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# **The Costs and Benefits of the Strict Protection of Creditor Rights: Theory and Evidence\***

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## **Abstract**

We first review the existing theories on the efficiency implications of the various regulations that protect creditors. We then empirically investigate the costs and benefits of the strict protection of creditor rights. Building on the sample of 49 countries developed by La Porta *et al.* (1998), we study the impact on debt volume, interest rates and default rates of both an aggregate measure of the degree of protection of creditor rights and the efficiency of the judicial system. We confirm previous results showing that an effective judicial system is crucial for the development and optimal performance of the credit market. Yet, in contrast to previous studies, we find no conclusive evidence on the sign and magnitude of the effect of creditor rights protection on credit market efficiency. Instead, macroeconomic stability appears to be crucial for the outgrowth of wide debt markets.

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## 1. Introduction

What are the efficiency implications of the various laws and regulations that protect creditor rights? Many economists and legal experts argue that protecting creditor rights is crucial for the development and optimal performance of the credit market (see La Porta *et al.*, 1997 and 1998). These authors maintain that the primary economic function of the credit market is to provide cheap funds, and that this function can only be accomplished when creditor rights are protected and sanctions on non-performing debtors are enforced.

This *orthodox* view, however, can be disputed on several grounds. First, there are important moral and distributional objections (which nonetheless are most often ignored by economists). In this respect, debtor-oriented laws and regulations are usually advocated in order to protect less-well-off households and small-business entrepreneurs from the harsh consequences of default. A second criticism states that while creditor-oriented laws may be efficient *ex ante*, as the proponents of the orthodox view suggest, they are likely to create severe inefficiencies *ex post*, that is, once the uncertainty embedded in the entrepreneur's investment project is resolved. (See Gertner and Scharfstein, 1991, among many others.) This is because if creditors are protected against debtors' default, they may have little incentive to allow entrepreneurs to restructure financially in order to reorganize their ventures, even when their investment projects should be permitted to continue as going concerns. Also, unless debtors are discharged from their residual unpaid obligations at the end of a bankruptcy procedure, their incentives to work or invest in new (creditworthy) projects will be necessarily diminished. This suggests a trade-off in deciding what the optimal protection of credit rights should be:

“Other things equal, the easier it is for a borrower to escape from its obligations to pay interest and, ultimately, repay a loan, the more likely it is that creditors will lose some of the money they lend, and so the less willing they will be to extend credit. Less plentiful credit means less economic activity. Against this should be set important benefits that can result from bankruptcy law, says Lawrence Ausubel ... When someone is too deeply in debt, he may have little incentive to work, or, at least, to do any work that is legal, as any income earned will have to go to creditors. Free him from his debts and his incentives to work (legally) are restored. In a sense, the right to go bust is an insurance policy against financial disaster” (Economist 1998).

Some authors also dispute the *ex ante* efficiency properties of legal arrangements that strongly protect creditors. For instance, Posner, in his now seminal book, *The Economic Analysis of the Law* (1992, p. 400), argues that lenders may assume unjustified risks if protected against default:

“Some [U.S.] states have generous household [bankruptcy] exemptions for insolvent debtors, others chintzy ones. In the former states, the risk of entrepreneurship is reduced because the cost of failure is less, but interest rates are higher because default is more likely and the creditor's position in the event of default is weaker. And note that higher interest rates make default all the more likely. *Cutting the other way, however, is the fact that in the low-exemption states lenders' risk is less, which induces lenders to make more risky loans, i.e.,*

*loans likelier to end in bankruptcy. It is therefore unclear whether there will be more bankruptcies in the high-exemption states or in the low-exemption ones.”*  
(Italics added.)

It has also been noticed that mitigating the costs of failure to entrepreneurs is likely to raise entrepreneurial incentives to take risk and effort. In this respect, some economists consider that in a legal environment where creditor rights are strongly protected, forward-looking agents with bright but somewhat adventurous ideas may find it unattractive to go into business. This is believed to be the case in Europe. For example, The Economist (1997) argues that the problem of insufficient creation of start-up companies “requires a shift in Europe’s laws and attitudes towards bankruptcy. If you start a company in London or Paris and go bust, you have just ruined your future. Do it in Silicon Valley, and you just completed your entrepreneurial training.”

Manove and Padilla (1999) and Manove, Padilla and Pagano (1999) point out that the credit market serves other economic functions beyond providing cheap credit. These functions include: screening of projects along dimensions in which banks and other lenders have superior expertise, insuring risk-averse entrepreneurs who face investment projects with large idiosyncratic risks, and protecting overconfident entrepreneurs and households from their impulsive but legitimate investment and purchasing decisions. These authors show that because of market imperfections in the banking industry, the strict protection of creditor rights may lead to market equilibria in which cheap credit is inappropriately emphasized over these other functions. They also show that regulatory restrictions on collateral requirements and the protection of debtors in bankruptcy proceedings may redress this imbalance and restore market efficiency *ex ante*.

It is important to make clear that none of these *critical theories* questions the need for an efficient judicial system that effectively enforces existing laws and regulations, whatever their nature and content. They all reckon that, in the absence of such a judicial system, economic activity would be seriously hampered by all sorts of opportunistic behavior. What these theories dispute is the statement that creditor-oriented laws and regulations constitute a prerequisite for the efficient performance of the credit market.

In this paper, we present the existing theories on the efficiency implications of the various regulations that protect creditors, and review the empirical literature dealing with this issue (Sections 2 and 3, respectively). The main bulk of the paper is devoted to the empirical investigation of the costs and benefits of the strict protection of creditor rights (Section 4). For this purpose, we build on the sample of 49 countries developed by La Porta *et al.* (1998) by introducing some new variables. We use this sample to study the impact on debt volume, interest rates and default rates of both an aggregate measure of the degree of protection of creditor rights and the efficiency of the judicial system. We confirm previous results by La Porta *et al.* (1997, 1998) showing that an effective judicial system is crucial for the development and optimal performance of the credit market. Yet, in contrast to previous studies, we find no conclusive evidence on the sign and magnitude of the effect of creditor rights protection on credit market efficiency. Our empirical analysis uncovers the great importance of macroeconomic stability for credit market performance. In particular, we find that countries with lower inflation have wider debt markets.

Although this paper focuses on the legal prerequisites for the development of credit markets, our conclusions have far wider economic implications. In a recent paper, Rajan and Zingales (1998) show, for a large sample of countries, how industrial sectors requiring

external finance develop much faster in countries with well-functioning financial markets. This article reveals the existence of a fundamental link between the development of the credit system and the growth potential of a given country. Consequently, it seems crucial to determine what legal institutions best contribute to the development of wide and well-performing credit markets in order to foster economic growth around the world.

## **2. Creditor Rights and Economic Efficiency: The Theory**

A credit relationship usually involves three parties: a lender who provides the funds, a borrower who invests these funds and promises to pay principal plus interest, and the courts of law that enforce the loan contract in case of dispute between the lender and the borrower. Inasmuch as the borrower may put the lender's funds to a better (more productive or simply more personally rewarding) use, lender and borrower have a common interest: they both wish to share the gains from trading with each other. Yet, they are likely to disagree about the price and amount of the loan, i.e., on how to split those gains from trade. Furthermore, they are also likely to hold different views on how the loaned funds should be invested, as well as on how to proceed in the event of default. These conflicting views result from the borrower's ability to behave opportunistically (e.g., taking excessive risks, behaving negligently, or just plainly diverting the funds to his own pocket), thus depriving the lender of an adequate return on his investment.

These conflicts may be severe enough to prevent the extension of credit and, consequently, the realization of the gains from trade. The courts of justice may help to remedy this problem by punishing opportunistic behavior. For instance, no lender would ever consider funding a borrower unless there is a third party (usually, the courts of justice) effectively enforcing repayment. In the absence of such third party, the borrower would simply refuse to repay and the lender would have no option but to afford losses.<sup>1</sup> It is true that loan contracts often include collateral requirements whose main aim is to protect lenders against the consequences of default by the borrower. But again, these collateral requirements are effective only if there is a third party who stands ready to protect and enforce the creditor's right to foreclose any posted collateral in the event of default. Therefore, the existence of a third party who performs this enforcement role is instrumental for the development of the credit market. The greater the efficiency and predictability of the third party's actions and proceedings, the easier it is for lenders and borrowers to realize their potential gains from trade. Consequently, we should expect to find a more widespread use of external finance, and in particular debt, in countries with more efficient judicial systems, where contracts are effectively enforced.

As Hart (1995) points out, in any lending relationship involving a single lender and a single borrower, the courts of justice should simply ensure that the terms of the loan contract are upheld. That is, they just need to enforce repayment in no default states and the transfer of ownership and control upon default. Instead, when there are multiple creditors, the role of the legal and judicial system becomes more complicated. The problem is that, when the debtor cannot fully repay his debts, his lenders may engage in a socially inefficient race to repossess their collateral or to foreclose the debtor's assets through a court's judgement. This race may lead to the separate liquidation of the borrower's assets and to a loss of value for the creditors when these assets are worth more as a whole. Thus, in the

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<sup>1</sup> Obviously, the creditor could do his own enforcement. This is precisely what the Mafia does to sustain its lending activity. But, private enforcement involves important private costs and substantial social distortions, which makes it in general an inferior alternative to public enforcement.

presence of multiple creditors, the legal system must provide a (bankruptcy) procedure to dispose of the borrower's assets in an orderly and value-maximizing manner.<sup>2</sup> Bankruptcy law, as well as various other credit regulations, can be understood as standard contracts provided by the State, which largely determine the extent of legal protection enjoyed by creditors within the lending relationship.

La Porta *et al.* (1998) show that there are many differences among countries in their bankruptcy laws and credit regulations. Consequently, the degree of protection of creditor rights exhibits a great deal of variation across countries. In most countries, collateral requirements and restrictive loan covenants are legally feasible. Yet, some countries have important collateral limitations, bankruptcy exemptions and discharge provisions built into their bankruptcy codes, while others do not. For example, in the U.S., "fresh-start" provisions in the 1978 Bankruptcy Code mandate the discharge of all debts remaining at the conclusion of bankruptcy proceedings. This is not true in Spain and many other European countries. Also, while in some countries "absolute priority rules," which state that a senior creditor is entitled to be paid in full before junior creditors and equityholders get anything, are respected, in others important deviations do occur. Finally, the enforcement of creditor rights also varies across countries. For instance, in some countries court-supervised auctions of repossessed assets are manipulated by colluding mafias or, even worse, are run by corrupt officials. The value of collateral in these countries is, consequently, substantially reduced.

Given all these differences, the question arises as to what constitutes the best practice in this respect. More precisely, what is the optimal extent of protection of creditor rights? The rest of this Section is devoted to reviewing the benefits and costs associated with the strict protection of creditor rights.

### **2.1. The Benefits of the Strict Protection of Creditor Rights: The Orthodox View**

A well-established strand of the literature sustains that investor protection is central to the development of capital markets. In particular, this literature argues that credit would not be extended if creditors were not legally entitled to repossess collateral:

"... [C]reditors are paid because they have the right to repossess collateral. Without these rights, investors would not be paid, and therefore firms would not have the benefit of raising funds from these investors" (La Porta *et al.*, 1998).

This orthodox view originates from the idea that adverse selection and moral hazard are the main problems in credit relationships. Let us briefly consider these two problems in order. The credit market operates under substantial asymmetries of information. Indeed, when a borrower applies for a loan, the lender most likely does not know many personal and professional features of the borrower that may be crucial for an appropriate risk assessment. For example, the borrower may either be an honest entrepreneur with a creditworthy investment project or a crook whose only intention is to take the money and run. The lender may understand that he may face one of these two types, but he cannot determine with precision the exact type of a given borrower. This problem is only severe if, in addition, the lender cannot observe (or, is not able to verify in front of a court of law) the cause of default. Honest entrepreneurs repay their debts unless, due to bad luck, their

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<sup>2</sup> Posner (1992) and Hart (1995) discuss several reasons why, in a world of costly contracting, this bankruptcy procedure is best provided by the State rather than by the parties themselves.



investment projects do not yield the expected returns. Crooks never repay. The dilemma for creditors in this story is that they cannot assert whether default is fraudulent or not.

Suppose that the loan contract can only specify an interest rate, that is, assume that the lenders cannot impose collateral requirements. Due to the lender's inability to discriminate between honest entrepreneurs and crooks, the equilibrium interest rate will have to be set at a sufficiently high level to compensate for the risk of lending to a crook. But, while a crook is willing to borrow at any interest rate, an honest entrepreneur's demand for credit decreases as the loan's interest rate rises. The crook does not intend to pay the loan in any case, which explains why his demand is not sensitive to price. Instead, the honest entrepreneur will borrow only at interest rates for which his investment project has a positive NPV. Consequently, high interest rates due to asymmetric information may end up excluding the honest entrepreneur from the credit market. This phenomenon is known as *adverse selection*. (See Stiglitz and Weiss, 1981.) Note that, if this were the case, the market outcome would be highly inefficient, since the investment project of the honest entrepreneur would not be funded despite its positive NPV. In this example, adverse selection produces market collapse. The only borrower who is willing to apply for a loan at the prevailing rates has no intention to repay. The lender who understands these incentives will not lend to anyone in equilibrium.

In a credit market with asymmetric information, it may be optimal to allow the parties to write contracts specifying collateral requirements, so lenders can appropriate the collateralized assets in the event of default. The wealth of an entrepreneur is easily observable, unlike his intentions or luck. An honest entrepreneur with a positive NPV project will be more willing to post collateral in order to obtain a sufficiently low interest rate than a crook, who has no investment project available and, consequently, will lose any collateral offered. Hence, a borrower's willingness to post collateral can convey useful information concerning his type. Bester (1985), Besanko and Thakor (1987a and 1987b), and Chan and Thakor (1987) show that this information can improve the allocation of credit in equilibrium, tempering the problems created by adverse selection. Lenders can discriminate among different borrowers' types by offering a menu of contracts: each contract specifies an interest repayment and a collateral requirement. A contract specifying a large collateral requirement will also include a lower interest rate and vice versa. Entrepreneurs with safer projects (such as our honest entrepreneur) will post collateral and obtain lower interest rates.

Another benefit of collateral requirements is to mitigate *moral hazard* problems on the debtor's side. Borrowers have the incentive to engage in opportunistic behavior at their creditors' expenses. These problems are due to the lenders' inability to supervise the borrowers' actions that affect the value of the loan. The borrower may, for instance, invest the funds in a project that does not coincide with the original project presented for approval. If the new project is riskier, then the interest rate specified in the original contract does not adequately compensate the lender for the additional credit risk. The lender would like to punish this deviant behavior, but such punishment is not feasible unless the diversion of funds is both observable by the lender and verifiable in a court of law. Asset substitution is not the only example of borrowers' opportunistic behavior; other examples are the undersupply of effort in the management of the project, the debt overhang or underinvestment problem, or outright fraud.

The right to repossess collateral gives lenders an essential threat to ensure that borrowers will not behave in this way.<sup>3</sup> The reason is that opportunistic actions make the borrower's default as well as the repossession of collateralized assets more likely. This raises the cost of value-reducing deviant behavior and, thus, reduces the incentives to undertake such actions. In short, the borrower risks his own money and not only the funds lent by creditors. If creditors do not have the right to require collateral or cannot effectively repossess collateralized assets, interest rates will rise in response to these agency problems and, if that is not enough to cover the opportunity cost of lending, the credit market may even collapse. The strict protection of the creditor's right to repossess collateral leads to cheaper credit. Consequently, many valuable investment projects, which would not be funded because of moral hazard problems, can be financed when the debtor is allowed to commit his own wealth to the repayment of his debts.

So far, we have presented several arguments supporting the claim that the strict protection of creditor rights raises the efficiency of the credit market *ex ante*. We shall now briefly consider the same issue but from an *ex post* viewpoint, i.e., once the uncertainty embedded in the investment project is resolved. Suppose that the borrower defaults in his promise to repay at maturity. There are two possible courses of action: either the assets comprising the investment project are sold and the liquidation value is used to repay the creditors, or else an agreement is reached and the project is continued as an ongoing concern. Liquidation is efficient if the liquidation value of the assets exceeds the value of the project as an ongoing concern. Yet, if the bankruptcy procedure allows the borrower to file for reorganization without the creditors' consent, keeping the administration of his property during the reorganization process, and imposes an automatic stay on the assets of the firm upon reorganization, liquidation may not take place even when it is efficient. This is allegedly the case in the U.S. and many other countries, such as Spain. The strict protection of the creditors' right to repossess collateral and to be repaid according to absolute priority rules eliminates this *ex post* overinvestment problem (see Gertner and Scharfstein, 1991).

## 2.2. The Cost of the Strict Protection of Creditor Rights: Critical Theories

On the other hand, credit-oriented regulations may lead to underinvestment *ex post*. This is because if creditors are strongly protected in case of default, they will have no incentive to allow their debtors to restructure financially and continue their investment projects. Thus, the debtors' assets may be liquidated even when efficiency would require keeping them in the hands of debtors as part of their ongoing investment projects.

The *ex ante* efficiency of pro creditor laws can also be disputed. First, these laws limit the incentives of entrepreneurs to take risks. Consequently, creditworthy projects may not be funded in equilibrium. To illustrate this point, let us consider the two following scenarios. In the first case, an entrepreneur obtains funds for his (fixed-size) investment project at a given interest factor  $R_0$ , but he is not required to post any assets as collateral for his loan. The entrepreneur's liability is thus limited: his promise is to repay principal plus interest from the proceedings of his investment project. In a competitive credit market,  $R_0$  will be equal to  $R/p$  in equilibrium, where  $p$  is the probability of repayment and  $R$  the opportunity cost of funds for the lender. Hence, if the project is successful, the entrepreneur

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<sup>3</sup> The right to repossess collateral is the most fundamental right awarded to creditors. Most other rights are intimately related to or even derived from it. Among others, we can cite the right to introduce restrictive covenants into the loan contract, the right to veto the reorganization of bankrupt firms, the right to gain possession of their security during such reorganizations, and the right to be repaid according to their absolute priority in the event of bankruptcy.

earns the project's returns minus  $R_0$ . If, instead, the project fails, the entrepreneur does not lose anything.

In the second scenario, the entrepreneur posts his house as collateral for his loan. In this situation, the risk borne by the lenders is less, since in the event of default by the entrepreneur they can repossess his house and liquidate it in order to recover their funds. Consequently, the lenders will be willing to fund the entrepreneur's investment project at a lower interest factor. In a competitive credit market, the total cost of funds for the entrepreneur (which includes the pecuniary cost associated with the potential loss of his house) is the same in the two scenarios being considered. Yet, the risk borne by the entrepreneur is greater in the second scenario. In this last case, the entrepreneur earns a larger profit when the project succeeds, since he must pay a lower interest factor. But, if the project ends in a fiasco, the entrepreneur loses his house. Therefore, if the entrepreneur is risk-averse, his incentives to invest are reduced in the second scenario.

In summary, a pro-creditor bias in bankruptcy law may act as a barrier for the entry of new businesses. This problem is particularly severe, since as pointed out by Arrow (1962), in a society where individuals are risk-averse and in the absence of adequate mechanisms to diversify risk, investment in risky but highly rewarding activities is suboptimal, even when there is *no* pro-creditor bias in the credit regulations. Furthermore, Carr and Mathewson (1988) show that unlimited liability rules constitute barriers to entry even in the absence of risk aversion. This is because unlimited liability generates a moral hazard problem stemming from the ability of some shareholders to free ride on the wealth of others, who provide the guarantee of additional payments to cover insolvencies.

Creditor-oriented lending laws may generate other *ex ante* inefficiencies. Bebchuk and Piker (1998) have pointed out that deviations from absolute priority raise the incentives of owner-managers to make investments in managerial human capital and reduce their incentives to entrench themselves as managers by choosing projects for which their input is essential. Likewise, Berkovitch, Ronen and Zender (1997) argue that in deciding about an optimal bankruptcy law, the legislator must take into account the *ex ante* incentives of managers to invest in firm-specific human capital. Deviations from absolute priority might also discourage excessive risk-taking in financial distress prior to filing for bankruptcy (see Gertner and Scharfstein, 1991) and facilitate the initiation of bankruptcy proceedings when such initiation is desirable (see Baird, 1991). Finally, Bebchuk and Fried (1996, p. 857) argue that "a borrower and a secured creditor may have incentives under full priority to expend resources inefficiently encumbering an asset merely to transfer value from non-adjusting creditors." These "non-adjusting" creditors include tort claimants, government tax and regulatory agencies, and voluntary creditors with small claims as well as voluntary creditors with large but fixed claims.

As we discussed above, one of the main rationales in support of pro-creditor laws is that they lead to a reduction in the cost of capital. Yet, the credit market can serve other important economic functions. Among others, these functions include project screening, insuring risk-averse individuals, and protecting society from overconfidence. Manove and Padilla (1999), and Manove, Padilla and Pagano (1999) show that, when collateral requirements are enforceable, competition among lenders leads to lower interest rates, but that, because of several credit market imperfections (arising from asymmetric information or bounded rationality), creditors will not pay due emphasis to their other economic functions.

Jackson (1986) argues that lenders, such as banks, may be more capable than entrepreneurs of assessing the performance of potential investment projects. This is because banks acquire valuable information in the course of dealing with entrepreneurs so that they can develop useful yardsticks with respect to which new projects can be evaluated. Banks also have superior sectoral and cyclical information and can better predict the impact of wide macroeconomic trends on the profitability of specific investment projects. Banks are, or ought to be, in the project-evaluation business. Yet, a high level of collateral will weaken a bank's incentive to do so. For instance, if the loan is fully collateralized, the bank is not exposed to default risk and, therefore, it is indifferent as to the nature of the investment project that is financed with its funds. Jackson (1986, p. 249) stresses that

“Discharge ... heightens creditors' incentives to monitor: by providing for a right of discharge, society enlists creditors in the effort to oversee the individual's credit decisions.”\.

Jackson makes clear that this incentive problem on the creditors' side is most important when the social security or some other “safety net” insures borrowers. This is because in such a case borrowers will have an incentive to undertake excessively risky projects while banks will have no incentive to restrain them because of the protection awarded by collateral.

“If there were no right of discharge, an individual who lost his assets to creditors might rely instead on social welfare programs. The existence of those programs might induce him to underestimate the true cost of his decisions to borrow. In contrast, discharge imposes much of the risk of ill-advised credit decisions, not on social insurance programs, but on creditors. The availability of an unlimited non-waivable right of discharge in bankruptcy therefore encourages creditors to police extensions of credit and thus minimizes the moral hazard created to safety-net programs. Because creditors can monitor debtors and are free to grant or withhold credit, the discharge system contains a built-in checking mechanism. The importance of encouraging creditor monitoring in a society that provides other safety nets may explain why the right of discharge is not waivable” (Jackson, 1986).

Manove, Padilla and Pagano (1999) develop a formal equilibrium model that allows us to evaluate the robustness of Jackson's arguments once all market interactions are taken into account. In this model, entrepreneurs have privileged information on their respective ability to develop profitable investment projects. Entrepreneurs differ in this ability: some are more able than others in identifying valuable investment projects. Banks know that entrepreneurs differ along this dimension, but cannot distinguish among types when confronted with a given borrower. Entrepreneurs, irrespective of their types, may end up with a bad project. Consequently, the *ex ante* screening of investment projects adds value to all entrepreneurs, even to capable ones. The authors, following Jackson, assume that banks have an advantage in project evaluation, so that from a social standpoint this activity should be undertaken by banks.

Entrepreneurs must obtain loans from banks to invest. Banks can discover the quality of a given project by screening it at a cost. Screening is non-observable and non-contractible. Therefore, banks will only screen projects as part of a loan approval procedure when the direct benefit to the bank of the information obtained exceeds the screening cost. Entrepreneurs whose loan applications are approved pay not only their own screening costs, but also a prorated share of the screening costs of those applicants whose loans are denied.

Banks with fully collateralized loans have no incentive to screen. If a bank screens, then it will only approve the loan if it is found to be good.

In this setting, because of entrepreneurial heterogeneity, banks would like to be able to introduce collateral requirements into their loan contracts in order to discriminate among entrepreneurial types, as well as to protect themselves against default risk. But, as we have just noted, collateral reduces their incentives to screen projects prior to loan approval. Suppose that screening costs are not too high, so that screening is socially efficient for all entrepreneurs. In any competitive pooling equilibrium, in which no entrepreneur posts collateral, all projects are screened and thus only good projects will be funded. In this equilibrium, no entrepreneurs of either type will default. However, able entrepreneurs will pay a share of the screening costs from approved loans not only of able applicants but of less-able entrepreneurs as well. Because the latter's costs are higher, since less-able entrepreneurs are more likely to have bad projects, able entrepreneurs have an incentive to separate by posting sufficient collateral. But this in turn removes the incentives of banks to screen. Manove, Padilla and Pagano (1999) show that, for an intermediate range of the screening costs, banks underinvest in project evaluation. Too many unworthy projects are funded and too many creditworthy entrepreneurs experience bankruptcy. This inefficiency can be partially corrected via collateral limitations, bankruptcy exemptions or discharge provisions.

A somewhat related argument is made by Bebchuk and Fried (1996), who claim "to the extent that the bank is insulated by a security interest from the effects of the borrower's misbehavior, the bank will have less incentive to control the borrower's behavior." This paper, however, differs from Manove, Padilla and Pagano (1999) in two respects. First, it focuses on *ex post* monitoring rather than *ex ante* screening. Second, and most importantly, in this paper the inefficiencies associated with the creation of a security interest originate in the existence of creditors who cannot adjust their claims to take into account that any security interest subordinates their unsecured claims.

Jackson (1986) identifies another reason why limiting creditor rights may be value-increasing. He claims that these policy measures may help to correct possible psychological biases that affect individual investment and consumption choices. That is, they may contribute to limit the harmful decisions of individuals acting under misperceptions or in an impulsive and irrational manner. Jackson points out that many economic agents process available information in such a way that they consistently underestimate future risks. In the words of Adam Smith:

"The overweening conceit which the greater part of men have of their abilities is an ancient evil remarked by the philosophers and moralists of all ages. Their absurd presumption in their own good fortune has been less taken notice of [but is], if possible, still more universal ... The chance of gain is by every man more or less overvalued, and the chance of loss is by most men undervalued" (Adam Smith, *The Wealth of Nations*, Book I, Chapter X).

The available empirical evidence seems to support these statements. De Bondt and Thaler (1995, p. 389), in a survey paper reviewing a large number of studies on behavioral economics written by economists, psychologists and sociologists, report "perhaps the most robust finding in the psychology of judgment is that people are overconfident." That is, people are unrealistically optimistic about their ability, power and the outcome of their own

actions. Psychologist Shelley E. Taylor (1989) concludes that the most important lesson from the existing evidence is that optimism is an essential characteristic of the healthy mind.

Because individuals entertain optimistic expectations about the future, many of their decisions in an uncertain context may not really reflect their “true” subjective preferences for consumption or investment, on the one hand, and savings, on the other. This discrepancy between an individual’s “revealed” preferences and his “true” preferences has its origins in the individual decision process, which is corrupted by misperceptions of whose existence the individual is completely unaware.

Jackson considers that this psychological bias justifies the enactment of non-waivable collateral limitations. In the absence of such limits, overconfident entrepreneurs will commit large parts of their wealth to obtain loans at a lower cost. Optimistic entrepreneurs underestimate the likelihood of bankruptcy and, hence, the opportunity cost of collateral. Because of their optimism, these entrepreneurs would waive any discretionary protection, which explains why collateral limitations have to be non-waivable if we want them to be effective.

Many would argue that this position is highly paternalistic. This is true. Jackson considers that optimism does not constitute an excuse from the loyal fulfillment of one’s obligations. But for the very same reason, he sustains that we must limit the choice of optimists in order to protect them against their own mistakes and to prevent their exploitation by individuals with superior information. This paternalistic intervention does not contradict the main tenets of economic and philosophic liberalism since, as pointed out by Feinberg (1986) and Trebilcock (1993), any choice based on ignorance or misperception is not truly free.

One may object that a paternalistic intervention is not actually needed because the market has a large number of institutions for dealing with overconfidence and excessive boldness among entrepreneurs. Indeed, banks and other lending institutions serve as a first line of defense. However, Manove and Padilla (1999) show that a competitive credit market does not afford enough protection against entrepreneurial optimism.

Entrepreneurial optimism generates two different kinds of distortions from a social viewpoint. First, optimists invest their borrowed funds in projects with a return below the social cost of funds. Society as a whole would be better off if those funds had been invested in alternative uses. Second, optimists may have less risky (and therefore less subject to their optimistic expectations), creditworthy alternatives, which they incorrectly tend to disregard. Society would be better off if they invested any borrowed funds in these safer, albeit less glamorous, projects.

Banks do internalize the opportunity cost of the funds lent when fixing the interest rates for their loans. That is, they raise the rates charged to ensure a sufficient return in their lending activities. In this way, they solve the first distortion generated by optimism. Yet, they do not cope with the second distortion. Competitive banks fail to appropriate the surplus that would accrue if the entrepreneur would invest in safer alternatives. Hence, interest rates do not incorporate this opportunity cost and, consequently, the optimistic entrepreneur also neglects it. This outcome is due to the competitive nature of the credit market, which in effect induces banks to maximize the entrepreneurs’ “perceived” preferences, as well as to the inability of the latter to figure out that they are subject to unrealistic expectations.

Manove and Padilla show that if banks can require collateral to protect themselves from non-performing loans, the resulting lower interest rates may serve only to encourage the already overconfident entrepreneurs. That is, collateral requirements, which are efficient in other settings, are inefficient in this case. To sum up, Manove and Padilla provide a formal justification to the kind of paternalistic intervention suggested by Jackson, by showing that solving the distortions generated by entrepreneurial optimism cannot be left to private contracting.

### **2.3. A Brief Summary**

In the last two subsections we have reviewed a number of theories on the optimal degree of protection of creditor rights. Our purpose now is to summarize their main implications regarding some direct, though not fully comprehensive, measures of credit market performance. These measures are lending volume, interest rates and default rates.

The orthodox view suggests that the strict protection of creditor rights will lead to cheaper credit because of the protection conferred to lenders and also because, by forcing entrepreneurs to risk their own wealth, they provide entrepreneurs with the right incentives to perform. The reduced cost of funds will in turn lead to increased lending volumes and investment levels, and to a reduction in the proportion of defaulted loans and insolvent enterprises.

The critical theories surveyed in Section 2.2 also predict lower interest rates in response to a stricter prediction of creditor rights. But, in contrast to the orthodox view, they predict a larger proportion of defaulted loans and insolvent businesses. Too many unworthy projects are funded when creditors are protected against default, because creditors' incentives to screen projects and to discourage investment by overconfident entrepreneurs are reduced as default risk falls. The prediction regarding lending volume is mixed. On the one hand, cheaper funds should lead to larger lending volumes. This is a supply-side effect. On the other hand, a pro-creditor bias in credit regulations may reduce the demand for credit.

These predictions are summarized in the following table.

**Table 1**

*The impact of a stricter protection of creditor rights*

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	Lending volume	Interest rates	Default rates
Orthodox view	-	-	-
Critical theories	- -	-	-

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### **3. Creditor rights and economic efficiency: the evidence**

It seems to us that, in order to evaluate the relative merits of these conflicting views of the credit market, we need a number of empirical studies that seriously consider the actual efficiency implications of protecting creditor rights. Unfortunately, there are few of them available to us so far.

In a pair of excellent papers, La Porta *et al.* (1997 and 1998) have empirically analyzed for a large set of 49 countries the relationship between the strength of protection of creditor rights and the efficiency of the judicial system, on one side, and lending volumes, on the other. They show how countries with a more efficient judicial system and a greater respect for the law enjoy greater lending volumes.

They also show that common-law countries, such as the U.S., the U.K. and Japan, give better protection to creditors and have wider debt markets than civil law countries, such as France, Germany, Italy and Spain. We must qualify these last statements, though, because there are important differences within each legal family. For instance, among common-law countries, the U.K. awards maximal protection to creditors whereas the U.S. bankruptcy code has a marked pro-debtor bias. Among those countries whose law is classified within the French civil law family, there are also substantial differences. For example, the degree of protection awarded to creditors in Spain is similar to that prevailing in Scandinavian countries and not significantly inferior to that in countries classified within the German civil law tradition. In contrast, France has a minimal degree of creditor protection, according to the index developed by La Porta *et al.* Yet, this cannot be attributed to the Napoleonic tradition that defines what we tend to denominate as French civil law. The Napoleonic Commercial Code of 1807 treated debtors as criminals, even if default was not fraudulent, and focused mainly on the repayment of unpaid debts. France reformed its bankruptcy law in 1984, which became the most biased towards debtors of those in place in 1994 (see Espina, 1997).

The positive relationship between lending volume and the degree of protection of creditor rights is also found by Gropp, Scholz and White (1997). They analyze, using U.S. data, how cross-state differences in personal bankruptcy rules affect the amount of credit available to low-asset households. They conclude that, somewhat ironically, bankruptcy exemptions divert credit towards relatively wealthier households.



The finding of La Porta *et al.* (1997) that more effective judicial systems sustain wider credit markets has also been confirmed by several other studies. Freixas (1991) shows how in Europe both the average cost as well as the duration of the judicial process required to repossess collateralized assets are inversely related to the amount of funds available to finance consumption and housing acquisitions. Meador (1982) and Jaffee (1985) have found evidence that interest rates also respond to the efficiency of the judicial system. They find that interest rates in the U.S. mortgage market are higher in those states where the cost and duration of judicial interventions to repossess collateral are higher. Similar results have been found by Alston (1984). Lastly, Demirgüç-Kunt and Maksimovic (1998a) show that, in countries whose legal systems score high on an efficiency index, a greater proportion of firms use long-term external financing.

Finally, Demirgüç-Kunt and Maksimovic (1998b) show that most creditor rights are not significantly related to the debt composition decisions of large firms. The only exception is the right to seize collateral after default; this right is associated with a significantly shorter maturity of debt for large firms. Interestingly, this right is not similarly correlated with the financing decisions of small firms. In short, these authors have not been able to consistently relate specific investor protections with firm financing.

Broadly speaking, the existing studies have focused on the impact of creditor rights protection on lending volume.<sup>4</sup> They show that the relationship between these two variables is negative and statistically significant. But, as we discussed in Section 2.3, this is not enough to evaluate the relative merits of the different theories that study the effects of creditor rights protection. To properly discriminate among them, we should consider other measures of credit market performance, such as default rates. This is one of the aims of the following Section.<sup>5</sup>

## **4. Another Look at the Effects of a Stricter Protection of Creditor Rights**

In this Section, we revisit the analysis by La Porta *et al.* (1997) on the legal determinants of debt finance. We first reconsider their cross-country investigation of the impact of creditor rights on debt volume by introducing some additional macroeconomic controls of great theoretical relevance. We then proceed to study how creditor rights affect real interest rates and default rates for their sample of 49 countries.

### **4.1. Data**

We build on the sample developed and firstly used by La Porta *et al.* (1997, 1998). We introduce two new dependent variables (the default rate and the real interest rate) and two new explanatory variables (inflation and government surplus). Table 2 presents the description of the variables used in our analysis, the data we use and their sources.

As in La Porta *et al.* (1997), we measure the overall ability of the private sector to access debt finance through the ratio of the sum of the bank debt of the private sector and the face value of corporate bonds to GNP in each country. The real interest rate is measured,

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<sup>4</sup> A survey of this literature can be found in La Porta and López-de-Silanes (1998).

<sup>5</sup> No study has so far established a positive relationship between the filing rate and the generosity of the state property exemptions. For instance Domowitz and Eovaldi (1993) conclude that the 1978 pro debtor amendment of the US Bankruptcy Code cannot be established as the cause of the increase in the number of non-business bankruptcies that took place in the early 1980s. Business cycle conditions and demographic trends seem to explain the bulk of the increase.

as standard, as the real lending rate charged by banks on loans made to prime customers. We use two different proxies for the default rate. First, we employ the ratio of non-performing loans to total loans in each country. Given that there are few available observations for this variable, we also use the ratio of bank provisions for loan losses to total loans in each country.<sup>6</sup> These last two variables are taken from the BankScope bank-level data set published by IBCA.

Our macroeconomic controls include GDP growth and the logarithm of real GNP, as in La Porta *et al.* (1997), plus two indicators of the government's macroeconomic policy: the inflation rate and the size of the government's fiscal surplus (deficit). GDP growth is included because of its likely impact on valuations and also because it may constitute an appropriate indicator of the financing needs of firms. The log of real GNP is introduced because larger economies may have larger credit markets simply as a result of economies of scale.<sup>7</sup>

The inflation rate and the size of the government's fiscal surplus (deficit) provide valuable indicators of the government's management of the economy and of the stability of the macroeconomic context within which firms operate in each country. The inflation rate also indicates the extent to which the local currency provides a stable measure to be used in debt contracts (Demirgüç-Kunt and Maksimovic, 1998b). Hence, a higher inflation rate should negatively impact debt volume. The size of the government's fiscal surplus affects the amount and cost of funds available to the private sector. A larger (smaller) surplus (deficit) improves the private sector's access to debt finance.

Our measure of creditors' protection is taken from La Porta *et al.* (1997 and 1998), and is an aggregate index of the various credit rights in the liquidation and reorganization procedures that follow after a borrower's default. As an indicator of the efficiency of the legal system in each country, we use the variable rule of law, which is an assessment of the law and order tradition in the country (see La Porta *et al.* 1997 and 1998). Table 3 contains the raw data used in our analysis.

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<sup>6</sup> Note that both variables may be subject to severe accounting problems and measurement errors. They may be fundamentally driven by differences in banking regulatory practices across countries that lie outside our control. Furthermore, the provision for loan losses ratio may be distorted by the discretionary nature of these provisions.

<sup>7</sup> See La Porta *et al.* (1997, p. 1137) and Demirgüç-Kunt and Maksimovic (1998b).

**Table 2***Description of the variables*

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Debt/GNP	Ratio of the sum of bank debt of the private sector and outstanding non-financial bonds to GNP in 1994, or last available. Source: La Porta <i>et al.</i> (1997).
Non-performing loans/total loans	Ratio of total non-performing loans to total loans in each country (1994-95 country average). This variable is based on the BankScope bank-level data set by IBCA. Source: Jappelli and Pagano (1998).
Bank provisions for loan losses/total loans	Ratio of bank provisions for loan losses to total loans in each country (1994-95 country average). This variable is based on the BankScope bank-level data set produced by IBCA. Source: Jappelli and Pagano (1998).
Real interest rate	Real lending rate charged by the banks on loans to prime customers in 1994. Inflation in 1994 (consumer price index) is used to compute real interest rate. Source: The World Bank, <i>World Development Report 1996</i> and United Nations, <i>Monthly Bulletin of Statistics, XLIX, 1995</i> .
GDP growth	Average annual percent growth of per capita gross domestic product for the period 1970-1993. Source: La Porta <i>et al.</i> (1997).
Log GNP	Logarithm of the Gross National Product in 1994. Source: La Porta <i>et al.</i> (1997).
Inflation	Inflation in 1994 (consumer price index). Source: United Nations, <i>Monthly Bulletin of Statistics, XLIX, 1995</i> .
Government surplus (% GDP)	Ratio of current and capital revenue and official grants received, less total expenditure and lending minus repayments to Gross Domestic Product in 1994. Source: The World Bank, <i>World Development Report 1996</i> .

## Table 2

### *Description of the variables (continued)*

Rule of law

Assessment of the law and order tradition in the country. Average of the months of April and October of the monthly index between 1982 and 1995. Scale from 0 to 10, with lower scores for less tradition of law and order. La Porta *et al.* (1997).

Creditor rights

An index aggregating creditor rights. The index is formed by adding 1 when: (1) the country imposes restrictions, such as creditors' consent or minimum dividends, to file for reorganization; (2) secured creditors are able to gain possession of their security once the reorganization petition has been approved (no automatic stay); (3) the debtor does not retain the administration of its property pending the resolution of the reorganization; (4) secured creditors are ranked first in the distribution of the proceeds that result from the disposition of the assets of a bankrupt firm. The index ranges from 0 to 4. Source: La Porta *et al.* (1997).

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**Table 3a***Data*

Country	Debt/ GNP	Non- performing loans/total loans	Bank provisions for loan losses/total loans	Real interest rate	GDP growth	Log GNP	Inflation	Government surplus (% GDP)	Rule of law	Creditor rights
<b>OECD countries</b>										
Australia	0.76	3.7	0.34	9.92	3.06	12.64	1.89	-2.9	10	1
Austria	0.79	(na)	0.9	(na)	2.74	12.13	3.05	-5.1	10	3
Belgium	0.38	(na)	0.26	6.84	2.46	12.29	2.4	-6.1	10	2
Canada	0.72	2.34	0.79	6.61	3.36	13.26	0.27	-4.5	10	1
Denmark	0.34	(na)	1.37	6.2	2.09	11.84	1.98	-5.7	10	3
Finland	0.75	3.3	2.51	6.74	2.4	11.49	1.09	-14.1	10	1
France	0.96	8.81	0.95	6.13	2.54	14.07	1.67	-5.5	8.98	0
Germany	1.12	(na)	0.6	8.54	2.6	14.46	2.73	-2.5	9.23	3
Greece	0.23	(na)	1.2	14.86	2.46	11.25	10.92	-15.6	6.18	1
Ireland	0.38	(na)	(na)	3.7	4.25	10.73	2.31	-2.3	7.8	1
Italy	0.55	5.21	1.74	6.89	2.82	13.94	4.03	-10.6	8.33	2
Japan	1.22	1.66	0.53	3.42	4.13	15.18	0.66	-1.6	8.98	2
Mexico *	0.47	7.09	2.89	(na)	3.07	12.69	6.95	(na)	5.35	0
Netherlands	1.08	(na)	0.05	5.4	2.55	12.68	2.75	-0.5	10	2
New Zealand	0.9	(na)	(na)	7.86	1.67	10.69	1.71	0.8	10	3
Norway	0.64	4.6	-0.06	6.91	3.43	11.62	1.39	-7.5	10	2
Portugal	0.64	5.56	1.56	9.25	3.52	11.41	5.26	-2.2	8.68	1
Spain	0.75	4.74	0.98	3.94	3.27	13.19	4.77	-4.8	7.8	2
Sweden	0.55	7.02	1.12	8.2	1.79	12.28	2.22	-13.4	10	2
Switzerland	(na)	(na)	0.75	4.58	1.18	12.44	0.88	(na)	10	1
Turkey	0.15	6.11	2.26	(na)	5.05	12.08	106.27	-4	5.18	2
UK	1.13	(na)	0.16	3.01	2.27	13.86	2.42	-6.6	8.57	4
US	0.81	1.65	0.56	4.46	2.74	15.67	2.53	-3	10	1
<b>Non OECD countries</b>										
Argentina *	0.19	(na)	3.79	5.68	1.4	12.4	4.18	(na)	5.35	1
Brazil *	0.39	6.31	3.63	(na)	3.95	13.03	2502.5	-4	6.32	1
Chile *	0.63	0.93	0.34	7.97	3.35	10.69	11.42	1.7	7.02	2
Colombia *	0.19	7.34	1.74	14.03	4.38	10.82	23.21	-0.6	2.08	0
Ecuador *	(na)	4.64	1.99	13.09	4.55	9.49	27.33	0	6.67	4
Egypt	(na)	(na)	2.63	7.74	6.13	10.53	8.13	2.1	4.17	4
Hong Kong	(na)	(na)	0.28	(na)	7.57	11.56	8.08	(na)	8.22	4
India	0.29	(na)	3.87	5.41	4.34	12.5	10.33	-6	4.17	4
Indonesia	0.42	(na)	0.84	10.83	6.38	11.84	8.45	0.6	3.98	4
Israel	0.66	(na)	0.85	4.47	4.39	11.19	12.38	-3	4.82	4
Jordan	0.7	5.54	0.86	6.64	1.2	8.49	2.21	1.9	4.35	(na)
Kenya	(na)	(na)	(na)	(na)	4.79	8.83	29.04	-3.6	5.42	4
Malaysia	0.84	(na)	0.63	3.75	6.9	11	3.71	4.1	6.78	4
Nigeria	(na)	(na)	(na)	-23.25	3.43	10.36	57.01	(na)	2.73	4
Pakistan	0.27	(na)	(na)	(na)	5.5	10.88	12.47	-6.9	3.03	4
Peru *	0.27	8.93	3.45	24.14	2.82	10.92	23.73	3.1	2.5	0
Philippines	0.1	3.05	0.38	5.54	0.3	10.44	9.06	-1.4	2.73	0
Singapore	0.6	(na)	(na)	2.31	1.68	11.68	3.51	15.7	8.57	3
South Africa	0.93	(na)	0.73	6.1	7.48	10.92	8.95	-9.2	4.42	4

**Table 3a***Data (continued)*

South Korea	0.74	(na)	0.79	(na)	9.52	12.73	(na)	0.3	5.35	3
Sri Lanka	0.25	(na)	0.83	4.2	4.04	9.28	8.45	-8.7	1.9	3
Taiwan	(na)	(na)	0.32	(na)	11.56	12.34	(na)	(na)	8.52	2
Thailand	0.93	(na)	0.49	8.28	7.7	11.72	5.65	1.9	6.25	3
Uruguay *	0.26	3.52	1.47	34.78	1.96	9.4	44.75	-3	5	2
Venezuela *	0.1	(na)	8.11	-8.85	2.65	10.99	60.84	-4.3	6.37	(na)
Zimbabwe	(na)	(na)	(na)	10.33	2.17	8.63	22.27	(na)	3.68	4

Notes: \* Latin American country; (na): not available.

## 4.2. Summary Statistics

Tables 4a and 4b present some useful summary statistics, while Table 5 contains the raw correlations between our dependent and independent variables. As we can see from Table 4a, our sample contains substantial cross-sectional variability for each of the variables being considered. To construct Table 4b, we have grouped countries according to two different criteria. We first distinguish between OECD and non-OECD countries. Then, we separate the Latin American countries from the rest. We interpret membership in the OECD as an indicator of macroeconomic stability and sound macroeconomic policy management.<sup>8</sup>

**Table 4a***Summary statistics*

	Number of Observations	Mean	Standard Deviation	Min	Max
Debt/GNP	41	0.59	0.31	0.10	1.22
Non-performing loans/total loans	21	4.86	2.28	0.93	8.93
Bank provisions for loan losses/total loans	42	1.42	1.50	-0.06	8.11
Real interest rate	40	6.92	8.08	-23.25	34.78
GDP growth	49	3.79	2.23	0.30	11.56
Log GNP	49	11.73	1.58	8.49	15.67
Inflation	47	65.49	363.73	0.27	2502.50
Government surplus (% GDP)	42	-3.26	5.43	-15.60	15.70
Rule of law	49	6.85	2.63	1.90	10.00
Creditor rights	47	2.30	1.37	0.00	4.00

<sup>8</sup> “Under the terms of Article 2 of the [OECD] Convention, OECD countries undertake to ensure growth and *external and internal stability*” (OECD website: [www.oecd.org](http://www.oecd.org)).

**Table 4b***Summary statistics (continued)*

	Means		Test of means t-statistic	Means		Test of means t-statistic
	OECD country	Non OECD country		Latin American country	Non Latin American country	
Debt/GNP	0.69	0.46	-2.60	0.31	0.65	4.23
Non-performing loans/total loans	4.75	5.03	0.26	5.53	4.52	-0.88
Bank provisions for loan losses/total loans	1.02	1.81	1.75	3.04	0.97	-2.75
Real interest rate	6.67	7.16	0.19	12.98	5.63	-1.38
GDP growth	2.84	4.62	3.16	3.12	3.93	1.56
Log GNP	12.69	10.87	-4.86	11.15	11.85	1.37
Inflation	7.39	121.15	1.10	300.54	9.81	-1.06
Government surplus (% GDP)	-5.60	-0.91	3.07	-1.01	-3.71	-1.86
Rule of law	8.91	5.01	-7.85	5.18	7.22	2.80
Creditor rights	1.73	2.83	2.99	1.25	2.51	2.37

Table 4b reveals a number of interesting results. OECD economies have significantly wider debt markets and lower default rates (measured by the ratio of provisions for loan losses to total loans) than non-OECD economies. However, although on average, the OECD countries have lower (real) interest rates, this difference is not statistically significant. These differences may be explained in part because OECD countries enjoy safer and sounder macroeconomic policies. But OECD economies also have a substantial (and statistically significant) higher index of law and order than their non-OECD counterparts. (The variable rule of law equals 8.91 for OECD countries and 5.01 for non-OECD countries.) This may well explain why OECD countries have better access to debt finance. Interestingly, OECD countries have a lower creditor rights index than non-OECD countries. This difference, which is highly significant, is at odds with the orthodox claim that a better protection of creditor rights increases the availability of credit.

Focusing our attention in Latin American countries, we find that they have narrower debt markets and higher default rates (again measured by the ratio of provisions for loan losses to total loans) than the other countries in our sample. They also have a lower index of

legal enforcement and, supporting the orthodox view discussed in previous sections, a lower index of creditor rights protection. Yet, if we look at these figures for the nine Latin American countries included in our sample, we observe that, whereas there is a significant positive correlation between the Debt/GNP ratio and the variable rule of law, the Debt/GNP ratio is not significantly correlated with our measure of creditor rights protection. This again casts some doubts on the validity of the orthodox view of creditor rights. The Latin American puzzle may be resolved in part by considering the macroeconomic context. Indeed, for Latin America, there seems to be a positive association between low inflation and large and positive government surpluses and wider debt markets. (For the Latin American countries in the sample, the correlations between inflation and the Debt/GNP ratio<sup>9</sup> and between government surplus and the ratio Debt/GNP are equal to  $-0.56$  and  $0.42$ , respectively.)

Table 5 confirms our impressions so far and indicates the absence of severe multicollinearity problems in our sample. A more systematic analysis of our evidence requires a regression framework.

**Table 5**  
*Correlation matrix*

Variables	Debt/ GNP	Non-performing Loans/total loans	Bank provisions for loan losses/ total loans	Real interest rate	GDP Growth	Log GNP	Inflation	Government surplus (% GDP)	Rule of law	Creditor rights
Debt/GNP	1									
Non-performing loans/total loans	-0.3369 (0.1464)	1								
Bank provisions for loan losses/total loans	-0.5434 (0.0005)	0.5656 (0.0075)	1							
Real interest rate	-0.2163 (0.2121)	0.2563 (0.3046)	-0.1562 (0.3701)	1						
GDP Growth	0.1425 (0.3743)	0.0591 (0.7990)	-0.1480 (0.3496)	-0.0333 (0.8385)	1					
Log GNP	0.4871 (0.0012)	-0.1252 (0.5887)	-0.1373 (0.3858)	-0.1553 (0.3385)	-0.0066 (0.9641)	1				
Inflation	-0.1241 (0.4455)	0.1536 (0.5063)	0.2544 (0.1132)	-0.1339 (0.4100)	0.0446 (0.7660)	0.1078 (0.4706)	1			
Government surplus (% GDP)	0.1262 (0.4440)	-0.0446 (0.8519)	-0.0387 (0.8203)	0.0126 (0.9418)	0.1348 (0.3945)	-0.1525 (0.3349)	-0.0179 (0.9115)	1		
Rule of law	0.5711 (0.0001)	-0.3678 (0.1009)	-0.3123 (0.0441)	-0.0649 (0.6906)	-0.1956 (0.1781)	0.5638 (0.0000)	-0.0519 (0.7291)	-0.1480 (0.3495)	1	
Creditor rights	0.2693 (0.0973)	-0.3600 (0.1190)	-0.1993 (0.2176)	-0.2799 (0.0888)	0.3923 (0.0064)	-0.3086 (0.0348)	-0.1354 (0.375)	0.1319 (0.4173)	-0.1780 (0.2314)	1

Note: p-values are shown  
in parentheses.

<sup>9</sup> To calculate the correlation coefficient between inflation and the Debt/GNP ratio, we excluded Brazil from the sample because its inflation rate in this year was several standard deviations away from the sample mean.



### 4.3. Regression Analysis

Tables 6-10 present ordinary least square regressions (with robust standard errors) of private debt financing, default rates and real interest rates on several macroeconomic controls, a measure of the legal protection of creditor rights, and an index of the quality of legal enforcement and respect for the law.<sup>10</sup>

#### A. *Creditor Rights and Debt Finance*

Table 6 presents our regression results for the Debt/GNP ratio. The regressions reported in this table include all countries in our original sample for which data on all variables employed in the analysis was available.

**Table 6**

*Debt/GNP OLS regressions. Total sample*

Independent variables	Dependent variable: debt/GNP	
GDP growth	0.0438 <sup>b</sup> (0.0186)	0.0464 <sup>b</sup> (0.0246)
Log GNP	0.0637 <sup>b</sup> (0.0272)	0.0737 <sup>b</sup> (0.0280)
Inflation		-0.0001 <sup>a</sup> (0.0000)
Government surplus/GNP		0.0084 (0.0052)
Rule of law	0.0633 <sup>a</sup> (0.0142)	0.0597 <sup>a</sup> (0.0140)
Creditor rights	0.0475 <sup>c</sup> (0.0280)	0.0395 (0.0298)
Intercept	-0.8753 <sup>a</sup> (0.2686)	-0.9184 <sup>a</sup> (0.2666)
Number of observations	39	36
Adjusted R <sup>2</sup>	0.5325	0.5261

Notes:

<sup>a</sup> Significant at 1%; <sup>b</sup> Significant at 5%; <sup>c</sup> Significant at 10%.

Robust standard errors are shown in parentheses.

<sup>10</sup> In Table 10 we also show weighted least squares results for our default rates regressions.

The first column in Table 6 reproduces the first regression in Table VII of La Porta *et al.* (1997).<sup>11</sup> They find a positive relationship between the aggregate measure of indebtedness and both GDP growth and the log of GNP. Most importantly, they also find a positive and statistically significant association between debt finance and the variables describing the legal institutions in place: rule of law and creditor rights. The effect of rule of law is large and robust to alternative specifications indicating legal origin dummies (see Section 3 above). This is not the case for the creditor rights index, which loses significance when those legal origin dummies are introduced.

The second column in Table 6 presents an alternative specification where two additional macroeconomic controls are included: inflation and size of the government fiscal surplus. Both have the expected signs, but only inflation has a statistically significant effect. Our regression results indicate that a higher inflation rate and a lower (larger) government surplus (deficit) limit private sector access to debt finance. The introduction of these new controls does not affect much the size and statistical significance of the rule of law variable. However, the creditor rights index loses its significance under the new specification. The correlation between the creditor rights index and both of our new macroeconomic controls is low and not significant (see Table 5 above). Therefore, the loss of significance of the creditor rights variable cannot be explained simply by multicollinearity. We have also attempted another specification where the creditor rights variable and the variable rule of law are interacted to check whether a stricter protection of creditor rights has differential effects in countries with disparate law and order traditions. This interaction term turned out to be non-significant, which further confirms our previous results on the irrelevance of creditor rights for debt volume.<sup>12</sup>

**Table 7**  
*Debt/GNP OLS regressions. OECD vs. Non OECD countries*

Independent variables	Dependent variable: debt/GNP	
	OECD countries	Non OECD countries
GDP growth	-0.0287 (0.0591)	0.0877 <sup>a</sup> (0.0150)
Log GNP	0.0995 <sup>a</sup> (0.0295)	-0.0193 (0.0350)
Inflation	-0.0045 <sup>b</sup> (0.0018)	-0.0001 <sup>b</sup> (0.0001)
Government surplus/GNP	0.0231 <sup>c</sup> (0.0113)	-0.0087 (0.0079)
Rule of law	0.0108 (0.0385)	0.1210 <sup>a</sup> (0.0230)

<sup>11</sup> The differences in the point estimates between La Porta *et al.* and our regression are minimal and may be due to differences in the use of decimals. The different values of the standard errors may arise because we employ a robust regression framework, which is appropriate given potential heteroskedasticity. In any case, the qualitative results are identical.

<sup>12</sup> The regression including the interaction between the creditor right index and the rule of law variable can be obtained from the authors upon request.

**Table 7, continued**

Creditor rights	0.0468 (0.0463)	-0.0415 (0.0260)
Intercept	-0.4936 (0.4905)	-0.1411 (0.3665)
Number of observations	21	15
Adjusted R <sup>2</sup>	0.4791	0.7544

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Notes:

<sup>a</sup> Significant at 1%; <sup>b</sup> Significant at 5%; <sup>c</sup> Significant at 10%.

Robust standard errors are shown in parentheses.

Table 7 presents the results of OLS regressions like that in the second column of Table 6 for different subdivisions of our overall sample. In the first column, we report our results for the subsample of OECD countries. We find that whereas our macroeconomic controls -- inflation and budget surplus -- are both significant and have the theoretically expected signs, the effects of the legal variables, rule of law and creditor rights, are not statistically significant. In the second column, we focus our attention on the non-OECD countries of our sample. We find results that are qualitatively identical to those for the whole sample: among the two legal indicators, only rule of law has a large and significant impact on indebtedness.

Finally, Table 8 presents the results of our regression for Latin American countries only. Here, we have dropped inflation and government surplus as explanatory variables, due to lack of enough degrees of freedom. The number of observations is very small, which tells us that these results should be taken with great caution. Yet, this regression, which incorporates the same explanatory variables as the first column in Table 6, provides an interesting result: a higher creditor rights index leads to a lower Debt/GNP ratio. This is a puzzling result from an orthodox viewpoint, although it is consistent with some of the (critical) views reported in Section 2.2. Due to our limited sample size for Latin America, we only report simple regression results for our macroeconomic policy controls: inflation and budget surplus. In both cases, we obtain the expected signs: inflation is negatively associated with the Debt/GNP ratio,<sup>13</sup> whereas the relationship between this ratio and government surplus is positive. However, only inflation seems to have a statistically significant effect on the size of the debt market.

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<sup>13</sup> Again, we exclude Brazil from this regression for the reasons outlined in footnote 8.

**Table 8***Debt/GNP OLS regressions. Latin American countries*

Independent variables	Dependent variable: debt/GNP
GDP growth	0.0485 <sup>c</sup> (0.0118)
Log GNP	-0.1555 <sup>b</sup> (0.0229)
Rule of law	0.1980 <sup>b</sup> (0.0234)
Creditor rights	-0.2924 <sup>b</sup> (0.0496)
Intercept	1.2737 <sup>b</sup> (0.2322)
Number of observations	7
Adjusted R <sup>2</sup>	0.7832

Notes:

<sup>a</sup> Significant at 1%; <sup>b</sup> Significant at 5%; <sup>c</sup> Significant at 10%.

Robust standard errors are shown in parentheses.

In sum, the results of this section suggest that the availability of external finance for private firms is significantly greater if (i) inflation is lower and (ii) laws and regulations are widely respected. Macroeconomic stability and law enforcement are the main determinants of debt volume. The degree of protection of creditor rights appears to be irrelevant in this respect.

### ***B. Creditor Rights and the Real Interest Rate***

In Table 9 we empirically investigate the determinants of interest rates. To do so, we use the same explanatory variables employed in the analysis of debt volume. The real interest rate in each country is influenced by a combination of factors, namely, the country's monetary and fiscal policy, its position in the business cycle (which, in turn, determines the demand for credit), and the structure and conduct of its lending and legal institutions. Our explanatory variables can be understood as proxies for these determinants of the real interest rate.

**Table 9***Real interest rate OLS regressions. Total sample*

Independent variables	Dependent variable: debt/GNP
GDP growth	0.2455 (0.2772)
Log GNP	-0.0665 (0.3589)
Inflation	0.6725 <sup>a</sup> (0.0916)
Government surplus/GNP	-0.0782 (0.0636)
Rule of law	0.6247 <sup>b</sup> (0.2995)
Creditor rights	-1.0358 <sup>b</sup> (0.4674)
Intercept	0.5396 (4.4495)
Number of observations	34
Adjusted R <sup>2</sup>	0.7638

Notes:

<sup>a</sup> Significant at 1%; <sup>b</sup> Significant at 5%; <sup>c</sup> Significant at 10%.

Robust standard errors are shown in parentheses.

Concerning our macroeconomic controls, we find that only the inflation rate has a statistically significant effect on the real interest rate: a higher inflation rate is associated with a higher real interest rate. The other macroeconomic variables have the expected signs but are not statistically significant. Overall, our regression results confirm the standard view that higher real interest rates indicate a rapidly expanding economy, high budget deficits and a tight monetary policy.

Our results additionally show that the real interest rate is also significantly related to our legal variables. A higher value of the creditor rights index is associated with a lower interest rate. This sign is consistent with both orthodox and critical theories presented in Section 2 and, therefore, it does not allow us to discriminate among them. Surprisingly, the relationship between our rule of law variable and the real interest rate is positive and significant. This is the opposite of what we would have expected. We have no proper explanation for this awkward result. Indeed, from Table 5, we have assumed that both variables are negatively, though non-significantly, correlated. This result remains a puzzle that requires further research.

### C. Creditor Rights and Defaults

We finally consider the empirical determinants of the default rate in each country. As we explained above, we use two variables as proxies for the default rate: the ratio of non-performing loans to total loans in each country and the ratio of provisions for loan losses to total loans. In the first two columns of Table 10, we present our regression results for the frequency of non-performing loans. The first column presents ordinary least squares regression results, whereas the second column shows the same regression estimated this time by weighted least squares, using as weights the number of banks for which IBCA reports non-performing loans. In principle, using weighted least squares should yield better results, given that the number of banks available to compute the country averages differs markedly across countries. However, given that we do not know the total number of banks per country, the weights employed may not appropriately capture the actual statistical significance of the various country averages.

**Table 10**

*Default rate regressions. Total sample*

Independent variables	Dependent variable: non-performing loans/total loans		Dependent variable: bank provisions for loan losses/total loans	
	Ordinary least squares	Weighted least squares	Ordinary least squares	Weighted least squares
GDP growth	0.8515 <sup>b</sup> (0.3871)	1.2233 <sup>c</sup> (0.5945)	0.0016 (0.1263)	0.0171 (0.1054)
Log GNP	-0.1333 (0.2736)	-0.8351 <sup>b</sup> (0.3195)	0.0064 (0.1231)	0.0178 (0.0737)
Inflation	0.0001 (0.0002)	-0.0002 (0.0004)	0.0009 <sup>a</sup> (0.0001)	0.0009 <sup>a</sup> (0.0001)
Government surplus/GNP	-0.2689 <sup>c</sup> (0.1303)	-0.4888 <sup>a</sup> (0.1026)	-0.0284 (0.0383)	-0.0884 <sup>a</sup> (0.0286)
Rule of law	-0.4008 <sup>b</sup> (0.1817)	-0.1558 (0.3002)	-0.1542 (0.1018)	-0.2620 <sup>b</sup> (0.1000)
Creditor rights	-0.9352 (0.5631)	-2.3234 <sup>b</sup> (0.8585)	-0.0292 (0.1554)	0.0054 (0.0612)
Intercept	6.7814 <sup>b</sup> (2.9521)	14.1525 <sup>a</sup> (3.2864)	2.1031 (1.3665)	2.5047 <sup>b</sup> (1.1418)
Number of observations	19	19	34	34
Adjusted R <sup>2</sup>	0.0702	0.6771	0.1871	0.6275

Notes:

<sup>a</sup> Significant at 1%; <sup>b</sup> Significant at 5%; <sup>c</sup> Significant at 10%.

Robust standard errors are shown in parentheses. Regression in second column is weighted by the number of banks used to compute non-performing loans in each country. Regression in fourth column is weighted by the number of banks used to compute provisions for loan losses in each country.

We find that the ratio of non-performing loans is higher for expanding economies. This may be explained because, as noted by Gavin and Hausmann (1996), buoyant economic growth often leads to lending booms in which the underlying quality of the funded projects is not properly assessed by lenders. This ratio is also higher for countries with lax fiscal policies. Focusing on our legal indicators, our results are different for the two estimation methods. Using ordinary least squares, we find that a higher value of the rule of law index is associated with a lower incidence of non-performing loans. This relationship is significant at the 5% level. In contrast, a stricter protection of creditor rights does not seem to have a significant effect on this ratio. On the other hand, when we use weighted least squares, we obtain exactly the opposite picture: creditor rights have a negative and highly significant impact on the ratio of non-performing loans, while rule of law appears to be statistically irrelevant.

The number of observations for the frequency of non-performing loans is quite small. This might explain the ambiguity regarding the legal determinants of default rates. In the second pair of columns in Table 10, we repeat our analysis using a different proxy for the default rate: the ratio of provisions for loan losses to total loans. We have a larger number of observations for this variable which, on the other hand, is a conceptually worse proxy for the default rate (see footnote 6 above). Roughly speaking, when we estimate this regression by ordinary least squares, we find the same signs as in the previous two columns, although now only inflation has a statistically significant impact on defaults. Higher inflation translates into a larger ratio of provisions for loan losses to total loans. None of our legal indicators is significant in this regression. Our weighted least square results confirm the statistical significance of inflation. But in this last regression, the default rate is also significantly related to the tightness of fiscal policy and the rule of law. A lax fiscal policy increases this ratio, which is in turn lower in countries with a better law and order tradition. In both regressions, however, the exact protection awarded to creditor rights appears to be of no importance for the determination of this ratio.

#### **4.4. Implications for the Theoretical Debate**

How can we reconcile our empirical findings with the theories described in Section 2? Table 1' expands Table 1 to incorporate our regression results on the impact of a stricter protection of creditor rights on lending volumes, interest rates and default rates. From Table 1', it should be clear that our empirical analysis does not allow us to fully discriminate between the orthodox views and the critical theories presented in Sections 2.1 and 2.2, respectively. If anything, our results suggest that elements of both theories seem to be needed to understand the credit market.

As predicted by both sets of theories, a stricter protection of creditor rights significantly reduces the cost of external finance. In contrast, strengthening the protection awarded to creditors has no significant effect on lending volume. This result is consistent with what we have denoted as critical theories, which emphasize both the *ex ante* benefits and costs of protecting creditor rights, but it contradicts the orthodox view on this issue as well as previous results by La Porta *et al.* (1997).

Our regression results do not present a clear-cut picture regarding default rates. In three of our four different regressions on default rates, creditor rights protection had no significant impact on the incidence of default. Only in one of these exercises did a stricter protection of creditor rights lead to a statistically significant lower proportion of defaults. The orthodox view on the efficiency implications of protecting creditor rights argues that a

stricter protection of creditor rights should unambiguously lead to fewer defaults by solving several adverse selection and moral hazard problems on the side of borrowers. The exactly opposite stance is taken by many other authors, who note the importance of moral hazard among lenders. In practice, credit markets may be subject to both types of information asymmetries and non-contractibility problems, which may explain our ambiguous findings.

**Table 1'**

*The impact of a stricter protection of creditor rights: theory and evidence*

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	Lending volume	Interest rates	Default rates
Orthodox view	-	-	-
Critical theories	- -	-	-
Our evidence	Æ	-	?

---

These inconclusive results can be reasonably interpreted as suggestive of the practical irrelevance of the degree of protection awarded to creditors. The efficiency of judicial enforcement, as well as the stability of the macroeconomic scenario where firms operate, appear to have more significant effects on credit markets. Yet, further empirical investigations are needed to reach more definitive conclusions. For instance, it would be desirable to control for differences in the degree of competitiveness of credit markets around the world, using proxies of the structure and conduct of financial intermediaries in various countries. Most importantly, it seems crucial to develop a data panel -- enlarging the current data set along its time dimension -- in order to control for possible fixed effects and obvious endogeneity problems, which may distort our current estimates.

## 5. Conclusions and Policy Implications

In this paper, we have reviewed the existing theories on the efficiency implications of the various regulations that protect the rights of creditors. We have investigated, for a sample of 49 countries developed by La Porta *et al.* (1998), the impact on debt volume, interest rates and default rates of a stricter protection of creditor rights and a more efficient judicial system. Our results confirm previous analysis by La Porta *et al.* (1997) showing that an effective judicial system constitutes an essential prerequisite for the development and optimal performance of the credit market. Yet, in contrast to these studies, we find no conclusive evidence on the sign and magnitude of the effect of creditor rights on credit market efficiency. Most importantly, we have also uncovered that macroeconomic developments do significantly contribute to credit market efficiency. In particular, countries with high inflation have narrower debt markets.

Focusing on Latin America, we concur with La Porta and López-de-Silanes (1998) in that it “offers investors a rather unattractive legal environment.” We also agree with them in that reforms in Latin America tending to improve the efficiency of judicial enforcement



are crucial. But we disagree on the need of enhancing creditor rights in Latin America. Our regression results show that this policy recommendation is, at best, unwarranted. Instead, we find that a more stable macroeconomic framework seems crucial for the development of well-functioning debt markets.

To illustrate these last claims, let us compare the cases of Chile, Mexico, and Uruguay using our 1994 data. Chile and Uruguay both had a creditor rights index equal to 2. Mexico, instead, had an index of creditor rights protection equal to 0. Chile had a higher debt/GNP ratio than Mexico (0.63 in Chile and 0.47 in Mexico). But Mexico, in turn, had a higher debt/GNP ratio than Uruguay (this ratio is 0.26 in Uruguay). Our measures of legal enforcement and macroeconomic policy variables, such as inflation and government surplus/deficit, better explain these credit market ratios. Indeed, Chile's rule of law index exceeds Mexico's, which is larger than the corresponding value for Uruguay (7.02, 5.35 and 5, respectively). In 1994, inflation in Mexico (6.95 %) was lower than in Uruguay (44.75%). In this year, Chile sustained a surplus of 1.7% of GNP, whereas Uruguay had a budget deficit equal to 3% of GNP.

In this paper, we have treated a country's legal code and law enforcement tradition as exogenous. In a recent and thought-provoking paper, Svensson (1998), given the importance of adequate legal institutions for economic development, asks the question: "why does not a rational, forward-looking government choose to reform the legal code, or alternatively invest in legal infrastructures?" The answer provided by Svensson (1998), in the spirit of North (1981), is based on rent seeking and lobbying by interest groups. Svensson's theory constitutes an interesting, though partial, answer to his question, which definitively requires further consideration.

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**Table 1***The impact of a stricter protection of creditor rights*


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	Lending volume	Interest rates	Default rates
Orthodox view	-	-	-
Critical theories	- -	-	-

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**Table 2***Description of the variables*


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Debt/GNP	Ratio of the sum of bank debt of the private sector and outstanding non-financial bonds to GNP in 1994, or last available. Source: La Porta <i>et al.</i> (1997).
Non-performing loans/total loans	Ratio of total non-performing loans to total loans in each country (1994-95 country average). This variable is based on the BankScope bank-level data set by IBCA. Source: Jappelli and Pagano (1998).
Bank provisions for loan losses/total loans	Ratio of bank provisions for loan losses to total loans in each country (1994-95 country average). This variable is based on the BankScope bank-level data set produced by IBCA. Source: Jappelli and Pagano (1998).
Real interest rate	Real lending rate charged by the banks on loans to prime customers in 1994. Inflation in 1994 (consumer price index) is used to compute real interest rate. Source: The World Bank, <i>World Development Report 1996</i> and United Nations, <i>Monthly Bulletin of Statistics, XLIX, 1995</i> .
GDP growth	Average annual percent growth of per capita gross domestic product for the period 1970-1993. Source: La Porta <i>et al.</i> (1997).
Log GNP	Logarithm of the Gross National Product in 1994. Source: La Porta <i>et al.</i> (1997).
Inflation	Inflation in 1994 (consumer price index). Source: United Nations, <i>Monthly Bulletin of Statistics, XLIX, 1995</i> .

## Table 2

### *Description of the variables (continued)*

Government surplus (% GDP)	Ratio of current and capital revenue and official grants received, less total expenditure and lending minus repayments to Gross Domestic Product in 1994. Source: The World Bank, <i>World Development Report 1996</i> .
Rule of law	Assessment of the law and order tradition in the country. Average of the months of April and October of the monthly index between 1982 and 1995. Scale from 0 to 10, with lower scores for less tradition for law and order. La Porta <i>et al.</i> (1997).
Creditor rights	An index aggregating creditor rights. The index is formed by adding 1 when: (1) the country imposes restrictions, such as creditors' consent or minimum dividends, to file for reorganization; (2) secured creditors are able to gain possession of their security once the reorganization petition has been approved (no automatic stay); (3) the debtor does not retain the administration of its property pending the resolution of the reorganization; (4) secured creditors are ranked first in the distribution of the proceeds that result from the disposition of the assets of a bankrupt firm. The index ranges from 0 to 4. Source: La Porta <i>et al.</i> (1997).

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**Table 3a***Data*

Country	Debt/ GNP	Non- performing loans/total loans	Bank provisions for loan losses/total loans	Real interest rate	GDP growth	Log GNP	Inflation	Government surplus (% GDP)	Rule of law	Creditor rights
<b>OECD countries</b>										
Australia	0.76	3.7	0.34	9.92	3.06	12.64	1.89	-2.9	10	1
Austria	0.79	(na)	0.9	(na)	2.74	12.13	3.05	-5.1	10	3
Belgium	0.38	(na)	0.26	6.84	2.46	12.29	2.4	-6.1	10	2
Canada	0.72	2.34	0.79	6.61	3.36	13.26	0.27	-4.5	10	1
Denmark	0.34	(na)	1.37	6.2	2.09	11.84	1.98	-5.7	10	3
Finland	0.75	3.3	2.51	6.74	2.4	11.49	1.09	-14.1	10	1
France	0.96	8.81	0.95	6.13	2.54	14.07	1.67	-5.5	8.98	0
Germany	1.12	(na)	0.6	8.54	2.6	14.46	2.73	-2.5	9.23	3
Greece	0.23	(na)	1.2	14.86	2.46	11.25	10.92	-15.6	6.18	1
Ireland	0.38	(na)	(na)	3.7	4.25	10.73	2.31	-2.3	7.8	1
Italy	0.55	5.21	1.74	6.89	2.82	13.94	4.03	-10.6	8.33	2
Japan	1.22	1.66	0.53	3.42	4.13	15.18	0.66	-1.6	8.98	2
Mexico *	0.47	7.09	2.89	(na)	3.07	12.69	6.95	(na)	5.35	0
Netherlands	1.08	(na)	0.05	5.4	2.55	12.68	2.75	-0.5	10	2
New Zealand	0.9	(na)	(na)	7.86	1.67	10.69	1.71	0.8	10	3
Norway	0.64	4.6	-0.06	6.91	3.43	11.62	1.39	-7.5	10	2
Portugal	0.64	5.56	1.56	9.25	3.52	11.41	5.26	-2.2	8.68	1
Spain	0.75	4.74	0.98	3.94	3.27	13.19	4.77	-4.8	7.8	2
Sweden	0.55	7.02	1.12	8.2	1.79	12.28	2.22	-13.4	10	2
Switzerland	(na)	(na)	0.75	4.58	1.18	12.44	0.88	(na)	10	1
Turkey	0.15	6.11	2.26	(na)	5.05	12.08	106.27	-4	5.18	2
UK	1.13	(na)	0.16	3.01	2.27	13.86	2.42	-6.6	8.57	4
US	0.81	1.65	0.56	4.46	2.74	15.67	2.53	-3	10	1
<b>Non OECD countries</b>										
Argentina *	0.19	(na)	3.79	5.68	1.4	12.4	4.18	(na)	5.35	1
Brazil *	0.39	6.31	3.63	(na)	3.95	13.03	2502.5	-4	6.32	1
Chile *	0.63	0.93	0.34	7.97	3.35	10.69	11.42	1.7	7.02	2
Colombia *	0.19	7.34	1.74	14.03	4.38	10.82	23.21	-0.6	2.08	0
Ecuador *	(na)	4.64	1.99	13.09	4.55	9.49	27.33	0	6.67	4
Egypt	(na)	(na)	2.63	7.74	6.13	10.53	8.13	2.1	4.17	4
Hong Kong	(na)	(na)	0.28	(na)	7.57	11.56	8.08	(na)	8.22	4
India	0.29	(na)	3.87	5.41	4.34	12.5	10.33	-6	4.17	4
Indonesia	0.42	(na)	0.84	10.83	6.38	11.84	8.45	0.6	3.98	4
Israel	0.66	(na)	0.85	4.47	4.39	11.19	12.38	-3	4.82	4
Jordan	0.7	5.54	0.86	6.64	1.2	8.49	2.21	1.9	4.35	(na)
Kenya	(na)	(na)	(na)	(na)	4.79	8.83	29.04	-3.6	5.42	4
Malaysia	0.84	(na)	0.63	3.75	6.9	11	3.71	4.1	6.78	4
Nigeria	(na)	(na)	(na)	-23.25	3.43	10.36	57.01	(na)	2.73	4
Pakistan	0.27	(na)	(na)	(na)	5.5	10.88	12.47	-6.9	3.03	4
Peru *	0.27	8.93	3.45	24.14	2.82	10.92	23.73	3.1	2.5	0
Philippines	0.1	3.05	0.38	5.54	0.3	10.44	9.06	-1.4	2.73	0
Singapore	0.6	(na)	(na)	2.31	1.68	11.68	3.51	15.7	8.57	3
South Africa	0.93	(na)	0.73	6.1	7.48	10.92	8.95	-9.2	4.42	4
South Korea	0.74	(na)	0.79	(na)	9.52	12.73	(na)	0.3	5.35	3
Sri Lanka	0.25	(na)	0.83	4.2	4.04	9.28	8.45	-8.7	1.9	3

Taiwan	(na)	(na)	0.32	(na)	11.56	12.34	(na)	(na)	8.52	2
Thailand	0.93	(na)	0.49	8.28	7.7	11.72	5.65	1.9	6.25	3
Uruguay *	0.26	3.52	1.47	34.78	1.96	9.4	44.75	-3	5	2
Venezuela *	0.1	(na)	8.11	-8.85	2.65	10.99	60.84	-4.3	6.37	(na)
Zimbabwe	(na)	(na)	(na)	10.33	2.17	8.63	22.27	(na)	3.68	4

Notes: \* Latin American country; (na): not available.

### Table 3b

#### Data

Country	Non-performing loans/total loans	Number of banks used to estimate non performing loans	Bank provisions for loan losses/total loans	Number of banks used to estimate provisions for losses
<b>OECD countries</b>				
Australia	3.7	12	0.34	34
Austria	(na)	(na)	0.9	71
Belgium	(na)	(na)	0.26	76
Canada	2.34	7	0.79	17
Denmark	(na)	(na)	1.37	84
Finland	3.3	6	2.51	8
France	8.81	125	0.95	336
Germany	(na)	(na)	0.6	1597
Greece	(na)	(na)	1.2	18
Ireland	(na)	(na)	(na)	(na)
Italy	5.21	236	1.74	250
Japan	1.66	108	0.53	120
Mexico *	7.09	22	2.89	22
Netherlands	(na)	(na)	0.05	24
New Zealand	(na)	(na)	(na)	(na)
Norway	4.6	21	-0.06	30
Portugal	5.56	13	1.56	31
Spain	4.74	19	0.98	163
Sweden	7.02	15	1.12	16
Switzerland	(na)	(na)	0.75	87
Turkey	6.11	25	2.26	27
UK	(na)	(na)	0.16	59
US	1.65	495	0.56	497
<b>Non OECD countries</b>				
Argentina *	(na)	(na)	3.79	97
Brazil *	6.31	94	3.63	95
Chile *	0.93	29	0.34	31
Colombia *	7.34	24	1.74	27
Ecuador *	4.64	25	1.99	24
Egypt	(na)	(na)	2.63	21
Hong Kong	(na)	(na)	0.28	5
India	(na)	(na)	3.87	63
Indonesia	(na)	(na)	0.84	46
Israel	(na)	(na)	0.85	16
Jordan	5.54	6	0.86	9
Kenya	(na)	(na)	(na)	(na)
Malaysia	(na)	(na)	0.63	31
Nigeria	(na)	(na)	(na)	(na)
Pakistan	(na)	(na)	(na)	(na)



**Table 3b***Data (continued)*

Peru *	8.93	23	3.45	18
Philippines	3.05	8	0.38	13
Singapore	(na)	(na)	(na)	(na)
South Africa	(na)	(na)	0.73	6
South Korea	(na)	(na)	0.79	13
Sri Lanka	(na)	(na)	0.83	6
Taiwan	(na)	(na)	0.32	33
Thailand	(na)	(na)	0.49	17
Uruguay *	3.52	5	1.47	7
Venezuela *	(na)	(na)	8.11	15
Zimbabwe	(na)	(na)	(na)	(na)

Notes: \* Latin American country; (na): not available.

**Table 4a***Summary statistics*

	Number of Observations	Mean	Standard Deviation	Min	Max
Debt/GNP	41	0.59	0.31	0.10	1.22
Non-performing loans/total loans	21	4.86	2.28	0.93	8.93
Bank provisions for loan losses/total loans	42	1.42	1.50	-0.06	8.11
Real interest rate	40	6.92	8.08	-23.25	34.78
GDP growth	49	3.79	2.23	0.30	11.56
Log GNP	49	11.73	1.58	8.49	15.67
Inflation	47	65.49	363.73	0.27	2502.50
Government surplus (% GDP)	42	-3.26	5.43	-15.60	15.70
Rule of law	49	6.85	2.63	1.90	10.00
Creditor rights	47	2.30	1.37	0.00	4.00

**Table 4b***Summary statistics (continued)*

	Means		Test of means t-statistic	Means		Test of means t-statistic
	OECD country	Non OECD country		Latin American country	Non Latin American country	
Debt/GNP	0.69	0.46	-2.60	0.31	0.65	4.23
Non-performing loans/total loans	4.75	5.03	0.26	5.53	4.52	-0.88
Bank provisions for loan losses/total loans	1.02	1.81	1.75	3.04	0.97	-2.75
Real interest rate	6.67	7.16	0.19	12.98	5.63	-1.38
GDP growth	2.84	4.62	3.16	3.12	3.93	1.56
Log GNP	12.69	10.87	-4.86	11.15	11.85	1.37
Inflation	7.39	121.15	1.10	300.54	9.81	-1.06
Government surplus (% GDP)	-5.60	-0.91	3.07	-1.01	-3.71	-1.86
Rule of law	8.91	5.01	-7.85	5.18	7.22	2.80
Creditor rights	1.73	2.83	2.99	1.25	2.51	2.37

**Table 5***Correlation matrix*

Variables	Debt/ GNP	Non-performing Loans/total loans	Bank provisions for loan losses/ total loans	Real interest rate	GDP Growth	Log GNP	Inflation	Government surplus (% GDP)	Rule of law	Credito rights
Debt/GNP	1									
Non-performing loans/total loans	-0.3369 (0.1464)	1								
Bank provisions for loan losses/total loans	-0.5434 (0.0005)	0.5656 (0.0075)	1							
Real interest rate	-0.2163 (0.2121)	0.2563 (0.3046)	-0.1562 (0.3701)	1						
GDP Growth	0.1425 (0.3743)	0.0591 (0.7990)	-0.1480 (0.3496)	-0.0333 (0.8385)	1					
Log GNP	0.4871 (0.0012)	-0.1252 (0.5887)	-0.1373 (0.3858)	-0.1553 (0.3385)	-0.0066 (0.9641)	1				
Inflation	-0.1241 (0.4455)	0.1536 (0.5063)	0.2544 (0.1132)	-0.1339 (0.4100)	0.0446 (0.7660)	0.1078 (0.4706)	1			
Government surplus (% GDP)	0.1262 (0.4440)	-0.0446 (0.8519)	-0.0387 (0.8203)	0.0126 (0.9418)	0.1348 (0.3945)	-0.1525 (0.3349)	-0.0179 (0.9115)	1		
Rule of law	0.5711 (0.0001)	-0.3678 (0.1009)	-0.3123 (0.0441)	-0.0649 (0.6906)	-0.1956 (0.1781)	0.5638 (0.0000)	-0.0519 (0.7291)	-0.1480 (0.3495)	1	
Creditor rights	0.2693 (0.0973)	-0.3600 (0.1190)	-0.1993 (0.2176)	-0.2799 (0.0888)	0.3923 (0.0064)	-0.3086 (0.0348)	-0.1354 (0.375)	0.1319 (0.4173)	-0.1780 (0.2314)	1

Note: p-values are shown  
in parentheses.

**Table 6***Debt/GNP OLS regressions. Total sample*

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Independent variables	Dependent variable: debt/GNP	
GDP growth	0.0438 <sup>b</sup> (0.0186)	0.0464 <sup>b</sup> (0.0246)
Log GNP	0.0637 <sup>b</sup> (0.0272)	0.0737 <sup>b</sup> (0.0280)
Inflation		-0.0001 <sup>a</sup> (0.0000)
Government surplus/GNP		0.0084 (0.0052)
Rule of law	0.0633 <sup>a</sup> (0.0142)	0.0597 <sup>a</sup> (0.0140)
Creditor rights	0.0475 <sup>c</sup> (0.0280)	0.0395 (0.0298)
Intercept	-0.8753 <sup>a</sup> (0.2686)	-0.9184 <sup>a</sup> (0.2666)
Number of observations	39	36
Adjusted R <sup>2</sup>	0.5325	0.5261

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Notes:

<sup>a</sup> Significant at 1%; <sup>b</sup> Significant at 5%; <sup>c</sup> Significant at 10%.  
Robust standard errors are shown in parentheses.

**Table 7***Debt/GNP OLS regressions. OECD vs. Non OECD countries*

Independent variables	Dependent variable: debt/GNP	
	OECD countries	Non OECD countries
GDP growth	-0.0287 (0.0591)	0.0877 <sup>a</sup> (0.0150)
Log GNP	0.0995 <sup>a</sup> (0.0295)	-0.0193 (0.0350)
Inflation	-0.0045 <sup>b</sup> (0.0018)	-0.0001 <sup>b</sup> (0.0001)
Government surplus/GNP	0.0231 <sup>c</sup> (0.0113)	-0.0087 (0.0079)
Rule of law	0.0108 (0.0385)	0.1210 <sup>a</sup> (0.0230)
Creditor rights	0.0468 (0.0463)	-0.0415 (0.0260)
Intercept	-0.4936 (0.4905)	-0.1411 (0.3665)
Number of observations	21	15
Adjusted R <sup>2</sup>	0.4791	0.7544

Notes:

<sup>a</sup> Significant at 1%; <sup>b</sup> Significant at 5%; <sup>c</sup> Significant at 10%.

Robust standard errors are shown in parentheses.

**Table 8***Debt/GNP OLS regressions. Latin American countries*

Independent variables	Dependent variable: debt/GNP
GDP growth	0.0485 <sup>c</sup> (0.0118)
Log GNP	-0.1555 <sup>b</sup> (0.0229)
Rule of law	0.1980 <sup>b</sup> (0.0234)
Creditor rights	-0.2924 <sup>b</sup> (0.0496)
Intercept	1.2737 <sup>b</sup> (0.2322)
Number of observations	7
Adjusted R <sup>2</sup>	0.7832

Notes:

<sup>a</sup> Significant at 1%; <sup>b</sup> Significant at 5%; <sup>c</sup> Significant at 10%.

Robust standard errors are shown in parentheses.

**Table 9***Real interest rate OLS regressions. Total sample*

Independent variables	Dependent variable: debt/GNP
GDP growth	0.2455 (0.2772)
Log GNP	-0.0665 (0.3589)
Inflation	0.6725 <sup>a</sup> (0.0916)
Government surplus/GNP	-0.0782 (0.0636)
Rule of law	0.6247 <sup>b</sup> (0.2995)
Creditor rights	-1.0358 <sup>b</sup> (0.4674)
Intercept	0.5396 (4.4495)
Number of observations	34
Adjusted R <sup>2</sup>	0.7638

Notes:

<sup>a</sup> Significant at 1%; <sup>b</sup> Significant at 5%; <sup>c</sup> Significant at 10%.

Robust standard errors are shown in parentheses.

**Table 10***Default rate regressions. Total sample*

Independent variables	Dependent variable: non-performing loans/total loans		Dependent variable: bank provisions for loan losses/total loans	
	Ordinary least squares	Weighted least squares	Ordinary least squares	Weighted least squares
GDP growth	0.8515 <sup>b</sup> (0.3871)	1.2233 <sup>c</sup> (0.5945)	0.0016 (0.1263)	0.0171 (0.1054)
Log GNP	-0.1333 (0.2736)	-0.8351 <sup>b</sup> (0.3195)	0.0064 (0.1231)	0.0178 (0.0737)
Inflation	0.0001 (0.0002)	-0.0002 (0.0004)	0.0009 <sup>a</sup> (0.0001)	0.0009 <sup>a</sup> (0.0001)
Government surplus/GNP	-0.2689 <sup>c</sup> (0.1303)	-0.4888 <sup>a</sup> (0.1026)	-0.0284 (0.0383)	-0.0884 <sup>a</sup> (0.0286)
Rule of law	-0.4008 <sup>b</sup> (0.1817)	-0.1558 (0.3002)	-0.1542 (0.1018)	-0.2620 <sup>b</sup> (0.1000)
Creditor rights	-0.9352 (0.5631)	-2.3234 <sup>b</sup> (0.8585)	-0.0292 (0.1554)	0.0054 (0.0612)
Intercept	6.7814 <sup>b</sup> (2.9521)	14.1525 <sup>a</sup> (3.2864)	2.1031 (1.3665)	2.5047 <sup>b</sup> (1.1418)
Number of observations	19	19	34	34
Adjusted R <sup>2</sup>	0.0702	0.6771	0.1871	0.6275

Notes:

<sup>a</sup> Significant at 1%; <sup>b</sup> Significant at 5%; <sup>c</sup> Significant at 10%.

Robust standard errors are shown in parentheses. Regression in second column is weighted by the number of banks used to compute non-performing loans in each country. Regression in fourth column is weighted by the number of banks used to compute provisions for loan losses in each country.



**Table 1'***The impact of a stricter protection of creditor rights: theory and evidence*

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	Lending volume	Interest rates	Default rates
Orthodox view	-	-	-
Critical theories	- -	-	-
Our evidence	Æ	-	?

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