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*Legal Institutions, Corporate Governance and Aggregate Activity:
Theory and Evidence*

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Abstract

This paper investigates the interaction between legal institutions and financial arrangements and the effects that these have on corporate decisions and aggregate activity, both theoretically and empirically. In the theoretical part, we develop a two country general equilibrium model with overlapping generations and asymmetric information in the credit market. We show that, at the steady state equilibrium, the country providing tighter legal enforcement has a larger aggregate output level and a bigger capital stock. Moreover, on the level of the individual firm, credit financing, capital stock and firm size are also higher where the judicial system is working better, while the leverage ratio is the same in the two countries. The driving force behind these results is that improvements in the legal protection of the creditor rights to repossess a collateral asset, increase the investment rate of return, by tempering the inefficiencies due to asymmetric information. In the empirical part, we provide evidence that confirms our theoretical predictions: firms located in Spanish or Italian judicial districts where courts are more efficient (the number of backlogs is lower, the number of concluded trials is larger or the average length of a trial is shorter) have access to a larger amount of external finance and have a larger size. We also document that Italian regions with more effective courts are endowed with a higher stock of private capital and enjoy a higher welfare level, if measured by the added value or the gross domestic product.

Keywords: Judicial enforcement, external finance, leverage ratio, firm size, aggregate activity

JEL-Class E20, K40, G32

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Contents

1	Introduction	6
2	Theoretical Framework	8
2.1	Credit Contract and Legal Enforcement	9
2.2	Workers, Investors and Entrepreneurial Decisions	10
2.2.1	The Labor and Consumption Choice	10
2.2.2	Optimal Credit Contract	11
3	Steady State Equilibrium Analysis	14
4	Comparative Static Analysis	15
4.1	The Role of the Judicial System for Firm Activity	16
4.2	The Role of the Judicial System for Aggregate Activity	19
5	Empirical Analysis	21
6	Data	22
6.1	Spanish Data Set	22
6.2	Italian Data Set	23
7	Empirical Results	24
7.1	Judicial System and Corporate Decisions	24
7.2	Judicial System and Aggregate Activity	30
8	Conclusions	31
9	Appendix 1	32
9.1	Spanish Data Set	32
9.2	Italian Data Set	34

1 Introduction

This paper belongs to the growing empirical literature which investigates whether institutional variables, like content of laws, degree of legal enforcement and accounting standards, are important determinants of the size of capital markets, share returns and corporate decisions. Even though all this evidence suggests that stronger degree of legal protection of creditor rights are positively correlated with firm size, credit and equity market size, quite surprisingly, these empirical findings have not received a foundation in the theoretical literature.

One purpose of this paper is to fill part of this gap, by providing a microeconomic mechanism through which the legal environment is able to shape the gains from credit contract relationships, by affecting the seriousness of the distortion generated by the asymmetric information problem in the financial markets. This mechanism is based on the assumption that the behaviour of courts affects indirectly the liquidation value of the assets pledged as collateral in a credit contract relationship. Using this mechanism, we construct a model able to rationalize the positive correlation between degree of legal enforcement and availability of external finance or firm size.

At the same time, this paper shows the relevance of legal institutions for aggregate activity. We prove that countries providing tighter legal enforcement has higher aggregate output levels and capital stocks. From a normative point of view, this allows us to derive an important policy implication: governments can increase the social welfare level by improving the functioning of the judicial system. Moreover, by showing that cross-country differences in the wage can at least in parts be explained by differences in the efficiency of legal institutions, our paper contributes to the open debate about the determinants of the cross-country differences in total factor productivity.

The existence of the theoretical framework gives us precise indications on how to develop the empirical analysis, that we perform in the second part of the paper, in order to test the validity of some theoretical implications. For example, it allows us to distinguish clearly between endogenous variables, like, for example, external finance, firm capital assets, firm size, inside equity and the exogenous ones, like the degree of legal enforcement. This is a very important point because, under some hypothesis about the structure of the error terms, it guarantees that our estimates are consistent. This methodological aspect makes our approach different from the one generally used in the empirical corporate finance literature, in which the estimated equations are not derived from theoretical models ¹.

We also provide new empirical evidence that bad judicial systems can distort corporate decisions in Spain and in Italy and the capital accumulation in Italian regions.

To derive our theoretical results, we consider an economy with overlapping generations of individuals living in two countries with perfectly integrated capital markets and segmented labor markets. Each individual lives for two periods. In the first period, he has no initial wealth but he can work and save. In the second period, he can

¹See for example, Kumar et al. [14] or Giannetti [12].

only choose how to invest his savings. Two alternatives are available: he can invest his money into a banking deposit or he can start an entrepreneurial activity which is risky. If he decides to become entrepreneur he asks for a positive loan from a banking sector. Following Holmstrom and Tirole [13], we introduce a moral hazard problem, by assuming that the outcome of the project depends on the effort of the entrepreneur. This implies that the entrepreneur needs to invest his savings in the project for the credit to be provided by the banking sector. We also assume that it is optimal for the entrepreneur to pledge the all capital assets as collateral to the bank. Then, we introduce a legal system which is responsible for the enforcement of the collateralized credit contracts and we assume that the behavior of courts shapes the liquidation value of the collateral assets.

Under these hypothesis and by assuming that the two countries differ only in the behavior of legal institutions, we show that, at the steady state equilibrium, the country providing tighter legal enforcement has a higher aggregate output and capital stock and a positive amount of credit is flowing from that country to the other one. Moreover, on the level of the individual firm, credit financing, capital stock and firm size are also higher where the judicial system is more effectively working, while the firm leverage ratio is the same. The driving force behind these results is that improvements in the legal protection of the creditor rights to repossess the collateral asset, increase the wage and the investment rate of return, by tempering the inefficiencies due to asymmetric information. This fosters the individuals' optimal accumulation of capital.

In the empirical part, we use data at firm and regional level for Spain and Italy to test some of the previous theoretical results. We find that legal institutions are responsible for differences in the corporate finance and production decisions in both countries: firms located in Italian or Spanish judicial districts with a larger proportion of concluded proceedings or a lower average length of trials, receive a larger amount of external financing, have a larger size and a bigger capital stock. In the same regions, aggregate private capital stock and aggregate output level are also higher. The positive correlation between amount of external finance and quality of legal institutions documented in our paper parallels the empirical evidence found by La Porta et al. [17], Modigliani and Perotti [15], Bianco et al. [4] and Cristini et al. [7]. La Porta et al. [17]. At the same time, the positive correlation between firm size and degree of legal enforcement that we document for Italy and Spain is also in line with some recent empirical evidence provided by Kumar et al. [14].

Three features distinguish our empirical analysis from the related literature. First, contrary to what is generally done in empirical works related to this topic, the existence of a theoretical model allows us to clearly distinguish between endogenous and exogenous variables, which is a necessary condition to obtain consistent estimates. Second, we provide new evidence about the relevance of legal institutions, at a firm and regional level for Spain and Italy. Finally, our proxies of legal enforcement are different from the ones generally used in related empirical works. The majority of these works (see, for example Kumar et al. [14], or Modigliani and Perotti [15], or La Porta et al. [18] or

Giannetti [12]) use measures provided by international organizations, like the Business International Corporation. These variables are based on the assessment of "efficiency and integrity of legal environment as it affects business". In our work, following Fabbri and Padula [10] and Bianco et al.[4], we use direct and objective information about the activity of civil trials across Spanish and Italian judicial districts which is provided by the National Institutes of Statistics.

The paper is organized as follows. In section 2, we describe the model and we analyze the optimal choice of workers, investors and entrepreneurs. In section 3, we solve the model at the steady state. In section 4, we discuss the role of the judicial system by looking at its implications on firm optimal behavior (external finance, capital stock and size) and on aggregate variables (total capital stock and total output). In section 5, we briefly resume the implications derived in previous sections that we test in the empirical analysis. Section 6, describes the data. Section 7 shows the main results of the regression analysis while section 8 concludes.

2 Theoretical Framework

We consider an economy with overlapping generations of individuals living for two periods in two different countries, denoted by A and B . In each country, each new generation has size equal to 1.

In the first period of live, each individual has no initial wealth but he can work and save. In the second period, he can only decide how to invest his savings choosing between two alternatives. He can put his money into a bank, in which case he receives a fixed interest rate, r_{t+1} . Alternatively, he can become entrepreneur. The entrepreneurial activity is risky and it consists in producing a consumption good using capital and labor as inputs. Following Holmstrom and Tirole [13], we introduce asymmetric information in the form of a moral hazard problem, by assuming that the outcome of the project depends on the effort of the entrepreneur. This implies that the entrepreneur needs to invest his savings in the project for the credit to be provided by the banking sector. We also assume that it is optimal for the entrepreneur to pledge the all capital assets as collateral. In our model, the banking industry collects funds (deposits) from the population to finance the entrepreneurs². We assume that banks are risk neutral and there is free entry in the intermediation activity, which implies that each bank makes zero expected profits. At the end of the second period, each agent can consume what he has saved plus the return of the investment. Therefore, even if all the individuals are ex ante equal, in the second period some of the agents will be entrepreneurs and some other investors.

We assume that each individual is risk neutral, i.e. the individual utility function depends on the expected level of consumption in the two life-periods and on the working

²In our model, the banking sector we model is performing a pooling activity of liquidity. In the literature about banking, there are different ways to justify the existence of an intermediate sector. For a survey about this topic, see Freixas and Rochet [11].

time³: $EU = E[c_{1t} + c_{2t+1} - (l_t)^2]$. We also assume that in period $t = 0$, when this economy starts, people are endowed with a positive amount of wealth equal to H .

Finally, we introduce a public sector. It provides a public good, which is the activity of courts. We assume that the amount of public spending affects the performance of the judicial system and, through this channel, it shapes the effective degree of legal enforcement provided to the creditors' rights. To simplify the analysis, we assume that there is no taxation⁴.

2.1 Credit Contract and Legal Enforcement

In this section we describe the credit contract relationship between entrepreneurs and the banks.

Consider the agent born in period t , who decides to become entrepreneur. In period $t + 1$ he has to choose the optimal amount of capital and labor. If he decides to invest an amount of capital, k_{t+1} , then he must borrow the quantity $(k_{t+1} - S_t)$ from the bank, where S_t is the amount of his saving from the previous period. The realization of the production activity is stochastic. If the good state realizes, then the level of production is equal to $y_{t+1} = \min\{\alpha k_{t+1}, \theta l_{t+1}\}$, otherwise the output is equal to zero. The probability of having a positive amount of final good depends on the level of effort that the entrepreneur decides to put into the project. We assume that the entrepreneur can choose between two levels of effort: high effort (behaving) or low effort (shirking). Behaving yields the probability $p = p_h$ of success and no private benefits to the entrepreneur. Misbehaving yields the probability $p = p_l < p_h$ of success and private benefits $Bk_{t+1} > 0$ ⁵. This implies that the default is more probable when the borrower decides to exert the lower level of effort. The success and the failure of the entrepreneurs can be observed at no cost.

After the realization of the production activity, the entrepreneur has to repay the loan to the bank and to pay the wages to the workers. We assume that there is no depreciation in the capital assets.

We consider a *collateralized debt contract*: the entrepreneur has the possibility to pledge all the investment goods, k_{t+1} , as collateral to the lender in case of failure. The reason why the optimal policy is pledging some assets to the lender is that incentive considerations require punishing the borrower in case of poor performance.

We introduce transaction costs⁶, by assuming a wedge between the collateral value for the borrower, k_{t+1} , and for the lender, given by (gk_{t+1}) , where $0 \leq g \leq 1$. We interpret them as *legal costs*, by assuming that the parameter g depends on the amount

³Notice that we assume that the discount factor (β) is equal to 1.

⁴We could also assume that the provision of legal enforcement is financed by taxes, but this hypothesis would not change the qualitative results of our analysis, as it is shown in chapter one.

⁵We can interpret private benefits as a disutility from effort, which is saved in case of low level of effort. We assume that they are linear in the amount of capital goods, as in Holmstrom and Tirole [13].

⁶This assumption is quite usual in the literature on credit rationing. For example it can be found in Bester [2], Bester [3], Besanko and Takor [1] and Chan and Kanatas [6].

of public spending assigned to the legal system⁷. We can interpret this assumption in the following way: a bad functioning of the legal system implies a waste of resources for the lender which reduces the liquidation value of the collateral.

The entrepreneur is protected by limited liability. This implies that in case of failure he loses the property right on the assets.

As we said before, the financial sector collects funds to finance the productive sector. Therefore, for any unit of money received from the investors in period t , it has to pay back at the end of the second period a fixed interest rate, r_{t+1} . This implies that, in case of failure, it obtains a net income given by the liquidation value of the collateral assets minus the total cost of the loan [$gk_{t+1} - (k_{t+1} - S_t)r_{t+1}$].

In case of success, the entrepreneur and the bank share what is left from the total income after the distribution of the wages to the workers: $(y_{t+1} - w_{t+1}l_{t+1})$. Let us denote the share received by the bank by R_{t+1}^b and the one received by the entrepreneur by R_{t+1}^e . The entrepreneur's net pay-off is equal to [$R_{t+1}^e + k_{t+1}$] in case of success and high level of effort and it is equal to [$R_{t+1}^e + k_{t+1} + Bk_{t+1}$] in case of success and low level of effort. Since the entrepreneur can repay the loan, the bank gets a net pay-off equal to [$R_{t+1}^b - (k_{t+1} - S_t)r_{t+1}$], in both cases, low and high level of effort.

Following Holmstrom and Tirole [13], we consider the case where the project is viable only if the borrower behaves. This implies that we are assuming that the project has a negative net present value in case of misbehavior of the entrepreneur and a positive net present value in case of good behavior. In principle, these two conditions must be satisfied at any time, but we are mainly interested in the characterization of the steady state.

Assumption 1 $p_l(1 + \alpha) + (1 - p_l)g + B < 1$

Assumption 1 requires that the probability of the good state in case of misbehavior is sufficiently low. It guarantees that the net present value is negative under the low level of effort. It is easy to show that no more conditions must be introduced to guarantee that the net present value is positive under the high level of effort if we restrict our attention to the steady state. We will discuss this point in section 3, when analysing the properties of the steady state equilibrium.

2.2 Workers, Investors and Entrepreneurial Decisions

2.2.1 The Labor and Consumption Choice

Let us consider the generic agent born in period t . When he is young he is working in the firm of an (old) entrepreneur for a given wage w_t . Since there is uncertainty in the

⁷We could assume that the degree of legal enforcement which in our model is captured by the parameter g , depends on the amount of public spending through a production function $f(G)$ where G is the amount of public spending in justice. In this case, we could interpret the function $f(\cdot)$ as a production function in the public sector. To simplify the notation we only use the parameter g , but doing that, we are implicitly assuming that the degree of legal enforcement depends on the activity of the legal system which also depends on the amount of public spending.

entrepreneurial activity, he receives the wage only with a probability $p_h < 1$. In order to optimally choose his consumption level (saving) and his labor supply in the first life period, he has to solve the following maximization problem:

$$\begin{aligned} \max_{l_t, c_{1t}, c_{2t+1}} EU &= E[c_{1t} + c_{2t+1} - (l_t)^2] \\ E[c_{1t}] &= w_t p_h l_t - S_t \\ E[c_{2t+1}] &= S_t \max\{r_{t+1}, \mu_{t+1}\} \end{aligned}$$

where r_{t+1} is the interest rate on banking deposits and μ_{t+1} is the expected investment return from the entrepreneurial activity.

Since individuals do not discount future income, for any given investment rate larger than one, it is optimal for the agent to save all the labor income in order to consume only in the second period. This implies that: $E[c_{1t}] = 0$ and $E[c_{2t+1}] = w_t p_h l_t \max\{r_{t+1}, \mu_{t+1}\}$. Substituting these two equations in the utility function and differentiate with respect to the labor variable, we can find the individual labor supply, l_t . Finally, substituting the labor supply into the budget constraint yields the optimal level of savings, S_t :

$$l_t = \frac{w_t p_h \max(r_{t+1}, \mu_{t+1})}{2} \quad (1)$$

$$S_t = \frac{w_t^2 p_h^2 \max(r_{t+1}, \mu_{t+1})}{2} \quad (2)$$

From equations 1 and 2, we can see that labor supply and savings depend positively on the wage rate and on the investment rate received in the second period⁸. Of course, each agent will decide to invest his saving in the investment opportunity with the larger rate of return. Since each agent is risk neutral, he simply has to compare the safe rate of return from the deposits, r_{t+1} with the expected return from the entrepreneurial activity, μ_{t+1} . Since, this last value depends on the optimal choices of the entrepreneur, in order to find it we have to solve the optimal credit contract.

2.2.2 Optimal Credit Contract

Let us assume that the agent has saved the amount S_t in the first life period. If he becomes entrepreneur, in period $t + 1$ he has to choose the optimal amount of capital inputs, k_{t+1} , the optimal demand of working hours, l_{t+1}^d and the optimal level of effort, maximizing the level of expected consumption at the end of the second period, taking as given the wage, w_{t+1} .

⁸Notice that the first order conditions are sufficient to characterize the optimal solution, since the problem is concave.

$$\begin{aligned}
\max_{k_{t+1}, l_{t+1}, R_{t+1}^l, R_{t+1}^e} E(c_{2t+1}^e) &= p_h [R_{t+1}^e + k_{t+1}] \\
[R_{t+1}^e + k_{t+1}] p_h &\geq p_l [R_{t+1}^e + k_{t+1}] + Bk_{t+1} \\
p_h R_{t+1}^b + (1 - p_h)gk_{t+1} &= (k_{t+1} - S_t)r_{t+1} \\
\left[\min\{\alpha k_{t+1}, \theta l_{t+1}\} - R_{t+1}^b - w_{t+1}l_{t+1} \right] &= R_{t+1}^e
\end{aligned}$$

The objective function is the entrepreneur's expected level of consumption at the end of the second period. This function does not take into account what happens if the borrower decides to exert the low level of effort. This derives from the assumption that the only feasible contract is the one in which the entrepreneur exerts the high level of effort.

The first inequality represents the incentive compatibility constraint of the entrepreneur. It requires that the total expected utility he gets from behaving (left hand side) is at least equal to the one obtained from shirking (right hand side). This constraint becomes relevant for our analysis only if the incentive to exert the low level of effort is sufficiently high. To be sure that this is the case, we have to introduce the condition that the private benefits per unit of capital are larger than one:

Assumption 2 $\frac{B}{(p_h - p_l)} > 1$

The second constraint is the participation constraint for the bank. The bank is willing to finance the risky project only if it is able to obtain an expected total return at least equal to the interest rate he has to pay to the investors. The hypothesis of free entry in the banking sector requires that the total expected revenues from financing the risky project (left hand side) must be exactly equal to the total costs, given by the total repayments of the deposits (right hand side). According to the optimal credit contract, the bank receives a positive return in the good state R_{t+1}^b , while in the bad state it has the right to liquidate the collateral pledged by the entrepreneur (gk_{t+1}). To make our analysis interesting and reasonable, we have to be sure that the lender's return in good state is always larger than the maximum one he can get in bad state for each degree of legal enforcement: $R_{t+1}^b > gk_{t+1}$ for any g . A sufficient condition for that is the following:

Assumption 3 $\left[\alpha - \frac{B}{(p_h - p_l)} \right] > \left(\frac{1}{2} \right)^{\frac{3}{2}}$

The last equation is a feasibility condition: the maximum amount of profits obtained by the entrepreneur can not be larger than the share of the total production which is left after paying back the loan to the bank and paying the wages to the workers.

The solution to the optimal credit contract yields the following capital rationing function (k_{t+1}), and the optimal labor demand (l_{t+1}^d):

$$k_{t+1} = \frac{1}{1 - \left(\frac{1}{r_{t+1}}\right) \left(\gamma - \frac{p_h \alpha w_{t+1}}{\theta}\right)} S_t \quad (3)$$

$$l_{t+1}^d = \frac{\frac{\alpha}{\theta}}{1 - \left(\frac{1}{r_{t+1}}\right) \left(\gamma - \frac{p_h \alpha w_{t+1}}{\theta}\right)} S_t \quad (4)$$

where $\gamma = \left[p_h(1 + \alpha) - \frac{B p_h}{(p_h - p_l)} + (1 - p_h)g \right]$.

The capital rationing function is a rationed demand of capital. This curve represents, for any given interest rate and wage, the maximum amount of assets purchaseable by each entrepreneur, given the rationed supply of external finance from the banking sector. The labor demand is a multiple of the amount of capital. As we can see, both functions depend negatively on the return on deposits r_{t+1} and on the wage that the entrepreneur must pay to the workers in period $t + 1$, where the production takes place, w_{t+1} . To make our analysis interesting we have to assume that the denominator in equations 3 and 4 is positive and also lower than 1, otherwise the entrepreneur would obtain a negative loan from the banking sector. To make sure that this is the case, we have to introduce a new assumption⁹:

Assumption 4 $1 < \left[p_h(1 + \alpha) + (1 - p_h)g - \frac{p_h B}{(p_h - p_l)} \right]$

If we consider the optimal credit contract, the incentive compatibility constraint of the lender is binding. From that, we can derive the total amount of expected profits as a function of capital: $R_{t+1}^e = k_{t+1} \left(\frac{B}{p_h - p_l} - 1 \right)$. Substituting this term and equation 3 into the objective function, we can derive the expected level of consumption in the second period and the expected return from the risky investment. This last variable is defined as the amount of consumption units provided by each unit of saving invested in the entrepreneurial activity.

$$E(c_{2t+1}^e) = \left(\frac{r_{t+1} \frac{B p_h}{(p_h - p_l)}}{r_{t+1} + \frac{p_h \alpha}{\theta} w_{t+1} - \gamma} \right) S_t$$

$$\mu_{t+1} = \frac{r_{t+1} \frac{B p_h}{(p_h - p_l)}}{r_{t+1} + \frac{p_h \alpha}{\theta} w_{t+1} - \gamma} \quad (5)$$

⁹The denominator in equations 3 and 4 is positive and lower than 1, if the following two requirements are satisfied:

$$\frac{\theta}{\alpha p_h} \left[p_h(1 + \alpha) + (1 - p_h)g - \frac{p_h B}{(p_h - p_l)} - r_{t+1} \right] < w_{t+1},$$

$$w_{t+1} < \frac{\theta}{\alpha p_h} \left[p_h(1 + \alpha) + (1 - p_h)g - \frac{p_h B}{(p_h - p_l)} \right]$$

In principle, these two conditions must hold at any time. Since we concentrate our attention on the steady state, we only require that they are holding in the steady state. This allows us to rewrite them in the form of assumption 4.

3 Steady State Equilibrium Analysis

We consider the case in which the two countries, A and B , are equal except for the degree of legal enforcement: $g_A \geq g_B$. We also assume that the two capital markets are perfectly integrated, but there is no mobility in the labor markets between the two countries. Denote by $\pi_{A,t+1}$ and $\pi_{B,t+1}$ the share of the population born in period t that decides to become entrepreneur in period $t + 1$, respectively in country A and in country B .

Proposition 1 *There exists a unique steady state equilibrium¹⁰ defined by a constant value for the interest rate, r , two constant wage rates, w_A, w_B and a fixed proportion of entrepreneurs in both countries, π_A, π_B .*

Proof. The steady state equilibrium coincides with a set of constant values for the interest rate, the wage and the number of entrepreneurs such that the equilibrium conditions in the capital and in the labor market are simultaneously satisfied, and each agent is indifferent between being an investor or an entrepreneur. The steady state equilibrium is the solution to the following system of five equations:

$$S_{A,t}(r_{t+1}, w_{A,t}) + S_{B,t}(r_{t+1}, w_{B,t}) = \pi_{A,t+1}k_{A,t+1}(r_{t+1}, w_{A,t+1}) + \pi_{B,t+1}k_{B,t+1}(r_{t+1}, w_{B,t+1}) \quad (6)$$

$$l_{A,t+1}(r_{t+2}, w_{A,t+1}) = \pi_{A,t+1}l_{A,t+1}^d(r_{t+1}, w_{A,t+1}) \quad (7)$$

$$l_{B,t+1}(r_{t+2}, w_{B,t+1}) = \pi_{B,t+1}l_{B,t+1}^d(r_{t+1}, w_{B,t+1}) \quad (8)$$

$$r_{t+1} = \mu_{A,t+1} \quad (9)$$

$$r_{t+1} = \mu_{B,t+1} \quad (10)$$

Equation 6 represents the equilibrium condition in the credit market at period $t + 1$. The left hand side is the total supply of funds. Given the hypothesis of integrated capital markets, it corresponds to the amount of saving from the population of the two countries. The right hand side is the rationed demand of capital from the productive sectors in the two countries. Equations 7 and 8 are the equilibrium conditions respectively in the labor market of country A and B at period $t + 1$. The left hand side of both equations is the total supply of labor (from the young population born in period $t + 1$), while the right hand side is the total demand of working hours from entrepreneurs born in period t . Equations 9 and 10 requires that the expected return from the risky entrepreneurial activity is equal to the fixed interest rate received by the workers investing money into the bank in each country. They guarantee that each agent is indifferent between being an investor or an entrepreneur.

The system has two solutions, but only one can be the steady state equilibrium for our economy, since one solution implies a negative w_B for some values of the probability ph :

¹⁰We could find conditions about the parameters that guarantee that this equilibrium is locally stable.

$$\mu = r = p_h(1 + \alpha) + \frac{1}{2}(1 - p_h)(g_A + g_B) - \frac{1}{2}\left(1 + \sqrt{1 - z^2}\right) \quad (11)$$

$$w_A = \frac{\theta}{2\alpha p_h} \left[(1 + z) + \sqrt{1 - z^2} \right] \quad (12)$$

$$w_B = \frac{\theta}{2\alpha p_h} \left[(1 - z) + \sqrt{1 - z^2} \right] \quad (13)$$

$$\pi_A = \frac{2 \frac{B p_h}{(p_h - p_l)}}{\left[p_h(1 + \alpha) + z - \frac{1}{2}(1 - z + \sqrt{1 - z^2}) \right] \left[p_h(1 + \alpha) + \frac{1}{2}(1 - p_h)(g_A + g_B) - \frac{1}{2}(1 + \sqrt{1 - z^2}) \right]} \quad (14)$$

$$\pi_B = \frac{2 \frac{B p_h}{(p_h - p_l)}}{\left[p_h(1 + \alpha) + z - \frac{1}{2}(1 + z + \sqrt{1 - z^2}) \right] \left[p_h(1 + \alpha) + \frac{1}{2}(1 - p_h)(g_A + g_B) - \frac{1}{2}(1 + \sqrt{1 - z^2}) \right]} \quad (15)$$

where $z = (1 - p_h)(g_A - g_B)$. ■

Let us now to discuss more carefully assumptions 1 and 4. As we argued in section 2, we have considered the case where the project is viable only if the borrower behaves. A negative net present value in case of low effort implies that the condition $[p_l(1 + \alpha)k_t + (1 - p_l)gk_t + Bk_t < k_t r_t]$ must be satisfied at any time t . Since the rate of return on savings must be positive and also larger than one in order to have positive savings, a sufficient condition is the following: $p_l(1 + \alpha) + (1 - p_l)f(G) + B < 1$. At the same time, a positive net present value in case of high level of effort requires that $p_h(1 + \alpha)k_t + (1 - p_h)gk_t > k_t r_t$. By substituting the equilibrium value of the interest rate, we can easily show that at the steady state, this condition is always satisfied for both countries.

Let us now to look at assumption 4. The denominator in equations 3 and 4 is always positive and lower than 1, if the following two requirements are satisfied: $\frac{\theta}{\alpha p_h}(\gamma - r_{t+1}) < w_{t+1} < \frac{\theta}{\alpha p_h}\gamma$. The left side condition simply prevents the denominator of equations 3 and 4 to be equal to zero. The right side condition requires a wage rate not so high to eliminate the borrower's incentive to ask for a positive loan. In principle, these two conditions must hold at any time. Since we concentrate our attention on the steady state, we only require that they are holding at this point. Once defined the equilibrium value of the variables, it is easy to show that the left hand side condition is satisfied at the steady state because it requires $\left(-\frac{p_h B}{p_h - p_l}\right) < 0$, while the right side one is always satisfied under assumption 4.

4 Comparative Static Analysis

In this section we want to focus our attention on the role of the legal system. To do so, we consider the following experiment: we assume that both countries initially have the same degree of legal enforcement; then country A decides to invest more public spending in justice. We divide the analysis in two parts. First, we investigate the implications of different degrees of legal enforcement for firm activity: external financing, capital stock and firm size. In the second one, we discuss the macroeconomic effects. In

particular, we analyze how an increment in the legal enforcement in one country affects cross-country differences in the level of capital, output and factor prices.

4.1 The Role of the Judicial System for Firm Activity

Proposition 2 *Firms located in countries which provide stronger legal protection to creditor rights have bigger amount of capital assets, i.e. if $g_A \geq g_B$ then $k_A \geq k_B$.*

Proof. By substituting the equilibrium values of interest rate and wage in the capital rationed demand given by equation 3 for the two countries, we obtain the amount of capital asset invested by each entrepreneur in the production activity: $k_A =$

$$\left[\frac{r^2 p_h^2}{2 \left(\frac{p_h B}{p_h - p_l} \right)} w_A \right], k_B = \left[\frac{r^2 p_h^2}{2 \left(\frac{p_h B}{p_h - p_l} \right)} w_B \right].$$

Given that $w_A \geq w_B$, it follows that $k_A \geq k_B$.

Notice that, given the hypothesis of complementarity of the two inputs in the production function, proposition 2 also implies that in country A firms have a larger size. We can use two alternative definitions for "firm size": the number of employees, denoted by (E) or the level of production (y). Given that the workers' population has size equal to 1 and there are π_A and π_B entrepreneurs in the two countries, it follows that $E_i = \left(\frac{1}{\pi_i} \right)$ where $i = A, B$. From that we obtain:

$$\frac{E_A}{E_B} = \frac{w_A}{w_B} > 1 \quad (16)$$

$$\frac{y_A}{y_B} = \left(\frac{w_A}{w_B} \right)^2 > 1 \quad (17)$$

Given that $w_A > w_B$, it follows that also the firm size is larger in country A than in country B , regardless the two measures. ■

The intuition behind these two results is the following. An increment in the degree of legal protection fosters the individual capital accumulation, by reducing the inefficiency in the financial market due to asymmetric information. Each individual has more incentive to work and to save. This implies that each entrepreneur is endowed in the second period with a larger amount of initial wealth, which allows him to receive from the banking sector a larger amount of external financing. This is because due to the moral hazard problem, the loan size is linear in the down-payment. The larger availability of funds together with the higher initial wealth allows the entrepreneur to enlarge the production scale.

Before investigating the effects of the degree of legal enforcement on credit rationing, let us denote the amount of external finance received by each firm in the two countries by d_A and d_B .

Proposition 3 *Firms located in countries which provide stronger legal protection to creditor rights have access to a larger external financing, i.e. if $g_A \geq g_B$, then $d_A \geq d_B$.*

Proof. We will show that: $\frac{d_A}{d_B} \geq 1$. To do so, let us consider the amount of firm capital in equilibrium in the two countries. From proposition 2, we know that $k_A \geq k_B$. Then, let us denote the firm leverage ratio¹¹ in the two countries by $\frac{d_A}{k_A}$ and $\frac{d_B}{k_B}$. Taking into account that $d_A = k_A - S_A$, $d_B = k_B - S_B$, and by substituting the expression for the capital stock (equation 3) and the equilibrium value of the two wages (equations 12 and 13), we find the following two expressions: $\frac{d_A}{k_A} = \frac{\left[p_h(1+\alpha) - \frac{Bp_h}{(p_h-p_l)} + (1-p_h)g_A - \frac{1}{2}(1+z+\sqrt{1-z^2}) \right]}{r}$ and $\frac{d_B}{k_B} = \frac{\left[p_h(1+\alpha) - \frac{Bp_h}{(p_h-p_l)} + (1-p_h)g_B - \frac{1}{2}(1-z+\sqrt{1-z^2}) \right]}{r}$. Since $(1-p_h)(g_A - g_B) = z$, the two leverage ratios are equal: $\frac{d_A}{k_A} = \frac{d_B}{k_B}$. From the two previous results, it follows that if $g_A \geq g_B$, then it must also be that $d_A > d_B$. ■

Notice that we have shown that the amount of firm external finance is larger in country with more efficient courts even if the leverage ratios are exactly equal. The intuition behind this result is the following. The amount of external finance received by each entrepreneur can be expressed as a function of the savings (or down-payment, or inside equity) with a positive multiplier, $d_i = \psi_i S_i$, where $\psi_i = \frac{\gamma - \frac{p_h \alpha w_i}{\theta}}{r - [\gamma - \frac{p_h \alpha w_i}{\theta}]}$, $S_i = \frac{w_i^2 p_h^2 r}{2}$, and $\gamma = [p_h(1+\alpha) - \frac{Bp_h}{(p_h-p_l)} + (1-p_h)g_i]$. Both terms depend on the degree of legal enforcement, but through different channels. The multiplier depends on the legal enforcement, directly through the parameter g and indirectly, through the two equilibrium prices, while the saving amount depends on the degree of legal enforcement only indirectly through the wage and the interest rate. From the previous proof, it follows that differences in the degree of legal enforcement and in the wages across countries compensate each other in such a way that the two multipliers in equilibrium are exactly the same, $\psi_A = \psi_B$. What happens is that, the increment in the degree of legal enforcement in country A relaxes the participation constraint of the bank in that country and increases the expected return from the entrepreneurial activity. Then, further adjustments in the two labor markets generate a wedge between the two wages which completely eliminates the initial comparative advantage of country A . This also implies that the cross-country effect of the legal enforcement on the amount of external finance goes only through changes in the down-payment of each entrepreneur, driven by the increment in the per capita saving. In fact, we obtain that in equilibrium $w_A > w_B$ which implies that the per capita saving in country A is larger than in country B .

The previous discussion implies that differences in the degree of legal enforcement do not generate differences in the leverage ratio. But this does not imply that legal institutions have no effects on the leverage ratio. In fact, if we look at the cross-time effects of the legal variable, we find that an increment in the degree of legal enforcement in one country increases the leverage ratio in both countries¹². We will discuss more

¹¹In the corporate finance literature there exist many different definitions of "leverage". In this model we use the broadest one, which is the ratio of total liabilities to total assets.

¹²We could rewrite the firm leverage ratio in country A in the following way: $\frac{d_A}{k_A} = \frac{\left[p_h(1+\alpha) + \frac{1}{2}(1-p_h)(g_A+g_B) - \frac{1}{2}(1+\sqrt{1-z^2}) - \frac{Bp_h}{(p_h-p_l)} \right]}{p_h(1+\alpha) + \frac{1}{2}(1-p_h)(g_A+g_B) - \frac{1}{2}(1+\sqrt{1-z^2})}$. Calculating the partial derivative with respect to the

deeply this point in the empirical part, by comparing our results with the existing empirical evidence about this topic.

Proposition 4 *The number of entrepreneurs decreases in both countries after an increment in the degree of legal protection but it is larger in country with lower legal enforcement, i.e. $\frac{\partial \pi_A}{\partial g_A} < 0$, $\frac{\partial \pi_B}{\partial g_A} < 0$ and if $g_A \geq g_B$, then $\pi_A \leq \pi_B$.*

Proof. From the equilibrium solution, we know the number of entrepreneurs. Differentiating it with respect to the legal variable of country A , we can show that:

$$\frac{\partial \pi_A}{\partial g_A} = \frac{-(1-p_h) \frac{Bp_h}{(p_h-p_l)}}{[p_h(1+\alpha)-1]^2 [p_h(1+\alpha) + \frac{1}{2}(1-p_h)(g_A+g_B)-1]^2} < 0$$

$$\frac{\partial \pi_A}{\partial g_A} = \frac{-(1-p_h) \frac{Bp_h}{(p_h-p_l)}}{[p_h(1+\alpha)-1]^2 [p_h(1+\alpha) + \frac{1}{2}(1-p_h)(g_A+g_B)-1]^2} < 0$$

Moreover, taking the ratio between the shares of entrepreneurs in the two countries, we obtain that:

$$\frac{\pi_A}{\pi_B} = \frac{w_B}{w_A} < 1$$

■

This result might seem surprising at the first sight. In fact, one might have expected that a better functioning of the legal system, by increasing the return of the entrepreneurial activity, would induce more people to become entrepreneurs. The reason why is not so is that in our model not only the capital supply but also the capital demand is increasing in the interest rate, through the equilibrium effect on saving and its multiplier effect on credit demand. Moreover, an improvement in the judicial system increases the total demand of credit more than the total supply, for a given number of entrepreneurs. To balance the capital market, the number of entrepreneurs has to decrease in both countries. The reason why this variable decreases more in country A than in country B is related to the fact that it is more effective reduce it in the first country, since in that country each entrepreneur has a larger rationed credit demand.

In propositions 2 and 4 we have shown that differences in the degree of legal enforcement between two countries generate differences in the firm capital stock and in the number of entrepreneurs, but in opposite directions: in the country which provides stronger protection to creditor rights the firm capital stock is larger, but a lower proportion of population will decide to become entrepreneur. We investigate in the next section which one of these two effects dominates at the aggregate level.

legal enforcement variable, we find that $\frac{d(\frac{d_A}{k_A})}{dg_A} > 0$. Similar comments hold also for country B , given that the two leverage ratios are equal.

4.2 The Role of the Judicial System for Aggregate Activity

In the previous section, we already discussed the implication of different degrees of legal enforcement on labor price. From the equilibrium solution, it follows that in the country where courts are more effective in enforcing the credit contracts, the wage is larger than in the other country. The intuition behind this result is that an increment in the legal enforcement of the investors' rights in country A increases the expected return from the risky investment in this country, but then also the equilibrium value of the international interest rate. This produces a wedge between the return from the safe investment (which benefits from the larger degree of legal enforcement through the international credit market) and the expected return from the entrepreneurial activity in country B . Since now banking deposits are more profitable than the entrepreneurial activity, less people would decide to become entrepreneur. This decision reduces not only the demand of capital but also the demand of labor. As a consequence, the equilibrium wage goes down. The adjustment in the labor market of country B stops when the difference between the two wages has completely eliminated the initial wedge between the two investment returns.

Denote the aggregate level of capital and output in the two countries by K_A , K_B , Y_A , Y_B .

Proposition 5 *Differences in the activity of the legal system generate differences in the aggregate capital and output and induce a positive flow of saving from country A (with stronger legal enforcement) to country B , at the steady state equilibrium, i.e. if $g_A \geq g_B$, then $K_A \geq K_B$, $Y_A \geq Y_B$, $\frac{S_A}{K_A} > 1 > \frac{S_B}{K_B}$.*

Proof. To prove the first part of proposition 5, we need to derive the aggregate level of capital and output at the steady state. We can do that by multiplying the firm capital stock and the firm output level by the number of entrepreneurs in each country: $K_A = \pi_A k_A = \frac{\theta p_h}{2c} w_A r$, $K_B = \pi_B k_B = \frac{\theta p_h}{2c} w_B r$ and $Y_A = p_h \pi_A y_A = \frac{\theta p_h^2}{2} w_A r$ and $Y_B = p_h \pi_B y_B = \frac{\theta p_h^2}{2} w_B r$. By calculating the ratio of the aggregate level of capital and output between the two countries, it is easy to show that country A has a larger stock of capital and a larger level of output than country B .

$$\frac{K_A}{K_B} = \frac{w_A}{w_B} > 1$$

$$\frac{Y_A}{Y_B} = \frac{w_A}{w_B} > 1$$

To prove the second part of proposition 5, we need to derive the aggregate savings in the two countries, which is given by equation 2: $S_A = \frac{w_A^2 p_h^2 r}{2}$ and $S_B = \frac{w_B^2 p_h^2 r}{2}$. Substituting in the definition of saving and aggregate capital, the equilibrium values of wage, interest rate and number of entrepreneurs, given by equations 11-15, we can

derive the following two shares:

$$\frac{S_A}{K_A} = \frac{1 + z + \sqrt{1 - z^2}}{2} > 1$$

$$\frac{S_B}{K_B} = \frac{1 - z + \sqrt{1 - z^2}}{2} < 1$$

It follows that a positive amount of savings flows from country A to country B to finance the production activity in the last country. ■

The intuition behind these last results is related to differences in the wages. While the interest rate is the same across the two countries, the wage is lower in country with lower legal enforcement. This implies that per capita and aggregate savings are larger in country A than in country B . Therefore, also the supply of credit is larger in the first country than in the second. Further adjustments in the number of entrepreneurs generate an excess demand of capital in country B , which is compensated by a positive flow of money from country A .

From proposition 5, we can conclude that the positive effect of the legal variable on firm size dominates the negative one on the number of entrepreneurs.

Proposition 6 *In a world with two countries and integrated financial markets, an improvement in the legal environment in one of the two countries increases the international interest rate at the steady state equilibrium.*

Proof.

$$\frac{dr}{dg_A} = \frac{1}{2}(1 - p_h) \left[1 + \frac{1}{\sqrt{1 - z^2}} \right] > 0 \quad (18)$$

$$\frac{dr}{dg_B} = \frac{1}{2}(1 - p_h) \left[1 - \frac{1}{\sqrt{1 - z^2}} \right] > 0 \quad (19)$$

■

The reason is that the interest rate in equilibrium is equal to the expected return from the entrepreneurial activity, otherwise there would be some agents who could be better off, by changing the allocation of their savings. The expected return from the entrepreneurial activity is equal to the social expected productivity of each unit of capital minus the labor cost per unit of capital. Let us describe the determinants of the social productivity. Each unit of capital asset produces in this economy a different income according to the state of nature. In the good state, it produces α unit of consumption good. Moreover, given the hypothesis of zero depreciation rate, once the production activity takes place, each asset still has a full residual value which allows the entrepreneur to derive a positive utility from the consumption at the end of the second period. According to the optimal credit contract, in the bad state of nature (default), the property on the assets is transferred to banking sector. In this case, for each unit of capital the bank gets the liquidation value g , which negatively depends on the slowness and the inefficiency of the legal system. Given that, an improvement in the institutional

variable implies a reduction in the social loss associated to the transaction of the asset and therefore an increment in his productivity in bad state. This increases the expected return from investing in the risky project and therefore also the equilibrium interest rate.

5 Empirical Analysis

The purpose of the empirical analysis is to test the validity of some of the propositions contained in section 4.

In particular, we want to test whether differences in the degree of legal protection are associated to differences in corporate decisions (external finance, capital stock, firm size, leverage ratio) and in aggregate variables (capital stock and production level) across regions belonging to the same country. We apply our analysis to Spanish and Italian regions. Therefore, our measures of legal protection only take into account differences in the degree of legal enforcement due to the behavior of judicial districts and they are not caused by differences in the content of civil and commercial laws, which are the same across regions belonging to the same country.

To derive our testable implications we used a model with overlapping generations, where in each period a new generation of entrepreneurs starts the risky production activity. This implies that in our model there is no difference between flow-variables, like investment or credit, and stock variables, like capital or debt stock. Even if we are interested in the effect of the legal system on the stock variables (debt and capital), in order to be consistent, we will also use as dependent variables the investment level and the flow of credit received in the corresponding year.

Moreover, we assumed that regional financial markets are perfectly integrated but there is no labor mobility across countries (or regions). While the first assumption is standard, we are conscious that the second one is quite strong, if we are considering regions belonging to the same country. Nevertheless, this hypothesis it has been introduced only to simplify the analysis. Moreover, as long as there is no full mobility in the labor markets, our qualitative results do not change.

The existence of the theoretical framework gives us precise indications on how to develop the empirical analysis. For example, it allows us to distinguish clearly between endogenous variables, like external finance, firm capital assets, firm size, inside equity, leverage ratio and the exogenous ones, like the degree of legal enforcement. This is a very important point because, under some hypothesis about the structure of the error terms, it guarantees that our estimates are consistent.

Under this aspect, our approach differs from the one generally used in the empirical corporate finance literature, in which the estimated equations are not based on theoretical models¹³. Under the hypothesis that our model is correct, the inclusion of variables like the level of investment or the level of external finance in the set of explanatory vari-

¹³See for example, Kumar et al. [14] or Giannetti [12].

ables of firm size would yield biased estimates of the parameters (simultaneous equation bias).

6 Data

6.1 Spanish Data Set

To study the relationship between judicial efficiency and corporate decisions in Spain, we use indicators of judicial efficiency available for 50 provinces and economic data about firms in 1998.

The data used to proxy the degree of legal enforcement come from Civil Judicial Statistics, which are provided by the Spanish National Institute of Statistics (INE). Concluded civil proceedings are classified according to their type and their duration. Four different duration classes are available: less than two months, between two months and six months, between six months and one year and more than one year. By using this information, we construct two measures of legal enforcement. The first one is the average length. It is obtained by taking the average of each interval and multiplying that value by the number of concluded trials belonging to each interval over the total number of concluded trials. Since the last interval is open, we took the lower bound. The second measure is equal to the number of civil trials lasting more than one year to the total number of concluded proceedings. This variable can be interpreted as a proxy for the probability to be engaged in a very long trial. We construct these two variables by using alternatively the information about a subsample of civil trials which includes three types of civil proceedings: *verbales*, *de cognicion* and *menor cuantia* and the total number of civil trials. These data are referring to civil trials concerning credit and commercial matters like: loans, sale of real estate or goods, rentals and insurance. The four variables capture the degree of inefficiency of the judicial system and are measuring the cost that a lender should pay in order to enforce his property rights in case of defaulting borrowers.

Table 1 shows some descriptive statistics about legal variables. *Justice1* and *Justice2* are the average length calculated by using the information about the three categories of civil trials: *verbales*, *de cognicion* and *menor cuantia* and the total amount of civil proceedings respectively. Similarly, *Justice3* and *Justice4* measure the number of proceedings which last more than one year over the total number of concluded proceedings for the two groups of civil trials. From this table, we can see that there exists high dispersion in the two measures of legal enforcement. The average length varies between 99 days and 321 days according to the information that we use. Similarly, the probability to be engaged in a trial lasting more than one year can vary between zero and 0.77.

The firm data set comes from a survey which has been performed by the Fundación Empresa Publica. Each wave includes at least 1700 firms and for each firm the survey provides information about the regional location, production and selling activity,

corporate finance policy, legal structure and so on. Tables 1 and 2 host some descriptive statistics about firm variables used in the regression analysis. The variable, *N.of Workers* varies between 1 and 14.202 units, and almost 90% of the sample includes firms with less than 500 workers. 49 firms over 1776 (2,76% of the sample) are listed and 590 firms (33.22% of the sample) are integrated in a group. 1729 firms (97% of the sample) do not have any kind of public participation in the capital structure. If we look at the distribution of the market share across the sample, we find that 54% of the sample has almost zero share and that 40% of the sample has less 50% of the market share. Regarding the size of the selling market, 27.25% of the sample sells its products inside the regional market, 42.17% provides the national market, and 30.57% of the sample has an international market.

6.2 Italian Data Set

The measures of legal enforcement used in our analysis have been provided by the Centre for North South Economic Research (CRENOS). These measures have been constructed by using the information about the activity of judicial districts provided by the Italian National Institute of Statistics (ISTAT). We rely on two main indicators of judicial efficiency: the ratio of completed judicial proceedings to the total number of pending at the end of the year by regional courts, and the average length of a judicial proceedings. This last variable is constructed by taking the ratio of the number of judicial proceeding pending in the regional courts at the beginning and the end of each year, to the number of judicial proceedings started or completed in the same year, times 365. Both variables have been constructed for the first degree of judgement and for the second and third degree of judgement. Data about these four variables are available from 1970 to 1996.

All the measures of legal enforcement show a huge variability. Table 3 shows the sample average of the four proxies of legal enforcement in the period 1970-1996. The dispersion of the average length is quite impressive: a civil trial can last 40 days but also 425 days, depending on the judicial district and the year. A similar picture arises if we look at the second and third degree of judgement, where a trial can last 30 days, but also 4 years. These four indicators exhibit considerable variability across time. Figures 1, 2, 3 and 4 display the national averages of the four indicators in the period 1970-1996. The number of concluded trials over pending trials at all degrees of jurisdiction (figures 1 and 2) shows a clear decreasing pattern along all the period with a sharp reduction in the period 1985-1989. In these years the number of concluded trials at the first degree of jurisdiction reaches the 0.5 point, while the same variable at the second and third degree of jurisdiction becomes almost zero. If we look at the average length in figures 2 and 4, we can clearly see an increasing pattern of both indicators with a brief interruption around the year 1990: the average length at the second and third degree of jurisdiction peaks in 1995 at 793 days, three times the corresponding value in 1970. All this evidence suggests a decreasing of the effectiveness of the judicial system

in Italy from 1970 to 1996.

The data at firm level have been provided by the Mediocredito Centrale, which is an Italian bank and are available for the year 1991. This data set includes information about regional location, number of employees, amount of tangible assets, stock of debt, cost of credit, legal structure, research and development activity for firms belonging to manufacturing and metal-processing sector. We also know whether the firm is investing money in the activity of research and development. Finally, the firms are classified in five different groups according to the legal structure: Copartnership, Limited Liability Company, Stock Company, Cooperative Society, Other Forms. Table 3 shows the sample mean of the variables used in regression.

The panel data set by regions which includes information from 1970 to 1996 about the valued added, the amount of public spending, human capital and the population size has been provided by the Centre for North South Economic Research (CRENOS). Regional series for private capital stock from 1970 to 1995 has been kindly provided by Lucio Picci. Table 4 shows the sample mean of the regional variables used in the regression.

7 Empirical Results

7.1 Judicial System and Corporate Decisions

In this section, we test whether and in which direction the degree of legal enforcement affects financing and production decisions of firms located in Spain and Italy. We focus on five corporate decisions: external finance, capital stock, firm size, inside equity and leverage ratio. We discuss our findings by comparing them with our theoretical predictions and the existing empirical evidence.

In tables 5 and 6, we report the determinants of the amount of external finance for Spanish firms. In table 5, the dependent variable is equal to the logarithm of the total flow of credit (short term plus long term credit) received from the banking sector during the corresponding year. In table 6, the dependent variable is the logarithm of the stock of debt of each Spanish firm toward banks. In table 7, the dependent variable is the logarithm of the inside capital. This corresponds to the item *Own Funds* in the liabilities of the balance sheet.

The results reported in table 8 refer to Spanish firms and they are obtained by using as dependent variable the leverage ratio. This variable is defined as the ratio of financial debt to the book value of equity (including shareholders' funds, reserves and other provisions) plus financial debt.

Also tables 9, 10 and 11 refer to Spanish firms. In table 9, we show the results obtained by using the level of investment as dependent variable, while table 10 reports the determinants of the capital stock; here the dependent variable is the logarithm of the stock of tangible assets such as plants, machineries and so on. In table 11, we report the determinants of firm size, which is proxied by the logarithm of the total number of

workers. We could have also used the logarithm of the total sell to proxy the firm size, but the qualitative results would have been exactly the same.

In all the specifications contained in the tables mentioned before, we use as explanatory variables the degree of legal enforcement, called *Justice*, the age of the firm (*Age* and *Age Squared*), which, in the empirical literature of industrial organization, is assumed to be a proxy for firm reputation. We also include the firm market share (*MK Share*), and the share of public capital (*Public Capital*). Even if we do not explicitly model these three variables, we consider them as exogenous. The qualitative results of our analysis would not change by excluding age, market power and the share of public capital from the set of explanatory variables. Each regression also includes area dummies, legal structure dummies and sector dummies¹⁴. We aggregate the 17 Spanish regions in 5 areas to control for the impact of unobserved heterogeneity¹⁵. We constructed 6 dummies to take into account differences in the firm legal structure¹⁶ and 18 dummies to capture the information about the productive sector to which each firm belongs.

Contrary to what is usually done in related empirical works, as for example Giannetti [12], Rajan and Zingales [19] or Booth and al. [5], we do not include the degree of asset tangibility among the determinants of corporate decisions (external finance or leverage ratio), although we have information about the amount of total spending in research and development, at least for Spanish firms. The reason is that we think that the degree of asset tangibility and the amount of external finance are optimally jointly chosen by the firm. This implies that the degree of asset tangibility must be considered as an endogenous variable. Even if we do not explicitly consider the technology choice in our model, we can try to clarify this point through the following example. Consider a firm that can choose between two alternative technologies, both using fixed (but different) proportions of two inputs: physical assets and activity of research and development or advertising. Assume that under the first technology (that we called intensive in tangible assets), the marginal productivity of capital is larger than under the second technology, which is intensive in tangible assets. If the judicial system is completely inefficient ($g = 0$), each unit of tangible asset has a zero collateral value. In this case, each firm will choose the first technology which is more productive. On the other hand, if the degree of legal enforcement is positive and sufficiently high, it might be optimal for the entrepreneur to choose the second technology, the one intensive in

¹⁴To know how these dummy variables have been constructed see the appendix.

¹⁵The use of dummies at regional level instead of at area level is not allowed in our empirical analysis due to the nature of the legal variable. In fact, regional dummies are perfectly collinear with the proxy of legal enforcement. This is reason why we use dummies at area level.

¹⁶The survey provides information about the legal structure of the firm, by classifying each firm in one of the six following categories: Copartnership, Limited Liability Company, Stock Company, Worker Limited Liability Company, Cooperative Society, Other Forms. One difference is that, while, in the first case, the entrepreneur is responsible with all his wealth (the one invested in his business but also his own personal wealth), in all the others cases, the responsibility is limited to the firm capital according to different degrees.

tangible assets. The reason is that now physical assets have a positive collateral value and this enlarges the availability of external finance and therefore the total amount of inputs. In this second case, it turns out that although this technology is less productive, the rate of return of each unit of saving invested in the project is larger than under the other technology. From this analysis, we expect that firms located in judicial districts where courts are more efficient have a comparative advantage in choosing the technology which is intensive in tangible assets. The data seem to confirm these arguments: by testing the effect of the legal enforcement on the degree of asset tangibility, we obtain a significant and negative coefficient of the legal variable¹⁷.

In each table, columns differ in the proxy for justice. In the second column, we use the average length of three types of civil trials *verbales*, *de cognicion* and *menor cuantia*, (*Justice1*). The results reported in the third column have been obtained by using the average length of the total number of civil trials, (*Justice2*). In the fourth column we use the number of proceedings lasting more than one year over the total number of concluded trials belonging to the previous three categories of civil trials, (*Justice3*). Finally, in the fifth column we construct the same variable as in column four, but using the information about the total number of civil proceedings, (*Justice4*). In each table, we report the coefficients obtained through OLS estimations and the corresponding standard error in brackets.

The effect of the legal variable on financing and production decisions of Italian firms are reported in tables 12, 13 and 14. The results reported in table 12 have been obtained by using the logarithm of the total amount of debt as dependent variable. In table 13, we use the logarithm of the tangible capital stock as dependent variable. Finally, in table 14, the dependent variable is the logarithm of the total number of firm employees. Columns in each of the three tables differ in the specification of the legal variable. In the second column, we use the stock of completed judicial proceedings divided by the total number of pending proceedings in the first degree of jurisdiction as a proxy for the cost of repossessing the collateral, (*Justice1*). In the third column, we use a proxy for the average length which is equal to the stock of pending trials at the beginning and at the end, divided by the number of judicial proceeding started and completed in the same year times 365, (*Justice2*). In columns four and five, we constructed the same proxies as in the previous two columns, but using information about the proceedings at second and third degree of jurisdiction, (*Justice3*) and (*Justice4*). In each regression we use the same set of explanatory variables. We report in each table the value of the coefficients obtained through OLS estimations and the corresponding standard errors in brackets.

Looking at the relationship between creditor protection and financing decisions, we find that the degree of legal enforcement is positively correlated with the availability of external finance in Spain and In Italy, (no matter whether we use the stock of debt

¹⁷In our analysis, the degree of legal enforcement is proxied by the average length of a trial or by the number of concluded trials after one year over the total number of concluded trials. This explains the negative sign of the legal variable.

or the flow of credit to proxy the amount of funds). In tables 5 and 6, which refer to Spanish data, the legal variable is almost everywhere significant at 0.05 percent level and with a negative sign, no matter which proxy for the legal enforcement we use. Since our proxies are measures of the inefficiency of the creditor protection, its negative sign implies that firms located in Spanish judicial districts where courts are slowest and less efficient have access to a lower amount of external finance. Similar comments hold for corporate decisions in Italy. The degree of legal enforcement appears to be an important explanatory variable in all the specifications reported in tables 12. Its coefficient is positive and significant in columns two and four where the legal variable is proxied by the number of completed trials over pendings, while it is negative and still significant in the other two columns, where the cost to repossess the collateral asset is measured by the average length. We can conclude that also in Italy, where the legal system is more efficient, firms have access to a larger amount of external finance.

The impact of the functioning of the legal system on financing decisions is significant not only statistically but also economically in both countries. Moving from the Spanish region with the highest average length of civil trials to the region with the lowest average length, increases the amount of external finance of a percentage roughly equal to 35%. Regarding the Italian case, moving from the region with the lowest degree of legal enforcement in terms of average length to the region with the highest one, implies an increment in the total stock of debt that varies between 9% and 27%.

This finding confirms our theoretical prediction and it is also in line with the existing empirical evidence. That a stronger legal protection of the creditor's rights is associated with lower credit rationing or larger credit market is documented in several works. La Porta et al. [17], using a cross-section of 49 countries, document that external finance (external equity and debt) is more abundant in countries where the law and the courts provide a larger degree of legal protection to the outside investors' rights. Bianco et al. [4] provide evidence that in Italian provinces with relatively longer ordinary civil trials or a relatively large backlog of pending trials, credit to the corporate sector is less available than in provinces with more efficient courts. Cristini et al. [7] find strong evidence about the relevance of the legal system in Argentina. They show that if all the provinces could obtain the legal effectiveness of the best performer (the city of Buenos Aires), then the credit could grow by 2% of GDP on a national level. While all these empirical findings are obtained by using aggregate data at provincial, regional or country level, we provide evidence about the relevance of legal institutions on corporate decisions by using data at firm level, which are the most appropriated given the goal of the analysis.

From tables 5 and 6, it also appears that *Age* and *Age Squared* are both significant but with opposite sign: the first is positive, while the second one is negative. This is compatible with some theoretical literature¹⁸ suggesting that in the first stages of the firm life cycle, when firms are likely to need more external finance to finance their

¹⁸See Diamond [9] and Myers [16].

expansion, the age can be considered as a proxy for reputation from the banking sector. This could explain the positive sign of the variable *Age*. Then, in the last stages of firm life cycle, as the entrepreneur accumulates wealth, it is reasonable to expect that external funds may be substituted with cheaper internal sources. This could justify the negative sign of the variable *Age Squared*. From the same tables, we also see that the market share, called *MK Share*, and the presence of public capital in the corporate structure of the firm, captured by the variable *Public Capital*, are important determinants of the level of external finance. In all the specifications, the coefficients of these two explanatory variables are positive and statistically significant, suggesting that, for firms with larger power in the selling market or with some public property in the capital structure, it is easier to get external finance. This is reasonable if we assume that the share of the market can be used as a screening device in the decision to provide positive loan and the presence of the public sector in the corporate structure can be considered as a guarantee of solvency from the banking industry.

If we look at the other explanatory variables of financing decisions in Italy (see table 12), we can see that belonging to the manufacturing sector is positive correlated with debt. We include in all the regressions five legal structures dummies. In table 12, the dummy variable which is dropped is *Legal Structure5*, which includes firms with very specific legal structure. Among these dummy variables, the only one which is significant is *Legal Structure4*. Its positive sign suggests that, changing from *Legal Structure5* to take the structure of a Cooperative, increases the amount of debt.

The availability of data for Spanish firms allows us to study the relationship between inside equity and legal institutions. In the theoretical section of the paper, we have shown that the initial wealth of the entrepreneur is larger where the judicial system is better working. The reason is that better legal institutions increase the incentive to save. If we interpret the item "own funds", which appears in the balance sheet of the firm among the liabilities, as a proxy for the down-payment of the entrepreneur, we find a negative and significant coefficient for each measure of legal enforcement (see table 7).

Always in line with our theoretical predictions, we find that regional differences in legal institutions do not help to explain differences in the leverage ratio across firms. From table 8, it is clear that the degree of legal enforcement is not significant, independent of the proxy for the quality of legal institutions we use. Moreover, this finding is robust to different specifications for the leverage ratio; in fact, one obtains similar results, by using the total stock of debt, instead of the financial debt in the definition of leverage ratio. This does not mean that legal institutions have no effect on the leverage ratio. As we have shown in section 4.1, an increment in the degree of legal enforcement in one of the two countries increases the average ratios of firms located in both countries (even if this increment turns out to be the same). This suggests that, in order to capture the effect of legal institutions on leverage ratios, we should take into account the time dimensions in our estimations. This is an important point that we leave for future research.

Our result seems to contrast with the existing empirical evidence (see, for example, Giannetti [12] and Demirguc-Kunt and Maksimovic [8]¹⁹). The reasons why our empirical findings differ from the ones found in the literature can be several. The existing evidence about this topic is based on cross-country analyses, in which the hypothesis of integrated capital markets might not hold. A possible alternative explanation is related to the approach used in the empirical corporate finance literature, in which the estimated equations are not based on theoretical models. In doing that, it can happen that endogenous variables are used as exogenous ones, which would yield biased estimates of the parameters (simultaneous equation bias).

Regarding the relationship between creditor protection and capital stock or firm size, we provide evidence consistent with our theoretical predictions and also in line with the empirical findings documented by Kumar et al. [14]. In table 9, 10, 11, 13 and 14, the legal variable is almost everywhere significant at 0.05 percent level and with the expected sign, no matter which proxy for the legal enforcement we use. If we consider the economic impact of legal institutions on firm size, we find that, moving from the Spanish region with the highest average length of civil trials to the region with the lowest average length, increases the number of workers of a percentage roughly equal to 18%. In Italy, the movement from the region with the lowest indicator (in terms of concluded over pending trials at the first degree of jurisdiction) to the region with the highest indicator should induce a firm to enlarge its production scale by hiring a share of employees around 36%. Moreover, similar comments to the ones mentioned for the external finance about the significance of the explanatory variables different from the degree of legal enforcement, are holding also for capital stock, firm size.

All the econometric results shown in previous tables and referring to Spanish firms have been obtained by using the whole sample, which includes, as we mentioned in the descriptive section, listed and not listed firms with very different size, if measured by the number of workers. Nevertheless, it is reasonable to expect that large listed companies, as for example the multinational ones, have easier access to international financial markets and, therefore their corporate decisions are less subject to the institutional constraints imposed by regional domestic markets. Moreover, these companies can strategically choose the localization of their plants according to some specific advantages that we are not able to control for. To eliminate all the possible distortions due to these problems, we also applied our analysis to a subsample of firms with a number of workers less than 500. The coefficients of the legal variables remain significant and with the expected sign. Similar comments hold if we reduce even more the sample by considering firms with less than 500 workers which are not listed.

¹⁹Giannetti [12] finds that legal institutions affect the relationship between degree of asset collateralizability and leverage ratio. In particular, she finds that a reduction in the degree of tangibility of the collateral assets decreases the leverage ratio more in countries with poor legal protection than in the other ones. Demirguc-Kunt and Maksimovic [8] provide evidence suggesting a positive relation between bank development and leverage.

7.2 Judicial System and Aggregate Activity

In this section we use regional Italian data to test our theoretical predictions about the role of the judicial system for aggregate activity. In particular, we test whether the behaviour of legal institutions still matter if we want to explain regional differences in the endowment of private capital stock and in the production level.

Tables 15 and 16 show the effect of legal institutions on the regional private capital stock and the regional production level. In table 15, the dependent variable is the regional private capital stock, while in table 16 the dependent variable is the regional added value at factor prices, net of banking services. In both tables, we use the same proxies for legal enforcement as in the empirical analysis about corporate decisions. Columns differ in the specification of the legal variable. We use the same classification as before. In the second column, we use the stock of completed judicial proceedings divided by the total number of pending proceedings in the first degree of jurisdiction as a proxy for the cost of repossessing the collateral, (*Justice1*). In the third column, we use a proxy for the average length which is equal to the stock of pending trials at the beginning and at the end, divided by the number of judicial proceeding started and completed in the same year times 365, (*Justice2*). In columns four and five, we constructed the same proxies as in the previous two columns, but using information about the proceedings at second and third degree of jurisdiction, (*Justice3*) and (*Justice4*). Both tables report the coefficients obtained by using fixed effect estimation and including a full set of year dummies. The corresponding standard errors are reported in brackets.

We provide evidence confirming our theoretical predictions: the behaviour of civil courts is important to explain regional differences in the capital stock accumulation and welfare levels²⁰. The legal variable is always significant at the 0.05 percent level and with the expected sign in all the specifications, suggesting that regions, where judicial districts are more efficient, have a larger stocks of private capital and enjoy higher welfare levels. The size of the population and the amount of public spending are also important explanatory variables.

Also the macroeconomic costs of bad legal institutions are relevant. Let us consider the largest improvement in the degree of legal enforcement in period 1970-1996. Focusing on the first degree of jurisdiction, this improvement in the productivity of judicial districts corresponds to an increment in the stock of productive capital equal to 47%, if we consider the number of concluded over pending trials. This result suggests that the misbehavior of the judicial system can strongly distort the development patterns of Italian regions, by affecting the accumulation decisions of the private sector.

²⁰We could obtain similar coefficients by using the Gross Domestic Product (GDP) as a proxy for the output level.

8 Conclusions

This paper investigates whether and to what extent the behavior of the judicial system can affect economic activity. The importance of institutions and, in particular, of legal institutions has recently caught the attention of economists in a variety of fields. Some claim that institutions are the key to economic growth and development. We deal with this issue at two different levels: theoretical and empirical. We focus our attention on corporate credit market.

In the theoretical part of the paper, we consider a framework with two countries, that differ only in the degree of legal protection provided to creditor rights. Under the hypothesis of perfectly integrated financial markets and no mobility between the two labor markets, we show that, at the steady state equilibrium, the country providing more legal enforcement has a higher capital stock and higher aggregate output level. Moreover, on the level of the individual firm, credit financing, capital stock and firm size are also higher where the judicial system is better working. The driving force behind these results is that improvements in the legal protection of creditor rights to repossess the collateral increase the investment rate of return, by tempering the inefficiencies due to asymmetric information. This fosters the accumulation of capital, both on individual and aggregate level.

In the empirical part, we provide evidence for Spain and Italy confirming our theoretical predictions: the behaviour of civil courts is important to explain differences in corporate decisions, in the regional capital accumulation and regional production levels.

Our analysis is relevant under several aspects. First of all, our model is able to rationalize some empirical evidence in the corporate finance literature which documents a positive correlation between the degree of legal protection, the availability of external finance and the firm size. Second, it shows the relevance of legal institutions for aggregate activity.

Regarding our empirical analysis, three main features distinguish our contribution from the existing literature related to the topic. First, contrary to what is generally done in related empirical works, the relationships that we test are obtained in a theoretical model. This allows us to clearly distinguish between endogenous and exogenous variables, which is a necessary condition to obtain consistent estimates. Second, our analysis represents the first attempt to measure the economic effects of legal institutions on firm behavior in Spain and in Italy. Moreover, regarding the Italian case, it provides the first evidence that the accumulation of private capital and the production activity is affected by the activity of the legal system. Finally, our proxies of legal enforcement are different from the ones generally used in related empirical works.

9 Appendix 1

9.1 Spanish Data Set

The firm data set includes information about 1700 firms in 1998. The data are drawn from Fundación Empresa Publica. We know the regional location of each firm.

Judicial data are available for the 1998 for 50 provinces. We group provinces belonging to the same region in order to merge the two data sets.

Below we report the definition and source of the variables used in the estimations.

Flow of External Finance, by firm, year 1998. Amount of total credit (short term and long term credit) granted to firms from the banking sector during the interview's year, thousand of pesetas. Fundación Empresa Publica.

Stock of Financial Debt, by firm, year 1998. Stock of total debt toward banks, thousand of pesetas. Fundación Empresa Publica.

Investment Level, by firm, year 1998. Level of investment in tangible assets during the corresponding year, thousand of pesetas. Fundación Empresa Publica.

Stock of Tangible Assets, by firm, year 1998. Stock of tangible assets including lands, plants, machineries, buildings, thousand of pesetas. Fundación Empresa Publica.

Leverage Ratio, by firm, year 1998. Ratio of financial debt to the book value of equity (including shareholders' funds, reserves and other provisions) plus financial debt. Fundación Empresa Publica.

Inside Equity, by firm, year 1998. Amount of inside capital from the firm balance sheet, thousand of pesetas. Fundación Empresa Publica.

N. of Workers, by firm, year 1998. Total number of employees registered at the end of the interview's year. Fundación Empresa Publica.

Total Sell, by firm, year 1998. Total amount of sales, thousand of pesetas. Fundación Empresa Publica.

Total Labor Spending, by firm, year 1998. Total remuneration of the labor factor, thousand of pesetas. Fundación Empresa Publica.

Research and Development, by firm, year 1998. Amount of spending in activity of research and development, thousand of pesetas. Fundación Empresa Publica.

MK Share by firm, year 1998. Share of firm sales over total sales in the market. Fundación Empresa Publica.

Integration, by firm, (1998). Dummy variable taking value equal to 1 if the firm is part of a group of firms and zero otherwise. Fundación Empresa Publica.

Public Capital, by firm, (1998). Share of firm capital hold by the public sector directly or indirectly through an other firm over the total amount of capital. Fundación Empresa Publica.

Age, by firm, (1998). Difference between the interview's year and the date of firm constitution. Fundación Empresa Publica.

Legal Structure1, by firm, (1998). Dummy variable taking value equal to one if the firm is a Copartnership. Fundación Empresa Publica.

Legal Structure2, by firm, (1998). Dummy variable taking value equal to one if the firm is a Limited Liability Company and zero otherwise. Fundación Empresa Publica.

Legal Structure3, by firm, (1998). Dummy variable taking value equal to one if the firm is a Stock Company and zero otherwise. Fundación Empresa Publica.

Legal Structure4, by firm, (1998). Dummy variable taking value equal to one if the firm is a Worker Limited Liability Company and zero otherwise. Fundación Empresa Publica.

Legal Structure5, by firm, (1998). Dummy variable taking value equal to one if the firm is a Cooperative Society and zero otherwise. Fundación Empresa Publica.

Legal Structure6, by firm, (1998). Dummy variable taking value equal to one if the firm takes different forms not included in the previous categories and zero otherwise. Fundación Empresa Publica.

Sector1- Sector18, by firm, (1998). Set of 18 dummy variables, each one taking value equal to one if the firm belongs to each one of the 18 sectors and zero otherwise. Fundación Empresa Publica.

Area1, by firm, (1998). Dummy variable taking value equal to one if the firm is located in one of the following Spanish regions: Asturias, Cantabria, Galicia, Pais Vasco. Fundación Empresa Publica.

Area2, by firm, (1998). Dummy variable taking value equal to one if the firm is located in one of the following Spanish regions: Aragón, Cataluña, Comunidad Valenciana, Madrid, Navarra. Fundación Empresa Publica.

Area3, by firm, (1998). Dummy variable taking value equal to one if the firm is located in one of the following Spanish regions: Andalucía, Extremadura, Murcia. Fundación Empresa Publica.

Area4, by firm, (1998). Dummy variable taking value equal to one if the firm is located in one of the following Spanish regions: Castilla-León, Castilla La Mancha, La Rioja. Fundación Empresa Publica.

Area5, by firm, (1998). Dummy variable taking value equal to one if the firm is located in one of the following Spanish regions: Baleares, Canarias. Fundación Empresa Publica.

Justice1, by provincial judicial district, (1998). Proxy for the average length of civil trials belonging to the following three categories: *verbales*, *de cognición* and *menor cuantía*. Civil concluded proceedings are classified every year according to their type and their duration. Four different duration classes are available: less than two months, between two months and six months, between six months and one year and more than one year. By using this information for the previous three categories, we construct the average length. It is obtained by taking the average of each interval and multiplying that value by the number of concluded trials belonging to the interval over the total. Since the last interval is open, we took the lower bound. Spanish National Institute of Statistics (INE).

Justice2, by provincial judicial district, (1998). Average length of the total number of civil trials. We followed the same procedure described in *Justice1*. Spanish National

Institute of Statistics (INE).

Justice3, provincial judicial district, (1998). Number of proceeding lasting more than one year over the total number of concluded trials belonging to the previous three categories of civil trials: *verbales*, *de cognicion* and *menor cuantia*. Spanish National Institute of Statistics (INE).

Justice4, provincial judicial district, (1998). Number of civil trials lasting more than one year to the total number of concluded proceedings. Spanish National Institute of Statistics (INE).

9.2 Italian Data Set

The firm data set include information about 800 firms in 1991. The data are drawn from the Mediocredito Centrale, which is an Italian bank. We know the regional location of each firm.

Economic regional data are available from 1970 to 1996. The data are drawn by the Centre for North South Economic Research (CRENOS) and by Lucio Picci's data set.

Judicial data are available from 1970 to 1996. They are provided by the Italian Institute of Statistics (ISTAT).

Below we report the definition and source of the variables used in the estimations.

Value Added, by firm, year 1991. Amount of added value produced by each firm, thousand of lire. Mediocredito Centrale.

Stock of Tangible Assets, by firm, (1991). Stock of productive capital assets, thousand of lire. Mediocredito Centrale.

Stock of Total Debt, by firm, (1991). Total debt, thousand of lire. Mediocredito Centrale.

N. of Workers, by firm, (1991). Total number of employees. Mediocredito Centrale.

Research and Development, by firm, (1991). Dummy variable taking value if equal to 1 if the firm is investing some money in the activity of research. Mediocredito Centrale.

Sector, by firm, (1991). Dummy variable, taking value equal to 1 if the firm belong to the manufacturing sector and zero if the firm belongs to the metal-processing industry. Mediocredito Centrale.

Legal Structure1, by firm, (1991). Dummy variable taking value equal to one if the firm is a Copartnership and zero otherwise. Mediocredito Centrale.

Legal Structure2, by firm, (1991). Dummy variable taking value equal to one if the firm is a Limited Liability Company and zero otherwise. Mediocredito Centrale.

Legal Structure3, by firm, (1991). Dummy variable taking value equal to one if the firm is a Stock Company and zero otherwise. Mediocredito Centrale.

Legal Structure4, by firm, (1991). Dummy variable taking value equal to one if the firm is a Cooperative Society and zero otherwise. Mediocredito Centrale.

Legal Structure5, by firm, (1991). Dummy variable taking value equal to one if the firm takes different forms not included in the previous categories and zero otherwise. Mediocredito Centrale.

Area1, by firm and region (1991). Dummy variable taking value equal to one if the firm is located in the North-West of Italy, which includes the following regions: Piemonte, Valle D'Aosta, Liguria and Lombardia. Mediocredito Centrale.

Area2, by firm, (1991). Dummy variable taking value equal to one if the firm is located in the North-East of Italy, which includes the following regions: Trentino Alto Adige, Veneto, Friuli Venezia Giulia and Emilia Romagna. Mediocredito Centrale.

Area3, by firm, (1991). Dummy variable taking value equal to one if the firm is located in the Centre of Italy which includes the following regions: Toscana, Umbria, Marche and Lazio. Mediocredito Centrale.

Area4, by firm, (1991). Dummy variable taking value equal to one if the firm is located in the South of Italy, which includes one of the following regions: Campania, Calabria, Sicilia, Sardegna, Abruzzo, Molise, Puglia. Mediocredito Centrale.

Stock of Private Capital, by region, (1970-1996). Stock of aggregate private capital including plants, building, machineries etc, thousand millions of lire. Lucio Picci's Data Set.

Added Value, by region, (1970-1996). Value added at factor prices, net of bank services, thousand millions of lire. Centre for North South Economic Research (CRENOS).

N. of Workers, by region, (1970-1996). Units of labor in thousand of units. Centre for North South Economic Research (CRENOS).

Population, by region, (1970-1996). Resident population in units. Centre for North South Economic Research (CRENOS).

Public Spending, by region, (1970-1996). Public Works (GVA deflator to compute constant prices), thousand millions of lire. Centre for North South Economic Research (CRENOS).

Education, by region, (1970-1996). Number of registered in high school in scholastic year over the population in the age class between 15 and 19 at January, 1th. Centre for North South Economic Research (CRENOS).

Research and Development, by region, (1978-1996). Expenditure for scientific research (PIL deflator to compute constant price), millions of lire. Centre for North South Economic Research (CRENOS).

Justice1, by region, (1970-1996). Stock of completed judicial proceedings divided by the total number of pending proceedings, first degree of jurisdiction. Centre for North South Economic Research (CRENOS).

Justice2, by region, (1970-1996). Stock of pending trials at the beginning and at the end, divided by the number of judicial proceeding started and completed in the same year times 365, first degree of jurisdiction. Centre for North South Economic Research (CRENOS).

Justice3, by region, (1970-1996). Stock of completed judicial proceedings divided by the total number of pending proceedings, second and third degree of jurisdiction.

Centre for North South Economic Research (CRENOS).

Justice4, by region, (1970-1996). Stock of pending trials at the beginning and at the end, divided by the number of judicial proceeding started and completed in the same year times 365, second and third degree of jurisdiction. Centre for North South Economic Research (CRENOS).

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Table 1: Spain, Descriptive Statistics about Legal and Firm Variables

<i>Variable</i>	<i>N. of Observations</i>	<i>Mean</i>	<i>Standard Deviation</i>	<i>Min</i>	<i>Max</i>
<i>Justice1</i>	1776	226.21	65.70	99.58	321.31
<i>Justice2</i>	1776	233.32	64.95	104.38	322.56
<i>Justice3</i>	1776	0.35	0.26	0	0.77
<i>Justice4</i>	1776	0.37	0.26	0	0.77
<i>Mk Share</i>	1649	13.04	20.74	0	100
<i>Research and Development</i>	1770	131405.7	1242244	0	3.43e+07
<i>N. of Workers</i>	1776	246.06	742.44	1	14202
<i>Total Sell</i>	1774	8679261	4.16e+07	8025	8.33e+08
<i>Stock of Tangible Assets</i>	1761	5140017	2.23e+07	138	4.56e+08
<i>Investment Level</i>	1775	369360	1657032	0	3.32e+07
<i>Stock of Financial Debt</i>	1771	1118213	5109341	0	1.59e+08
<i>Flow of External Finance</i>	1747	699698.2	3436986	0	1.07e+08
<i>Leverage Ratio</i>	1724	0.2871	0.2815	0	0.9966
<i>Inside Equity</i>	1735	3332867	1.40e+07	85	3.82e+08
<i>Public Capital</i>	1776	1.63	11.64	0	100
<i>Total Labor Spending</i>	1775	1341726	4485051	4818	8.37e+07
<i>Age</i>	1776	23	21	0	168

For a complete description of each variable reported in the table, see the Appendix. The variables *Total Sell*, *Stock of Tangible Assets*, *Investment Level*, *Stock of Financial Debt*, *Flow of External Finance*, *Inside Equity*, *Research and Development*, *Total Labor Spending*, are expressed in thousands of pesetas.

Table 2: Spain, Descriptive Statistics about Firm Variables

<i>Percentage of listed firms</i>	2.76%
<i>Percentage of firms with n. of workers lower than 500</i>	89.7%
<i>Percentage of firms with n. of workers lower than 100</i>	60.6%
<i>Percentage of firms with only private capital structure</i>	97.35%
<i>Percentage of firms with a share of public capital larger than 10%</i>	2.3%
<i>Percentage of firms which are part of a group of firms</i>	33.22%
<i>Percentage of firms with regional market</i>	27.25%
<i>Percentage of firms with national market</i>	42.17%
<i>Percentage of firms with international market</i>	30.57%
<i>Percentage of firms with a market share lower than 10%</i>	63.96%
<i>Percentage of firms with a market share lower than 50%</i>	92.65%

Table 3: Italy, Descriptive Statistics about Legal and Firm Variables in 1991

<i>Variable</i>	<i>N. of Observations</i>	<i>Mean</i>	<i>Standard Deviation</i>	<i>Min</i>	<i>Max</i>
<i>Justice1</i>	816	0.752	0.0402	0.691	0.8838
<i>Justice2</i>	816	106.61	27.44	73.78	156.41
<i>Justice3</i>	816	0.368	0.165	0.106	1.42
<i>Justice4</i>	816	421.37	238.49	166.39	824.18
<i>Added Value</i>	816	14123.74	34486.36	35.172	529283.6
<i>N. of Workers</i>	816	194.08	508.8761	10	9000
<i>Stock of Tangible Assets</i>	816	16255.86	49759.66	9.301442	788248
<i>Stock of Total Debt</i>	815	9735.253	32463.53	0	640196.5
<i>Wage</i>	816	41.25	18.33	0	257.75

For a complete description of each variable reported in the table, see the Appendix. The variables *Added Value*, *Stock of Tangible Assets*, *Stock of Total Debt*, *Wage*, are expressed in thousands of lire.

Table 4: Italy, Descriptive Statistics about Legal and Regional Variables

<i>Variable</i>	<i>N. of Observations</i>	<i>Mean</i>	<i>Standard Deviation</i>	<i>Min</i>	<i>Max</i>
<i>Justice1</i>	513	0.740	0.082	0.398	0.985
<i>Justice2</i>	513	127.161	51.980	40.027	425.535
<i>Justice3</i>	513	0.437	0.178	0.0015	1.416
<i>Justice4</i>	513	732.82	2482.84	62.325	49311.5
<i>Added Value</i>	513	52041.45	46979.95	2718.985	254851
<i>Stock of Private Capital</i>	494	56935.2	60396.18.	624.78	348282.3
<i>N. of Workers</i>	513	1155.01	899.37	113.7	4057.2
<i>Population</i>	513	2970345	2173960	319877	8958670
<i>Public Spending</i>	513	718.50	451.92	68	2332.02
<i>Education</i>	400	0.53	0.1	0.06	0.83
<i>Research and Development</i>	342	434.59	791.72	0	7875.267

For a complete description of each variable reported in the table, see the Appendix. The variables *Added Value*, *Stock of Private Capital*, *Public Spending*, are expressed in thousands of millions of lire. *N. of Workers* is thousand of units, while *Population* is in units. *Education* is an index and *Research and Development* is in millions of lire.

Table 5: Spain, Justice and the Flow of Firm External Finance

<i>Justice</i>	-0.0019**	-0.0021**	-0.5676**	-0.5532**
	(0.0009)	(0.0009)	(0.248)	(0.243)
<i>Age</i>	0.032**	0.032**	0.033**	0.033**
	(0.006)	(0.006)	(0.006)	(0.006)
<i>Age Squared</i>	-0.0002**	-0.0002**	-0.0002**	-0.0002**
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
<i>MK Share</i>	0.0082**	0.0082**	0.0082**	0.0082**
	(0.0027)	(0.0028)	(0.0028)	(0.0028)
<i>Public Capital</i>	0.0025	0.0024	0.0023	0.0023
	(0.0049)	(0.0049)	(0.0049)	(0.0049)
<i>Constant</i>	11.43**	11.49**	10.16**	10.16**
	(0.948)	(0.949)	(0.944)	(0.944)
R-sq	0.23	0.23	0.23	0.23
No. of observations	1224	1224	1224	1224

The dependent variable is the logarithm of the total credit (short term plus long term credit) received by each firm from the banking sector during the interview's year. We report the coefficients obtained through OLS estimations and the corresponding standard error in brackets. In all the regressions we control for fixed effects by using area dummies and we include sector and legal structure dummies. Columns differ in the proxy for legal enforcement. In the second column, we use the average length of three types of civil trials *verbales*, *de cognicion* and *menor cuantia*, that we denote by *Justice1*. In the third column we construct the average length using the information about the total number of civil trials, *Justice2*. In the fourth column we use the number of proceeding lasting more than one year over the total number of concluded trials belonging to the previous three categories of civil trials, *Justice3*. Finally, in the fifth column, we construct the same variable as in column four, but using the information about the total number of civil proceedings, *Justice4*. The variable *Age* is the difference between the interview's year and the year of the firm constitution. The variable *Age Squared* is the squared of *Age*. The variable *MK Share* is the share of firm sale over total sale in the market. Finally, the variable *Public Capital* is the share of firm capital hold by the public sector over the total capital stock.

Table 6: Spain, Justice and the Firm Stock of Financial Debt

<i>Justice</i>	-0.0021** (0.0009)	-0.0021** (0.0009)	-0.5259 (0.2611)	-0.4882* (0.2570)
<i>Age</i>	0.2911** (0.0065)	0.0287** (0.0065)	0.0291** (0.0065)	0.0289** (0.0065)
<i>Age Squared</i>	-0.00013** (0.00006)	-0.00013** (0.00006)	-0.00013** (0.00006)	-0.00013** (0.00006)
<i>MK Share</i>	0.0099** (0.0029)	0.0100** (0.0029)	0.0099** (0.0029)	0.0100** (0.0029)
<i>Public Capital</i>	0.0076 (0.0051)	0.0076 (0.0051)	0.0075 (0.0051)	0.0075 (0.0051)
<i>Constant</i>	10.692** (1.24)	10.602** (1.24)	10.358** (1.22)	10.341** (1.22)
R-sq	0.2315	0.2307	0.2310	0.2308
No. of observations	1297	1297	1297	1297

The dependent variable is the logarithm of the stock of financial debt (short term and long term debt) of each firm toward banks. We report the coefficients obtained through OLS estimations and the corresponding standard error in brackets. In all the regressions we control for fixed effects by using area dummies and we include sector and legal structure dummies. Columns differ in the proxy for legal enforcement. In the second column, we use the average length of three types of civil trials *verbales*, *de cognition* and *menor cuantia*, that we denote by *Justice1*. In the third column we construct the average length using the information about the total number of civil trials, *Justice2*. In the fourth column we use the number of proceeding lasting more than one year over the total number of concluded trials belonging to the previous three categories of civil trials, *Justice3*. Finally, in the fifth column, we construct the same variable as in column four, but using the information about the total number of civil proceedings, *Justice4*. The variable *Age* is the difference between the interview's year and the year of the firm constitution. The variable *Age Squared* is the squared of *Age*. The variable *MK Share* is the share of firm sale over total sale in the market. Finally, the variable *Public Capital* is the share of firm capital hold by the public sector over the total capital stock.

Table 7: Spain, Justice and Firm Inside Equity

<i>Justice</i>	-0.0021**	-0.0021**	-0.5188**	-0.4885**
	(0.0007)	(0.0007)	(0.1895)	(0.1862)
<i>Age</i>	0.0415**	0.0414**	0.0415**	0.0414**
	(0.0048)	(0.0048)	(0.048)	(0.0048)
<i>Age Squared</i>	-0.0002**	-0.0002**	-0.0002**	0.0002**
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
<i>MK Share</i>	0.0124**	0.0124**	0.0124**	0.025**
	(0.0021)	(0.0021)	(0.0021)	(0.0021)
<i>Public Capital</i>	0.0091**	0.0090**	0.0091**	0.0091**
	(0.0044)	(0.0044)	(0.0044)	(0.0044)
<i>Constant</i>	11.654	11.681	11.361	11.362
	(0.534)	(0.536)	(0.524)	(0.524)
R-sq	0.5978	0.5977	0.5973	0.5972
No. of observations	1602	1602	1602	1602

The dependent variable is the logarithm of the Inside Equity as appears in the balance sheet of the firm. We report the coefficients obtained through OLS estimations and the corresponding standard error in brackets. In all the regressions we control for fixed effects by using area dummies and we include sector and legal structure dummies. Columns differ in the proxy for legal enforcement. In the second column, we use the average length of three types of civil trials *verbales*, *de cognicion* and *menor cuantia*, that we denote by *Justice1*. In the third column we construct the average length using the information about the total number of civil trials, *Justice2*. In the fourth column we use the number of proceeding lasting more than one year over the total number of concluded trials belonging to the previous three categories of civil trials, *Justice3*. Finally, in the fifth column, we construct the same variable as in column four, but using the information about the total number of civil proceedings, *Justice4*. The variable *Age* is the difference between the interview's year and the year of the firm constitution. The variable *Age Squared* is the squared of *Age*. The variable *MK Share* is the share of firm sale over total sale in the market. Finally, the variable *Public Capital* is the share of firm capital hold by the public sector over the total capital stock.

Table 8: Spain, Justice and the Firm Leverage Ratio

<i>Justice</i>	-0.00005 (0.0001)	-0.00004 (0.0001)	-0.0185 (0.0275)	-0.0172 (0.0275)
<i>Age</i>	-0.0022** (0.0008)	0.0022** (0.0008)	0.0021** (0.0008)	0.0021** (0.0008)
<i>Age Squared</i>	0.00001 (7.89e-06)	0.00001 (7.89e-06)	0.00001 (7.89e-06)	0.00001 (7.89e-06)
<i>MK Share</i>	-0.0012** (0.0003)	-0.0012** (0.0003)	-0.0012** (0.0003)	-0.0012** (0.0003)
<i>Public Capital</i>	0.0007 (0.0008)	0.0007 (0.0008)	0.0007 (0.0008)	0.0007 (0.0008)
<i>Constant</i>	0.1872* (0.1006)	0.1861* (0.1009)	0.1834* (0.0977)	0.1830* (0.0978)
R-sq	0.078	0.078	0.078	0.078
No. of observations	1601	1601	1601	1601

The dependent variable is the leverage ratio defined as the ratio of financial debt to the book value of equity (including shareholders' funds, reserves and other provisions) plus financial debt. We report the coefficients obtained through OLS estimations and the corresponding standard error in brackets. In all the regressions we control for fixed effects by using area dummies and we include sector and legal structure dummies. Columns differ in the proxy for legal enforcement. In the second column, we use the average length of three types of civil trials *verbales*, *de cognicion* and *menor cuantia*, that we denote by *Justice1*. In the third column we construct the average length using the information about the total number of civil trials, *Justice2*. In the fourth column we use the number of proceeding lasting more than one year over the total number of concluded trials belonging to the previous three categories of civil trials, *Justice3*. Finally, in the fifth column, we construct the same variable as in column four, but using the information about the total number of civil proceedings, *Justice4*. The variable *Age* is the difference between the interview's year and the year of the firm constitution. The variable *Age Squared* is the squared of *Age*. The variable *MK Share* is the share of firm sale over total sale in the market. Finally, the variable *Public Capital* is the share of firm capital hold by the public sector over the total capital stock.

Table 9: Spain, Justice and the Firm Investment Level

<i>Justice</i>	-1222.39*	-1301.36*	-349506.1*	-336297.7*
	(699.02)	(708.26)	(188967)	(185671)
<i>Age</i>	7182.05	7213.40	7276.06	7253.50
	(0.4760)	(4761)	(4763)	(4763)
<i>Age Squared</i>	-5.399	-5.516	-5.641	-5.324
	(45.55)	(45.56)	(45.56)	(45.57)
<i>MK Share</i>	4681.65**	4669.92**	4638.76**	4647.77**
	(2051)	(2051)	(2051)	(2051)
<i>Public Capital</i>	1725	1702	1669	1653
	(3867)	(3867)	(3867)	(3867)
<i>Constant</i>	483316	505286	316929	317894
	(515637)	(517032)	(505085)	(505119)
R-sq	0.4908	0.4911	0.4907	0.4907
No. of observations	1648	1648	1648	1648

The dependent variable is the investment level in tangible assets. We report the coefficients obtained by using OLS estimations and the corresponding standard error in brackets. In all the regressions we control for fixed effects by using area dummies and we include sector and legal structure dummies. Columns differ in the proxy for legal enforcement. In the second column, we use the average length of three types of civil trials *verbales*, *de cognicion* and *menor cuantia*, that we denote by *Justice1*. In the third column we construct the average length using the information about the total number of civil trials, *Justice2*. In the fourth column we use the number of proceeding lasting more than one year over the total number of concluded trials belonging to the previous three categories of civil trials, *Justice3*. Finally, in the fifth column, we construct the same variable as in column four, but using the information about the total number of civil proceedings, *Justice4*. The variable *Age* is the difference between the interview's year and the year of the firm constitution. The variable *Age Squared* is the squared of *Age*. The variable *MK Share* is the share of firm sale over total sale in the market. Finally, the variable *Public Capital* is the share of firm capital hold by the public sector over the total capital stock.

Table 10: Spain, Justice and the Firm Capital Stock

<i>Justice</i>	-0.0025**	-0.0026**	-0.6707**	-0.6625*
	(0.0007)	(0.0007)	(0.2031)	(0.1995)
<i>Age</i>	0.0355**	0.0355**	0.0355**	0.0355**
	(0.0044)	(0.0044)	(0.0044)	(0.0044)
<i>Age Squared</i>	-0.0002**	-0.0002**	-0.0002**	0-.0002**
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
<i>MK Share</i>	0.0107**	0.0107**	0.0106**	0.0106**
	(0.0019)	(0.0019)	(0.0019)	(0.0019)
<i>Public Capital</i>	0.0157**	0.0156**	0.0157**	0.0156**
	(0.0036)	(0.0036)	(0.0036)	(0.0036)
<i>Constant</i>	9.803**	9.767**	9.529**	9.520**
	(0.617)	(0.611)	(0.596)	(0.596)
R-sq	0.4908	0.4911	0.4907	0.4907
No. of observations	1635	1635	1635	1635

The dependent variable is the logarithm of the stock of tangible assets. We report the coefficients obtained through OLS estimations and the corresponding standard error in brackets. In all the regressions we control for fixed effects by using area dummies and we include sector and legal structure dummies. Columns differ in the proxy for legal enforcement. In the second column, we use the average length of three types of civil trials *verbales*, *de cognicion* and *menor cuantia*, that we denote by *Justice1*. In the third column we construct the average length using the information about the total number of civil trials, *Justice2*. In the fourth column we use the number of proceeding lasting more than one year over the total number of concluded trials belonging to the previous three categories of civil trials, *Justice3*. Finally, in the fifth column, we construct the same variable as in column four, but using the information about the total number of civil proceedings, *Justice4*. The variable *Age* is the difference between the interview's year and the year of the firm constitution. The variable *Age Squared* is the squared of *Age*. The variable *MK Share* is the share of firm sale over total sale in the market. Finally, the variable *Public Capital* is the share of firm capital hold by the public sector over the total capital stock.

Table 11: Spain, Justice and the Firm Size

<i>Justice</i>	-0.0011**	-0.0012**	-0.2865**	-0.2819**
	(0.0004)	(0.0005)	(0.1345)	(0.1321)
<i>Age</i>	0.0219**	0.0219**	0.0219**	0.0219**
	(0.0033)	(0.0033)	(0.0033)	(0.0033)
<i>Age Squared</i>	-0.00007**	-0.00007**	-0.0002**	-0.0002**
	(0.00003)	(0.00003)	(0.0000)	(0.0000)
<i>MK Share</i>	0.0124**	0.0124**	0.0124**	0.0124**
	(0.0015)	(0.0015)	(0.0014)	(0.0014)
<i>Public Capital</i>	0.0138**	0.0138**	0.0137**	0.0137**
	(0.0028)	(0.0028)	(0.0027)	(0.0027)
<i>Constant</i>	2.896**	2.918**	2.727**	2.726**
	(0.414)	(0.415)	(0.400)	(0.400)
R-sq	0.4109	0.4111	0.4109	0.4108
No. of observations	1649	1649	1649	1649

The dependent variable is the logarithm of the total number of workers. We report the coefficients obtained through OLS estimations and the corresponding standard error in brackets. In all the regressions we control for fixed effects by using area dummies and we include sector and legal structure dummies. Columns differ in the proxy for legal enforcement. In the second column, we use the average length of three types of civil trials *verbales*, *de cognicion* and *menor cuantia*, that we denote by *Justice1*. In the third column we construct the average length using the information about the total number of civil trials, *Justice2*. In the fourth column we use the number of proceeding lasting more than one year over the total number of concluded trials belonging to the previous three categories of civil trials, *Justice3*. Finally, in the fifth column, we construct the same variable as in column four, but using the information about the total number of civil proceedings, *Justice4*. The variable *Age* is the difference between the interview's year and the year of the firm constitution. The variable *Age Squared* is the squared of *Age*. The variable *MK Share* is the share of firm sale over total sale in the market. Finally, the variable *Public Capital* is the share of firm capital hold by the public sector over the total capital stock.

Table 12: Italy, Justice and the Firm Stock of Total Debt

<i>Justice</i>	3.189**	-0.009**	0.686**	0.007**
	(1.511)	0.002)	(0.366)	(0.002)
<i>Sector</i>	0.575	0.631	0.628	0.673
	(0.255)	(0.253)	0.255)	(0.255)
<i>Legal Structure1</i>	0.326	0.385	0.282	0.205
	(1.260)	(1.252)	(1.260)	(1.258)
<i>Legal Structure2</i>	-0.589	-0.634	-0.478	-0.744
	(0.985)	(0.978)	(0.993)	(0.983)
<i>Legal Structure3</i>	1.246	1.198	1.362	1.114
	(0.964)	(0.957)	(0.970)	(0.962)
<i>Legal Structure4</i>	4.337**	4.119**	4.492**	4.288**
	(1.873)	(1.862)	(1.877)	(1.872)
<i>Constant</i>	3.426	6.523	5.403	5.351
	(1.567)	(1.069)	(1.089)	(1.079)
R-sq	0.27	0.28	0.27	0.27
No. of observations	807	807	807	807

The dependent variable is the logarithm of debt. We report the value of the coefficients obtained by using OLS estimations and in brackets the corresponding standard error. In all the regressions we control for fixed effects at area level. Columns differ in the proxy for the legal enforcement. In the second column, we use the stock of completed judicial proceedings divided by the total number of pending proceedings in the first degree of jurisdiction as a proxy for the cost of repossessing the collaterals, *Justice1*. In the third column, we use a proxy for the average length which is equal to the stock of pending trials at the beginning and at the end, divided by the number of judicial proceeding started and completed in the same year times 365, *Justice2*. In columns four and five, we constructed the same proxies as in the previous two columns, but using information about the proceedings at second and third degree of jurisdiction, *Justice3* and *Justice4*. *Sector* is a dummy variable, taking value equal to 1 if the firm belongs to the manufacturing sector and zero if the firm belongs to the metal-processing sector. *Legal Structure1* is a dummy variable taking value equal to one if the firm is a Copartnership and zero otherwise. *Legal Structure2* is a dummy variable taking value equal to one if the firm is a Limited Liability Company and zero otherwise. *Legal Structure3* is a dummy variable taking value equal to one if the firm is a Stock Company and zero otherwise. *Legal Structure4* is a dummy variable taking value equal to one if the firm is a Cooperative Society and zero otherwise. Finally *Legal Structure5* a dummy variable taking value equal to one if the firm takes different forms not included in the previous categories and zero otherwise.

Table 13: Italy, Justice and Firm Capital Stock

<i>Justice</i>	3.495**	-0.008**	0.585*	-0.0007**
	(1.399)	0.002)	(0.333)	(0.0003)
<i>Sector</i>	0.583**	0.644**	0.620**	0.680**
	(0.236)	(0.234)	(0.236)	(0.240)
<i>Legal Structure1</i>	0.266	0.130	0.175	0.131
	(1.177)	(1.169)	(1.179)	(1.176)
<i>Legal Structure2</i>	-0.355	-0.417	-0.310	-0.524
	(0.920)	(0.913)	(0.927)	(0.918)
<i>Legal Structure3</i>	1.164	1.104	1.215	1.021
	(0.900)	(0.894)	(0.906)	(0.899)
<i>Legal Structure4</i>	3.736**	3.519**	3.839**	3.684**
	(1.751)	(1.741)	(1.756)	(1.751)
<i>Constant</i>	4.186	7.827	6.545	6.696
	(1.421)	(0.919)	(0.926)	(0.902)
R-sq	0.27	0.27	0.27	0.27
No. of observations	816	816	816	816

The dependent variable is the logarithm of the stock of tangible assets. We report the value of the coefficients obtained by using OLS estimators and in brackets the standard errors. In all the regressions we control for fixed effect at area level. Columns differ in the proxy for the legal enforcement. In the second column, we use the stock of completed judicial proceedings divided by the total number of pending proceedings in the first degree of jurisdiction as a proxy for the cost of repossessing the collateral, *Justice1*. In the third column, we use a proxy for the average length which is equal to the stock of pending trials at the beginning and at the end, divided by the number of judicial proceeding started and completed in the same year times 365, *Justice2*. In columns four and five, we constructed the same proxies as in the previous two columns, but using information about the proceedings at second and third degree of jurisdiction, *Justice3* and *Justice4*. *Sector* is a dummy variable, taking value equal to 1 if the firm belongs to the manufacturing sector and zero if the firm belongs to the metal-processing sector. *Legal Structure1* is a dummy variable taking value equal to one if the firm is a Copartnership and zero otherwise. *Legal Structure2* is a dummy variable taking value equal to one if the firm is a Limited Liability Company and zero otherwise. *Legal Structure3* is a dummy variable taking value equal to one if the firm is a Stock Company and zero otherwise. *Legal Structure4* is a dummy variable taking value equal to one if the firm is a Cooperative Society and zero otherwise. Finally *Legal Structure5* a dummy variable taking value equal to one if the firm takes different forms not included in the previous categories and zero otherwise.

Table 14: Italy, Justice and Firm Size

<i>Justice</i>	1.806*	-0.005**	0.491**	-0.0001
	(0.985)	(0.001)	(0.233)	(0.0002)
<i>Sector</i>	-0.009	0.022	0.009	0.022
	(0.166)	(0.165)	(0.165)	(0.166)
<i>Legal Structure1</i>	1.101	1.128	1.069	1.029
	(0.829)	(0.825)	(0.827)	(0.829)
<i>Legal Structure2</i>	-0.055	-0.085	0.030	-0.647
	(0.647)	(0.644)	(0.650)	(0.647)
<i>Legal Structure3</i>	1.135*	1.106*	1.217*	1.069*
	(0.633)	(0.630)	(0.635)	(0.633)
<i>Legal Structure4</i>	2.673**	2.556**	2.772**	2.650**
	(1.232)	(1.228)	(1.233)	(1.234)
<i>Constant</i>	2.035	3.941	3.128	3.408
	(0.999)	(0.648)	(0.650)	(0.636)
R-sq	0.22	0.23	0.22	0.22
No. of observations	816	816	816	816

The dependent variable is the logarithm of the total number of employees. We report the value of the coefficients obtained by using OLS estimators and in brackets the standard errors. In all the regressions we control for fixed effect at area level. Columns differ in the proxy for the legal enforcement. In the second column, we use the stock of completed judicial proceedings divided by the total number of pending proceedings in the first degree of jurisdiction as a proxy for the cost of repossessing the collateral, *Justice1*. In the third column, we use a proxy for the average length which is equal to the stock of pending trials at the beginning and at the end, divided by the number of judicial proceeding started and completed in the same year times 365, *Justice2*. In columns four and five, we constructed the same proxies as in the previous two columns, but using information about the proceedings at second and third degree of jurisdiction, *Justice3* and *Justice4*. *Sector* is a dummy variable, taking value equal to 1 if the firm belongs to the manufacturing sector and zero if the firm belongs to the metal-processing sector. *Legal Structure1* is a dummy variable taking value equal to one if the firm is a Copartnership and zero otherwise. *Legal Structure2* is a dummy variable taking value equal to one if the firm is a Limited Liability Company and zero otherwise. *Legal Structure3* is a dummy variable taking value equal to one if the firm is a Stock Company and zero otherwise. *Legal Structure4* is a dummy variable taking value equal to one if the firm is a Cooperative Society and zero otherwise. Finally *Legal Structure5* a dummy variable taking value equal to one if the firm takes different forms not included in the previous categories and zero otherwise.

Table 15: Italy, Justice and the Regional Capital Stock

<i>Justice</i>	24607.27** (11929.55)	-69.69** (21.73)	27831.85** (6525.85)	-0.526** (0.231)
<i>Population</i>	0.0396** (0.0065)	0.0417** (0.0065)	0.0390** (0.0065)	0.0397** (0.0065)
<i>Public Spending</i>	21.868** (2.193)	21.743** (2.175)	20.278** (2.192)	21.958** (2.188)
<i>Education</i>	-24912.95 (35026.32)	-19289.57 (34813.12)	-16621.9 (344436.15)	-21323.38 (35086.72)
<i>Constant</i>	-33561.9 (23246.21)	-11076.31 (21890.18)	-30427.57 (21755.38)	-18016.73 (21940.61)
R-sq	0.73	0.73	0.73	0.73
No. of observations	400	400	400	400

The dependent variable is the regional stock of private capital. We report the value of the coefficients obtained by using fixed-effect estimator at regional level and the corresponding standard error in brackets. In all the regressions we also include a full set of year dummies. Columns differ in the proxy for the legal enforcement. In the second column, we use the stock of completed judicial proceedings divided by the total number of pending proceedings in the first degree of jurisdiction as a proxy for the cost of repossessing the collateral, *Justice1*. In the third column, we use a proxy for the average length which is equal to the stock of pending trials at the beginning and at the end, divided by the number of judicial proceeding started and completed in the same year times 365, *Justice2*. In columns four and five, we constructed the same proxies as in the previous two columns, but using information about the proceedings at second and third degree of jurisdiction, *Justice3* and *Justice4*. *Population* is the resident population in units. *Public Spending* is the level of spending in Public Works (GVA defactor to compute constant prices), while *Education* is the number of students registered in high school in scholastic year over the population in the age class between 15 and 19.

Table 16: Italy, Justice and the Regional Added Value

<i>Justice</i>	14098.25*	-35.48**	18201.06**	-0.377**
	(8478.05)	(15.52)	(4645.85)	(0164)
<i>Population</i>	0.042**	0.043**	0.042**	0.042**
	(0.005)	(0.005)	(0.005)	(0.005)
<i>Public Spending</i>	14.496**	14.450**	13.435**	14.519**
	(1.558)	(1.558)	(1.560)	(1.551)
<i>Education</i>	2352.118	4960.37	8097.334	5492.845
	(24892.39)	(24861.93)	(24515.55)	(24880.22)
<i>Constant</i>	-68024.64**	-55576.55**	-67245.35**	-59137.32**
	(24892.39)	(15632)	(15487.94)	(15558.23)
R-sq	0.8594	0.8603	0.8603	0.8590
No. of observations	400	400	400	400

The dependent variable is the regional added value at factor prices, net of bank services. We report the value of the coefficients obtained by using fixed-effect estimators at regional level and the corresponding standard error in brackets. In all the regressions we also include a full set of year dummies. Columns differ in the proxy for the legal enforcement. In the second column, we use the stock of completed judicial proceedings divided by the total number of pending proceedings in the first degree of jurisdiction as a proxy for the cost of repossessing the collateral, *Justice1*. In the third column, we use a proxy for the average length which is equal to the stock of pending trials at the beginning and at the end, divided by the number of judicial proceeding started and completed in the same year times 365, *Justice2*. In columns four and five, we constructed the same proxies as in the previous two columns, but using information about the proceedings at second and third degree of jurisdiction, *Justice3* and *Justice4*. *Population* is the resident population in units. *Public Spending* is the level of spending in Public Works (GVA deflator to compute constant prices), while *Education* is the number of students registered in high school in scholastic year over the population in the age class between 15 and 19.

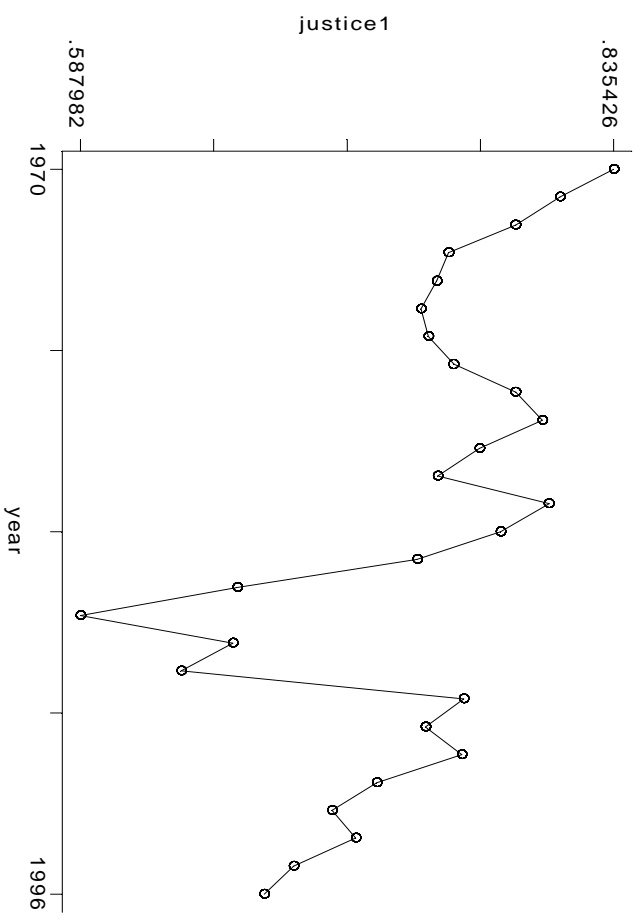


Figure 1: Completed trials over pending trials at the first degree of jurisdiction

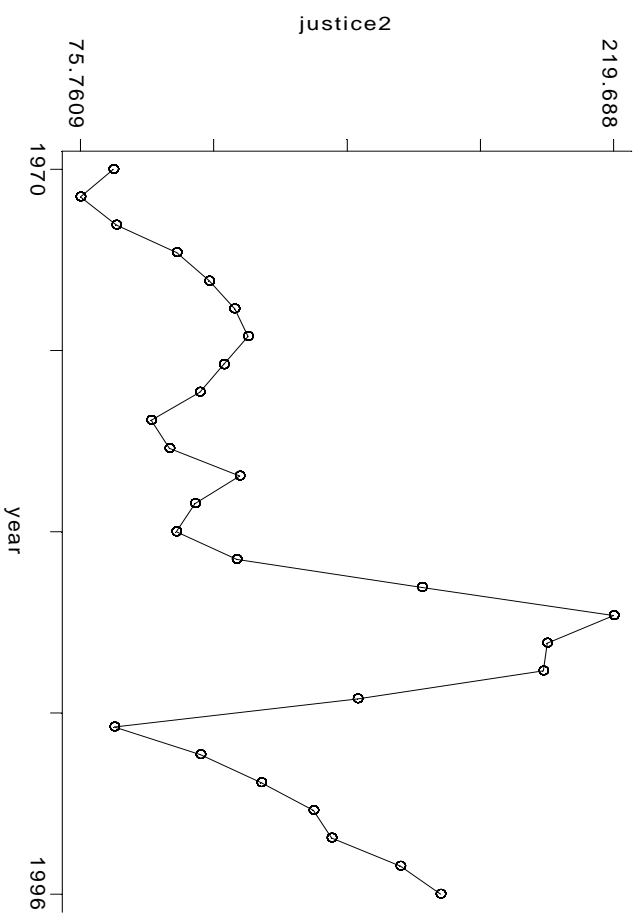


Figure 2: Average length of trials at the first degree of jurisdiction

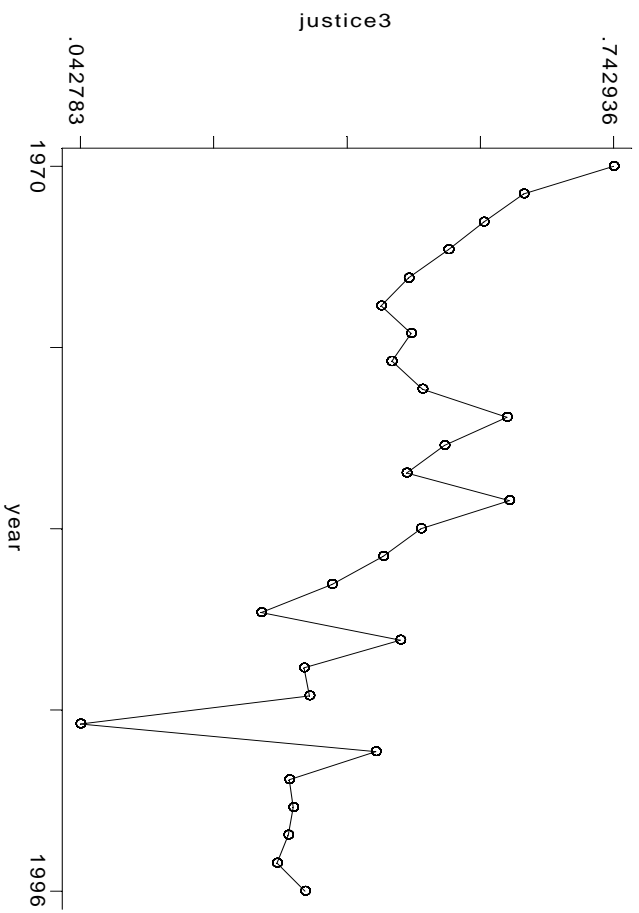


Figure 3: Completed trials over pending trials at the second and third degree of jurisdiction

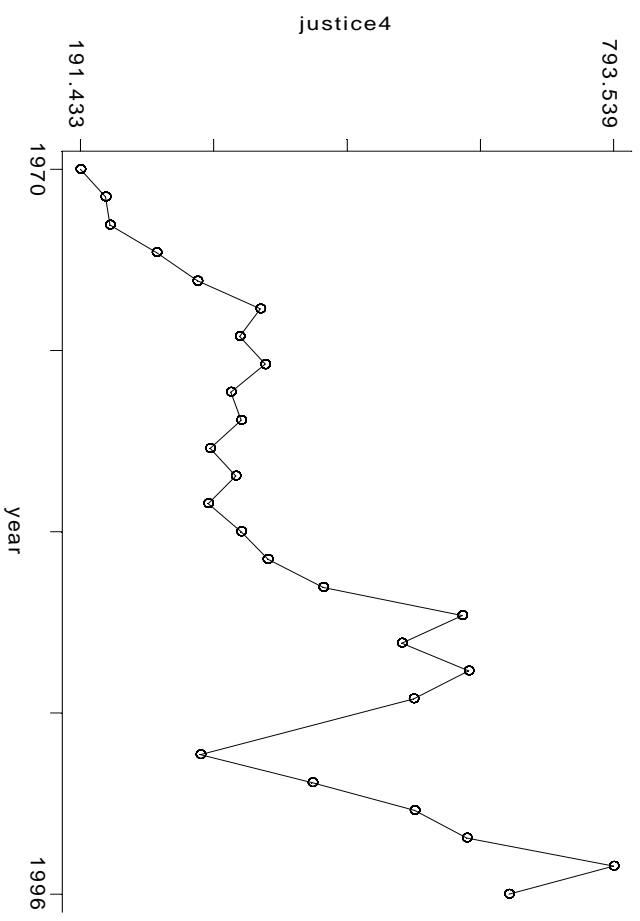


Figure 4: Average length of trials at the second and third degree of jurisdiction