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**Market- vs. Bank-Based
Financial Systems: Do Investor
Rights Really Matter?**

by Ozgur Emre Ergungor



FEDERAL RESERVE BANK OF CLEVELAND

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JEL Codes: G10, G21, K42

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Abstract

Why are common-law countries market-dominated and civil-law countries bank-dominated? This paper provides an explanation tied to legal traditions. Civil-law courts have been less effective in resolving conflicts than common-law courts because civil-law judges traditionally refrain from interpreting the codes and creating new rules. In a civil-law environment, where potential conflicts between borrowers and individual lenders inhibit the development of markets because the courts are unable to penalize defrauding borrowers, I show that banks can induce borrowers to honor their obligations by threatening to withhold services that only banks can provide. In other words, banks emerge as the primary contract enforcers in economies where courts are imperfect. (JEL G10, G21, K42)

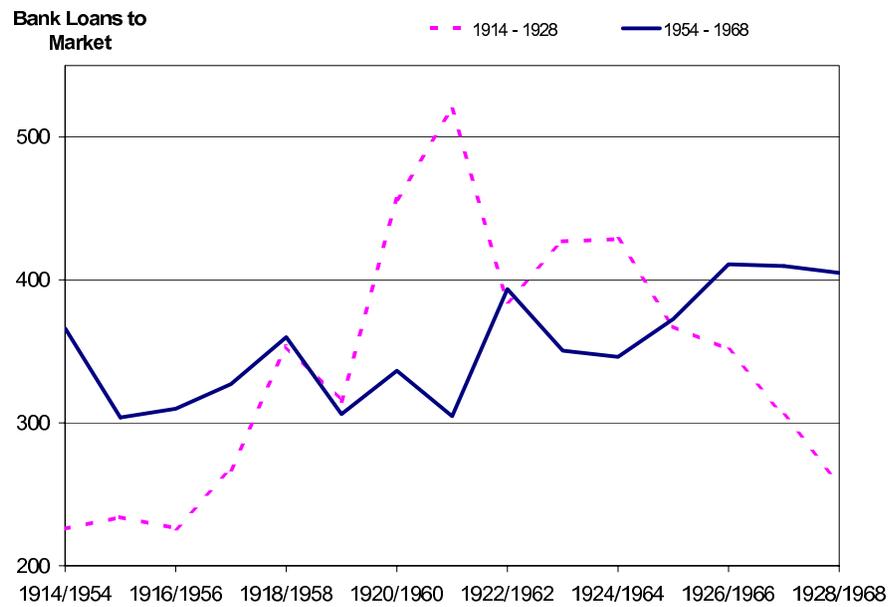
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Better-developed financial systems positively influence economic growth. Yet, it is relatively unimportant for economic growth whether overall financial development stems from bank or market development (Demirguc-Kunt and Maksimovic, 1998; Levine and Zervos, 1998). Then, why are common-law countries market-dominated and civil-law countries bank-dominated when either financial structure serves the same purpose in terms of economic growth?

One explanation stems from the countries' regulatory environment. In the U.S. for example, Depression-era restrictions on the banking industry may have led to the small size of the banking industry relative to capital markets. This argument, however, does not explain two facts: First, Figure I shows that the importance of banks as a financing source has not declined as a result of the change in the regulatory environment. The change in the size of all bank loans relative to the stock market capitalization before the Great Depression and after the WWII is insignificant. Second, U.K. and U.S. have developed market-oriented systems although there were no regulatory restrictions on British banks comparable to those in U.S.

A second explanation comes from Allen and Gale (1999, 2000). They argue that markets are needed in situations of rapidly-advancing technologies because they can aggregate information from a wide range of disparate sources. Banks, however, are needed when technologies are clearly understandable and investments just need monitoring.

Figure I: Banking development and equity market capitalization in the U.S.



Source: Market Index: U.S. Index of All Common Stock Prices, Cowles Commission and Standard And Poor's Corporation (1935-1939=100); NBER Macrohistory Database

Loans by all Banks: Board of Governors of the Federal Reserve System: Banking and Monetary Statistics

Although this argument holds in Western Europe and North America, it does not explain why markets are more important than banks in Nigeria, Zimbabwe, Malaysia, and South Africa (the ratio of loans by deposit-taking banks to market capitalization is 0.85, 0.78, 0.68, and 0.43 respectively in 1994; all common-law countries) but banks are the key players in Austria, Germany, Portugal and France (the same ratio equals 22.67, 12.62, 12.00, and 6.57 respectively in 1994; all civil-law countries).¹

A third argument might be based on the findings of LaPorta et al. (1997, 1998) (henceforth LLSV) and Levine (1998, 1999). LLSV find that markets develop better in countries where shareholder rights are well-protected. Because high shareholder rights are found in common-law countries, they conclude that it is no wonder that markets are larger in common-law countries relative to civil law countries. Levine finds that banks develop better in countries where creditor rights are well-protected and that civil-law countries have well-developed banks.²

Two questions Levine (1998, 1999) leaves unanswered are that if banks develop better when creditors are well-protected, why is the banking system of the common-law countries not significantly larger (in terms of their total share in the economy) than the banking system of French/Scandinavian-civil-law countries even though creditors are

¹Source: bank data comes from Levine (1998), market data comes from LaPorta et al. (1997). I calculated the ratio.

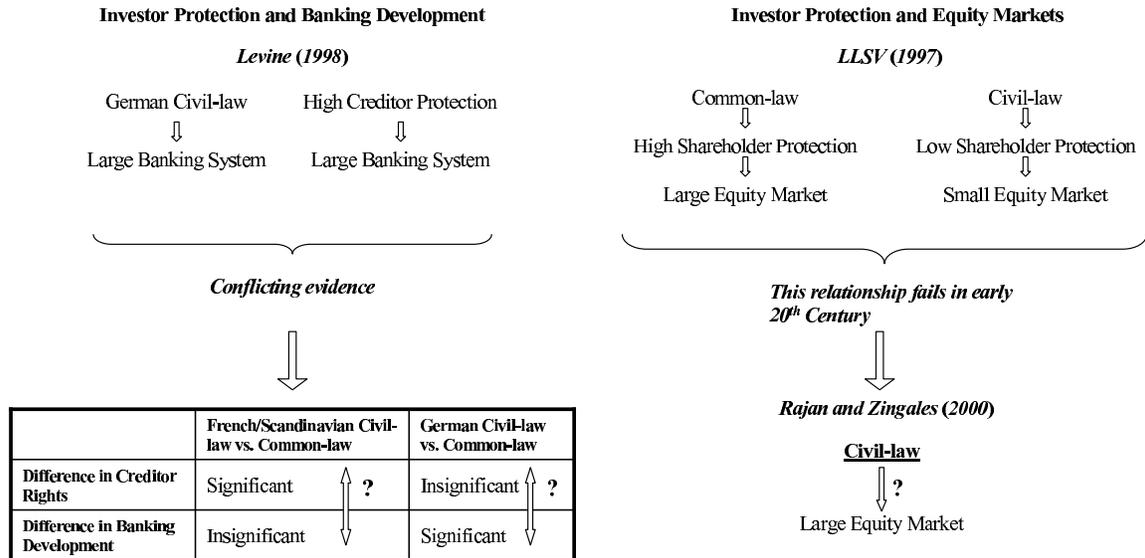
²Shareholder rights refer to the protection provided to minority shareholders. Creditor rights refer to the rights of the secured creditors in the event of bankruptcy.

better-protected in common-law countries? Similarly, given that the differences in the level of creditor protection are insignificant between German-civil-law and common-law countries, why is the German banking system significantly larger than the common-law banking system? (See Fig. II).

Likewise, Rajan and Zingales (2000) object to the connection LLSV make between market friendliness and legal tradition. Rajan and Zingales find that France's stock market was much bigger as a fraction of its GDP than markets in the U.S. in 1913 (0.78 vs. 0.41). In 1980, roles had reversed (0.09 vs. 0.46) and in 1999, the difference between the two countries is no longer astonishing (1.17 vs. 1.52). Also, in the beginning of the 20th century, equity issues were more common in Germany than they were in United Kingdom. In the light of these facts, Rajan and Zingales assert that "the relative market friendliness of common-law countries uncovered by LLSV seems a fluctuating phenomenon, and is unlikely to be explained by something as permanent as the origin of the legal system". (See Fig. II).

This conclusion, however, may be too strong in that it goes so far as to claim that a permanent legal tradition precludes fluctuations in the structure of the financial system. Rajan and Zingales do not clarify why this must be so. The mere observation that investors were better-protected in civil-law countries at the turn of the 20th century is not enough to reject the connection between legal traditions and financial system structure. It is possible that the level of investor protection in an economy, reflected

Figure II: Conflicting evidence in the literature



in shareholder and creditor rights, does not capture the important differences between the legal traditions, and therefore, using this variable would not reveal the connection between the origin of a legal system and the structure of a financial system. Legal scholars Merryman and Clark (1978) argue that a legal tradition is more than a set of rights and regulations:

A legal tradition, as the term implies, is not a set of rules of law about contracts, corporations and crimes, although such rules will almost always be in some sense a reflection of the tradition. Rather, *it is a set of deeply rooted, historically conditioned attitudes about the nature of the law, about the role of law in the society and the polity, about the proper organization and operation of a legal system, and about the way the law is or should be made, applied, studied, perfected and taught.* The legal tradition relates the legal system to the culture of which it is a particular expression.³

Based on these findings and remarks, the goal of this paper is to develop a theory that addresses the following question:

- How do we explain a country's choice of bank- or market-oriented financial system based on its legal tradition by describing this tradition not as a set of rules of law (such as shareholder or creditor rights) but as *an attitude about the way law is made and applied?*

³My emphasis. I quote from Katz (1986).

Clearly, we need to identify the fundamental difference between common-law and civil-law traditions to answer this question. Although there is no agreement among legal scholars on the most fundamental difference, there are two widely accepted views. First, common-law courts are more effective than civil-law courts in resolving conflicts because they have the right to create the law when the statutes do not address a particular problem. Second, even when the statutes in civil-law countries explicitly give the judges the right to interpret (read create) the law, civil-law judges use this power very infrequently. I will elaborate on these issues in Section A. Starting with these two premises, I show that because civil-law courts are not sufficiently effective in settling disputes between credit-market participants, banks will emerge in civil-law countries as institutions that can resolve conflicts and enforce contracts without court intervention.

To see how, imagine a world where a borrower finds a way to fraudulently transfer an asset to the detriment of the lender, and civil-law courts are unable to rectify the situation because the borrower's technique is not defined in the statutes. Courts behave that way not because of neglect or incompetence but because, unlike their common-law counterparts, they put more emphasis on following the word of the law than on fairness. This allows insiders in civil-law countries to creatively structure unfair transactions so as to conform to the letter of the law. Johnson et al. (2000) empirically verify this sluggishness of the civil-law courts in a conflict between minority and controlling shareholders. They observe that civil-law courts allow substantial expropriation of minority shareholders in situations where controlling shareholders transfer the assets

and profits out of the firm.

The repercussion of the courts' behavior on the economy is that borrowers cannot credibly commit themselves to not exploit the lender and consequently, cannot borrow from the capital markets. What is the advantage of a bank in this setting? Banks can provide borrowers with a valuable service that individual investors are unable to offer. More specifically, banks can credibly commit themselves to provide an interest rate subsidy relative to future spot-market interest rates, but individual investors cannot. The reason is that it is more costly for an institution to not honor its contractual promises than it is for an individual, even when they are both subject to the same structure of penalties for refusing to honor contracts.⁴ When a conflict arises between a borrower and lender from a fraudulent asset transfer by the borrower, the bank can still extract its contractual rents by credibly threatening the borrower with withholding the subsidy. The bank's superior bargaining power relative to individual investors, arising from the unique services it can provide, allows the borrower to obtain funds in environments where markets fail because courts are unlikely to reach fair decisions.

However, banks do not provide their services for free. Banks, being large institutions, suffer from agency problems. Although I do not endogenize the costs associated with these problems, I assume that they are borne by the borrowers so that bank shareholders can break even. Therefore, in countries where courts are sufficiently effective,

⁴Boot et al. (1991) have discussed this commitment problem in an effort-aversion moral hazard setting. I formalize it in an asset-substitution moral hazard setting in Section IV.

borrowers prefer markets over banks because they are less costly. Thus, common-law countries are market dominated while the civil-law countries are dominated by banks.

The primary implication of the paper is that in countries where courts are not sufficiently effective, banks will emerge as institutions that can resolve conflicts. Hence, the model can explain the structure of a country's financial system based on its legal tradition without referring to the degree of development of investor rights. Clearly, as Merryman and Clark note, such rights will almost always be in some sense a reflection of the tradition. For example, in civil-law countries where banks can resolve conflicts with little or no court intervention, the need for creditor rights will be less than the need for creditor protection in common-law systems, where courts are the primary enforcer of contracts.⁵ Because courts need the guidance of laws and regulations to reach a decision, one would expect to observe a more thorough definition of creditor rights in common-law countries. In support of this argument, LLSV report better shareholder and creditor protection in common-law countries relative to civil-law countries. As a further evidence for the relative inessentiality of creditor protection in civil-law countries, I show that creditor rights do not play any significant role in banking development in civil-law countries. This contrasts with the findings of Levine (1998) who used a pooled sample of common- and civil-law countries to measure the importance of creditor protection in banking development. I show that a model that pools civil-

⁵This argument is based on the functionalist view of lawmaking. See Vago (2000) and Section V for further discussion.

and common-law countries together is misspecified. Therefore, these legal traditions should be analyzed separately.

The contribution of this paper to the literature is three-fold. First, the current literature argues that better legal rights lead to well-developed financial systems (La-Porta et al., 1997; Levine, 1998; Rajan and Zingales, 2000; Fohlin, 2000). I show that this is not necessarily so. The legal tradition, defined as the way the laws are made and applied, determines the structure of the financial system. Legal rights and regulations arise from the necessities of this structure. In other words, regulations are the end product rather than the determinant of a financial system. Second, the idea that relationship-based systems are superior to market-based systems in environments where laws are poorly drafted and enforced has been mentioned in Rajan and Zingales (1998). This paper shows that even in countries where judicial systems are considered to be efficient, differences in legal traditions may be enough to explain why German and French financial systems are bank-dominated, while English and American systems are market-dominated. Finally, although I model bank loan commitments as a unique bank service that capital markets are unable to provide, there is nothing in the model that prevents other *non-bank* financial intermediaries from offering a similar service. Therefore, the paper's results go beyond a comparison of banks and markets to a comparison of intermediated and unintermediated sectors. Thus, this paper is a new addition to the *comparative financial systems* literature, which tries to explain the origins of the cross-country differences in financial systems.

The rest of the paper is organized as follows. Section I contains a brief description of the civil-law and common-law traditions and identifies the main issues that set them apart. Note that the discussion in this section is not on what determines a country's choice of legal traditions (See Glaeser and Shleifer, 2001, for a nice review of the histories of these traditions) but on how each tradition affects judicial decision making. This section also depicts the main features of a bank loan commitment. Section II introduces the players in the model and the information structure. Section III rationalizes the existence of loan commitments. Section IV establishes that selling loan commitments is a service unique to banks. The results of Sections III and IV are not new. They simply show that results of earlier papers still hold in my setting. Therefore, I keep the discussion of those results at a minimum. Section V explains how banks can use their unique services to extract payments from fraudulently defaulting borrowers. Section VI tests the empirical implications of the model. Section VII concludes.

I Background

A A Comparison of Legal Traditions: How Should the Law Be Made and Applied⁶?

In the Anglo-American judicial system based on common law, the traditional idea was to formulate laws only when social conditions made them necessary while in the civil

⁶In the following discussion, I borrow heavily from Katz (1986) and Mattei (2000). Also see Glaeser and Shleifer (2001) for a nice review of the historic roots of legal traditions.

law system, the idea was that there must be a codified framework of law in which any law needed by the community could be found. In the common law tradition, the judge at times feels that he must not only apply the law but also interpret and, to a degree, even to create the law. The declaratory theory of common law refers to this creation process as “*the discovery of the old unwritten custom of the land*”. Greenberg (1986) notes: “*Common law can be compared to Newton’s laws of nature. They always existed and Newton did nothing more than discover and label them*”. Judicial formulation of rules is based frequently on the principle that judges should build on the precedents established by past decisions, known as the doctrine of stare decisis. Vago (2000) argues that “*following precedents is often much easier and less time-consuming than working out all over again solutions to problems that have already been faced. It enables the judge to take advantage of the accumulated wisdom of preceding generations. It minimizes arbitrariness and compensates for weakness and inexperience. More important, the practice of following precedents enables individuals to plan their conduct in the expectation that past decisions will be honored in the future*”. Interestingly, this system has been blamed by some legal scholars for tolerating “*a certain moral insensitivity in the interest of economic efficiency*”.

The civil law judge, however, feels that his only duty is to strictly apply the law as laid down in the codes and enactments of the legislature. “*French lawmakers, for example, have strenuously denied judges any lawmaking role, refusing to acknowledge the role of judicial creativity in filling in the gaps of the Napoleonic Code*” (Mattei

2000). Surely, this does not mean that statutory law does not need to be interpreted. Frederic the Great of Prussia attempted to write a law which needs no interpretation in its Prussian Land Code, which contained about 17,000 clauses; but he soon found out that even legislation on this massive scale could not be applied in a purely mechanical way. As a result, the Austrian Civil Code of 1811, the Spanish Civil Code of 1888 and the Italian Civil Code of 1942 contained explicit directions on interpretation of legislative texts. Glendon et al. (1999) mention the Article 1 of the Swiss Civil Code of 1907 as the most famous of all such interpretive directions. That article “*provides that if the judge can find no rule in the enacted law, he must decide in accordance with customary law, and failing that, according to the rule which he as a legislator would adopt, having regard to approved legal doctrine and judicial tradition... However, in the years since the Swiss Civil Code has been in force, Article 1 has been rarely invoked, Swiss judges almost always preferring to couch their decisions in the language of more traditional methods of interpretation*”. These methods involve grammatical analysis, and such logical operations as reasoning by analogy or contrast from code provisions, or deriving an inclusive principle from a set of related sections. Glendon et al. trace back the civil-law judges’ reluctance to use their interpretive powers to the times of the French Revolution. During the Revolution, the royal judges were accused of betraying the people by systematically ruling in favor of the aristocrats. “*The revolutionary reaction against the royal courts found expression in Article 5 of the French Civil Code of 1804, forbidding judges to lay down general rules in deciding*

cases, and that mistrust of judges importantly affected the organization of the court system. [The judges] were not eager to test the limits of their power. They were concerned to show their submissiveness to the new order". This extreme obedience to the word of law became an integral part of the civil law tradition.

Based on these facts and arguments, I assume in this paper that common-law courts are more effective in resolving conflicts because they are less constrained in creating and interpreting the law when the statutes are incomplete and do not address a particular situation. This assumption may seem too strong given that LLSV find that Western European and North American countries have very efficient judicial systems. LLSV's measure of judicial efficiency represents the "efficiency and integrity of the legal environment (based on) investors' assessments of conditions in the country in question". It deals with issues ranging from the speed of the trial to whether or not parties can bribe the judges. I do not measure "efficiency" by number of cases or time and money expenditure per case.⁷ Neither am I questioning judges' integrity. Similar to our discussion above, Glaeser and Shleifer (2001) argue that codes in civil law countries are much more powerful than those in common law countries as a restraint on the judge. So, the efficiency of a legal system that I am interested in this paper is about the way judges interpret the law as a result of the legal tradition.

⁷To learn more about the problems associated with using these measures as performance indicators, see the studies done by World Bank Legal Institutions of the Market Economy Group. <http://www1.worldbank.org/publicsector/legal/performancebrief.htm>

Next, I describe the important characteristics of a loan commitment contract that will be shown in later sections to be effective in environments where courts are imperfect. Readers familiar with the topic may proceed to Section II.

B Loan Commitments

I show later in the paper that banks can sell loan commitments to borrowers to commit themselves to lend at a subsidized interest rate. A loan commitment is a contractual promise to lend to a specific borrower up to a certain amount at prespecified terms.⁸ These terms include the maturity of the commitment, the type and purpose of the loan, the formula for calculating the loan interest rate, the various fees which must be paid over the life of the commitment, the covenants demanded by the bank (such as limits on the firm's accounting ratios) and the conditions under which the bank can revoke the commitment. In particular, every loan commitment contains a *Material Adverse Change* (MAC) clause, which gives the bank the right to refuse to make the loan if the borrower's creditworthiness deteriorates dramatically.

Two features of the loan commitment contract are particularly important: the fee structure and the MAC clause. The fee structure may include a commitment fee

⁸Loan commitments are widely used in the economy. A recent Federal Reserve survey (Release E2 - June 2000) shows that 79 percent of all commercial and industrial lending is made under commitment contracts. Moreover, as of March 31, 2000, outstanding (unused) loan commitments of U.S. corporations have grown to \$1 trillion 564 billion up from \$743 billion in 1990 (FDIC). Ergungor (2001) contains a review of the rich loan commitment literature.

which is an upfront fee paid when the commitment is made, an annual (service) fee which is paid on the borrowed amount and a usage fee which is levied on the available unused credit. The second important feature, the MAC clause, grants the bank some measure of discretion over whether to honor the contract. A typical MAC clause reads: “Prior to [loan] closing, there shall not have occurred, *in the opinion of the Bank*, any material adverse change in the Borrower’s financial condition from that reflected in its annual report for its fiscal year ending December 31, ----, or in the Borrower’s business operations or prospects”. Note that, the bank may repudiate the contract based solely on its opinion about the borrower’s financial condition. That is, the clause allows the bank to use its private information about the borrower, which may be unverifiable to outsiders.

II The Agents and the Information Structure

I assume a perfectly competitive, two-period (labeled $\{0, 1, 2\}$) credit market populated by four types of risk-neutral agents: safe borrowers, risky borrowers, individual investors and a court of law. Borrowers have no collateralizable assets and are endowed at date 0 with a risky project which must be funded externally. Whether a borrower is safe or risky will be determined by the riskiness of the projects available in the second period, which I will describe momentarily. The first-period project requires an initial investment of I_0 and pays out Y_1 with probability γ_1 (high state) and 0 with probability $(1 - \gamma_1)$ (low state); $\gamma_1 \in (0, 1)$. Y_1 is unobservable to all except the

borrower and the investor who funded the project at time 0.

When the project concludes at time 1 and *irrespective* of its outcome, both types of borrowers have additional projects to invest in with probability θ or no projects at all with probability $(1 - \theta)$. The project availability of each borrower is independent of the project availability of other borrowers. Moreover, borrowers and investors can observe whether or not a project became available at time 1. If available, the safe-borrower may invest I_1 in a safe project that pays out S_2 at date 2. The risky borrower has a choice between a safe and a risky project. The safe project is identical to the project of the safe-borrower. The risky project costs I_1 and pays out Y_2 at date 2 with probability γ_2 (high state) and 0 with probability $(1 - \gamma_2)$ (low state); $\gamma_2 \in (0, 1)$.

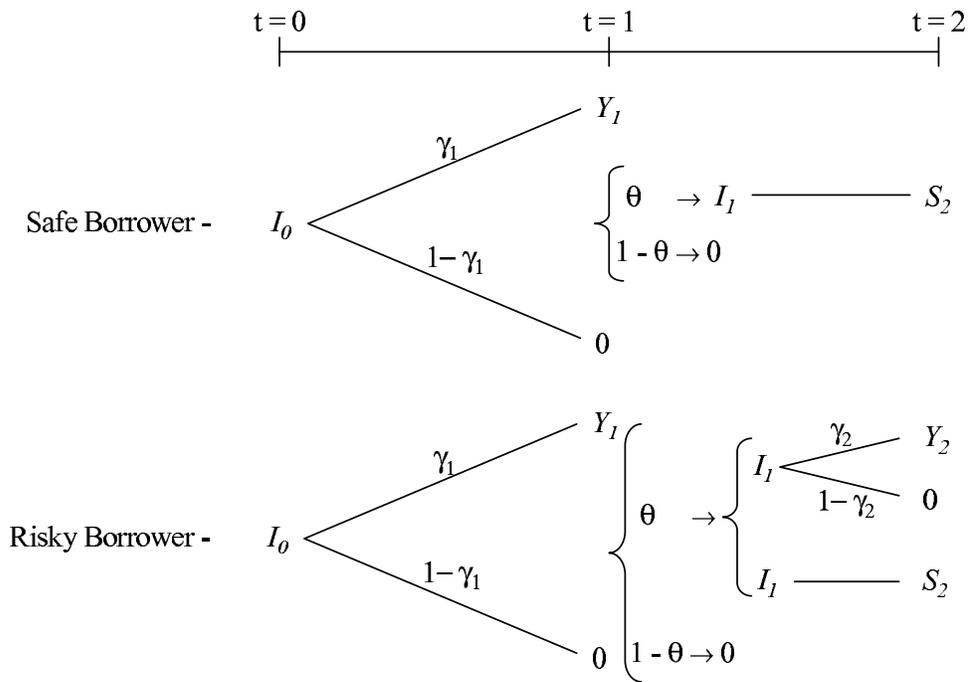
The cash flows of the projects depend on the individual skills of the borrower. Note that the borrower's skills will play no role in the model other than guaranteeing that creditors cannot seize the first- or the second-period project and hire another manager if the borrower-manager defaults at time 1. Whether a borrower is safe or risky is known at time 0. However, investors cannot observe the risky-borrower's project choice at time 1 or whether the time-2 cash flow comes from the safe or risky project. Fig. III illustrates the project cash flows.

I also make the following assumptions:

Assumption 1. (i) $Y_1\gamma_1 > I_0$: *The first-period project has positive NPV.*

(ii) $Y_2 > S_2 > \gamma_2 Y_2 > I_1$: *The second-period safe project is socially optimal.*

Figure III: Borrower types and project availability



(iii) The borrower borrows short-term in every period.

I describe the conditions under which Part iii of Assumption 1 holds in detail in Section V. The gist of it is that since this paper is about the contract enforcement problem at date-1, having a large date-2 cash flow that would be sufficient to pay for the entire investment (I_0 and I_1) would trivially solve the problem by allowing the borrower to take a two-period loan at date-0. In Section V, I put an upper bound on the date-2 cash flow and force the borrowers to take a one-period loan at time 0.

Now let us turn our attention to the third group of agents: the individual investors. There is a countable infinity individual investors at date 0 (capital markets). Each investor has an illiquid wealth (endowment) e at date 0 in addition to the cash available for lending to one borrower (I_0). As in Boot et al. (1991), e may be visualized as the value of a project which requires no funding and pays off at the end of the second period. Investors may also join their endowments and become an institutional lender. Although there are no depositors in this model, I will refer to this institution as a bank. The bank serves no purpose other than pooling the gains and losses incurred while serving a group of borrowers.

Because there are a large number of individual investors, it is too costly to involve each investor in the bank's lending/decision-making process. Therefore, the decision-making power is delegated to a manager that represents the interests of the investors (shareholders of the bank). However, the availability of a large amount of very liquid

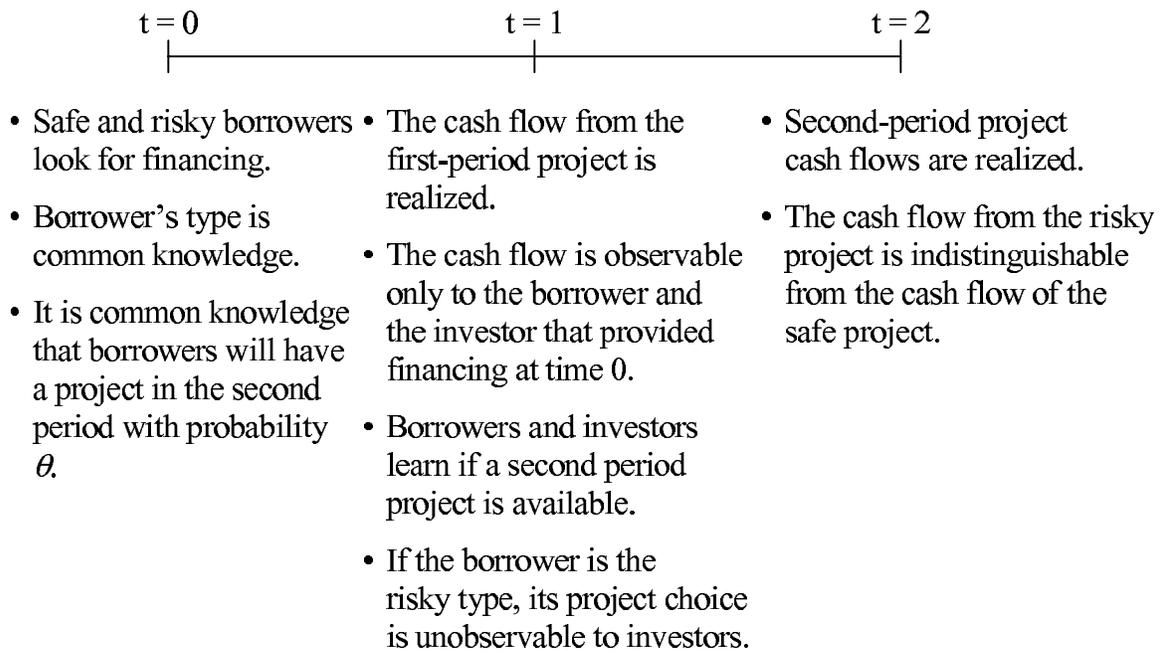
assets to the manager is likely to increase the agency costs (see Myers and Rajan, 1998; Kashyap et al., 2002). I do not endogenize these costs but assume that they are borne by the borrowers because the investors will refuse to form an institution if they are not compensated for the associated expenses. Hence, borrowing from a bank costs a borrower ω .⁹ Fig. IV summarizes the information structure.

There is an inevitable conflict between borrowers and lenders in this model. Note that a default in the first period does not affect the borrower's ability to raise new funds in the second period because it has no effect on the borrower's future performance. Then, the borrower has an incentive to hide Y_1 for personal consumption and declare itself in the low state if it can find a technique that is consistent with the "word" of the law.¹⁰ Similarly, the risky-borrower has an incentive to hide Y_2 at time 2. Notice, however, that only cash flows from risky projects may be hidden because borrowers cannot explain how the sure cash flow of a safe project has disappeared. Clearly, the lender may attempt to limit fraudulent action by a long list of loan covenants. Unfortunately, it can never write a leak-proof, complete contract that thwarts every possible fraudulent conveyance scheme. Its only recourse is to take the borrower to court when it believes that the borrower's default is due to a fraudulent transfer of the assets of the firm.

⁹An alternative assumption is that the agency costs exceed the legal fees associated with going to court by ω .

¹⁰As a matter of fact, because debt has no disciplining power over the firm, the first period contract could just as well be equity.

Figure IV: The information structure



This brings us to the fourth player in the market: the court of law. The court interprets and applies the law in accordance with the country's legal tradition. The important point is that the court is an *imperfect* arbitrator. Note that by assumption, the lender observes the cash flow of the first-period project and if it takes the borrower to court, this is a clear signal that the borrower has done something wrong. Although this is the rational conclusion given the assumption, it is not sufficient to guarantee a court ruling in favor of the lender because the court will penalize the borrower only if the law proclaims the borrower's asset transfer technique illegal or the court is willing to use its interpretive powers to fill in the gaps of the law. In other words, the borrower's action may be *immoral* but not necessarily *illegal*.

My previous discussion of legal traditions suggests that a civil-law court is less likely to identify the unfair nature of the borrower's behavior because it works within the limits imposed by the civil-law tradition. Then, denoting the court's probability of penalizing the borrower by α , I make the following assumption:

Assumption 2. $\alpha_{\text{common}} > \alpha_{\text{civil}}$: *Common-law courts are more effective than civil-law courts in resolving conflicts.*

If the court identifies a fraudulent conveyance of assets, it takes possession of Y_1 . The penalty structure is exogenous to the model. The only constraint I impose on the penalty is the upper bound, Y_1 , which prohibits infinitely large penalties that will always force the borrower to honor its obligations. In other words, harsh penalties such

as hanging the borrower are ruled out.

To simplify the analysis, I also assume without loss of generality that if the risky-borrower picks the risky-project at time 1, it has no incentive to hide the project cash flow at time 2 due to litigation risk. This allows me to focus solely on the conflicts arising at time 1.

Assumption 3. $\alpha > \tilde{R}I_1/(\gamma_2Y_2)$: *the risky borrower does not hide the cash flow from the second period risky project due to risk of litigation.*

\tilde{R} is the second-period interest rate factor, which will be defined momentarily. Assumption 3 states that the borrower's profit from paying its debt is greater than its profit from hiding the assets and taking on the litigation risk. Then,

$$(1 - \alpha)Y_2 < Y_2 - \tilde{R}I_1/\gamma_2$$

which is the same constraint imposed in assumption 3.

Also, to simplify the notation, I will drop the subscripts of α until Section VI where I extract the implications of the model about the effects of the legal tradition on the organization of a financial system.

In the next section, I rationalize loan commitments as an optimal contracting mechanism in a world where courts always identify and penalize dishonest actions by borrowers ($\alpha = 1$; perfect courts) and therefore, borrowers always pay their debt in the high state. The analysis of imperfect courts is left to Section V.

III The Loan Commitment as an Optimal Contract in a World with Perfect Courts

The purpose of this section is to show that banks will exist even when courts are perfect. At date 0, the date 1 interest rate factor is a random variable $\tilde{R} \in \{\underline{R}, \overline{R}\}$ where $\overline{R} > \underline{R} > 1$. \overline{R} occurs with probability λ and \underline{R} occurs with probability $(1 - \lambda)$. The lenders earn zero expected profit because the loan market is perfectly competitive. If the lender anticipates that the risky borrower will choose the risky project, then the competitive interest factor charged for the spot loan to a risky borrower at date 1 will be $\tilde{R}\gamma_2^{-1}$. A borrower that will choose the safe project is charged the market rate \tilde{R} .

The following lemma is adapted from Boot et al. (1993).

Lemma 1. *If $\underline{R} < (S_2 - \gamma_2 Y_2) (I_1(1 - \gamma_2))^{-1} < \overline{R}$, then there is a Nash equilibrium in which the risky borrower chooses the safe project if $\tilde{R} = \underline{R}$ and the risky project if $\tilde{R} = \overline{R}$, and the competitive lender charges an interest factor of \underline{R} if $\tilde{R} = \underline{R}$ and $\overline{R}\gamma_2^{-1}$ if $\tilde{R} = \overline{R}$. There is no Nash equilibrium in which the risky borrower chooses the safe project if $\tilde{R} = \overline{R}$.*

Proof: See Appendix A. ■

If the risky borrower is restricted to spot borrowing, the equilibrium is inefficient. The reason for the inefficiency is the moral hazard created by high interest rate. Because the debt payment is fixed and the borrower has limited liability, the borrower collects the benefits of investing in the high-risk, high-cash-flow project while the lender

bears the risk.

The social cost of investing in the socially suboptimal (risky) project is

$$S_2 - \gamma_2 Y_2 > 0$$

This cost is avoidable if the risky borrower were to purchase a loan commitment from the lender at date 0 that would permit him to borrow I_1 at date 1 at a fixed interest factor. From Lemma 1, the incentive compatible interest factor is,

$$R^C = (S_2 - \gamma_2 Y_2) (I_1(1 - \gamma_2))^{-1} \quad (3)$$

Now the borrower will choose the safe project regardless of the spot borrowing rate at $t=0$ although the commitment will be exercised only if $\tilde{R} = \bar{R}$. At time 0, the lender will charge the borrower a fee to recoup the *expected* loss from future lending at $R^C < \bar{R}$ in the high-interest-rate state. To simplify the notation, I will denote the total subsidy $(\tilde{R} - R^C) I_1$ by Σ . The commitment fee, C , charged at time 0 equals

$$C = \theta\lambda\Sigma \quad (4)$$

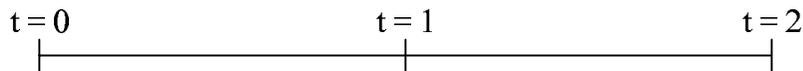
where $\theta\lambda\Sigma$ is the expected cost of subsidy given that the borrower will take down a loan if the spot interest rate is high (λ) and it has a project available (θ). Note that the fee equals $\theta\lambda\Sigma + \omega$ if the lender is a bank where ω is the cost of doing business with a bank. I will assume that $(S_2 - \gamma_2 Y_2) > \omega$ so that it is still beneficial to use a bank loan. Obviously, if an individual investor can credibly commit itself to lend, a loan commitment is always cheaper when purchased from an individual. However,

I show in the next section that only banks can sell credible commitments. Also note that only the risky-borrowers will purchase loan commitments because safe-borrowers do not need a subsidy and borrowing from a bank is costly. Figure V summarizes this discussion on contract choice.

If the risky-borrower has an initial wealth sufficient to pay C , an alternative to buying a loan commitment to deter moral hazard might be an equity investment. However, Boot et al. (1987) show that loan commitments are more effective than equity investment in attenuating moral hazard. The intuition is as follows. When the borrower invests in equity, this reduces the borrower's interest burden for all realizations of future interest rates. This is clearly inefficient because low interest rates are not distortionary; yet the equity still reduces the payment burden in those states. The effect of a loan commitment, on the other hand, is selective across interest rates. At low market rates, the borrower can still benefit from those rates. The loan commitment reduces the interest burden only when the market rates are high. Therefore, the amount of commitment fee required to mitigate moral hazard is less than the equity investment needed to create the same effect.

So far in the discussion I implicitly assumed that the lender always keeps its promises and provides a subsidized loan when the market interest rate is high. In the next section, I relax this assumption and show that banks can credibly commit themselves to lend but individual investors cannot.

Figure V: The contract choice when courts are perfect arbitrators



- Both types of borrowers raise funds for the first-period project.
- Safe-borrowers borrow at the market interest rate.
- Investors are willing to lend because the project is profitable (assumption 1-i).
- Risky-borrowers use their loan commitments if the market interest rate is high. They borrow at the market rate if it is low.
- Risky-borrowers purchase a loan commitment to fund their second-period projects.

IV The Bank as the Exclusive Supplier of Credible Loan Commitments

The idea that banks are the only credible providers of loan commitments has been formalized in Boot et al. (1991). This section applies that idea to a new setting. The intuition is that the lender (bank or individual) is asked to honor the commitment and incur the cost of doing so (lending at a below market rate) only when the interest rates are high. Because the contract is made before the interest rate uncertainty is resolved, the lender is compensated for the expected cost of this service, which is smaller than the actual cost if the spot interest rate happens to be high. Therefore, the lender incurs a net loss when it honors the contract. The lender's alternative course of action is to breach the contract by repudiating the commitment, consume C and let itself be taken to court by the borrower where the court will seize its entire endowment, e , as a penalty. Then, the lender's decision rule is to choose the action that minimizes its loss. Proposition 1 explains how banks and individual investors differ in their decision.

Proposition 1. *Let the individual investor's endowment, e , be less than the subsidy Σ . Then, the individual investor always repudiates its commitment and therefore, its commitments are not credible. If the bank is sufficiently large, its commitments are credible for some values of e .*

Proof: See Appendix A. ■

Proposition 1 shows that the pooling of borrowers helps the bank diversify the risk

of a loss at high interest rates. The intuition is that if the interest rates are high at time 1, only a fraction of the borrowers with loan commitments will request a loan as the rest of the borrowers will not have any projects to invest in. Then, the total subsidy provided to borrowers is divided among all the investors, which means that each investor bears less than the full cost of lending to a borrower. If this cost is small compared to the loss of e , the bank honors the commitment. Clearly, if all the borrowers request a loan, the bank will decline to lend as each investor will have to pay the full subsidy, which is identical to the case of an individual investor. However, the probability of such an event is zero for a sufficiently large bank. Therefore, the bank's commitment is credible.

Note that if the contract contained a MAC clause that allowed the bank to repudiate the commitment with legal impunity when the borrower is in financial trouble, the bank would always invoke its right in the low state at time 1 where the borrower defaults, even though this action would prevent the borrower from investing in the socially optimal safe project. The reason is that the bank loses nothing when it repudiates the commitment by invoking the MAC clause but incurs the cost of the subsidy when it honors the promise. Therefore, in our current setting, the MAC clause is excluded from the contract because it destroys social welfare. This conclusion will change, however, when I introduce the imperfect court system in the next section.

V Cross-Country Differences in Financial Systems: the Case of Imperfect Courts

In this section, I turn my attention to the case of imperfect courts that have restricted decision-making abilities due to the characteristics of the legal tradition in which they operate. Thus, I reinstate the assumption that the court can identify a fraudulent action only with probability α . In Section A, I analyze the spot contract at time 0 and determine the conditions under which the date-0 spot market fails due to the contract enforcement problem at time 1. In Section B, I investigate how a bank can prevent a market failure at time 0.

A The Spot Contract and the Contract Enforcement Problem

Despite the litigation risk, when borrowers realize that they may avoid paying their debt with legal impunity at time 1, they will do so as long as the court is sufficiently ineffective. In other words,

$$(1 - \alpha)Y_1 > Y_1 - I_0\gamma_1^{-1} \tag{5}$$

rearranging,

$$\alpha < \alpha^* = I_0(Y_1\gamma_1)^{-1} \tag{5'}$$

The left-hand side of (5) is what the borrower expects to receive if it hides the first-period cash flows and the right-hand side is what it receives if it pays its loan. (5)

establishes that when the lender believes that the borrower will pay the loan back (interest factor γ_1^{-1}), the borrower will declare itself in default. Therefore, the lender must assume that the borrower will always default on the first-period loan. Note that (5') may be rewritten as

$$\alpha\gamma_1 Y_1 < I_0 \tag{5''}$$

which implies that if the courts are ineffective (α sufficiently low), lending to the borrower at time 0 is a negative NPV investment for the lender. Clearly, if the cash flow from the second-period project is sufficiently large, the lender may initially lend with a two-period loan so that it does not have to worry about the cash flow at date-1. Assumption 4 below rules out this trivial solution to the contract enforcement problem at time 1.

Assumption 4. $\theta S_2 \left(\lambda \bar{R}^{-1} + (1 - \lambda) \underline{R}^{-1} \right) < (I_0 + \theta I_1)$: *The cash flow of the second project is not enough to pay for the cost of both projects.*¹¹

Lemma 2 follows from this discussion.

Lemma 2. *If $\alpha < \alpha^*$, the spot loan market fails at time 0.*

The intuition is that individual investors who do not have any bargaining power, cannot force the borrower to honor its obligation when courts fail to enforce the debt contract. Then, although the first-period project is profitable (assumption 1-i), it is not funded by the spot market.

¹¹The second-period discount factor $\left(\lambda \bar{R}^{-1} + (1 - \lambda) \underline{R}^{-1} \right)$ follows from a no-arbitrage condition.

B The Bank and the Solution to the Contract Enforcement Problem

This section evolves around how the bank can use the MAC clause in the commitment contract to extract a payment from the borrower. Before we discuss this issue, let me describe when courts would allow banks to exercise their discretion and renege on their commitment using the MAC clause.

In the *absence* of a MAC clause, the lender does not have the right to revoke the contract under any circumstance. Therefore, a lender that reneges on its promise is always penalized. Note that this is different from the treatment the borrowers get when they default. In the case of defaulting borrowers, the court cannot observe whether the borrower's project has succeeded or not. Therefore, it has to look into the borrower's business records to determine if there has been an illegal action. This monitoring effort succeeds in identifying an illicit activity with probability α . In the case of repudiated commitments, once the creditor makes an irrevocable promise to lend, whether or not this promise is kept is readily observable and does not require a court investigation. So, the justice is swift and fair.

Now, suppose the loan commitment contract contains a MAC clause, which gives the bank the right to refuse to make the loan if the borrower defaults on its first-period loan. In this case, courts will penalize only the banks that break their promises in the high state. In other words, if the borrower pays the first-period loan, it will become

clear that the borrower is in the high state and repudiating the commitment will be considered a breach of contract.

Then, should loan commitments contain a MAC clause? I have already established in the previous section that the MAC clause destroys social welfare in the second period by allowing the bank to renege on its promise in the low state. However, when the court system is imperfect, the advantage of the MAC clause is that it gives the bank the bargaining power that it needs to prohibit the borrower from defaulting fraudulently on its first-period loan. The intuition is that by using the MAC clause, the bank can credibly commit itself to refuse to make a subsidized loan if it observes that the borrower is hiding its assets. The subsidy amount is set sufficiently large so that the borrower prefers to make the first-period loan payment over to lose the subsidy. Note that even the safe borrowers may buy loan commitments and pre-pay for the subsidy at date 0 to signal that they are going to pay their debt at date 1. Also notice that the bank can use its threat to withhold the subsidy only when the borrower has a project to invest in at time 1. The subsidy is worthless without a project.

So far, I have argued that a borrower that wishes to invest in the first-period project must purchase a bank loan commitment with a MAC clause. The safe borrower is always better off with this arrangement. It can invest in the first-period project and given that its type is common knowledge, it can always raise funds from the market at time 1 if the bank refuses to honor the commitment.

However, if the borrower is the risky-type, purchasing a loan commitment with a MAC clause leads to investing in the risky-project in the second-period if the first-period project fails because the bank can renege on its promise with legal impunity in the low state.¹² Therefore, we must determine whether it is optimal for the risky borrower to give up the socially optimal safe project in the low state at time 1, in order to invest in the first-period project by purchasing a loan commitment with a MAC clause. However, because this is an issue of secondary importance, I leave that discussion to Appendix B. In the rest of the paper, I will only consider loan commitments with a MAC clause. Proposition 2 describes the borrower's choice of funding source at time 1.

Proposition 2. *(i) $\alpha > \alpha^*$: Banks and Capital Markets co-exist in the financial system at time 1. Safe borrowers prefer capital markets and risky borrowers choose banks. The relative size of safe and risky borrowers in the economy determines which alternative (bank vs. capital markets) dominates the other. The economy is in a first-best state where all projects are undertaken.*

(ii) $\alpha < \alpha^$: Let $\theta \geq \frac{I_0 - \alpha\gamma_1 Y_1}{\gamma_1 Y_1 (1 - \alpha)}$. Both safe and risky borrowers prefer banks at time 1. The financial system is bank dominated. The economy is in a second-best state because of the forgone investments.*

¹²Note that renegotiation is not possible. The loan commitment rate is already set at the maximum rate at which the borrower would choose the safe project. Therefore, the bank cannot extract additional rents from the borrower in return for the subsidy.

Proof: See Appendix A. ■

The intuition behind the restriction on θ is that the bank's threat to withhold the subsidy is credible only if the borrower has a project to invest in at date-1, which occurs with probability θ . In other words, θ is the measure of the bank's bargaining power.

In this section, we have established that banks can use their ability to credibly commit themselves and the MAC clause as a carrot-and-stick to resolve conflicts with borrowers when courts are imperfect. The next step is to determine when the level of investor rights is an important factor in the financial system development.

The functionalist view of lawmaking argues that laws are a special kind of “reinstitutionalized custom”.¹³ Customs are norms or rules about the ways in which people must behave if social institutions are to perform their functions and society is to endure. Lawmaking is the restatement of *some* customs (for example, those dealing with economic transactions and contractual relations) so that legal institutions can enforce them. Courts, acting as contract enforcers, need the guidance of laws to settle disputes.

The functionalist view proposes that *failure in other institutional norms encourages the reinstitutionalization of the norms by the legal institution*. In other words, the tacit rules of the society are written into laws, if the society is unable to enforce those rules by other means. Then, if there are institutions in an economy, such as banks as

¹³In this discussion on the need for lawmaking, I heavily borrow from Vago (2000).

described in this paper, that use a carrot-and-stick approach to successfully enforce the contracts rather than threaten the other party with the penalties specified in the law, are detailed rules and regulations still needed to protect the investors? The answer is no. A contrapositive argument based on the functionalist view is that the absence of written rules and laws implies that the social institutions (financial institutions in my case) are able to successfully enforce the rules of the society (such as paying the debt) without court intervention.

Therefore, I conjecture that in civil-law countries where banks (and other large intermediaries) act like contract enforcers, there is relatively little need for investor rights compared to common-law countries where the courts are the primary contract enforcers. In the next section, I test this hypothesis and the other empirical implications of the paper.

VI Empirical Implications, Data and Tests

The main empirical implication of the paper is that if assumption 2 holds ($\alpha_{civil} < \alpha_{common}$) and $\alpha_{civil} < \alpha^* < \alpha_{common}$, then civil-law countries will be bank dominated and common-law countries will be bank or market dominated depending on the characteristics of the borrower pool (Proposition 2). This result is already empirically-verified in various books and papers (Allen and Gale, 1995, 1999, 2000; LaPorta et al., 1997; Rajan and Zingales, 2000, to name a few. Also see Table I below).

Proposition 2, however, goes beyond this result. It shows that even when $\alpha_{civil} < \alpha_{common}$, whether a country's financial system is bank- or market-dominated depends on the prevalent economic conditions because α^* is economy-specific (it depends on I_0 , γ_1 and Y_1). If projects in country 1 have, for some reason, higher rates of return than the projects in country 2, then $[I_0(\gamma_1 Y_1)^{-1}]_1 < [I_0(\gamma_1 Y_1)^{-1}]_2$ and $\alpha_1^* < \alpha_2^*$. Therefore, even when both countries belong to the same legal tradition (same α), $\alpha_1^* < \alpha < \alpha_2^*$ would ensure that country 1 is market-dominated and country 2 is bank-dominated. The intuition is that in economies where projects are profitable, borrowers have more to lose if the court seizes their cash flows. Hence, they honor their obligations and are able to borrow from the capital markets.

Let us compare this implication to the observation in Rajan and Zingales (2000) that civil-law countries were more market-friendly than common-law countries in 1913. If we can show that investments in Germany and France were more profitable than British investments in that period, $\alpha_{(France)}^*_{Germany} < \alpha_{(France)}_{Germany} < \alpha_{UK} < \alpha^*_{UK}$ would generate the observation that Germany and France were more equity friendly than UK even though a common-law judiciary is more efficient.

Unfortunately, we do not have direct measures of return on investment in these countries at this time period. Still, Liesner (1989) reports that the real rate of growth in output was 2.93 percent in Germany, 1.70 percent in France but only 1.67 percent in UK in the 1900-1913 period. Similarly, the real rate of growth of total productivity

was 1.42 percent in Germany, 1.83 percent in France but only 0.81 percent in UK.¹⁴ Although observations on three countries are not enough to make a broad comparison between civil-law and common-law economies, the data still point in the right direction.

Proposition 2 also shows that the legal tradition may explain why some financial systems are bank-dominated and some others are market-dominated without any reference to the level of investor protection in the economy. The importance of this result is that it allows us to explain the degree of investor protection in a given economy not as the cause but as the outcome of a country's financial system structure. (see Fig. VI).

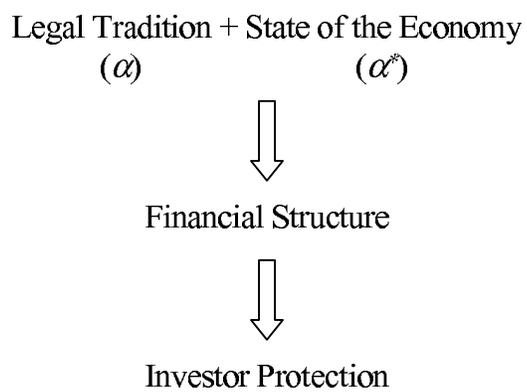
This solves one important puzzle. If creditor rights promote the growth of the banking sector in an economy, why do civil-law countries that are bank-dominated score so poorly in creditor rights compared to common-law countries? The answer that I propose is that when the legal tradition necessitates institutional arrangements to resolve the conflicts between lenders and borrowers, legal rights become *relatively* less important because problems are solved without court intervention. Alternatively, legal rights are more valuable when investors do not have sufficient clout over the borrowers and need court protection.

This brings us to the testable predictions of the model.

Prediction 1. *Civil-law economies are bank-dominated. Banks have sufficient clout*

¹⁴Productivity is measured in terms of output per employee.

Figure VI: A new hypothesis



over borrowers to resolve conflicts without court intervention. Therefore, creditor rights are less important relative to common-law systems where the courts are the primary contract enforcers.

Prediction 2. *Common-law economies are market-dominated. Conflicts are resolved through the court system. Therefore, there is a need for legal rules that protect the investors. Because banks have less clout over the borrowers, better creditor rights will promote the development of banks.*

In the next section, I present the data that I use to test these predictions.

A Data

To test the predictions, I use the same dataset developed by Levine (1998), which consists of 42 countries; 27 from the civil-law and 15 from the common-law tradition. The variables of interest are as follows (see Levine, 1998, for a more detailed definition of these variables):

Creditor Rights: The variable CREDITOR is a conglomerate of three individual creditor rights indicators that account for (1) how easily lenders can gain possession of collateral or liquidate the firm if the firm fails to meet a loan obligation; (2) whether or not the incumbent management continues to run the business pending the resolution of the reorganization process; and (3) whether the secured creditors are paid first if the firm is liquidated. The variable takes on values between 1 (best) and -2 (worst).

Banking Development: The variable BANK represents the average value of loans made by commercial banks and other deposit-taking banks to the private sector divided by the GDP over the 1976-1993 period.

Market Development: The data come from LaPorta et al. (1997). The variable MARKET is the ratio of the stock market capitalization held by minorities to GNP for 1994. The stock market capitalization held by minorities is the product of the aggregate stock market capitalization and the average percentage of common shares not owned by the top three shareholders in the ten largest non-financial, privately owned domestic firms in the country. It is a good proxy for the size of the non-intermediated financial sector in a country.

Levine also finds that the level of economic development has a positive effect on a country's banking development. Also, banks develop better in countries where contracts are rigorously enforced. The following variables are included in the analysis to capture these effects.

Efficiency of the Legal System: The variable ENFORCE is the average of the *Rule of Law* and *Risk of Contract Repudiation* variables developed by LaPorta et al. (1998). It assesses a country's law and order tradition and the risk that the government will repudiate, postpone or reduce its financial obligations.

Wealth Effect: The data source is the International Financial Statistics published by the IMF. The variable LGDPCAP is the natural log of each country's per capita

GDP.

Table I presents the summary statistics for each variable and a test of means (see Levine, 1998; LaPorta et al., 1997, for individual country values). Panel B shows that common-law countries provide better shareholder and creditor protection as predicted by this paper. The banking development seems to be unaffected by the legal tradition with the exception of the German-civil-law countries that have the largest banking sector in the dataset. Common-law countries have significantly well-developed markets compared to civil-law countries. On the question of which financial system dominates in the economy, the BANK/MARKET ratio shows that common-law countries are market-dominated (1.50) and civil law countries are bank-dominated (4.91) as predicted by this paper. The only exceptions are again the German-civil-law countries where the t-test cannot reject the hypothesis that the common-law and German-civil-law samples come from the same population. It is very likely that this result is an error due to small sample size of the German-civil-law countries (six countries in total) and the presence of two outliers Taiwan and Korea with BANK/MARKET ratios of 1.57 and 1.86 respectively. For comparison, Germany has a BANK/MARKET ratio of 12.62 and Austria of 22.67.

Table I: Summary Statistics and Tests of Means

Panel A - Summary Statistics

LEGAL SYSTEM	BANK MARKET	BANK/MARKET	LGDP	CAP	CREDITOR	ENFORCE
Common Law						
Average	0.76	0.65	1.50	8.51	0.47	7.16
Standard Deviation	0.37	0.47	0.86	1.65	0.83	2.20
Civil Law						
Average	0.89	0.28	4.91	9.08	-0.74	7.57
Standard Deviation	0.61	0.23	4.75	1.20	0.94	2.18
French - Civil Law						
Average	0.61	0.21	4.26	8.52	-1.00	6.61
Standard Deviation	0.42	0.19	3.25	1.15	1.00	2.04
German - Civil Law						
Average	1.64	0.46	7.70	9.96	0.00	9.12
Standard Deviation	0.63	0.32	8.39	0.60	0.63	1.23
Scandinavian - Civil Law						
Average	0.93	0.30	3.52	10.12	-0.75	9.72
Standard Deviation	0.22	0.14	1.38	0.19	0.50	0.13

Panel B - Tests of Means (p-values)

	BANK MARKET	BANK/MARKET	LGDP	CAP	CREDITOR	ENFORCE
Common - Civil	0.495	0.011	0.003	0.443	0.000	0.568
Common - French	0.287	0.004	0.003	0.984	0.000	0.470
Common - German	0.017	0.293	0.130	0.008	0.190	0.028
Common - Scandinavian	0.297	0.023	0.054	0.002	0.006	0.000
French - German	0.008	0.122	0.368	0.001	0.013	0.006
French - Scandinavian	0.065	0.367	0.498	0.000	0.490	0.000
German Scandinavian	0.041	0.309	0.282	0.566	0.072	0.336

Source: Levine (1998); LaPorta et al. (1997)

B Regression Analysis

This section examines whether legal rights play an important role in the development of banking systems. The model is of the form:

$$\text{BANK} = \alpha_1 + \beta_1 \text{CREDITOR} + \beta_2 \text{ENFORCE} + \beta_3 \text{LGDPCAP} \quad (6)$$

which is the same model used by Levine (1998).

Table II presents the results. Regressions (1)-(3) in Panel A recapture the results of Levine that creditor rights promote banking development. Moreover, regressions (4)-(6) show that when the sample is restricted to common-law countries, creditor rights still play a significant positive role in banking development as predicted by this paper. As Levine also points out, this positive effect is economically significant. However, the economic importance of creditor rights is much more significant than what Levine has predicted. A one standard deviation increase in CREDITOR (0.83) in common-law countries creates an increase of 0.20 in the BANK variable (using the *smallest* value of the estimated coefficients), which is about 26 percent of the mean value of BANK in common-law countries. Levine's estimate of the increase in BANK as a result of one standard deviation increase in CREDITOR is about 12 percent of the mean. The discrepancy is due to the fact that I focus on common-law countries and analyze civil-law countries separately.

In summary, the evidence suggests that banks in common-law countries develop better when courts are provided with laws that protect creditors' rights. This supports

Table II: Bank Development in Common- and Civil-Law Countries

Panel A - Parameter Estimates

Legal Tradition	Common and Civil Combined			Common			Civil		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Intercept	-0.4383 (0.015)	-1.5913 (0.000)	-1.1198 (0.002)	-0.6215 (0.016)	-1.3218 (0.000)	-1.2255 (0.000)	-0.6160 (0.022)	-2.1504 (0.002)	-1.2103 (0.107)
Creditor	0.0727 (0.073)	0.1226 (0.005)	0.1009 (0.017)	0.2863 (0.000)	0.2444 (0.000)	0.2656 (0.000)	0.0345 (0.572)	0.1006 (0.131)	0.0541 (0.430)
Enforce	0.1750 (0.000)		0.0886 (0.047)	0.1750 (0.000)		0.0470 (0.378)	0.2007 (0.000)		0.1369 (0.031)
Lgdpcap		0.2786 (0.000)	0.1504 (0.021)		0.2317 (0.000)	0.1797 (0.007)		0.3428 (0.000)	0.1206 (0.330)
R ² (percent)	50	50	52	71	80	81	52	50	53
# of observations	42			15			27		

Note: Heteroscedasticity-consistent (using White correction) p-values are in parenthesis.

Panel B - Chow Test Results (p-values)

(4) & (7)	
All variables	<0.001
Creditor	0.002
(5) & (8)	
All variables	0.017
Creditor	0.064
(6) & (9)	
All variables	0.003
Creditor	0.008

the argument that banks in common-law countries rely on courts to resolve some of their conflicts with the borrowers.

However, as predicted, creditor rights do not play a significant role among the civil law countries (regressions 7-9). A one standard deviation increase in CREDITOR (0.94) in civil-law countries creates a *statistically insignificant* increase of 0.09 in the BANK variable (using the *largest* value of the estimated coefficients), which is about 10 percent of the mean value of BANK in civil-law countries.¹⁵

Note that one possible explanation for the lack of statistical significance in the civil-law sample could be the lack of variation in the creditor rights variable among the civil-law countries. In other words, creditor rights could be important but the analysis might not be able to capture their effect if all civil-law countries have similar creditor-right scores. Panel A of Table I shows that the standard deviation of CREDITOR is 0.94 in civil-law countries and 0.83 in common-law countries. Given that CREDITOR is significant in the common-law sample despite the lower standard deviation, we can conclude that the effect of creditor rights on banking development is statistically insignificant in the civil-law countries.

Finally, in order to show that there are fundamental differences between common-law and civil-law countries, I run a Chow Test to test the null hypothesis that common-law and civil-law subsamples correspond to similar economic environments where in-

¹⁵If I use the smallest estimate, as I did with the common-law sample, the increase in the BANK variable is only 0.03.

vestor protection plays a comparable role in bank development. More precisely, the null is defined as:

$$H_0 : \alpha_{1,common} - \alpha_{1,civil} = 0 \text{ and } \beta_{1,common} - \beta_{1,civil} = 0 \text{ and } \beta_{2,common} - \beta_{2,civil} = 0 \\ \text{and } \beta_{3,common} - \beta_{3,civil} = 0$$

I also run a separate test that compares only the parameter estimates of CREDITOR in common-law and civil-law countries. That is,

$$H_0 : \beta_{1,common} - \beta_{1,civil} = 0$$

The results are in Table II-Panel B. Both nulls are rejected at 1 percent significance level in comparing the models (4) & (7) and models (6) & (9). The nulls are also rejected in (5) & (8) although only at 10 percent significance level. We can, therefore, conclude that civil-law and common-law countries have dissimilar economic environments where creditor rights play different roles.

VII Concluding Remarks

This paper makes one important point: Legal tradition and prevailing economic conditions jointly determine whether a country is bank- or market-dominated. The legal tradition is reflected in the way laws are made and applied rather than in specific rules on investor protection. For historical reasons, civil-law courts are less willing to interpret the laws and create new rules relative to their common-law counterparts. Therefore, they are less likely to reach a fair decision when contracts are breached in

a manner that is not described in the laws of the country. In an environment where individual investors do not wish to lend in the absence of court protection due to the risk of fraudulent action by the firm, banks are still willing to lend because they can influence firms' behavior by threatening to withhold the services that only banks can provide. This leads to bank-dominated economies in civil-law countries. Nevertheless, banks provide their services at a cost. I assume that bank shareholders must be compensated for the costs related to the agency problems that are likely to arise in a large institution. Therefore, firms prefer markets as a source of funds in common-law countries where courts are sufficiently effective in solving the conflicts between firms and individual investors. The paper also tests or provides evidence from the literature related to the three main predictions of the model:

- Common-law countries provide better investor protection than civil-law countries;
- Creditor protection is relatively less important in civil-law countries where banks can resolve conflicts without court intervention;
- Legal rules that protect creditors promote the growth of banks in common-law countries.

The data confirms these predictions.

As a cautionary note, the paper does not take into account the convergence of civil and common law traditions that has occurred in the late 20th century. An example to

this incident would be French tort law which is entirely judge-made in contrast to the assumption in this paper that civil-law judges do not create law. However, this is a recent phenomenon given the long history of these traditions. Whether a convergence in legal traditions leads to a convergence in financial system structure remains to be seen.

Appendix

A Proofs

Proof of Lemma 1:

Given the lender's equilibrium pricing policy, the risky borrower should not deviate from its choice of the safe project if $\tilde{R} = \underline{R}$ and its choice of the risky project if $\tilde{R} = \overline{R}$.

The following two constraints guaranty this condition.

$$S_2 - I_1 \underline{R} > \gamma_2(Y_2 - I_1 \underline{R}) \tag{A-1}$$

$$S_2 - I_1 \overline{R} < \gamma_2(Y_2 - I_1 \overline{R}) \tag{A-2}$$

A-1 establishes that if the interest rate is low and the creditor believes that the borrower will choose the safe project, the borrower will indeed choose the safe project. Therefore, the creditor will charge an interest factor of \underline{R} and earn zero profit. A-2 establishes that if the interest rate is high and the creditor believes that the borrower will choose the safe project, the borrower will actually choose the risky project. Therefore, the creditor must believe that the borrower will choose the risky project and charge an interest rate factor of $\overline{R}\gamma_2^{-1}$. Again, at this rate factor, the creditor makes zero profit. Rearranging A-1 and A-2, one obtains

$$\underline{R} < (S_2 - \gamma_2 Y_2) (I_1(1 - \gamma_2))^{-1} < \overline{R} \tag{A-3}$$

Thus, the borrower's project choice is a best response to the creditor's pricing policy and the creditor's pricing policy is a best response to the borrower's project choice. ■

Proof of Proposition 1:

The individual investor is willing to go to court and give up its endowment, if the net cost of honoring the contract and keeping the endowment e , $(C - \Sigma + e)$, is greater than the net benefit gained from consuming the fee, C , and losing the endowment e , (C) . In algebraic terms, if

$$\Sigma > e \tag{A-4}$$

In the case of a bank, I assume without loss of generality that the bank consists of N individual investors selling loan commitments to N borrowers. If the spot interest rate is high at time 1, let N_r be the actual number of borrowers with a loan commitment that have a project available and request a loan under the commitment ($N_r \leq N$). Let g be each investor's incremental gain from renegeing as opposed to not renegeing. g can be written as

$$g = C - (C + e - N_r N^{-1} \Sigma) \tag{A-5}$$

If the bank reneges, investors (shareholders) can consume C but the court will seize everything else. However, if the bank honors the contract, each investor pays the total subsidy requested by borrowers, $N_r \Sigma$, after its cost is divided among N investors and

it keeps C and e . Then, renegeing is unprofitable at date-1 ($g < 0$) if

$$e > N_r N^{-1} \Sigma \tag{A-6}$$

The credibility of a commitment at date-0 is determined by the probability that the contract will be honored at date-1. Note that in the event that N_r is sufficiently close to N , even the bank will renege on its commitment at date-1. So, the credibility of the commitment depends on the *unlikelihood* of this event or

$$\Pr(N_r < eN\Sigma^{-1}) \tag{A-7}$$

Let η be a positive finite integer. The probability that N_r will be in η neighborhood of N is

$$\sum_{i=0}^{\eta} \Pr(N_r = N - i) = \sum_{i=0}^{\eta} \theta^{N-i} \tag{A-8}$$

For N sufficiently large ($N \rightarrow \infty$), $\lim_{N \rightarrow \infty} \sum_{i=0}^{\eta} \theta^{N-i} = 0$. Note that for any η , there exists a sufficiently large but finite N such that $\theta^{N-\eta} \approx 0$ for all practical purposes. So, an infinite N is not necessary for my results. Then, for N sufficiently large,

$$\Pr(N_r < N - \eta) = 1$$

Therefore,

$$\Pr(N_r N^{-1} < 1) = 1$$

and

$$\Pr(N_r N^{-1} \Sigma < \Sigma) = 1 \tag{A-11}$$

Comparing A-4, A-6, and A-11, there exists values of e such that

$$\Pr(N_r N^{-1} \Sigma < e < \Sigma) = 1 \tag{A-12}$$

For those values of e specified in A-12, individual investors renege on their commitments and banks keep their promises. ■

Proof of Proposition 2:

The idea that loan commitments can be used to give borrowers the right incentives by taxing now and subsidizing later has been formalized in earlier studies (e.g. Boot et al., 1993). Therefore, I will not prove the equilibrium in great detail but simply quantify the “tax” and the “subsidy”.

Part (i) is just a summary of the ideas presented in Sections III and IV. To recapitulate, note that borrowers always pay their first-period loans when $\alpha > \alpha^*$ due to the high risk of successful litigation. Therefore, the date-0 spot market is available to all borrowers. Safe borrowers prefer capital markets in the second period because they do not need an interest rate subsidy and borrowing from a bank is costly (ω). Risky borrowers, however, choose banks and invest in the socially optimal safe project.

Now let $\alpha < \alpha^*$. I will initially analyze how the bank compels the safe borrower to pay its first-period loan and then consider the case of the risky borrower. The case

of the safe borrower is relatively less complicated because the bank does not have to worry about moral hazard in the second period.

Let \tilde{R}_S be the second-period interest rate factor offered to the safe borrower. \tilde{R}_S is set to such a level that the borrower's profit from hiding the cash flows and borrowing at the spot rate is less than the profit it would obtain by paying the first-period loan and receiving the subsidy. In algebraic terms,

$$(1 - \alpha)Y_1 + S_2\tilde{R}^{-1} - I_1 \leq Y_1 - I_0\hat{R} + S_2\tilde{R}_S^{-1} - I_1 \quad (\text{A-13})$$

where \hat{R} is the interest rate factor of the first-period loan which will be defined when I discuss the first-period contract. Let me assume for the moment that $Y_1 - I_0\hat{R} > 0$ so that \hat{R} is feasible. I will derive the feasibility condition in a moment. Rearranging A-13,

$$\tilde{R}_S = S_2 \left(\tilde{R} \left(\hat{R}I_0 - \alpha Y_1 \right) + S_2 \right)^{-1} \tilde{R} \quad (\text{A-13}')$$

The subsidized rate factor, \tilde{R}_S , depends on the spot rate and is state-contingent. One can also write the amount of subsidy given to the safe borrower, $\Sigma_S(\tilde{R})$, as

$$\Sigma_S(\tilde{R}) = \tilde{R} - \tilde{R}_S = \tilde{R}^2 \left(\hat{R}I_0 - \alpha Y_1 \right) \left(\tilde{R} \left(\hat{R}I_0 - \alpha Y_1 \right) + S_2 \right)^{-1} \quad (\text{A-14})$$

In return for the subsidy, the safe borrower pays a fee, C_S , at date-0 that represents the bank's expected cost and the cost of dealing with a bank, ω .

$$C_S = \gamma_1\theta \left(\lambda\Sigma_S(\bar{R}) + (1 - \lambda)\Sigma_S(\underline{R}) \right) I_1 + \omega \quad (\text{A-15})$$

The fee reflects the fact that the bank will not honor the contract if the safe borrower truthfully defaults at time 1. Therefore, the subsidy will be available with probability γ_1 .

Similarly, let \tilde{R}_Y be the second-period interest rate factor offered to the risky borrower. \tilde{R}_Y must be sufficiently low to prevent moral hazard in the second period if the spot rate is high and also low enough to induce the borrower to pay its first-period loan. Then, from (3) and (A-13'),

$$\tilde{R}_Y = \begin{cases} \min \left(S_2 \left(\bar{R}(\hat{R}I_0 - \alpha Y_1) + S_2 \right)^{-1} \bar{R}, (S_2 - \gamma_2 Y_2) (I_1(1 - \gamma_2))^{-1} \right) & \text{if } \tilde{R} = \bar{R} \\ S_2 \left(\underline{R}(\hat{R}I_0 - \alpha Y_1) + S_2 \right)^{-1} \underline{R} & \text{if } \tilde{R} = \underline{R} \end{cases} \quad (\text{A-16})$$

Note that \tilde{R}_Y offers the borrower two takedown alternatives. Multiple takedown alternatives are very typical of bank loan commitments we observe in the market today.

Let $\Sigma_Y(\tilde{R}) = \tilde{R} - \tilde{R}_Y$ be the amount of subsidy given to the risky borrower. Then,

$$\Sigma_Y = \begin{cases} \bar{R} - \min \left(S_2 \left(\bar{R}(\hat{R}I_0 - \alpha Y_1) + S_2 \right)^{-1} \bar{R}, (S_2 - \gamma_2 Y_2) (I_1(1 - \gamma_2))^{-1} \right) & \text{if } \tilde{R} = \bar{R} \\ \underline{R} - S_2 \left(\underline{R}(\hat{R}I_0 - \alpha Y_1) + S_2 \right)^{-1} \underline{R} & \text{if } \tilde{R} = \underline{R} \end{cases} \quad (\text{A-17})$$

In return for the subsidy, the risky borrower pays a fee, C_Y , at date-0 that represents the bank's expected cost.

$$C_Y = \gamma_1 \theta \left(\lambda \Sigma_Y(\bar{R}) + (1 - \lambda) \Sigma_Y(\underline{R}) \right) I_1 + \omega \quad (\text{A-18})$$

With the loan commitment in place, let us now see how the existence of banks affects the date-0 spot market. Note that because bank lending is costly (ω), borrowers will prefer capital markets at time 0. Then, the question is: Does the date-0 spot market exist and if it does, what is the first-period interest factor?

Knowing that the borrower will pay its first-period loan if a project is available in the second period (with probability θ), individual investors pick a first-period interest rate factor, \widehat{R} , at which they will break even at time 0:

$$\gamma_1(\theta I_0 \widehat{R} + (1 - \theta)\alpha Y_1) = I_0 \quad (\text{A-19})$$

or rearranging,

$$\widehat{R} = \theta^{-1} (\gamma_1^{-1} I_0 - (1 - \theta)\alpha Y_1) \quad (\text{A-19}')$$

The left-hand side of (A-19) accounts for the fact that if a second-period project is not available (with probability $(1 - \theta)$), the bank's subsidy is worthless and therefore, the borrower will not pay the first-period loan. Then, the investor will sue the borrower and receive Y_1 with probability α .

Now that we have defined \widehat{R} , we can conclude the proof by determining under what condition \widehat{R} is feasible. The interest factor \widehat{R} is feasible if $I_0 \widehat{R} \leq Y_1$. In other words, the loan must be affordable. Using, A-19' and rearranging, we get, $\theta \geq \frac{I_0 - \alpha \gamma_1 Y_1}{\gamma_1 Y_1 (1 - \alpha)}$, which is the restriction I impose on θ in part (ii) of the proposition. Note that $\frac{I_0 - \alpha \gamma_1 Y_1}{\gamma_1 Y_1 (1 - \alpha)} < 1$ by assumption 1-i. ■

B Optimality of the MAC Clause

A loan commitment with a MAC clause improves the borrower's welfare if

$$\begin{aligned} & \gamma_1 Y_1 - I_0 + \theta (\gamma_1 S_2 + (1 - \gamma_1) \gamma_2 Y_2) \left(\lambda \bar{R}^{-1} + (1 - \lambda) \underline{R}^{-1} \right) - I_1 \\ & > \theta \left(S_2 \left(\lambda \bar{R}^{-1} + (1 - \lambda) \underline{R}^{-1} \right) - I_1 \right) \end{aligned} \tag{B-1}$$

In other words, investing in the first-period project and taking the risk of investing in the risky project in the low state (left-hand side) dominates a sure investment in the safe project without investing in the first-period project (right-hand side).

Rearranging B-1, I obtain

$$\gamma_1 Y_1 - I_0 > \theta (1 - \gamma_1) (S_2 - \gamma_2 Y_2) \left(\lambda \bar{R}^{-1} + (1 - \lambda) \underline{R}^{-1} \right) \tag{B-1'}$$

That is, even though the first period project is profitable, if its profitability is below the limit set by the right-hand side of B-1', the borrower forgoes this investment.

Proposition 2 that I presented earlier assumes that the inequality in B-1' holds. Therefore, risky borrowers choose loan commitments with MAC clauses to be able to invest in the first-period project. Proposition 2' rephrases Proposition 2 assuming that B-1' does not hold.

Proposition 2'. *(i) $\alpha > \alpha^*$: Banks and Capital Markets co-exist in the financial system at time 1. Safe borrowers prefer capital markets and risky borrowers choose banks. The relative size of safe and risky borrowers in the economy determines which alternative (bank vs. capital markets) dominates the other. Loan commitments sold in*

this system do not contain a MAC clause. The economy is in a first-best state where all projects are undertaken.

(ii) $\alpha < \alpha^$: Both safe and risky borrowers prefer banks at time 1. The financial system is bank dominated. If B-1' holds, loan commitment contracts sold in this system contain a MAC clause. The bank refuses to lend in the second-period if the borrower is in the low state. If B-1' does not hold, loan commitments sold to safe (risky) borrowers (do not) contain a MAC clause. Risky borrowers do not invest in the first period project. The economy is in a second-best state because of the forgone investments.*

Proof: The proof is similar to that of Proposition 2. ■

When B-1' does not hold, the risky borrower prefers a sure investment in the second-period safe project to investing in the first-period project. Therefore, it purchases a loan commitment *without* a MAC clause and forgoes the first-period project. In return for the subsidy, the risky borrower pays the bank

$$C = \theta\lambda\Sigma + \omega$$

which is the same fee described in 4.

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