evaluates the conditions under which these types of contracts can be offered, the maximum number of successive renewals and the maximum cumulated duration of the contract. The Collective Dismissals index specifies what is defined as collective dismissal, the notification requirements provided by law and the associated delays and costs for the employers.[5]

The most important feature of the EPL indicator for us is that it provides both cross-sectional and within country time-variation of labor laws. Therefore, it allows for time-series as well as cross-sectional comparisons across different countries. The indicator ranges from 0 to 6. A higher EPL score indicates larger firing costs for firms and therefore stronger job security for workers, and vice versa. As shown in Table I, the average EPL score in our

[5]The original EPL indicator was constructed by OECD in 1985 as an equally weighted average of two sub-indicators, which take into account regulations on regular and temporary contracts respectively. Later on, the OECD redefined the indicator by adding also regulations on collective dismissals. This new version of EPL is available at an annual frequency since 1998 and it is constructed as a weighed sum of the three-sub-indicators. The weights for each of the sub-indicators are defined on the basis of the number of different items of employment protection grouped in each sub-indicator. There are 21 aspects related to employment protection covered in total. Allard (2005) reconstructed the OECD employment protection legislation providing a longer time-series of the three components included in the new OECD indicator. In our analysis we use this longer time series of the three individual EPL components provided by Allard (2005) and we construct the EPL index as an equally-weighted average of these three components. Attaching the same weights in the three components seems natural and it leads to giving a greater weight to the regulation of collective dismissals than in the OECD indicator. However, the results are robust to different weighting schemes as well as to the specific weights used by the OECD.

sample is about 2.3 and the standard deviation is quite large, at about 1. The summary statistics for the components of EPL show that there is large variation in all components. There is also a significant time-series variation in EPL. Figure 1 presents the plots of the EPL Indicator for each individual country. Our sample consists of 21 OECD countries for which the EPL indicator is available.[6]

III.2 Firm-Level Data

Our main data source is Worldscope. Our sample contains financial information on over 8,900 manufacturing companies in the 21 countries for which the EPL indicator is available. The sample spans the 1985-2004 period. Sample size varies over time because of missing information on some variables used in the analysis. We follow the 2-digit SIC classification to form our group of manufacturing companies. On average, the manufacturing sector comprises about 40% of total assets in the 21 countries.

Following the literature, our main proxy for leverage is market leverage, which is defined as the ratio of book value of debt over the market value of the firm (sum of book value of debt and market value of equity). Debt is the sum of long-term debt, short-term debt, and current portion of long-term debt. As a robustness check, we also consider alternative definitions of leverage: debt to total assets (also known as book leverage), where total assets refers to the book value of firms' assets; the ratio of net debt over market value of assets, where we subtract the cash and other marketable securities from total debt; and net debt over book value of assets. In our regression analysis, we include the standard, firm-level set of explanatory variables for leverage, as identified by Rajan and Zingales (1995) and many others: tangibility (which is defined as net property, plant and equipment over total assets) as a proxy for the amount of collateral that a firm can pledge; size (which is defined as the

[6]They are Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Japan, Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom, United States.

logarithm of firms' real assets) as a control for the degree of diversification and thus the risk of default; profitability (as measured by the Return on Assets, which is the ratio of EBIT over total assets) as a proxy for the availability of internal funds; and the market-to-book ratio, or Q (that is, the ratio of the market value of equity plus book value of debt over the book value of debt plus equity), as an indicator of growth opportunities.

We look at several other firm-level variables, which may be affected by changes in labor protection: trade credit is measured as the difference between the accounts payable minus the accounts receivable over total debt; short-term debt is measured as the portion of short-term debt over total debt; and labor costs are measured as the ratio of cost of staff over total assets. This variable is available however only for a sub-sample of firms. We also use the ratio of capital expenditures to assets to proxy for firms' investment and the growth rate of firms' sales to proxy for firm growth. To focus on access to finance as the channel through which labor regulation affects growth, we follow Rajan and Zingales (1998) and we measure the degree of firms' dependence on external sources of financing by using the ratio of firms' capital expenditures minus their cash flow from operations scaled by their capital expenditures.

As shown in Table I, there is a good deal of variability in all the important variables. The average market leverage, for example, is 28% with a standard deviation of 22%. The total debt to assets of all firms is 25% with a standard deviation of 16%, while the average net debt to assets is 12% and the standard deviation is 23%. Firm size is on average 7.9 and Q is on average 1.2. On average, 30% of firms' assets are tangible assets. The average profitability, as measured by ROA, is around 6.3%.

III.3 Other Variables

To take advantage of cross-sectional heterogeneity, we produce several industry-level variables, where industries are defined at the 2-digit SIC codes. Labor intensity is defined as

the median cost of staff normalized by sales at the 2-digit SIC industry level. Turnover is defined as the average job creation and destruction; it is measured at the 2-digit SIC industry level using data by Davis, Haltiwanger and Schuh (1996) for the US. Median Tangibility is the (2-digit SIC) industry median of tangibility, as defined above at the firm level.

To control for the differences in macroeconomic conditions and income across countries, we include in our set of control variables country-level GDP growth and GDP per capita. An important variable for our analysis is creditor protection, which is measured as the creditor rights indicator from Djankov, McLiesh and Shleifer (2007). The creditor rights index takes values from 0 to 4, with higher values indicating stronger creditor rights and it provides time variation in creditor protection. Another institutional factor we take into account is the countries' tax systems, using a variable defined as in Fan, Titman and Twite (2006) which describes how dividends and interest payments are taxed in each country. We also use indicators provided by La Porta, Lopez-de-Silanes, Shleifer, and Vishny (1998) to characterize the countries' legal origin, indicating whether a country's legal origin or commercial regulations follow French, German, Scandinavian or English law. Further, based on the Demirguc-Kunt and Levine (1999) classification, we identify which economies are bank-based and which are market-based.

IV Main Results

In this section we present the main results of the paper. We start by investigating the relation between EPL and leverage in our data. By employing a difference- in-differences methodology that exploits the inter-temporal variations in employment laws across countries, we find that firms reduce their use of debt following legal changes that increase employment protection. We then explore the cross-sectional heterogeneity in our sample and we find that the negative effect of labor protection on leverage is more pronounced for sectors that rely more on labor and that are subject to more frequent hiring and firing or

more "creative destruction". We also find that the negative effect of labor protection on leverage is more pronounced for firms that have fewer tangible assets and in countries with weaker creditor rights.

IV.1 Leverage and EPL

In this section we examine the effect of labor regulation on firms' capital structure. We thus exploit both time series and cross-sectional variation in the EPL index of employment protection and we employ a difference-in-differences research design to identify the causal impact of labor regulations on the capital structure of firms. Using firm level data, we analyze the following specification:

$$y_{it} = \gamma_t + \lambda_i + \delta \cdot EPL_{k,t-1} + \beta \cdot X_{it} + \epsilon_{it}, \tag{9}$$

where i denotes a firm, t denotes a year, j is an industry, and k is a country. The dependent variable y_{it} is debt to market value of assets; λ_i and γ_t are firm and year fixed effects respectively. X_{it} is the vector of control variables and ϵ_{it} is the error term. X_{it} includes the contemporaneous effect of profitability, investment opportunities, size and tangibility, which are important determinants of the costs of financial distress. The vector of controls also includes macroeconomic variables and in some specifications country-level controls, taking into account countries' different legal origins, tax systems and development of their financial markets (market based versus bank based economies). We cluster the standard errors at the country level, since the labor laws are changing at the country level. It is important to note that clustering at the country level generates the most conservative standard errors, that is, the standard errors become much smaller when we cluster them at the firm or industry level.[7]

A similar research design has been used in several studies, particularly in labor economics. The multiple pre-intervention and post-intervention time periods take care of

[7]The results can be obtained upon request.

many threats concerning validity. This methodology is best illustrated by the following example.[8] Suppose there are two countries, A and B, undergoing legal changes at times $t = 1$ and $t = 2$, respectively. Consider $t = 0$ to be the starting period in our sample. From $t = 1$ to $t = 2$, country B initially serves as a control group for legal change; and after that it serves as a treated group for subsequent years. Therefore, most countries belong to both treated and control groups at different points in time. This specification is robust to the fact that some groups might not be treated at all, or that other groups were treated prior to 1985, which is our sample's beginning date.

The results are reported in Table II. In column 1, besides controlling for all usual determinants of leverage, we have industry/year ($\alpha_j * \gamma_t$) fixed effects to control for industry-level dynamics. The coefficient of interest (δ in specification (1) above) is negative and statistically different from zero at the 1% level. In column 2, we add country fixed effects to the previous specification to control for country time-invariant characteristics. The results are unchanged: δ is negative and statistically different from zero at the 1% level. In columns 3 and 4 we add firm fixed effects, as a way to control for time-invariant, firm-specific characteristics. Column 3 adds the firm fixed effects to the specification estimated in column 1, which controls for industry/year fixed effects and other country-level variables. In column 4, we estimate the same specification as in column 3 with the addition of country/industry ($\alpha_k * \alpha_j$) fixed effects, which allow for differences across countries within the same industry.

Across all specifications reported in Table II, the coefficient of the EPL indicator is negative, always strongly statistically significant (at 5% level), and has a similar magnitude. Notice that the coefficients on Tangibility, Size, ROA and Q have the expected sign and are all strongly statistically significant. To gauge the economic significant of the findings, consider a two-unit increase in EPL: this change is associated with an approximately 8%

[8] In this example, we assume, for simplicity, that the labor variable is a 0-1 binary variable to provide the basic intuition. The discussion generalizes when the labor variable (e.g. EPL) is an index, as is the case in this paper. Essentially, the DID strategy identifies out of differences.

reduction in market leverage or with a reduction by 29% relative to its mean.

The negative relation between leverage and our measure of employment protection is consistent with Prediction 1 of our model. An increase in employment protection is associated with a reduction in the firm's ability to replace the current labor force in case of a "creative destruction" shock and thus a reduction in the firm's debt capacity.

An alternative explanation for this result is that an increase in labor protection would lead to a reduction in the demand of debt. An immediate effect of an increase in labor protection is an increase in the rigidity of labor contracts. For instance, after an increase in labor protection, firms may face tighter restrictions on their ability to restructure their labor force than before. In the presence of uncertainty, an increase in contractual rigidity leads to an increase in the probability of financial distress. As a simple application of the trade-off theory of capital structure, to reduce the risk of financial distress following the increase in labor protection, firms will reduce their demand of debt.

Both these mechanisms, lead to the same conclusion: higher employment protection legislation increases the cost of debt for firms, leading to lower levels of leverage. And therefore, both channels imply that an increase in EPL causes operating leverage to crowd out financial leverage. We will address this alternative explanation later on.

IV.2 Cross-Sectional Heterogeneity

The results so far suggest that labor laws have a causal impact on the financial structure of firms. Specifically, we document a negative relation between increases in labor protection and financial leverage. However, one concern with this causal interpretation is that EPL changes may be associated with other regulatory reforms, like changes in taxation or corporate governance, which may happen at the same time as changes in EPL. In such case, the worry is that the uncovered relation between employment protection and leverage may be spurious: in other words, we would incorrectly attribute the changes in leverage to changes

in labor laws.

A second concern with respect to a causal interpretation of our findings is that changes in labor regulation may be endogenous to firms' financial decisions. This concern is likely to be less severe than in the case of changes in variables that are directly affected by the choice of an individual firm, like the unionization rate. This is because, changes in EPL reflect changes in laws and thus are not directly affected by the decisions of individual firms. However, there may still be some concerns about the political economy of changes in labor protection. After all, firms or unions may lobby politicians to change labor regulations when it is in their interest to do so.

The existing empirical studies on the political economy of labor regulation do not find much support for a lobbying explanation. Botero, et al.(2004) show that legal origin and economic development are the most important determinants of labor regulation, with ideology being irrelevant. Moreover, existing political economy models have highlighted several potential determinants of employment protection which are exogenous to firms' decisions: Saint-Paul (2002) indicates that greater employment protection is likely to emerge in countries with less competitive labor markets; Pagano and Volpin (2005) predict that lower employment protection is likely to emerge as a political outcome in countries with majoritarian (as compared to proportional) electoral rules; Perotti and Von Thadden (2006) argue that when financial wealth is more concentrated, labor rents and labor protection are higher.

The specification in Table II (Column 1) already controls for legal origin, economic development and creditor rights, as suggested by Botero et al (2004). In unreported regressions, we also find that our basic results in Table II are unchanged when we control for a measure of the rigidity of the labor market (whether wage bargaining is centralized or decentralized) as suggested by Saint-Paul (2002), the degree of proportionality of the electoral system in a country, as suggested by Pagano and Volpin (2005), and income inequality as a

proxy for wealth inequality, as suggested by Perotti and Von Thadden (2006). However, it is important to emphasize that controlling for country/year ($\alpha_k * \gamma_t$) fixed effects, as done in this section, addresses all these concerns.

IV.2.1 Creative Destruction and Labor

It is intuitive that labor protection should affect leverage more in firms where labor is a more important production input. We thus expect to observe a greater negative correlation between EPL and leverage in sectors with greater labor costs. To test this prediction, we estimate the following regression specification:

$$y_{it} = \gamma_t + \lambda_i + \delta \cdot EPL_{k,t-1} + \zeta \cdot E_{it} + \theta \cdot (EPL_{k,t-1} \times E_{it}) + \beta \cdot X_{it} + \epsilon_{it} \qquad (10)$$

Here E_{it} denotes the relative use of employment in the production function in a given firm and our variable of interest is θ. All the other variables and subscripts are defined as in the previous specification. The specification above essentially represents a difference-in-difference-in-differences analysis. This specification has the added benefit that it allows us to control for country specific shocks as it allows us to include a fixed effect of each country/year pair ($\alpha_k * \gamma_t$). This addresses concerns that there might be changes at the country level, such as changes in the tax rates for example, which can have an impact on firms' leverage and which coincide with the labor regulation changes.

In columns 1-4 of Table III, we measure E_{it} as the median of the ratio of labor costs over sales for each 2-digit SIC industry in our sample. In column 1, besides the usual determinants of leverage, we control for firm fixed effects and industry/year fixed effects. In this specification we can see that EPL is negatively correlated with leverage only to the extent that firms operate in labor-intensive industries. In fact, the direct effect (coefficient δ in specification 2) is negative but statistically insignificant, while the coefficient on the interaction term between EPL and employment intensity E (coefficient θ in specification 2) is negative and statistically significant. In column 2, we estimate this specification

by including firm fixed effects and country/ year fixed effects. The parameter of main interest is the coefficient θ on the interaction term of EPL and labor intensity E_{it}, which remains negative and is statistically different from zero at the 10% level. The estimate of θ is negative and statistically different from zero at the 1% level in column 3, where we estimate the same specification as in column 2 with the further addition of industry/year fixed effects to control for differences in industry dynamics. In column 4, we further saturate our specification by adding industry/country fixed effects to the specification estimated in column 3. The estimate of θ is negative and statistically different from zero at the 5% level.

If an increase in EPL makes labor contracts more rigid (for example it becomes more difficult for firms to fire workers or make use of flexible temporary contracts), we expect to observe a more negative impact on leverage in industries where labor flexibility is more important. This follows from Prediction 2 of our model. Using data on employment creation and destruction at the industry level, we construct a measure of labor turnover for industries.[9] Higher values of this variable mean that these industries require higher labor turnover for their operation and therefore, the introduction of labor rigidities would impact these industries more negatively.

Hence, in columns 5-8 of Table III, we measure E_{it} as the labor turnover at the 2-digit SIC industry level testing Prediction 2 of our model. As before, this analysis allows us to control for different combinations of fixed effects. In column 5, besides the usual determinants of leverage, we control for firm fixed effects and industry/ year fixed effects. In this specification we can see that EPL is negatively correlated with leverage only to the extent that firms operate in high labor-turnover industries. In fact, the direct effect is positive and statistically insignificant, while the coefficient on the interaction term between EPL and employment intensity E is negative and strongly statistically significant (at 1%

[9]This data is available for the US by Davis, Haltiwanger and Schuh (1996) and we use them, making the assumption that industries share common characteristics (eg. technological) across countries.

level). In column 6, we control for firm fixed effects and country/year fixed effects. The parameter of main interest is the coefficient on the interaction term of EPL and labor turnover, which remains negative and statistically different from zero at the 1% level. The estimate of θ is negative and statistically different from zero at the 1% level in column 7, where we estimate the same specification as in column 2 with the further addition of industry/year fixed effects to control for differences in industry dynamics. In column 8, we once again saturate the specification by adding industry/country fixed effects to the specification estimated in column 7. The estimate of θ is negative and statistically different from zero at the 1% level. These results indicate that firms reduce debt more in sectors which are more likely to become effectively more constrained in their needs to restructure their labor force.

IV.2.2 Liquidation Value

We expect that the reduction of debt following an increase in EPL should be larger in firms with lower liquidation value (see Prediction 3 of our model).

We investigate the differential impact of strengthening employment protection on capital structure of firms that differ in the liquidation value of their assets by estimating the following regression specification:

$$y_{it} = \gamma_t + \lambda_i + \delta \cdot EPL_{k,t-1} + \zeta \cdot L_{it} + \theta \cdot (EPL_{k,t-1} \times L_{it}) + \beta \cdot X_{it} + \epsilon_{it} \qquad (11)$$

Here L_{it} denotes the liquidation value of the assets and our variable of interest is θ. All the other variables and subscripts are defined as in the previous specification. Specification (11) essentially represents a difference-in-difference-in-differences analysis. This specification has the added benefit that it allows us to control for country specific shocks as it allows us to include a fixed effect of each country/year pair ($\alpha_k * \gamma_t$). This addresses concerns that there might be changes at the country level, such as changes in the tax rates for example, which can have an impact on firms' leverage and which coincide with the labor regulation

changes.

The results are reported in Table IV, where we consider three alternative proxies for the liquidation value of a firm. In columns 1-4, we use median asset tangibility, which is computed as the median 2-digit SIC industry ratio of net property, plant and equipment to total assets. In columns 5 and 6, we use the country-level indicator of creditor rights provided by Djankov et al (2007). In columns 7-10, we proxy liquidation value in an industry/country as the product of median assets tangibility in the industry and the creditor rights in the country. This latter measure may be the most accurate proxy of the three as the creditors' proceeds from liquidation are affected both by the tangibility of the assets and creditor rights in bankruptcy.

In column 1 we start from a basic specification in which we control for firm and industry/year fixed effects. It is worth mentioning that we cannot estimate a coefficient for our proxy for liquidation value (L1) because it is absorbed by the industry/year fixed effects, given that it does not vary within a given industry/year. We confirm that EPL is negatively correlated with leverage, while the coefficient θ on the interaction term of EPL and L1 is positive and statistically significant. In column 2, we exclude the industry/year fixed effects and add the country/year fixed effects. Thus, we can now estimate the effect of L1 on leverage but we can no longer estimate the direct effect of EPL on leverage. The coefficient θ is positive but not statistically significant, while L1 has a negative effect on leverage but is also not statistically significant. In column 3, we add the industry/year fixed effects to the specification estimated in column 2: in this case we can only estimate θ and we find that it is positive and statistically significant at the 10% level. In column 4, we also add industry/country fixed effects: the estimate of θ is positive and statistically significant at the 5% level. Across all specifications, we find that an increase in EPL is associated with a smaller decrease in leverage in sectors that have more tangible assets. The effect of a one-standard deviation increase in tangibility on leverage is 1.6% higher in

a country with EPL equal to 3 (like Italy) compared with a country with an EPL of 1 (like Canada).

In columns 5 and 6 we use a country-level proxy for the liquidation value, namely the indicator of creditor rights proposed by Djankov et al (2007), labeled L2 in the Table. The idea is that creditors can extract a higher value in case of liquidation in countries in which they have stronger rights in case of bankruptcy. We thus expect that the correlation between leverage and EPL should increase with the quality of creditor rights. We test this prediction adopting the same specification used before: in column 5, we include both EPL and the interaction term of EPL and creditor rights while controlling for firm and industry/year fixed effects, firm and country level variables. In column 6, we also include industry/country fixed effects.[10] As can be seen, the interaction coefficient is positive and statistically different from zero at the 1% level in both specifications. The coefficient on EPL is negative and statistically significant at the 1% level; while creditor rights (L2) have by themselves a negative effect on leverage.

These results are even stronger when we consider the third proxy for liquidation value, L3, which is the product of industry median tangibility and creditor rights. As we do in column 1 of Table IV, in column 7 we start from a basic specification in which we include firm and industry/year fixed effects. We confirm that EPL is negatively correlated with leverage, while the coefficient θ on the interaction term of EPL and L3 is positive and statistically significant at 1% level. In this case, we can also estimate the coefficient on L3 because the latter proxy of liquidation value varies across countries, year and industry. A positive (and highly statistically significant) θ is also found in column 8, where we control for firm and country/year fixed effects. A similar result is found in column 9, where we add industry/year fixed effects to the previous specification; and finally, in column 10, where

[10]It is important to note that we cannot include country/year fixed effects in this specification because creditors rights do not vary across firms within the same country.

we also control for industry/country fixed effects. Across all specifications, the estimate of θ is statistically different from zero at the 5% or 1% level. The effect of a one-standard deviation increase in tangibility and a one-standard deviation increase in creditor rights is 1.5% higher in a country with EPL equal to 3 (like Italy) compared with a country with an EPL of 1 (like Canada).

In summary, across all specifications, we find that an increase in EPL is associated with a greater decrease in leverage in sectors with less tangible assets and in countries with lower protection of creditor rights. In those sectors or countries, with lower liquidation values increases in employment protection legislations will have a greater negative effect on leverage.

V Investment and Firm Growth

In this section, we examine the effect of stricter employment protection on firms' real activities. As derived in the model (Prediction 4), we expect employment friendly reforms to be associated with a reduction in overall firm growth since they restrict firms' ability to access external finance.[11] Our model also predicts that this effect is stronger for firms that are more dependent on external capital (Prediction 5).

Table V reports the results of a difference-in-differences analysis, which examines the effect of changes in employment protection legislations on firms' growth, measured as firms' sales growth (Columns 1-3). Column 1 includes country fixed effects to control for country time invariant characteristics and industry/year fixed effects to control for industry specific shocks. Column 2 includes firm fixed effects instead of the country fixed effects in column 1, to control for firm time-invariant characteristics, while column 3 adds country/industry

[11] A similar prediction could also follow, however, from a demand channel argument described by Besley and Burgess (2004): an increase in employment protection may reduce the incentive of an entrepreneur to invest.

fixed effects in addition to the controls in the previous specification. Consistent with Prediction 4 of the model, the estimated coefficients are negative throughout all specifications and statistically significant at 5% (Column 1) or 10% (Columns 2-3) levels of significance. These results are also economically significant. A two-unit increase in EPL is associated with a 7.8% reduction in firms' sales growth (Column 3).

In columns 4-7 of Table V, we exploit cross-sectional heterogeneity in the firms taking into account firms' dependence on external capital. Thus, columns 4-7 present the results of a difference-in-difference-in-differences estimation, where we test whether more financially dependent firms on external capital grow less following EPL increases. We interact the EPL variable with a time-invariant measure of firms' financial dependence at the firm level. All columns include firm fixed effects. Column 4 also includes industry/year fixed effects, while column 5 includes country/year fixed effects to control for country specific shocks. Column 6 includes both industry/year and country/year fixed effects in addition to the firm fixed effects and Column 7 adds country/industry fixed effects to the previous specification which allow for differences across countries within the same industry. Consistent with Prediction 5 in our model, across all specifications, we find that the interaction coefficient is negative and statistically significant at the 1% level. The effect of a one-standard deviation increase in firms' dependence on external capital on sales growth is 2.8% higher in a country with EPL equal to 3 (like Italy) compared with a country with an EPL of 1 (like Canada).

We next examine the effect of EPL on capital expenditures undertaken by firms. According to our model, an increase in EPL would result in a reduction in capital expenditures. This comes from the fact that capital and labor in our simple set-up (Leontief production function) are perfect complements. In reality, however, labor and capital might be substitutes.[12] In such a scenario, we would expect firms to change their production technology

[12]It is important to note that predictions 1-5 in our paper are not dependent on our choice of the production function; one would get exactly the same predictions using a generic production function.

away from the input that has become more expensive (labor) and towards the relatively cheaper one (capital). This substitution effect may lead to an increase in the capex/asset as EPL increases. Thus, the effect on capital expenditures is ambiguous and depends critically on the degree of complementarity between labor and capital.

However, there is a clear prediction for the cross-partial of capital expenditures with EPL and financial dependence on external capital (Prediction 6), which is independent of whether capital and labor are substitutes or complements: capital expenditures should decrease more for those firms that are more dependent on external capital.

We test these implications in Table VI and we find results consistent with this view. Columns 1-3 show the effect of EPL on capital expenditures over assets. The results are not statistically significant, which can be rationalized on the basis of the argument explained above. Similarly to Table V, in columns 4-7 we exploit cross-sectional heterogeneity in the firms taking into account firms' dependence on external capital. The interaction coefficients in columns 4-7 of VI are negative and statistically significant at the 1% level throughout all specifications. It is also worth emphasizing here that the estimates are robust to the inclusion of industry/year fixed effects, which take care of any concerns relating to the fact that the degree of complementarity between labor and capital might be correlated with our measure of financial dependence.

These results support a supply channel explanation: the increase in employment protection restricts firms' access to capital, and thus reduces investment and growth relatively more in financially dependent firms. The demand channel instead would have no such prediction and therefore these results rule out demand side effects.

VI Other Results

In this section, we report additional tests to check the robustness of our findings, and we extend the analysis in several directions. First, we check the robustness of our results by considering alternative definitions of leverage, and by studying the lead and lag relation between changes in EPL and leverage. This is a way to check for the presence of trends in leverage and reverse causality. As already mentioned, all our results survive and become even more statistically significant if we cluster the standard errors at the industry or firm level, rather than at the country level. Moreover, we have checked that our results are not driven by any specific country: our results are unaffected by dropping any individual country.

Second, we consider whether firms react to the increase in operating leverage by shortening the debt maturity and relying more on trade credit. Finally, to shed more light on the economic mechanism (namely, the idea that operating leverage crowds out financial leverage), we study the relation between EPL and firms' profitability and labor costs.

VI.1 Alternative Definitions of Leverage

In Table VII, we re-estimate our main Table II using different definitions of leverage to check the robustness of our results.

In columns 1-3, we use the book value of leverage as the dependent variable: book value of debt over the book value of assets. In column 1, besides controlling for all usual determinants of leverage, we have country and industry/year fixed effects. In column 2 we include firm fixed effects together with industry/year fixed effects, while in column 3, we estimate the same specification as in column 2 with the addition of country/industry fixed effects. The results are very similar to those in Table II: throughout our specifications, increases in labor protection are associated with decreases in leverage. Using the results in

column 3, the book leverage of a firm falls by approximately 5.4% as EPL increases by 2 units.

In columns 4-6, we test if our previous finding is robust when leverage is defined as net debt (which is defined as debt minus cash) over market value of assets. We find that the coefficient of the EPL Indicator is negative and statistically different from zero. The magnitude of the effect is also economically significant. Using the results in column 6, on average, net debt over assets fall by 5.8% as EPL increases by 2 units. In columns 7-9, we consider net debt over book value of assets and find that on average, net debt over assets falls by 9.6% as EPL increases by 2 units (Column 9). Hence, we can conclude that the negative relation between EPL and leverage is robust to different definitions of leverage.

VI.2 Capital Structure Dynamics

As mentioned earlier, the cross-sectional heterogeneity tests presented in Section IV.2 partially address concerns of reverse causality and endogeneity, in support of our interpretation that there is a causal impact of EPL on leverage. To further address reverse causality, we examine the dynamic effects of EPL changes on firms' capital structure in greater detail. In Table VIII, we replace the EPL indicator with four variables: EPL (+1) is the 1-year-forward value of EPL, EPL (0) is the contemporaneous value of EPL, EPL (-1) is the 1-year-lagged value of EPL and EPL (-2) is the 2-year-lagged value of EPL. We estimate similar specifications to those presented in Table II: in column 1, besides controlling for all usual determinants of leverage, we have country fixed effects to control for country time-invariant characteristics and industry/year fixed effects to control for industry-level dynamics. In column 2 we control for firm fixed effects and for industry/year fixed effects and in column 3, we estimate the same specification as in column 2 with the addition of country/industry fixed effects, which allow for differences across countries within the same industry.

The coefficient on EPL (+1) allows us to assess whether any leverage effects can be found prior to the passage of labor laws (EPL). Finding such an effect of the legislation prior to its introduction could be symptomatic of some reverse causation. Across all specifications, we find that the estimated coefficient on EPL (+1) is economically and statistically insignificant. This rejects any support for a reverse causality story. Moreover both EPL (-1) and EPL (-2) are statistically and economically significant in all specifications. This confirms that changes in EPL cause changes in firm leverage, supporting our causal interpretation of the results. It is worth mentioning here that these results suggest that it takes 2 years for the capital structure to adjust following the employment protection legislation changes and the effect remains thereafter.

VI.3 Debt Maturity and Trade Credit

An immediate implication of our result is that, as a Coasian response after an increase in EPL, firms will try to rely more heavily on debt that is less likely to be crowded out by the increase in operating leverage. In this section, we discuss two ways in which this can be achieved.

First, firms may increase their use of trade credit. Trade credit is, by its very nature, short-term and relatively senior (see Petersen and Rajan, 1997). We would then expect firms to increase their use of trade credit to counteract the increase in employment protection. In columns 2 and 3 of Table IX, we find strong evidence that firms rely more on trade-credit following increases in EPL. In Table IX, column 1 includes country and industry/year fixed effects; column 2 includes firm and industry/year fixed effects; column 3 adds country/industry fixed effects, which allow for differences across countries within the same industry.

Second, firms may also use more short-term debt because it is more likely than long-term debt to mature before the firm is hit by a "creative destruction" shock. Hence, we

would expect that short-term debt should increase relatively to long-term debt following an increase in EPL. In columns 4-6 of Table IX, firms increase their use of short-term debt (relative to total debt) when labor protection increases. However, the coefficients are not statistically different from zero. As before, column 4 includes country and industry/year fixed effects; column 5 includes firm and industry/year fixed effects; while column 6 adds country/industry fixed effects.

VI.4 Profitability and Labor Costs

The economic mechanism behind our analysis is the idea that an increase in the rigidity of the labor market (as proxied by an increase in firing costs or more restrictions to firing employees) increases the operating leverage of the firm and thus crowds out financial leverage. According to this view, an increase in EPL should be associated with a decrease in firms' profitability and is also likely to be associated with an increase in their labor costs.

In Table X, we show that indeed changes in EPL are associated with a decrease in firms' profitability and an increase in labor costs. We estimate a difference-in-differences specification similar to the one in Table II, where the dependent variable is ROA in columns 1-3 and Cost of Staff scaled by Assets in columns 4-6. Columns 1 and 4 include country and industry/year fixed effects; columns 2 and 5 include firm and industry/year fixed effects; while columns 3 and 6 also include country/industry fixed effects.

Across specifications, we find that firms' profitability decreases as EPL increases. Using the specification reported in column 3, a two-unit increase in EPL is associated with a reduction by about 3% in ROA. These findings are consistent with the idea in our theoretical model that stricter employment protection limits firms' access to finance and this may result in firms being unable to take advantage of investment opportunities.

The results on profitability confirm also findings in a large literature in labor economics. Ruback and Zimmerman (1984), Abowd (1989) and Hirsch (1991) find that labor unioniza-

tion has a negative effect on firms' earnings and market values; Lee and Mas (2009) show a negative effect of union elections on firm performance.

The results in columns 4-6 show instead that across all specifications labor costs increase as EPL increases. Relying on the estimates in column 6, a two-unit increase in EPL is associated with an increase by approximately 5.6% in staff cost over assets.[13] These findings indicate that employment protection is costly for the firms.

VII Conclusion

In this paper, using firm-level data from 21 OECD countries over the 1985-2004 period, we provide evidence that firm leverage decreases when employment protection increases. We also find that increases in employment protection have more negative effects on firms' leverage for firms where labor is a more important input of production, and where hiring and firing are more frequent. Further, the negative effect of labor-friendly legislation on firms' leverage is more pronounced when the liquidation value of firms' assets is lower. We also examine the effect of employment protection legislations on firms' investment and sales' growth. We find that increases in EPL dampen firms' growth and that the effect is more pronounced for firms which depend more on external capital. This paper thus identifies a channel through which labor regulation hinders growth: labor crowds out external finance.

Notwithstanding the political importance of employment protection, the existing literature still has no definitive answers to several important questions: What are the costs and benefits of providing employment protection? How does it affect investment and growth? What is the transmission channel through which labor impacts growth? How does employment protection interact with other forms of regulation? Answers to these questions further our understanding of the effects of labor regulation on the economy and facilitate

[13] Because of the large drop in the number of observations, one needs to interpret the results on labor costs with some caution.

the design of effective regulatory policies.

Our paper contributes to this debate and offers supporting evidence for the critics of employment protection laws by showing that labor friendly regulation has negative real effects by restricting access to external finance. This indicates that the transmission channel through which labor regulation impacts growth is through the supply of external capital. From a regulatory perspective, we also find that the negative effect of labor regulation on finance and growth is reduced in the presence of strong creditor rights. This indicates that a country may partially offset the negative effects of increases in employment protection by strengthening creditor rights.

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Table I: Main Variables: Descriptive Statistics

This table reports summary statistics for the main variables used in the analysis. The EPL Indicator is time-varying and its value range is 0-6. Its three components are Regular Contracts (which focuses on the laws protecting workers with regular contracts), Temporary Contracts (which focuses on laws affecting workers with fixed-term, temporary contracts) and Collective Dismissals (which focuses on regulations applying to collective dismissals). Total debt/Market Value is the ratio of total debt (which is the sum of long-term and short-term debt) and the market value of assets. Total debt/Assets is the ratio of total debt and the book value of assets. Net Debt/Market Value is the ratio of total debt net of cash and the market value of assets. Net Debt/Assets is the ratio of total debt net of cash and the book value of assets. Short-term Debt/Debt is the ratio of the short-term portion of debt over total debt. Net trade Credit/Total Debt is the difference of accounts payables minus accounts receivables over total debt. Tangibility is the ratio of net property, plant and equipment and total assets. Size is measured as the logarithm of firms' real assets. Q is the ratio of market value of assets over book value of assets. ROA is calculated as earnings before interest and taxes (EBIT) over total assets. Cost of staff/assets is the ratio of the total labor costs over total assets. Capex/Assets is the ratio of firms' capital expenditures over total assets. Sales' Growth is the growth rate of firms' sales. Financial Dependence is a constant variable at the firm level which captures the degree of firms' financial dependence on external capital. This is proxied by the average ratio of capital expenditures minus cash flow from operations over capital expenditures. Worldscope variables are winzorized at the 1% tails. Labor intensity is the median ratio for each 2-digit industry of the cost of staff normalized by firms' sales. Median Tangibility is the median tangibility ratio for each 2-digit level industry. Turnover is a variable defined at the 2-digit industry level using data from Davis, Haltiwanger and Schuh (1996). It is defined as the average of the employment creation and destruction variables provided by Davis, Haltiwanger and Schuh (1996) for the US industries. GDP per Capita is the logarithm of GDP per Capita expressed in current prices. Creditor Rights takes values from 0-4. The sample period is from 1985 to 2004.

	Source	Observations	Mean	Median	Std. Dev.
Labor Law Indicators					
EPL Indicator	Allard (2005)		2.336	2.393	0.918
Regular Contracts	Allard (2005)		2.213	2.250	1.097
Temporary Contracts	Allard (2005)		1.818	1.630	1.386
Collective Dismissals	Allard (2005)		2.976	3.130	1.203
Firm-level Variables					
Total Debt/Market Value	Worldscope	73,065	0.284	0.241	0.218
Total Debt/Assets	Worldscope	80,022	0.245	0.228	0.164
Net Debt/Market Value	Worldscope	77,476	0.120	0.111	0.317
Net Debt/Assets	Worldscope	79,299	0.121	0.132	0.227
Short-term Debt/Total Debt	Worldscope	69,355	0.431	0.409	0.278
Net Trade Credit/Total Debt	Worldscope	63,188	-1.576	-0.411	5.571
Tangibility	Worldscope	84,037	0.300	0.287	0.152
Size	Worldscope	82,222	7.853	7.757	1.757
Q	Worldscope	76,839	1.199	0.931	0.903
ROA	Worldscope	82,235	0.063	0.069	0.105
Cost of Staff/Assets	Worldscope	17,231	0.276	0.262	0.151
Capex/Assets	Worldscope	70,050	0.059	0.049	0.044
Sales' Growth	Worldscope	74,595	0.078	0.047	0.253
Financial Dependence Firm	Worldscope	83,755	-0.562	-0.635	3.200
Industry-level Variables					
Labor Intensity	Worldscope		0.278	0.291	0.061
Turnover	Worldscope		9.622	9.346	1.622
Median Tangibility	Worldscope		0.301	0.302	0.066
Country Factors					
GDP Growth (%)	IMF, WEO		2.466	2.673	1.762
log (GDP Per Capita)	IMF, WEO		10.126	10.150	0.317
Creditor Rights	Djankov et al (2007)		2.151	2.000	1.182

Table II: DID Analysis: Employment Protection Legislation

This table reports the results of regressions of leverage on the EPL Indicator and a set of controls. Leverage is defined as total debt over market value of assets. EPL is lagged by one year. Columns 1 and 2 include interacted year times two-digit industry fixed effects; column 2 also includes country fixed effects; column 3 includes firm and year times two-digit industry fixed effects and column 4 adds country times two-digit industry fixed effects. Other Control variables refer to macro factors (GDP Growth, log (GDP per Capita, Creditor Rights). In Column 1, these also include indicators characterizing countries' legal origin, tax system (using an indicator used by Fan, Titman and Twite (2006)) and countries' financial development, namely whether a country is a bank-based or a market-based economy. In the rest of the specifications these country-level controls are absorbed by the fixed effects. All variables are defined in Table I. Robust standard errors are reported in parentheses. *, **, ***, indicates significance at the 10%, 5% and 1% respectively. Standard errors are clustered at the country level. Firm-level variables are winsorized at the 1% tails. The sample consists of manufacturing firms in 21 countries. Coverage: 1985-2004.

	(1)	(2)	(3)	(4)
EPL	-0.0325	-0.0456	-0.0409	-0.0409
	(0.0068)***	(0.0134)***	(0.0162)**	(0.0163)**
Tangibility	0.166	0.168	0.251	0.253
	(0.0585)**	(0.0604)**	(0.0436)***	(0.0437)***
Size	0.0110	0.0110	0.0608	0.0608
	(0.0019)***	(0.0019)***	(0.0080)***	(0.0080)***
ROA	-0.555	-0.554	-0.499	-0.497
	(0.097)***	(0.100)***	(0.047)***	(0.046)***
Q	-0.0941	-0.0935	-0.0650	-0.0647
	(0.0044)***	(0.0045)***	(0.0041)***	(0.0040)***
Other Control Var.	X	X	X	X
Country*Industry FE				Yes
Country FE		Yes		
Ind*Year FE	Yes	Yes	Yes	Yes
Firm FE			Yes	Yes
Observations	61,248	61,248	61,248	61,248
Adjusted R^2	0.34	0.34	0.78	0.75

Table III: Cross-sectional Heterogeneity: Labor Intensity and Turnover

This table reports the results of regressions of cross-sectional heterogeneity. Total debt over market value of assets is regressed on the interaction of EPL with a proxy of Labor intensity at the industry level and a set of controls. Labor intensity is computed as the median cost of staf over sales for each industry defined at the 2-digit level. Turnover is a proxy for employment turnover calculated using data by Davis, Haltiwanger and Schuh (1996). All columns include firm fixed effects. Columns 1 and 5 include firm and year times two-digit industry fixed effects; columns 2 and 6 include firm and country times year fixed effects; Columns 3 and 7 include firm, year times two-digit industry fixed effects and country times year fixed effects and Columns 4 and 8 add country times two-digit industry fixed effects to the previous specification. Other Control variables refer to macro factors (GDP Growth, log (GDP per Capita, Creditor Rights). All variables are defined in Table I. Robust standard errors are reported in parentheses. *, **, ***, indicates significance at the 10%, 5% and 1% respectively. Standard errors are clustered at the country level. Firm-level variables are winsorized at the 1% tails. The sample consists of manufacturing firms in 21 countries. Coverage: 1985-2004.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
EPL	-0.0160				0.0029			
	(0.0240)				(0.0241)			
EPL*Labor Intensity	-0.0904	-0.0742	-0.0844	-0.0874				
	(0.0486)*	(0.0397)*	(0.0315)***	(0.0369)**				
Labor Intensity		0.0450						
		(0.048)						
EPL*Turnover					-0.0049	-0.0033	-0.0042	-0.0062
					(0.0015)***	(0.0006)***	(0.0009)***	(0.0014)***
Turnover						0.0101		
						(0.0031)***		
Tangibility	0.251	0.229	0.213	0.215	0.251	0.228	0.215	0.212
	(0.0435)***	(0.0438)***	(0.0412)***	(0.0419)***	(0.0436)***	(0.0438)***	(0.0412)***	(0.0419)***
Size	0.0608	0.0594	0.0628	0.0632	0.0607	0.0593	0.0632	0.0627
	(0.0080)***	(0.0081)***	(0.0081)***	(0.0082)***	(0.0081)***	(0.0082)***	(0.0082)***	(0.0082)***
ROA	-0.499	-0.518	-0.512	-0.510	-0.499	-0.518	-0.512	-0.510
	(0.0467)***	(0.0506)***	(0.0483)***	(0.0480)***	(0.0467)***	(0.0505)***	(0.0482)***	(0.0480)***
Q	-0.0649	-0.0567	-0.0554	-0.0552	-0.0650	-0.0567	-0.0555	-0.0553
	(0.0041)***	(0.0031)***	(0.0030)***	(0.0029)***	(0.0041)***	(0.0030)***	(0.0029)***	(0.0029)***
Other Control Var.	X				X			
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Ind*Year FE	Yes		Yes	Yes	Yes		Yes	Yes
Country*Year FE		Yes	Yes	Yes		Yes	Yes	Yes
Country*Industry FE				Yes				Yes
Observations	61,248	61,248	61,248	61,248	61,248	61,248	61,248	61,248
Adjusted R^2	0.78	0.79	0.76	0.77	0.78	0.79	0.76	0.77

Table IV: Cross-sectional Heterogeneity - Liquidation Values

This table reports the results of regressions of cross-sectional heterogeneity. Total debt over assets is regressed on the interaction of EPL with a proxy for the liquidation value of firms' assets (L) and a set of controls. The first proxy L1, is the median tangibility in the industry, L2 is a measure of creditor rights and L3 is the product of the two measures (L1*L2). All columns include firm fixed effects. Columns 1, 5 and 7 include also year times two-digit industry fixed effects. Column 6 controls for year times two-digit industry and country times two-digit industry fixed effects in addition to firm fixed effects. Columns 2 and 8 add year times country fixed effects to the firm fixed effects, Columns 3 and 9 add country times year and year times two-digit industry fixed effects to the firm fixed effects and Columns 4 and 10 control for firm, year times two-digit industry, country times year and country times two-digit industry fixed effects. Other Control variables refer to macro factors (GDP Growth, log (GDP per Capita, Creditor Rights). All variables are defined in Table I. Robust standard errors are reported in parentheses. *, **, ***, indicates significance at the 10%, 5% and 1% respectively. Standard errors are clustered at the country level. Firm-level variables are winsorized at the 1% tails. The sample consists of manufacturing firms in 21 countries. Coverage: 1985-2004.

Table IV *Continued*

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
EPL	-0.093				-0.105	-0.104	-0.087			
	(0.0158)***				(0.0214)***	(0.0204)***	(0.0164)***			
EPL*L1	0.171	0.088	0.103	0.125						
	(0.0675)**	(0.0548)	(0.0588)*	(0.0541)**						
L1		-0.162								
		(0.102)								
EPL*L2					0.0426	0.0423				
					(0.0113)***	(0.0111)***				
L2					-0.0618	-0.0621				
					(0.0177)***	(0.0174)***				
EPL*L3							0.0980	0.0690	0.0841	0.1000
							(0.0259)***	(0.0337)**	(0.0252)***	(0.0252)***
L3							-0.116	-0.140	-0.078	-0.022
							(0.0397)***	(0.0659)**	(0.0809)	(0.0843)
Tangibility	0.251	0.229	0.213	0.215	0.247	0.249	0.249	0.229	0.213	0.215
	(0.0432)***	(0.0439)***	(0.0412)***	(0.0419)***	(0.0412)***	(0.0413)***	(0.0413)***	(0.0440)***	(0.0410)***	(0.0416)***
Size	0.0608	0.0593	0.0627	0.0632	0.0609	0.0609	0.0609	0.0593	0.0627	0.0633
	(0.0080)***	(0.0081)***	(0.0081)***	(0.0082)***	(0.0080)***	(0.0080)***	(0.0079)***	(0.0080)***	(0.0081)***	(0.0081)***
ROA	-0.499	-0.518	-0.512	-0.055	-0.498	-0.496	-0.499	-0.518	-0.512	-0.510
	(0.0468)***	(0.0505)***	(0.0482)***	(0.0479)***	(0.0465)***	(0.0462)***	(0.0469)***	(0.0505)***	(0.0484)***	(0.0480)***
Q	-0.0650	-0.0567	-0.0554	-0.0552	-0.0645	-0.0643	-0.0647	-0.0567	-0.0554	-0.0553
	(0.0041)***	(0.0031)***	(0.0030)***	(0.0029)***	(0.0038)***	(0.0037)***	(0.0039)***	(0.0031)***	(0.0030)***	(0.0030)***
Other Control Var.	X				X	X	X			
Ind.*Country FE				Yes		Yes				Yes
Country*Year FE		Yes	Yes	Yes				Yes	Yes	Yes
Ind.*Year FE	Yes		Yes	Yes	Yes	Yes	Yes		Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	61,248	61,248	61,248	61,248	61,248	61,248	61,248	61,248	61,248	61,248
Adjusted R^2	0.78	0.79	0.76	0.77	0.79	0.76	0.79	0.79	0.76	0.77

Table V: Growth and Financial Dependence

This table reports the results of regressions of firms' sales growth on the EPL indicator and a set of controls (Columns 1-3) and on the interaction of EPL with a proxy for firms' financial dependence on external capital (constant at the firm level) and a set of controls (Columns 4-7). Column 1 includes country and interacted year and two-digit industry fixed effects; columns 2 and 4 include firm and interacted year and two-digit industry fixed effects; column 3 adds country times two-digit industry fixed effects. Column 5 controls for firm and country times year fixed effects. Column 6 adds industry times two-digit industry fixed effects to the previous specification and Column 7 adds also country times two-digit industry fixed effects to the specification in Column 6. Other Control variables refer to macro factors (GDP Growth, log (GDP per Capita, Creditor Rights). All variables are defined in Table I. Robust standard errors are reported in parentheses. *, **, ***, indicates significance at the 10%, 5% and 1% respectively. Standard errors are clustered at the country level. Firm-level variables are winsorized at the 1% tails. The sample consists of manufacturing firms in 21 countries. Coverage: 1985-2004.

	Growth of Sales			Growth of Sales			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
EPL	-0.0037	-0.0388	-0.0386	-0.0429			
	(0.018)**	(0.023)*	(0.023)*	(0.0224)*			
EPL*Financial				-0.00575	-0.00399	-0.00495	-0.00442
Dependence				(0.00156)***	(0.00121)***	(0.0014)***	(0.0010)***
ROA	0.334	0.639	0.638	0.636	0.6545	0.6256	0.6253
	(0.048)***	(0.043)***	(0.044)***	(0.0452)***	(0.0369)***	(0.03797)***	(0.03807)***
Q	0.044	0.024	0.024	0.0251	0.0292	0.0287	0.0285
	(0.006)***	(0.007)***	(0.007)***	(0.00706)***	(0.0061)***	(0.0062)***	(0.0063)***
Other Control Var.	X	X	X	X			
Firm FE		Yes	Yes	Yes	Yes	Yes	Yes
Country FE	Yes						
Ind*Year FE	Yes	Yes	Yes	Yes		Yes	Yes
Country*Year FE					Yes	Yes	Yes
Country*Industry FE			Yes				Yes
Observations	66,456	66,456	66,456	64,973	64,973	64,973	64,973
Adjusted R^2	0.14	0.34	0.25	0.34	0.27	0.28	0.28

Table VI: Capital Expenditure and Financial Dependence

This table reports the results of regressions of firms' investment measured as capital expenditures over assets on the EPL indicator and a set of controls (Columns 1-3) and on the interaction of EPL with a proxy for firms' financial dependence on external capital (constant at the firm level) and a set of controls (Columns 4-7). Column 1 includes country and interacted year and two-digit industry fixed effects; columns 2 and 4 include firm and interacted year and two-digit industry fixed effects; column 3 adds country times two-digit industry fixed effects. Column 5 controls for firm and country times year fixed effects. Column 6 adds industry times two-digit industry fixed effects to the previous specification and Column 7 adds also country times two-digit industry fixed effects to the specification in Column 6. Other Control variables refer to macro factors (GDP Growth, log (GDP per Capita, Creditor Rights). All variables are defined in Table I. Robust standard errors are reported in parentheses. *, **, ***, indicates significance at the 10%, 5% and 1% respectively. Standard errors are clustered at the country level. Firm-level variables are winsorized at the 1% tails. The sample consists of manufacturing firms in 21 countries. Coverage: 1985-2004.

	Capex/Assets			Capex/Assets			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
EPL	0.0002	-0.0009	-0.0008	-0.00183			
	(0.002)	(0.003)	(0.003)	(0.00310)			
EPL*Financial				-0.00115	-0.00105	-0.00115	-0.00116
Dependence				(0.0003)***	(0.00027)***	(0.00029)***	(0.00028)***
ROA	0.044	0.028	0.028	0.0279	0.0258	0.0243	0.0242
	(0.004)***	(0.004)***	(0.004)***	(0.0037)***	(0.0029)***	(0.0031)***	(0.0031)***
Q	0.004	0.003	0.004	0.00335	0.0043	0.0042	0.0042
	(0.001)***	(0.001)***	(0.001)***	(0.0006)***	(0.00047)***	(0.00049)***	(0.0005)***
Other Control Var.	X	X	X	X			
Firm FE		Yes	Yes	Yes	Yes	Yes	Yes
Country FE	Yes						
Ind*Year FE	Yes	Yes	Yes	Yes		Yes	Yes
Country*Year FE					Yes	Yes	Yes
Country*Industry FE			Yes				Yes
Observations	56,723	56,723	56,723	56,641	56,641	56,641	56,641
Adjusted R^2	0.15	0.55	0.48	0.55	0.49	0.49	0.49

Table VII: Other Definitions of Leverage

This table reports the results of regressions of alternate definitions of leverage on the EPL Indicator and a set of controls. Leverage is defined as Total Debt over Book Value of Assets in columns 1-3, as Net Debt (total debt minus cash) over market value of assets in columns 4-6, and as Net Debt over book value of Assets in columns 7-9. EPL and its component are lagged by one year. Columns 1, 4 and 7 include country and interacted year and two-digit industry fixed effects. Columns 2, 5 and 8 include firm and interacted year and two-digit industry fixed effects and columns 3, 6 and 9 add interacted country and two-digit industry fixed effects. Other Control variables refer to macro factors (GDP Growth, log (GDP per Capita, Creditor Rights). All variables are defined in Table I. Robust standard errors are reported in parentheses. *, **, ***, indicates significance at the 10%, 5% and 1% respectively. Standard errors are clustered at the country level. Firm-level variables are winsorized at the 1% tails. The sample consists of manufacturing firms in 21 countries. Coverage: 1985-2004.

	Total Debt/Assets			Net Debt/Market Value			Net Debt/Assets		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
EPL	-0.0273	-0.0261	-0.0265	-0.0493	-0.0478	-0.0285	-0.0281	-0.0283	-0.0481
	(0.0094)***	(0.0120)**	(0.0122)**	(0.0158)***	(0.0167)***	(0.0157)*	(0.0116)**	(0.0155)*	(0.0167)**
Tangibility	0.146	0.129	0.131	0.514	0.653	0.507	0.383	0.504	0.656
	(0.0492)***	(0.0240)***	(0.0242)***	(0.1060)***	(0.0697)***	(0.0269)***	(0.3830)***	(0.0283)***	(0.0693)***
Size	0.0120	0.0528	0.0531	0.0183	0.0775	0.0588	0.0124	0.0585	0.0776
	(0.0021)***	(0.0066)***	(0.0068)***	(0.0027)***	(0.0084)***	(0.0071)***	(0.0025)***	(0.0069)***	(0.0084)***
ROA	-0.374	-0.358	-0.356	-0.503	-0.499	-0.413	-0.387	-0.414	-0.497
	(0.0912)***	(0.0362)***	(0.0362)***	(0.1490)***	(0.0482)***	(0.0424)***	(0.1380)***	(0.0427)***	(0.0477)***
Q	-0.0098	0.0024	0.0025	-0.0398	0.0028	-0.0091	-0.0423	-0.0092	0.0031
	(0.0083)	(0.0047)	(0.0048)	(0.0127)***	(0.0112)	(0.0066)	(0.0113)***	(0.0065)	(0.0113)
Other Control Var.	X	X	X	X	X	X	X	X	X
Country*Industry FE			Yes			Yes			Yes
Country FE	Yes			Yes			Yes		
Ind*Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE		Yes	Yes		Yes	Yes		Yes	Yes
Observations	61,512	61,512	61,512	64,050	64,050	64,050	61,188	61,188	61,188
Adjusted R^2	0.14	0.76	0.72	0.19	0.76	0.76	0.19	0.79	0.73

Table VIII: Dynamics of Leverage

This table reports the results of regressions of leverage on the one-year lagged, the contemporaneous and the one-year and two-year forward values of the EPL indicator and a set of controls. Leverage is defined as total debt over Market Value of Assets. Column 1 includes interacted year times two-digit industry fixed effects and country fixed effects; column 2 includes firm and year times two-digit industry fixed effects and column 3 adds country times two-digit industry fixed effects. Other Control variables refer to macro factors (GDP Growth, log (GDP per Capita, Creditor Rights). All variables are defined in Table I. Robust standard errors are reported in parentheses. *, **, ***, indicates significance at the 10%, 5% and 1% respectively. Standard errors are clustered at the country level. Firm-level variables are winsorized at the 1% tails. The sample consists of manufacturing firms in 21 countries. Coverage: 1985-2004.

	(1)	(2)	(3)
EPL(+1)	0.0111	0.0037	0.0050
	(0.0106)	(0.0109)	(0.0110)
EPL(0)	-0.0061	-0.0037	-0.0042
	(0.0098)	(0.0105)	(0.0010)
EPL(-1)	-0.0203	-0.0148	-0.0139
	(0.0052)***	(0.0072)**	(0.0073)*
EPL(-2)	-0.0272	-0.0290	-0.0298
	(0.0068)***	(0.0086)***	(0.0084)***
Other Control Var.	X	X	X
Country*Industry FE			Yes
Country FE	Yes		
Ind*Year FE	Yes	Yes	Yes
Firm FE		Yes	Yes
Observations	49,171	49,171	49,171
Adjusted R^2	0.35	0.80	0.77

Table IX: Trade Credit and Short-Term Debt

This table reports the results of regressions of net trade credit over debt (columns 1-3) and short-term debt to debt (columns 4-6) on the EPL indicator and a set of controls. Columns 1 and 4 include country and interacted year and two-digit industry fixed effects; columns 2 and 5 include firm and interacted year and two-digit industry fixed effects; columns 3 and 6 add country times two-digit industry fixed effects. Other Control variables refer to macro factors (GDP Growth, log (GDP per Capita, Creditor Rights). All variables are defined in Table I. Robust standard errors are reported in parentheses. *, **, ***, indicates significance at the 10%, 5% and 1% respectively. Standard errors are clustered at the country level. Firm-level variables are winsorized at the 1% tails. The sample consists of manufacturing firms in 21 countries. Coverage: 1985-2004.

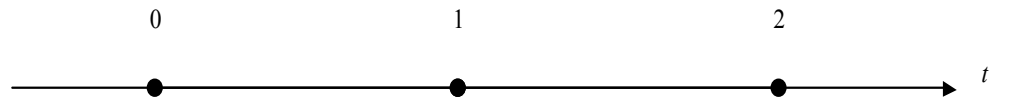
	Net Trade Credit/Debt			Short-term Debt/Debt		
	(1)	(2)	(3)	(4)	(5)	(6)
EPL	0.151	0.352	0.360	0.018	0.009	0.007
	(0.156)	(0.156)**	(0.161)**	(0.014)	(0.014)	(0.014)
Tangibility	3.973	4.664	4.724	-0.221	-0.090	-0.091
	(0.404)***	(0.779)***	(0.786)***	(0.022)***	(0.027)***	(0.029)***
Size	0.292	0.596	0.591	-0.020	-0.040	-0.039
	(0.067)***	(0.173)***	(0.175)***	(0.005)***	(0.009)***	(0.009)***
ROA	-5.654	-3.214	-3.135	-0.128	-0.128	0.128
	(0.759)***	(0.480)***	(0.508)***	(0.033)***	(0.025)***	(0.025)***
Q	-0.354	-0.151	-0.143	-0.005	-0.005	-0.005
	(0.069)***	(0.056)**	(0.054)***	(0.012)	(0.005)	(0.005)
Other Control Var.	X	X	X	X	X	X
Country*Industry FE			Yes			Yes
Country FE	Yes			Yes		
Ind*Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE		Yes	Yes		Yes	Yes
Observations	51,738	51,738	51,738	54,964	54,964	54,964
Adjusted R^2	0.05	0.50	0.42	0.25	0.63	0.57

Table X: Firms' Profitability and Cost of Labor

This table reports the results of regressions of net firms' profitability (columns 1-3) and labor costs (columns 4-6) on the EPL indicator and a set of controls. Columns 1 and 4 include country and interacted year and two-digit industry fixed effects; columns 2 and 5 include firm and interacted year and two-digit industry fixed effects; columns 3 and 6 add country times two-digit industry fixed effects. Other Control variables refer to macro factors (GDP Growth, log (GDP per Capita, Creditor Rights). All variables are defined in Table I. Robust standard errors are reported in parentheses. *, **, ***, indicates significance at the 10%, 5% and 1% respectively. Standard errors are clustered at the country level. Firm-level variables are winsorized at the 1% tails. The sample consists of manufacturing firms in 21 countries. Coverage: 1985-2004.

	ROA			Cost of Staff/Assets		
	(1)	(2)	(3)	(4)	(5)	(6)
EPL	-0.0091	-0.0140	-0.0147	0.0525	0.0281	0.0277
	(0.0060)	(0.0059)**	(0.0057)***	(0.0168)***	(0.0132)**	(0.0130)**
Tangibility	0.027	-0.099	-0.099	0.123	0.125	0.125
	(0.017)	(0.011)***	(0.011)***	(0.036)***	(0.033)***	(0.032)***
Size	0.0100	0.0156	0.0157	-0.0229	-0.0608	-0.0617
	(0.0021)***	(0.0037)	(0.0037)***	(0.0013)***	(0.0044)	(0.0044)***
ROA				0.0219	-0.1030	-0.1040
				(0.0209)	(0.0100)	(0.0102)***
Q	0.0262	0.0307	0.0305	-0.0164	-0.0034	-0.0036
	(0.0038)***	(0.0041)***	(0.0041)***	(0.0030)***	(0.0018)*	(0.0018)**
Other Control Var.	X	X	X	X	X	X
Country*Industry FE			Yes			Yes
Country FE	Yes			Yes		
Ind*Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE		Yes	Yes		Yes	Yes
Observations	64,732	64,732	64,732	13,461	13,461	13,461
Adjusted R^2	0.16	0.61	0.55	0.38	0.90	0.88

Figure 1: Model Time-line



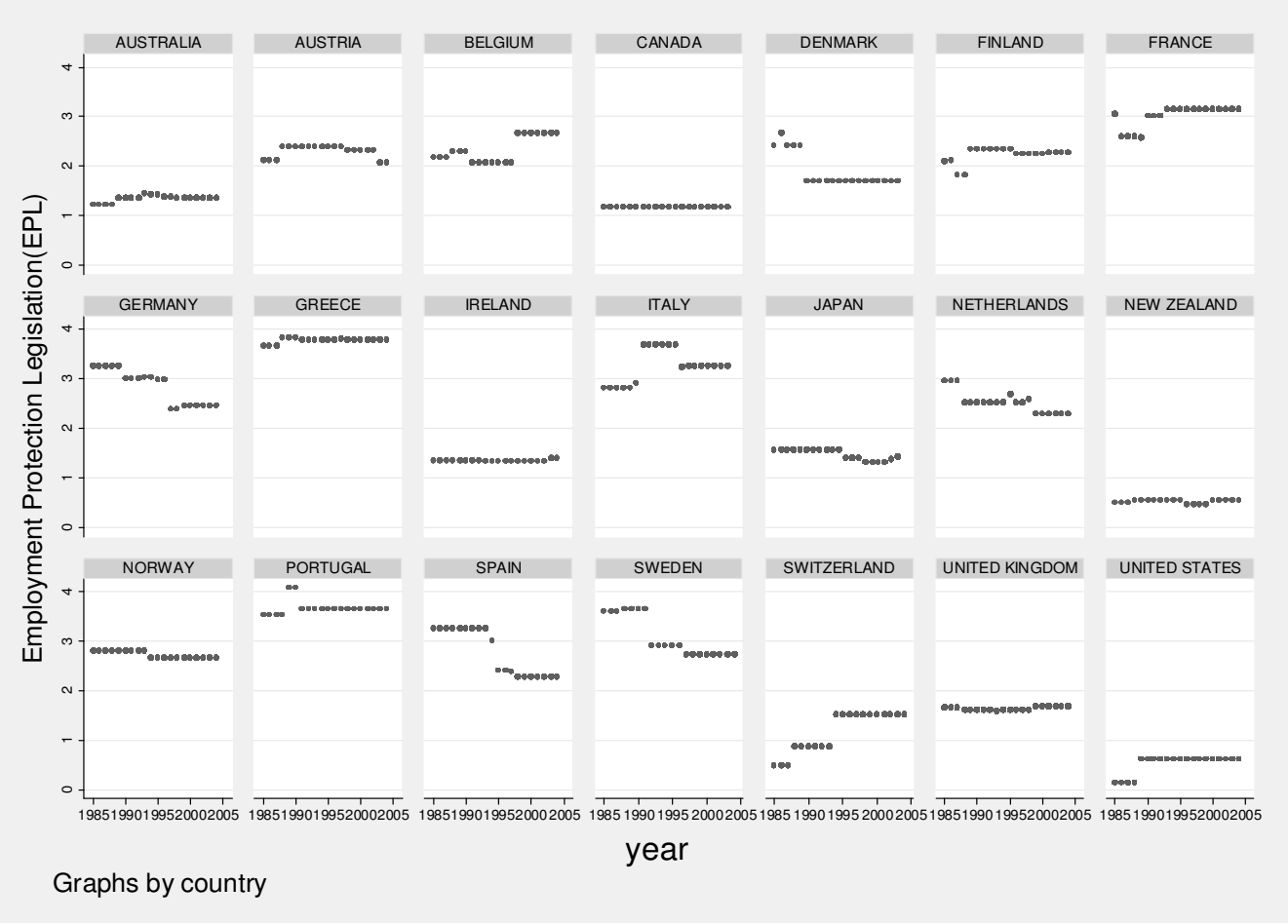
Entrepreneur chooses investment K:

- Investing her own wealth A and raising external capital D.
- Hiring K workers.

- With probability $1-\phi$ the firm produces output $Y_1 = \eta K$ and chooses whether to pay external financiers or not.
- With probability ϕ the firm produces output $Y_1 = 0$ and needs to restructure:
  - Only a fraction $f \le 1-\rho$ of the current employees can be replaced with new employees;
  - A fraction $l \in [0,1]$ of capital can be liquidated for λ per unit.

- If the firm is not restructured at t=1, output is $Y_2 = Y_1$;
- If the firm is restructured at t=1, output is $Y_2 = \eta \min\{f, 1-l\}K + l\lambda K$.

Figure 2: EPL


AUSTRALIA
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DENMARK
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ITALY
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NETHERLANDS
NEW ZEALAND
NORWAY
PORTUGAL
SPAIN
SWEDEN
SWITZERLAND
UNITED KINGDOM
UNITED STATES
Employment Protection Legislation(EPL)
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1
2
3
4
1985
1990
1995
2000
2005
year
Graphs by country