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RISKS TO LENDERS AND BORROWERS  
IN INTERNATIONAL CAPITAL MARKETS

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**ABSTRACT**

This paper provides a framework for understanding the risks to borrowers and lenders in capital markets. We begin with a description of a capital markets in a domestic context. This allows us to focus on two key imperfections which lie at the heart of all financial systems: imperfect information, and the difficulty of making credible commitments for repayment. In the international context, these problems tend to be exacerbated. There are also two sources of risk in international borrowing that are absent in a purely domestic context: the risk that sovereign borrowers will default, and the risk of macroeconomic instability that stems from the impact of net capital flows on the monetary system.

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## I. Introduction

This paper provides a framework for understanding the risks to borrowers and lenders in international capital flows. To isolate the features that are intrinsically *international*, we begin by analyzing the financial system in a purely *domestic* context. This allows us to focus on the extra effects associated with international activity.

All financial systems are fundamentally affected by two important and pervasive phenomena. First, borrowers and lenders are plagued by *asymmetric information*. Borrowers typically have better information about repayment prospects than do lenders, and try to use this to their advantage. But lenders are aware of this risk and act accordingly, limiting their exposure and charging a premium for bearing this risk. The second fundamental imperfection is that borrowers cannot credibly commit to make repayments that lenders can collect at low cost. Since borrowers may choose to renege on their commitments, lenders bear the risk of not being repaid, but again, since lenders are aware of this possibility, *enforcement risks* end up being shared. Together, these frictions lead to low levels of financial activity, high interest rates, and insufficiently spread investment risks.

When we add the international dimension, both problems are exacerbated. Information is better inside countries than across international boundaries, and it is easier to use the legal system to back up contracts within a country than between countries. Consequently we expect to see relatively low amounts of international lending and borrowing, substantial premia for international borrowing compared to domestic borrowing, and risks that are poorly spread across countries. Our framework makes it unsurprising then that we actually observe a low level of international (relative to

domestic) financial activity. However, international lending can still be expected to occur between countries with dramatically different levels of wealth, different sources of systemic risk, or if competition from foreign capital improves the efficiency of the domestic financial system.

The differences between domestic and international financial systems are not merely *microeconomic* issues of information and enforcement. International capital flows are associated with two additional *macroeconomic* risks that are essentially absent in the domestic context. The first is *sovereign risk*; governments can choose to default on their international obligations. The second is the risk that international capital flows create macroeconomic instability through *monetary spillovers*. When capital flows internationally, the effects on the balance of payments spill out to the macro-economy through the money supply and exchange rate, frequently with adverse effects.

In the next section of the paper, we begin our analysis with a description of the financial system in a purely domestic setting. After identifying the fundamental sources of risk in this context, we move on to an international setting. Section IV provides an analysis of the macroeconomic effects of international lending that are absent in a purely domestic setting. The paper ends with a few brief conclusions.

## **II. The Domestic Financial System**

We begin our analysis by considering the financial system at a relatively abstract level in a purely domestic context. This enables us to isolate the fundamental problems, which constitute extra risks to lenders and borrowers, that can, in principle, be avoided

with a perfect financial system. In the next two sections, we consider what extra issues emerge in an international context.<sup>i</sup>

It is easiest to isolate the issues of interest with a thought-experiment. Imagine an economy with a large number of farmers. The farmers are interested in borrowing seed (capital) to plant (invest) in their fields. A large number of individuals saving for the future are potentially interested in loaning funds to the farmers, especially if the returns exceed the “safe” (risk-free) rate of return.

Consider, first, an idealized setting in which a) all markets are competitive; b) information is costless; and c) borrowers and lenders can write credible contracts, guaranteed to be honored by both sides by a costless legal system, that cover all possible contingencies.

The role of a financial system is to mobilize the savings of potential lenders and allocate these funds efficiently across the investment projects of potential borrowers. In our idealized economy, how well does the system work?

Flawlessly. In the frictionless setting, savers lend to farmers freely at the risk-free rate.<sup>ii</sup> Market forces allocate the income of individuals efficiently between consumption and savings, and then allocate savings across different farmers’ investment projects. Each farmer borrows seed, signing a contract that specifies repayment plus interest to the lender under all possible circumstances. Since lenders compete to loan funds to borrowers, loan rates are driven down to the risk-free interest rate (arbitrage eliminates higher rates and no lender accepts less than the risk-free rate). Lenders do not have to worry about how much effort the farmer puts into tending crops — their repayment is not dependent on the farmer’s actions.<sup>iii</sup> All farmers are able to borrow up to the point that

the additional discounted expected return from capital just equals its price (the interest rate). There are no liquidity problems, and there is no need for precautionary savings. Government policy is unnecessary and would in general be counter-productive.<sup>iv</sup>

This idyllic example is illustrated with dashed lines in Figure 1. Perfect competition insures that the supply of funds (measured on the x-axis) is flat at the risk-free rate, denoted  $r$  (interest rates are measured on the y-axis).<sup>v</sup> The demand for loans is downward sloping.<sup>vi</sup> The point at which the two lines intersect gives the equilibrium quantity lent,  $x$ .

### **Imperfect Information and Enforcement**

Unfortunately, the idyllic situation portrayed in Figure 1 is far from reality. Each of the assumptions that we made is grossly unrealistic as a description of even advanced countries. There are barriers to entry in the financial system, information is unevenly distributed, and there are problems in enforcing contracts. Unsurprisingly, the predictions of the model are also not borne out in reality.

There are two fundamental reasons why our frictionless example is a poor description of reality: imperfect information and difficulties associated with writing and enforcing contracts.<sup>vii</sup> Information is costly to obtain and the law imposes restrictions on the set of loan contracts that can be written (e.g., a debtor cannot waive his right to file bankruptcy). Moreover, even within the set of legally enforceable contracts, the cost of using the legal system are high and uncertain.

The most critical legal limitations on loan contracts are those that limit the amount that can be seized from the borrower should the borrower default on the loan. Of these, the most important is the right to declare bankruptcy, which limits the debtor's liability.

In the case of individual borrowers, personal bankruptcy, elimination of debtors' prisons, and prohibitions on slavery combine to make it almost completely impossible to seize the typical individual's most valuable asset, his human capital. In many states, his second and third most valuable assets—his house and car—also enjoy some protection against seizure.<sup>viii</sup>

Limited liabilities laws and their ilk would not, *per se*, be directly relevant to lending in a world of full (symmetric) information. The borrower could take care of default risk by purchasing insurance from a third party, much in the way that some mortgage covenants require the borrower to obtain mortgage insurance and homeowner's insurance. In the real world, however, information is typically asymmetric, with the borrower having superior information about his prospects than a lender or insurer. Here, default risk becomes directly relevant to lending. As is well known (see, e.g., Rothschild and Stiglitz, 1976), when the insured have superior information to the insurers—a situation known as *adverse selection*—insurance markets do not work efficiently. In particular, risks will not be fully insured. Consequently, a lender will ultimately face some default risk. This has a number of consequences for lending.

First, because the lender is exposed to default risk, the lender will have to charge a higher interest rate as a means of being compensated for bearing this risk. Hence, the interest rate will be higher than it would be absent default risk.

Second, because the lender will want to know the extent of this risk, the lender will be forced to acquire information about the borrower. Since information acquisition is costly, it is inefficient for two parties, the lender and an insurer, to both collect this information. Consequently, efficiency dictates that the supplying of funds function and the insurance

function be bundled together by a single entity. That is, the interest rate is the sum of two prices: the cost of funds plus an “insurance premium” that the borrower pays the lender for the latter to assume the default risk. Moreover, because of asymmetric information, the borrower’s total cost of borrowing (the interest rate plus the “premium”) will be greater than it would have been given symmetric information. Hence, the volume of lending will be less relative to a symmetric-information world.

Third, lenders will tend to be “large.” Given that each loan is now risky, an individual would be reluctant to enter into a one-to-one lending arrangement; the individual would not want to absorb that risk. If, however, that individual pools his capital with the capital of others and this “syndicate” makes a variety of loans, they can diversify away much of the risk.<sup>ix</sup> The need for financial intermediaries to be “large,” combined with government regulation of entry into this industry, will yield these financial intermediaries a certain degree of market power. Consequently, we can expect these financial intermediaries to price their loans above their cost, which will further reduce the volume of lending relative to a symmetric-information world.

Fourth, asymmetric information can lead to both the misallocation of funds and an increase in interest rates due to a “lemons” problem.<sup>x</sup> This problem is most readily illustrated by an example: suppose that there are two types of farmers, high risk and low risk, who are equally represented in the population of farmers. A high-risk farmer will, with equal probability, produce either \$13 worth of output or \$0 worth of output. A low-risk farmer will produce \$7 worth of output with certainty. Observe that the low-risk farmer has the higher *expected* return. Both types of farmer have negligible capital and must borrow \$6 for seed. Although a farmer knows what type he is, a lender does not.



Assume that the farmers are protected by limited liability—should they default on a loan the lender gets only the value of the output. Finally, assume the risk-free interest rate is 10%, so lenders will only make loans that have an *expected* value of at least \$6.60. In this situation, the lender will require a payment of at least \$8.80 to make a loan of \$6; otherwise, because of default risk, the lender will certainly lose money on average.<sup>xi</sup> But since the low-risk farmer only earns \$7, he will certainly default; he would do better to exit farming and employ his negligible capital elsewhere—this despite the fact that were this a symmetric-information world he would want and could receive a loan of \$6. Recognizing that the low-risk farmer will exit the market, the lender will demand to be repaid at least \$13.20 to make a loan of \$6 (since it knows it will be lending to high-risk farmers only, who have a 50% default rate). But then the high-risk farmer will also certainly default and he, too, would exit farming. Viewed another way, the farm sector is starved of capital and hence ceases to function. Observe that although the high-risk farmer would be excluded from borrowing under *symmetric* information (his expected return of \$6.50 means a lender could not earn a 10% return), the low-risk farmer would not. Hence, we see that asymmetric information will lead to higher interest rates and the misallocation of capital.<sup>xii</sup>

Fifth, because the lender absorbs some of the risk—essentially provides partial insurance to the borrower—the borrower’s incentives can be dampened. Because what the borrower receives in good (non-default) outcomes is only a portion of his project’s return, his incentives to work for good outcomes is reduced. A related problem is that because the borrower is not gambling with his own money, his incentives under worsening financial conditions could be to “double up” on his bets—attempt to borrow

more or pursue riskier, asset-dissipating behavior—in a desperate attempt to generate cash. That is, because it's not his money on the margin, the desperate borrower feels no compunction against throwing good money after bad. Asymmetric information—the high cost of monitoring the borrower—makes it difficult for the lender to guard against such “moral hazard” problems.

Although the discussion so far paints a somewhat dire picture, it needs to be remembered that both lenders and borrowers can take measures to mitigate some of the problems caused by asymmetric information. Lenders can, for instance, monitor borrowers and employ methods of screening poor credit risks from good credit risks. They can also demand collateral (in fact, roughly 20% of FDIC-insured institutions lending is collateralized with real estate—see Table 1—suggesting that the importance of limiting default risk in lending). Since lenders presumably undertake these measures to reduce the costs to which they would otherwise be exposed from asymmetric information, these measures should serve to lower the cost of lending relative to a situation of “pure” asymmetric information. We note, for later, that these methods often benefit from (and may even require) proximity between lender and borrower. Borrowers too can attempt to mitigate problems of asymmetric information by taking actions that signal information about them (such as offering collateral). Unlike lender screening and monitoring, however, signaling does not necessarily lower borrowing costs. The reason is that there is something of a “rat race” component to signaling; for a signal to convince a lender of the borrower's credit worthiness, it may have to be “extreme.” Consequently, total borrowing costs (interest plus cost of signaling) can be greater than in a world in

which borrowers were prohibited from signaling.<sup>xiii</sup> This further increase in borrowing costs will, of course, lead to even less borrowing and an even smaller capital market.

The information and enforcement frictions between lenders and borrowers lead to two general conclusions. First, borrowers will pay a premium for “external finance,” i.e., non-collateralized borrowing. This premium compensates lenders for default risk, with the size of the premium being affected by the observable risk, the unobservable risk due to moral hazard, and the “lemons” problem (offset, somewhat, by the lender’s efforts to screen for credit worthiness and monitor existing loans). Second, as a consequence, investors are able to borrow less than they would with perfect (symmetric-information) financial markets. The scale of financial activity is smaller than it would be in the absence of these problems.

To make this more concrete, let us return to the farming example. Even with a perfect financial system, the harvest will be a result of many factors, some controlled by the farmer (e.g., the amount of effort spent tending the crops), some the result of the financial system (the amount of seed planted), and others more random still (weather). If it were costless to monitor the actions of farmers and to collect the payments specified in an all-encompassing and costlessly-enforced contract, a saver could lend funds directly to farmers without the need for any financial intermediary. In return, savers would receive a fixed return. But in reality, the farmer has better information than potential investors about soil quality, pest problems, and so forth. Furthermore, it is impossible to specify the amount of effort the farmer should apply in all circumstances; and even if it were, it would be impossible to monitor how much effort is actually applied. Court costs are far from negligible, and the farmer will also have the right to declare bankruptcy and walk

away from his debt in sufficiently bad circumstances. Financial intermediaries, which can exploit economies of scale to reduce information and enforcement costs plus diversify risk, will come into existence—with possibly some reduction in lending competition—and all financial activity will be channeled through them; the cost-advantage of intermediaries will eliminate direct loans from savers to borrowers. Intermediaries will only advance funds to farmer at a loan rate higher than the risk-free interest rate. The farmer will accordingly borrow less than he would have chosen at a lower loan rate.

As a result, the investment decisions made by the farmer will depend on the farmer's financial situation. The farmer will first use internal funds to buy seed, and only rely on external finance (e.g., bank loans) where necessary. The farmer will not maximize the value of the farm; crops will not be planted to the point where the risk-adjusted cost of funds equals the marginal expected gain from planting seed. Investors and farmers, consequently, lose out on profitable investment opportunities not undertaken and the farmers further lose in that they bear too much idiosyncratic risk.

The effects of asymmetric information and enforcement problems are readily shown in Figure 2. Both the demand for seed capital and the supply of savings are affected; the more realistic schedules are portrayed with solid lines (though otherwise the figure is identical to Figure 1). The supply of funds is unaffected at low levels of lending activity. Up to the point of the farmers' collateralizable net worth, farmers can simply self-finance investment projects or provide collateral for any net borrowing.<sup>xiv</sup> But after this point, finance from other lenders—"uncollateralized external finance" is required. Assuming a decreasing returns to scale screening and monitoring technology, the supply curve then

rises, reflecting the rising marginal cost of originating loans. The demand curve shifts in as well, since signaling behavior and the removal of full insurance raise the farmers' cost of borrowing.

## **Policy**

Policy towards the financial sector matters because it can make business more or less costly for financial intermediaries. The more costly lending is, the greater the premium intermediaries will demand and, as the price of funds increases, the less borrowing there will be.

Policy can also protect—or harm—the precarious balancing act financial intermediaries must perform: The fact that their assets—deposits—are less liquid than their liabilities renders their financial condition delicate and confidence is thus essential to their stability. If confidence wanes for any reason, the fact that demand for funds are met on a first-come, first-served basis gives creditors an incentive to liquidate their deposits at the first sign of trouble. Such a run means a contraction of lending activity.

For these reasons, governments wish to avoid disruptions to the financial sector. There are a number of standard policies which can be taken to strengthen the financial sector. These include: 1) deposit insurance for banks; 2) reserve requirements; 3) capital requirements; 4) restrictions on the riskiness of assets held by financial firms; 5) direct supervision; and 6) the provision of lender of last resort facilities. These policies can help to reduce ensure the stability of the financial sector, thereby reducing the underlying enforcement and information problems. By reducing risks they can encourage more efficient, inexpensive and widespread financial activity.<sup>xv</sup>

### **III. How Does International Lending Exacerbate Informational and Enforcement Problems?**

Both of the fundamental problems we considered with the financial system are exacerbated when we consider international lending. Local intermediaries are likely to have better information about local investment opportunities and risks than foreign intermediaries; they are also more likely to know how to squeeze payments from local borrowers.<sup>xvi</sup> In contrast, foreign intermediaries suffer from less information; hence, the problems of asymmetric information discussed above will be worse than for domestic lending.

The history of financial intermediation in the United States offers some support that domestic lenders have advantages over foreign lenders. Although partially due to restrictions on interstate banking and state restrictions on branch banking, most credit organizations in the U.S. have tended to be local operations despite the obvious risk-reduction advantages to geographic diversification. This was undoubtedly due to the high cost of obtaining information about geographically distant borrowers.<sup>xvii</sup> Indeed, even *social* distance proved sufficient to restrict many savings and loan societies to operating within a single local immigrant group. More recently, evidence from the operation of savings and loans in the 1980s finds that those that made “long-distance” loans were outperformed by those that did not.<sup>xviii</sup>

A related problem is that foreign intermediaries often must compete against domestic intermediaries. As we have just noted, domestic intermediaries will have an informational advantage *vis-à-vis* their foreign competitors. There are two consequences

of this advantage. First, the domestic intermediaries will, for reasons discussed previously, enjoy a cost advantage over foreign intermediaries. This allows them to be tougher competitors, which squeezes the foreign intermediaries' profits. Indeed, the cost advantage could be sufficient that foreign intermediaries are unable to capture enough of the market to cover the fixed costs of entry, so they are kept out of the domestic credit market altogether. The second consequence is that because a domestic intermediary is able to offer better rates than a foreign competitor, foreign competitors will be the second-choice lender for domestic borrowers. That is, the foreign intermediary could face an adverse selection of borrowers who have been denied credit by the better-informed domestic intermediaries. This adverse selection means that foreign lenders are exposed to even greater risk.

There is some empirical evidence to support these conjectures. When U.S. savings and loans were allowed by deregulation to pursue lines of business previously restricted to commercial banks, those that took advantage of these new powers were greatly outperformed by those that chose to stay with traditional lines of business.<sup>xix</sup> A plausible interpretation of this result is that those savings and loans that strayed from traditional lines were at an informational disadvantage *vis-à-vis* commercial banks. Consequently, they made lower profits and suffered higher rates of loan defaults.<sup>xx</sup>

Given these informational disadvantages faced by foreign lenders, the observed low levels of international financial activity seem unsurprising. This is especially true when we add the impact of enforcement problems.

Enforcement can be harder across international borders than within international borders. First, an alien legal system means that a foreign lender's domestic expertise on

enforcement is of lower value; the foreign lender may, therefore, need to make expensive investments in acquiring the necessary expertise or become reliant on expensive local expertise. Second, in countries where the rule of law does not always function well, such as some developing countries or some post-communist states, enforcement can be hampered by the borrower's ability to employ extra-legal methods to deter enforcement (e.g., harass auditors, spirit assets away, etc.). Third, the legal system could exhibit a nationalistic bias, making enforcement by a foreign lender more difficult than it would be for a domestic lender.<sup>xxi</sup> These problems add either directly to the foreign lender's cost of lending or, by increasing the foreigner's risk, indirectly to the cost of lending. Higher costs, in turn, mean the foreign supply of funds shifts in, raising the interest rate and lowering the total amount of lending.

A further problem with international lending is that international banking policy is less well developed than domestic banking policy. Many of the policy institutions that serve to reduce the risks in the domestic financial sector do not exist at the international level.<sup>xxii</sup> Deposit insurance, for instance, is essentially absent internationally.<sup>xxiii</sup> Lender-of-last-resort facilities are a very uncertain business at the international level.<sup>xxiv</sup>

On the other hand, financial intermediaries can benefit from a lack of regulation. Government-imposed reserve requirements and bank supervision are largely absent at the international level, and requirements on capital-adequacy and asset riskiness are much more difficult to monitor. This provides intermediaries greater flexibility, which, in theory, should allow them to make greater profits. The U.S. experience with saving and loan deregulation, however, suggests that greater flexibility may not be associated with greater profits in practice. The reasons for this are relevant to international lending.



Intermediaries may respond to greater flexibility by rationally pursuing riskier strategies; but then the rate of failure can be expected to go up. Because intermediaries are, themselves, debtors (their deposits, recall, are a loan from the depositors) protected by limited liability, they receive upside gains but can walk away from downside losses. This, in turn, can give them *risk-seeking* preferences; that is, they could prefer a lower expected return, but riskier venture to a higher expected return, but safer venture (see also footnote 13 *supra*).<sup>xxv</sup> Consequently, average returns could be lower than they would have been under tighter regulation.

In addition, the perception that international financial activity is risky may become a self-fulfilling prediction if governments create barriers to international capital flows. Historically, many governments have viewed international borrowing and lending as a source of more risk than opportunity, and erected international capital flow barriers.

The effects of international lending can be portrayed using the same conceptual apparatus as we applied in Section II. To clarify things, Figure 3 illustrates the effects of allowing either only domestic *or* foreign lending to finance investment projects. Both information and enforcement problems are exacerbated by international lending; the relevant demand and supply schedules are graphed with dashed lines. The supply curve is higher and to the left of the domestic case, since the collateralizable net worth of the borrower is lower to foreign lenders than it is to domestic lenders (because of additional enforcement and information problems). If borrowers are further restricted in the amount of insurance they are allowed to purchase, they may react to this increased risk-bearing by reducing their demand for funds, shifting the demand curve in.

The differences between international and domestic financial activity are simply a matter of degree to which the information and enforcement problems bite. They need not be large; indeed, they need not exist at all. In principle, both enforcement and information problems could be less serious for international lending.<sup>xxvi</sup> Still, the fact that international capital flows have been historically small — see Tables 1 and 2 for evidence, and the papers by Edwards, Ito and especially Tesar in this conference — is consistent with our arguments that enforcement and informational issues are worse for international lenders.<sup>xxvii</sup>

International lending is more difficult than purely domestic lending; but international capital flows do exist, and are in fact growing more rapidly than purely domestic activity. Why? The situation portrayed in Figure 3 is too pessimistic, since it ignores two important factors. First, it compares two different supply curves—one with only domestic savings, the other with only foreign savings. In reality, countries that allow international capital flows can finance investment projects with either or both. In this case, the aggregate supply of savings curve is unambiguously flatter than the purely domestic curve. Allowing capital flows can only reduce the capital-market imperfections, lowering interest rates and raising lending activity.

Second, the situation portrayed in figure 3 implicitly compares two identical countries. But countries differ in many ways; some—developing countries in particular—are capital-poor. A small developing country with a relatively low endowment of capital faces a steeper supply of domestic funds curve than it does if foreign capital is allowed to flow in. Since Northern countries are well capitalized, they will tend to have fewer investment opportunities with high rates of return, as most such

opportunities are exploited as they emerge. Hence, the North will be willing to lend funds at a rate of return lower than required by Southern residents. Foreigners need not even be better endowed with capital if their presence creates more competitive domestic capital markets. And the systemic risks that affect countries can be different, providing a potentially important argument for international diversification. As a result, interest rates can fall and loan activity rise with international capital flows.

Figure 4 provides an illustration of this case for a capital-poor country or a country with an uncompetitive domestic financial sector. As in Figure 3, to clarify the argument we compare financing all investment projects with either domestic or foreign savings. Because of information and enforcement problems, foreigners have access to a lower level of collateralizable net worth; the foreign supply curve starts to rise at a lower level. On the other hand, since foreigners have a larger (or more competitive) financial system because of their abundance of capital, the foreign supply curve is flatter than the purely domestic supply curve.<sup>xxviii</sup> The net result is ambiguous. Interest rates may be lower and total financial activity higher with only foreign finance, as depicted. If the country is relatively well-endowed with capital, or the domestic financial system is relatively efficient, then the more pessimistic situation of Figure 3 will prevail.

It is not unreasonable to assume that foreign capital systems are more efficient than domestic financial structures in many countries. Offshore capital markets are large and very competitive, as can be seen in Tables 1 and 2. International financial activity is large compared to domestic financial sectors for all except the largest industrial countries.

Finally, we should not forget that because foreign lending offers intermediaries geographic diversification of their loan portfolios, an intermediary in Country A could value a loan in Country B more than a Country B intermediary.

The growth of international capital flows is, arguably, a manifestation of policies that have systematically reduced the information and enforcement problems. For instance, the BIS rules can be viewed as an attempt to reduce information problems on the strength of banks viewed from an international perspective. The accession of countries to the international economic community (e.g., membership in the IMF, the World Trade Organization, and regional trade agreements) can be viewed as devices to lower enforcement costs. In addition, policies that allow for foreign control of domestic intermediaries mean that capital-rich foreign intermediaries can more easily team up with expertise-rich domestic intermediaries because the foreigners' control rights over the domestic intermediaries mean they can reduce their risks.<sup>xxix</sup> Finally, although not solely the result of government policy, high-speed computers, a globally improved telecommunications infrastructure, and greater competition in transportation, has reduced the costs of long-distance monitoring and screening of loans.

In summary, two fundamental problems are responsible for imperfect financial systems: imperfect information and the difficulty of writing credible and enforceable contracts. Foreigners are likely to have worse information about domestic investment projects; they are also likely to find it more difficult to write enforceable contracts at low cost. Since foreign intermediaries are usually at a disadvantage compared to domestic intermediaries, we would be surprised to see large amounts of international financial activity. There are, however, three caveats: large differences in capital abundance, a

desire for systemic risk diversification, and an inefficient domestic financial structure can all induce large capital flows.

#### **IV. Macroeconomic Aspects of International Lending**

We have discussed the financial imperfections at the heart of financial systems from a purely *microeconomic* viewpoint thus far. But an internationally-integrated financial system also differs from an autarkic domestic system in two important *macroeconomic* aspects. First, borrowing countries can choose to default on foreign debt. The possibility of *sovereign risk* must be taken into account by potential lenders. Second, the domestic monetary regime is strongly affected by the presence of capital flows. This also has important implications for the monetary system of a recipient country, adding *monetary instability* to the potential risks borne by borrowers.

##### **Sovereign Risk**

In any society, firms and individuals occasionally find themselves unable or unwilling to meet their financial obligations, often for reasons beyond their control. A declaration of bankruptcy typically then gives creditors the right to seize the assets of the debtor. Sovereign risk differs from ordinary bankruptcy risk because enforcing this right beyond the jurisdiction of the creditor's government requires the cooperation of another government; Eaton (1990). If the defaulting agent is itself a government, it is unlikely to hand over domestic assets to foreign creditors, and those creditors will have little or no legal recourse. Sovereign risk constitutes an important impediment to international financial activity.<sup>xxx</sup>

Table 4 contains a list of countries in official payments arrears at the end of 1995, as tabulated in the IMF's 1996 *Annual Report on Exchange Arrangements and Exchange Restrictions*.<sup>xxx1</sup> Long as this list is, it still understates the importance of sovereign risk. First, the very threat of sovereign risk has reduced international lending. Second, the list does not account for the effects of external rescue packages of the sort that prevented defaults by, for instance, Mexico and Argentina in 1994/1995 and Thailand and Korea in 1997. Third, arrears have been much higher in the recent past, as any bank exposed to Latin debt in 1980s is painfully aware.

The possibility of sovereign default is clearly an important risk borne by international borrowers and lenders. Still, it must be of limited importance in practice; if it were not, debtor countries would never pay back foreign creditors. Since repayment is the norm, there must be important reasons for government not to default. What are they?

One way to limit sovereign default risk is for creditors to threaten to seize the overseas assets of debtor countries. This incentive is of obviously limited importance if the borrower is a net debtor.<sup>xxxii</sup>

A more important reason why debtor countries continue to pay their international obligations is that creditor countries can refuse to engage in trade with debtors. Trade credit can be cut off, boycotts begun, and goods can be seized, thereby reducing the welfare of debtor countries.<sup>xxxiii</sup> Such sanctions can be important, especially for small countries with large gains from trade. Still, these sanctions are also limited in scope, since creditor countries also lose from disruptions in international trade. Creditor countries may lack the will to impose sanctions, particularly when the trade sectors have more political clout than the financial sector. Furthermore, to be most effective, the

creditor countries must put up a common front; however, the temptation to cheat on such a boycott could be large (particularly when the exports of the creditor countries are in competition), making united action difficult. Finally, not all trading partners could be creditor countries, which would mitigate the disruption (e.g., the defaulting nation could find substitute providers of critical imports and it could use these other trading partners to trans-ship goods).

Another potential way to limit sovereign risk is for lending countries to diversify their risks by spreading loans across debtor countries. Complete diversification however, requires negative correlation across default risks (e.g., as default risk in Mexico increases, default risk falls in Brazil). Yet, as shown by the Latin American experience of the 1980s, positive correlation would seem more likely than negative correlation.

An often-cited limit to sovereign risk is the “reputation effect.” Countries that anticipating needing foreign capital in the future will find it easier to borrow if they earn a reputation as a good credit risk by continued repayment.<sup>xxxiv</sup> After all, defaulting countries can be cut off from future borrowing by creditors or charged higher rates of interest than they would otherwise face. The empirical importance of this seems dubious, however. Many countries have defaulted on their international obligations only to re-enter international credit markets shortly thereafter; the most dramatic recent examples are the Latin countries since the Debt Crisis of 1982.<sup>xxxv</sup>

Yet, re-entry into the credit markets does not necessarily disprove the logic of the reputation effect. While it is true that early game-theoretic models of the reputation effect envisioned infinite punishment of transgressors (i.e., being infinitely barred from borrowing),<sup>xxxvi</sup> more recent models have realized that the logic still applies even if the

penalties are of finite-length. In particular, if the transgressor plays a “penance strategy” (i.e., inherently suffers from its transgression), then the punishment phase need last only a short time. Given the financial disruptions associated with a major default, it could be argued that something resembling a penance strategy is being played after a default, which could help to explain why defaulting countries are soon welcomed back by the international financial community.<sup>xxxvii</sup> In short, then, reputation effects serve as a principal—but by no means perfect—way of enforcing repayment.

If reputation effects are indeed important, it might seem strange that we ever see sovereign default. In particular, why can’t the creditor and debtor renegotiate when default is anticipated; thereby avoiding the costs incurred by actually defaulting? In fact, we actually do observe such negotiations in many instances (the equivalent of private workouts in the domestic context). A case could even be made that were creditor and debtor *symmetrically* informed about the debtor’s circumstances, we should always see renegotiation rather than default. The problem is that once, again, asymmetric information makes it difficult for the debtor to communicate its circumstances convincingly. Consequently, the creditor worries that the debtor is trying to get away with repaying less than it actually could. The creditor, therefore, takes a harder stance in many instances than is warranted, leading, ultimately, to a default. Although the parties have an incentive to cooperate—analogously to partners in a game of bridge—they misread each other’s signals, resulting in disaster. Nonetheless, the ability to renegotiate in advance of default can lessen the costs of default and reduce the impact of sovereign risk. Moreover, as creditor’s information about the debtor improves, this risk-reducing benefit is enhanced.



In summary, sovereign risk is a significant problem in international lending, one without an obvious analogue in domestic lending.<sup>xxxviii</sup> Direct enforcement is impossible. Direct punishment (e.g., seizing the debtor nation's assets abroad, trade boycotts, gun boat diplomacy, etc.) are likely to be applied in a haphazard way, at best, and so create few incentives for debtor nations to repay. The primary incentive, therefore, for repayment are reputation effects. In a world of certainty and symmetric information, reputation effects would be sufficient to deter all default; however, in the real world of uncertainty and asymmetric information, defaults will still occur.

### **Monetary Spillovers**

In an autarkic country, the monetary regime is controlled by the central bank. The level of interest rates (the "risk-free" rate in the discussion above) is determined by the authorities; additional risk premia that compensate for information and enforcement problems are determined by market forces. The aggregate level of short-run real interest rates is a purely domestic matter.<sup>xxxix</sup>

The situation is dramatically different in a country with free international capital mobility. While foreign capital can provide a healthy tonic of competition for domestic financial markets, it also compromises the ability of the central bank to conduct monetary policy from a purely domestic perspective.

The relationship between international lending and macroeconomic instability stems from two simple relationships. First, the domestic monetary base -- the most important component of the aggregate money supply -- is composed of domestic credit and international reserves. Second, the balance of payments accounting identity links

international flows of goods, services and capital to changes in international reserves. Exogenous foreign shocks result in capital flows that lead to shifts in reserves and corresponding movements in the domestic money supply and the macroeconomy.

To make this concrete, consider a country's balance of payments:

$$\text{Current Account} + \text{Net Capital Flows} = \text{Net Reserve Flows}.$$

Countries with net capital inflows which more than compensate for any current account deficit, are in a "balance of payments surplus" and experience rising levels of international reserves. But reserve flows are linked to the money supply since:

$$\text{Money Supply} = \text{International Reserves} + \text{Domestic Credit}.$$

So increases in international reserves lead to increases in the money supply, unless they are deliberately counteracted by the monetary authorities. The greater the degree of capital mobility, the faster and larger the reaction of net capital flows and the greater the impact on the money supply. Since the money supply is an important determinant of macroeconomic stability, undesired capital flows can compromise macroeconomic performance.

The first fundamental choice for a country with a non-zero balance of payments is whether to stem the imbalance, or allow it to continue. For the sake of simplicity, we consider the case of a country with net capital inflows, which results in increasing international reserves.<sup>x1</sup> To further sharpen our focus, assume, too, that the current

account is balanced, and capital begins to flow into a country for purely foreign reasons.<sup>xli</sup>

Allowing the capital to flow in might seem, at first blush, to be the obvious choice. After all, the country receives international reserves which can be kept for many purposes (e.g., defending the country's currency in the future). But the increase in international reserves raises the money supply if domestic credit policy is left unchanged. This loosening of monetary policy can result in undesirable future inflation. It can also fuel bubbles in asset prices, especially stock, bond, and real estate prices. If domestic banks become heavily exposed to asset price risk, either through design or neglect, popping asset bubbles can bankrupt the financial system, as Sweden and Japan found out in the early 1990s and Thailand more recently.

Still, even if the payments imbalance is allowed to continue it need not result in looser monetary policy. The central bank can offset increases in international reserves with an offsetting decline in domestic credit, usually sales of government bonds. This "sterilization" of reserve movements is not without its own perils though. Reductions of domestic credit tend to keep interest rates high. Since the government pays a higher interest rate on its bonds than it receives on its foreign (reserve) holdings, sterilization represents a non-trivial cost to the government. Sterilization also encourages continued capital inflows, so that the cause of the problem -- the payments imbalance -- persists. Further, sterilization is at best only a temporary policy, since it is naturally limited by the size of the credit base. The evidence to date indicates that while there is some scope for sterilization in the short run, there are few indications that sterilization is a viable policy over long periods of time.<sup>xlii</sup>

A third problem of allowing capital inflows to continue is that the international borrowing has to be repaid in the future (ignoring the sovereign risk considerations discussed above). Wisely invested, foreign capital can yield returns that pay back the original lenders while also providing domestic benefits. But if borrowing from abroad is used to finance consumption, perhaps by delaying painful but necessary fiscal adjustments, then repayment can be more difficult. Investing foreign capital in unprofitable projects with low returns is little better, as many Asian countries discovered in 1997.

Finally, it is always wise to remember that what has flowed in can also flow out. Foreign capital has an awkward habit of fleeing a country at the worst periods of time, as many countries have rediscovered recently; Mexico in 1994, Argentina in 1995, and Korea and Thailand in 1997 are perhaps the most important recent examples.

Clearly, there are risks associated with allowing capital to continue to flow into a country for long periods of time.<sup>xliii</sup> The alternative is to stop the capital from coming in the first place.

There are two conceptually different methods of stemming capital inflows. The first is simply to restrict capital flows through administrative controls. Providing insulation from international capital flows through fiat has long been a standard tactic for developing countries (as a glance through the IMF's *Exchange Arrangements and Exchange Restrictions* indicates). Chile is often cited as a country that avoided the "Tequila Effect" of 1995 because of its controls on capital inflows. Indeed, many OECD countries imposed capital controls throughout the long post-WWII boom and have only removed them recently; France and Italy only reduced barriers in 1990.

But legal restrictions on capital flows come at a cost. While international financial activity may be “naturally” limited because of the enforcement and information reasons discussed above, it may still be enormously beneficial for capital-poor countries or countries that need the competitive international markets to discipline domestic markets. Restricting access to foreign pressures over long periods can reduce domestic growth as a result. Moreover, countries are understandably reluctant to compromise their long-term access to international capital markets for short-term reasons.

Instead of permanently disrupting the linkage between the domestic and foreign financial systems, a more reasonable approach to countering a capital inflow may be to eliminate the underlying causes of the inflow. Both monetary and fiscal policy have important effects on the balance of payments and can be used to reduce or eliminate capital inflows. By lowering interest rates through the application of loose monetary policy, the monetary authorities can induce lower capital inflows directly. Alternatively, tighter fiscal policy can lower domestic absorption, thereby improving the current account and reducing net capital inflows; a fixed exchange rate can be devalued towards the same end.

While domestic policy instruments can be used to eliminate the underlying capital flows, the point remains: the independence of national macroeconomic policy is compromised as a result of international capital flows. In the case of unwanted capital inflows, either domestic monetary policy must be loosened, or fiscal policy must be tightened. Neither policy may be desirable from a purely domestic perspective.

This argument is usually expressed in a more concise form which focuses on the purely monetary effects of capital inflows. Mundell’s celebrated “Incompatible Trinity”

states that international capital mobility, fixed exchange rates, and domestic monetary independence are mutually incompatible. A country may choose to stabilize its exchange rate for a variety of different reasons (for instance, to provide a nominal anchor for monetary policy or to encourage international trade by lowering exchange rate volatility). But once the country has decided to smooth its exchange rate, allowing unrestricted international capital flows comes at the risk of monetary instability. More precisely, the country relinquishes its ability to conduct monetary policy for purely domestic reasons because maintaining the exchange rate becomes the objective of monetary policy. As a result, the country bears higher risks of business-cycle fluctuations. And if the country chooses instead to focus monetary policy on purely domestic objectives, this comes at the risk of unstable exchange rates and the instability that is associated with exchange rate variability.

In sum, reducing barriers to international capital flows may provide a number of microeconomic benefits, as discussed above. But the increased exposure to foreign capital means that the ability of the authorities to conduct independent policy oriented towards domestic objectives becomes more limited. Openness and external stability (of the exchange rate and balance of payments) come at the cost of the increased risk of domestic fluctuations.

### **Summary**

Both sovereign risk and the monetary effects of net capital flows are macroeconomic issues which constitute extra risks from international financial activity. Sovereign risk is an issue of concern for both lending and borrowing countries. Net creditors face the risk

of expropriation and default, but borrowers are affected because of the resulting higher interest rates and loan limits. Similarly, the monetary regimes of both lending and borrowing countries are fundamentally affected by openness to international capital flows; unwanted capital flows create macroeconomic instability.

## **V. Conclusions**

In this paper we have provided a framework to analyze the risks to borrowers and lenders which are inherent in international financial activity. *Microeconomic* risks in all financial activity stem from two basic problems. Imperfect information compromises the ability of lenders to monitor the behavior of borrowers; the inability of borrowers and lenders to sign enforceable all-encompassing contracts at low cost also limits financial activity. Both of these problems are serious even in a purely domestic setting. And both are likely to be more problematic when financial activity takes places across international boundaries. At first glance, the low levels of international financial activity would seem to be unsurprising, except for countries with very differing levels of capital, systematically different risks or inefficient domestic financial sectors (the very countries that typically restrict international capital flows). This is especially true when we take into account two macroeconomic risks which have no analogue in a purely domestic setting: sovereign risk and monetary spillovers.

Still, many fundamental sources of risks are slowly being overcome. Information flows more easily than ever before and the advantages that domestic residents have over foreigners in both enforcement and information are being eroded. Economic liberalization, an increased dependence on foreign trade, and a reduction in the state

sectors of many countries reduce the risk of nations defaulting on their debt or nations using their sovereignty to thwart collection of debts from domestic firms. As these trends continue, we should see greater amounts of international capital flows and lower exposures to risk.



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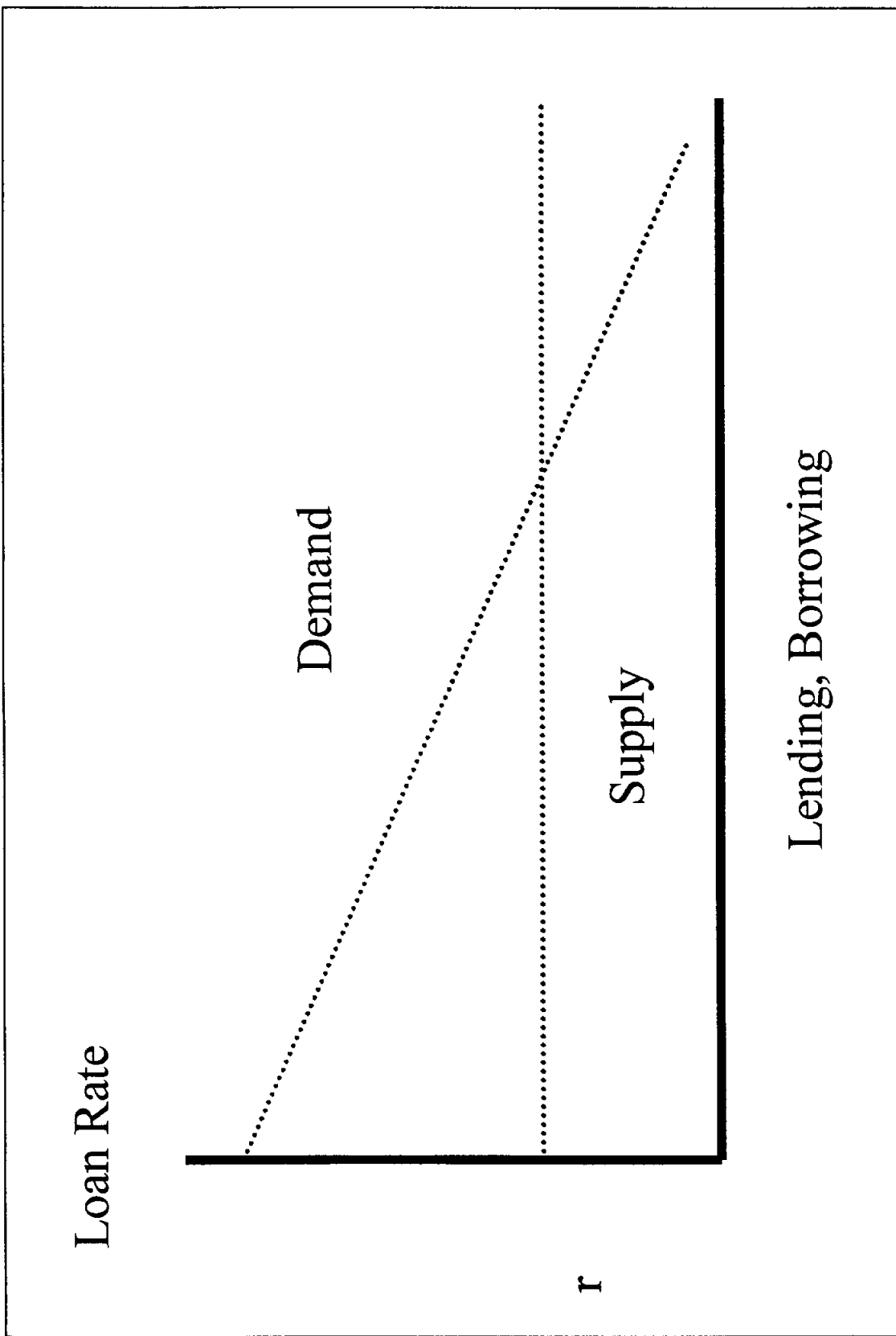
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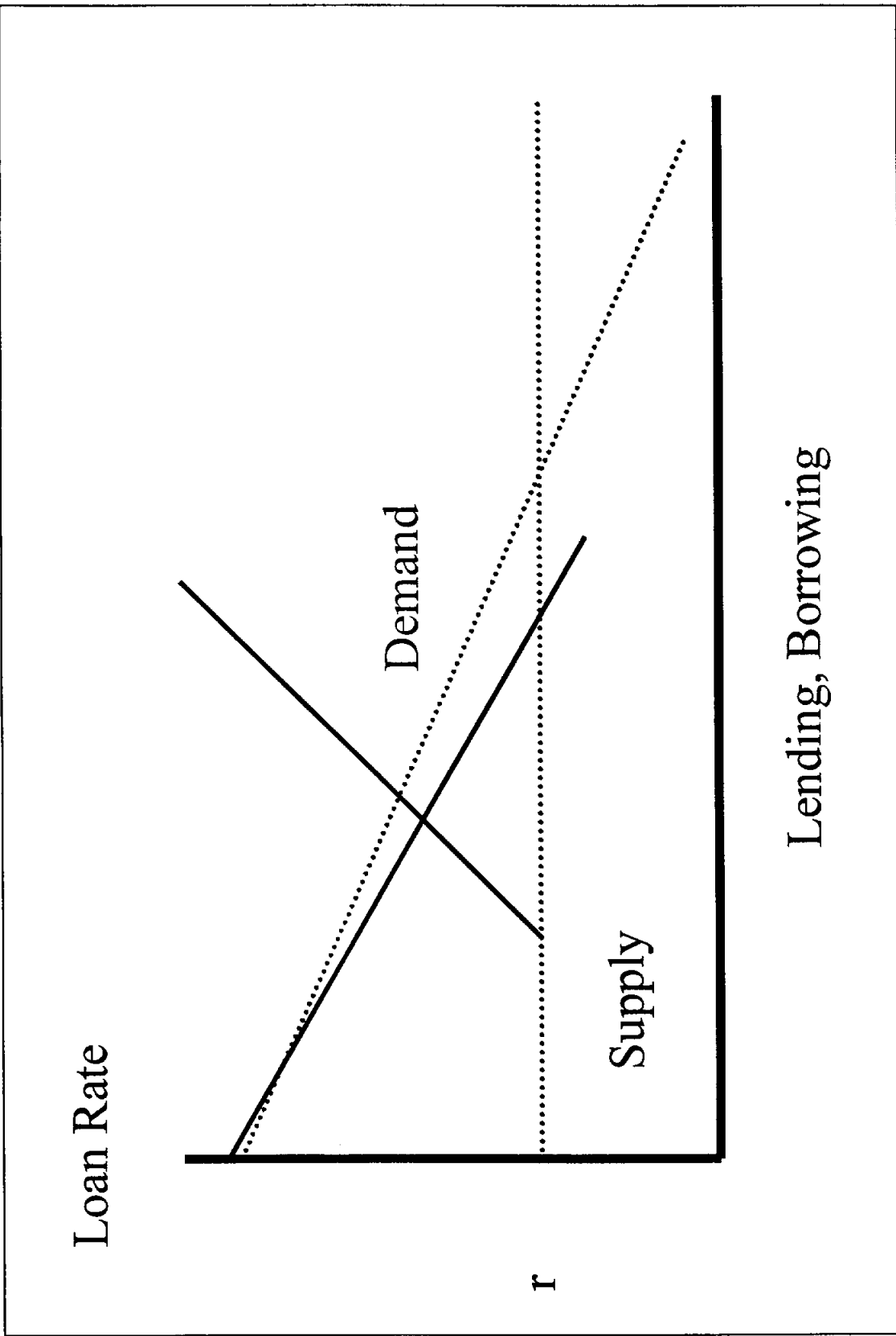
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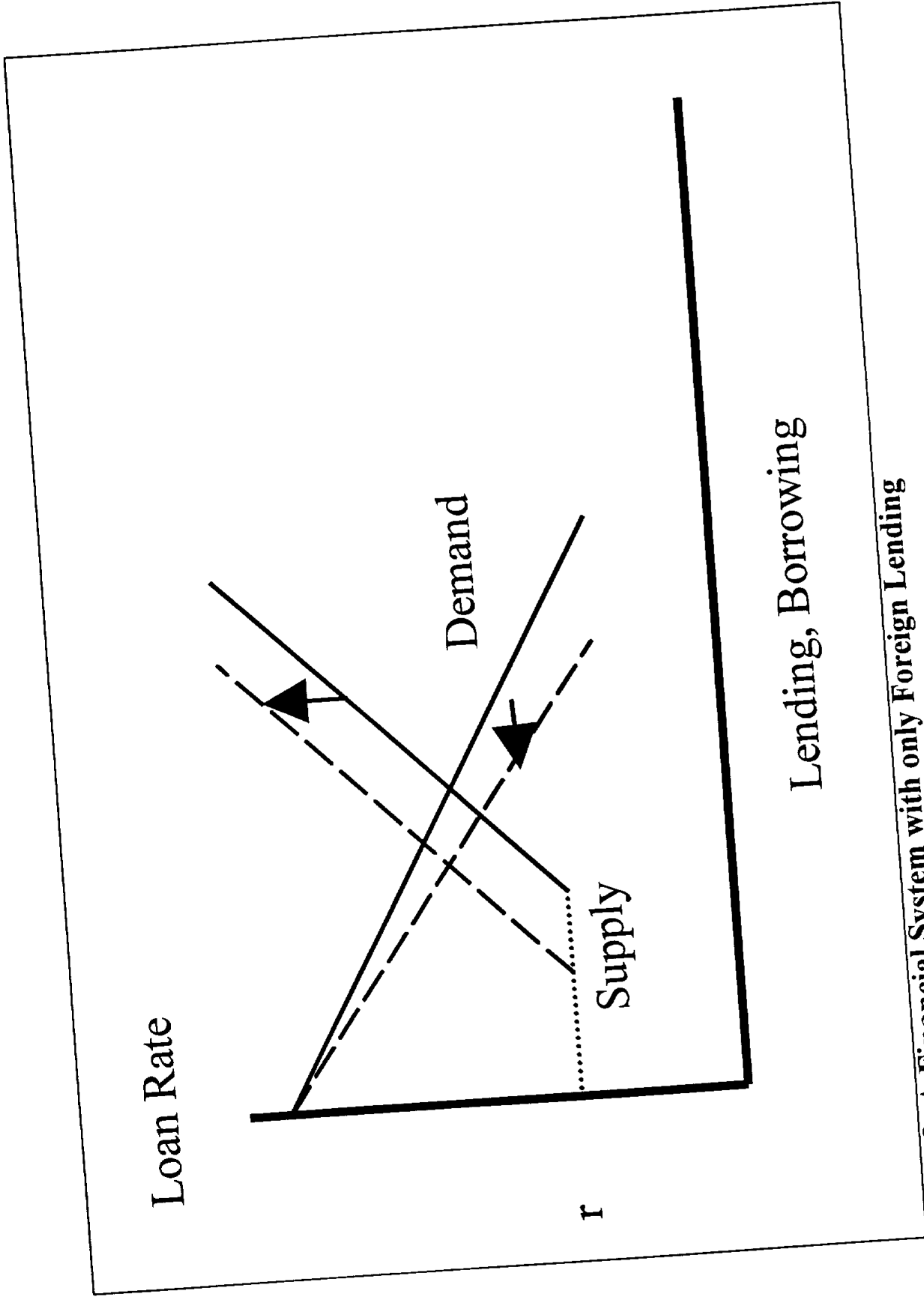
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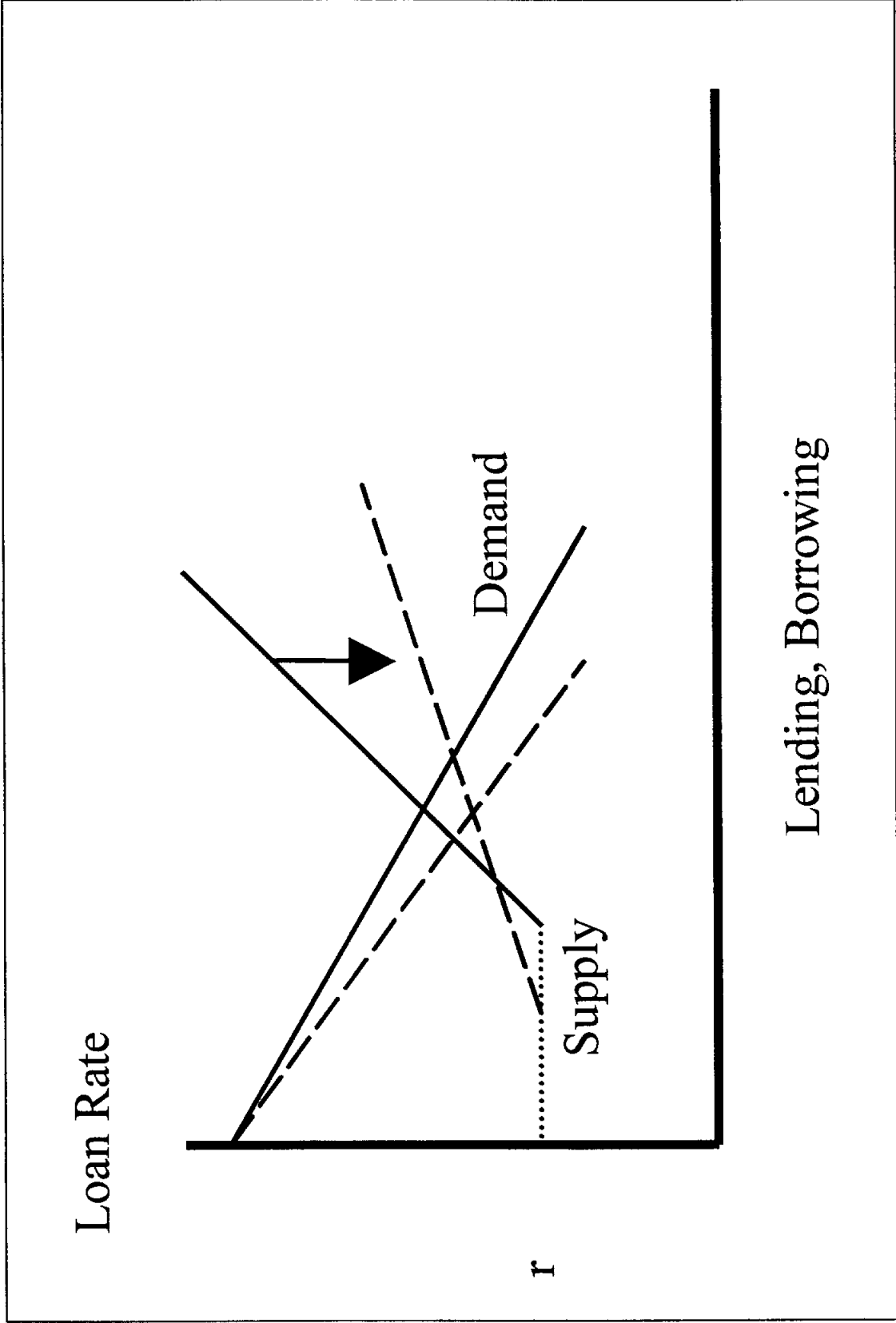
**Figure 1: The Financial System with Perfect Information and Credible Commitments**



**Figure 2: The Financial System with Imperfect Information and Enforcement Problems**



**Figure 3: A Financial System with only Foreign Lending**



Lending, Borrowing

Figure 4: Foreign Lending for a Capital-Poor Country





**Table 1: Percent of FDIC-insured Lenders' Debt Collateralized by Real Estate<sup>xliv</sup>**

<b>Year</b>	<b>Percent</b>
1995	21%
1994	21%
1993	22%
1992	22%
1991	21%
1990	20%
1989	19%
1988	18%
1987	17%
1986	15%
1985	13%
1984	13%

**Table 2: Stocks and Net Issues of Domestic Debt**

	<b>1993</b>	<b>1994</b>	<b>1995</b>
<b>Total</b>	19,714.5	22,171.4	24,110.0
<b>US</b>	9340.2	9963.1	10726
<b>Japan</b>	3976.7	4750	4958.6
<b>UK</b>	440.8	524.6	598.7
<b>Canada</b>	469.6	463.6	503.3
<b>Net Issues</b>	1,604.4	1,474.4	1,680.3

\$ billions for OECD (excluding Iceland and Turkey). Source: Ito and Folkerts-Landau (1996), p 59.

**Table 3: Stocks and Net Issues of International Debt**

	-----Stocks-----			Net issues
	1993	1994	1995	1995
<b>All Countries</b>	2,037.8	2,441.7	2,803.3	313.2
<b>Industrial</b>	1,650.3	1,976.4	2,277.8	261.8
<b>US</b>	176.9	209.3	272.8	60.6
<b>Japan</b>	340.1	360.6	356.7	7.3
<b>Developing</b>	121.8	162.1	192.9	31.3

\$ billions. Source: Ito and Folkerts-Landau (1996), p 57.

**Table 4: Countries in External Payments Arrears, end of 1995**

Albania	Angola	Antigua and Barbuda	Azerbaijan	Belarus
Benin	Burkina Faso	Cameroon	Cape Verde	Central African Republic
Chad	Comoros	Congo	Costa Rica	Cote d'Ivoire
Croatia	Dominican Republic	Ecuador	Egypt	Equatorial Guinea
Eritrea	Ethiopia	Guatemala	Guinea	Guinea-Bissau
Jordan	Kenya	Liberia	Mali	Mauritania
Myanmar	Nicaragua	Niger	Panama	Paraguay
Peru	Russia	Rwanda	Sao Tome and Principe	Senegal
Seychelles	Sierra Leone	Sudan	Suriname	Syrian Arab Republic
Tajikistan	Tanzania	Turkmenistan	Ukraine	Venezuela
Vietnam	Zambia			

Source: 1996 Annual Report on Exchange Arrangements and Exchange Restrictions, IMF.

## Endnotes

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<sup>i</sup> This section borrows from Eichengreen and Rose (1997) and Gertler and Rose (1994).

<sup>ii</sup> Given costless information, the farmers will face an efficient market for insurance against the financial hazards incurred in farming (e.g., weather, price volatility, etc.).

Hence, there is no reason for insurance to be bundled with financing. Since the farmers can obtain insurance and there is complete freedom of contracting, default risk is irrelevant in this idyllic setting. When, however, information is costly, economies of scale in information gathering can make the bundling of financing and insurance desirable *vis-à-vis* their separate provision. Consequently, we can expect to see lenders take on some insurance role through their willingness to face default risk. We develop this point in greater detail below.

<sup>iii</sup> The farmer's insurer will, however, care about the farmer's efforts. Since, however, we are assuming costless information and freedom of contract, this will not pose a problem; i.e., there can be no moral hazard problem. Hence, any tradeoff between insurance and incentives can be avoided.

<sup>iv</sup> If the rest of the world were also described by these assumptions, there would be no relationship between domestic savings and investment; the identity and national origin of savers and borrowers would be irrelevant.

<sup>v</sup> There is an implicit assumption that the market for farm capital is sufficiently small relative to the overall economy that the movement of funds to the farm sector does not cause the price of capital in other markets (i.e., the risk-free rate) to rise. That is, we are assuming *general* equilibrium effects are small.

<sup>vi</sup> This is a standard property of all factor demands.

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<sup>vii</sup> We think of imperfect competition in the financial system as being less important; it usually results either from policy or from the information and enforcement problems.

<sup>viii</sup> See, e.g., Aghion and Hermalin (1990) for an economic analysis of such laws.

<sup>ix</sup> Since there are also significant economies of scale in raising capital, providing banking services (e.g., an ATM network), etc., diversification is not the only motive for large financial intermediaries to arise, but it is, nevertheless, a significant one.

<sup>x</sup> See Akerlof (1970).

<sup>xi</sup> Let  $B$  be the amount to be repaid (the face-value of the debt). Suppose the lender could expect to receive  $B$  100% of the time from low-risk farmers (who make up half the population). Clearly, however, it can only expect repayment 50% of the time from high-risk farmers (who make up the other half of the population). Hence, its probability of repayment would be only 75%; so it would need to ask for a 33% premium to be insured against default risk (i.e.,  $.75 \times B \geq 6.60$  only if  $B \geq 8.80$ ).

<sup>xii</sup> If we changed the high-risk farmer's good outcome from \$13 to \$13.50, then the low-risk farmer, who would still have the higher expected return, would still be blocked from borrowing, but the high-risk farmer would now be able to borrow (at an effective interest rate of 120%). Here, then, capital would be diverted from a high-return use to a lower-return use.

<sup>xiii</sup> See Aghion and Hermalin (1990) for details and examples.

<sup>xiv</sup> However, self-financing means that farmers may bear too much idiosyncratic risk.

<sup>xv</sup> Of course, such policies can have inadvertent and perverse consequences. For instance, providing deposit insurance reduces the incentives of depositors to monitor the intermediaries' activities. In addition, deposit insurance—coupled with limited

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liability—turns intermediaries into giant “put options” for shareholders: the shareholders receive the upside gain but can “put” the intermediary to the deposit insurer in bad states. This can lead intermediaries to behave in a risk *seeking* manner with corresponding inefficiencies and misallocations of resources (see Hermalin and Wallace, 1994 and 1997, for empirical estimates of this effect in the context of U.S. savings and loans).

<sup>xvi</sup> This point is often made in the development literature, where it is argued that a good way to deliver credit to rural farmers is to use village elders and chieftains as agents because of their superior knowledge of credit-worthiness and their greater ability to force repayment (e.g., by threatening social sanctions). See Fuentes (1996) for more on this point, as well as references to empirical confirmation.

<sup>xvii</sup> This could also reflect *within* firm informational problems exacerbated by geographic distance (e.g., it could be harder to control a local agent of the firm the farther he is from headquarters).

<sup>xviii</sup> See Hermalin and Wallace (1994) for evidence on this matter.

<sup>xix</sup> This result controls for pre-deregulation performance, so this is not the case of incompetent thrifts, unable to compete in their traditional lines, going looking for greener pastures.

<sup>xx</sup> See Hermalin and Wallace (1994) for a complete discussion.

<sup>xxi</sup> This is a problem within the United States in lender-liability suits where juries often favor local debtors (the plaintiffs) against distant banks (the defendants). See Fischel (1989).

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<sup>xxii</sup> The absence of these institutions is part of the *raison d'être* for the offshore financial sector. “Eurobanks” began to flourish in part because of the cost advantages that stemmed from the lack of regulation and reserve requirements.

<sup>xxiii</sup> This may also restrict foreign lenders to lending domestically raised funds. Since the source of funds is not as well diversified as it would be were the lender able to attract non-domestic funds, the lender is exposed to greater risks—such as duration mismatches—which raises its cost of business (although this cost is incurred regardless of where it lends).

<sup>xxiv</sup> While the Basle Committee has improved the supervision of multinational banks (most famously of late through the bank capital measures), there are still many ambiguities, especially in the lender of last resort facilities.

<sup>xxv</sup> Hermalin and Wallace (1994) find evidence that deregulation resulted in many thrifts switching to riskier, but lower expected return lines of business from their traditional lines of business.

<sup>xxvi</sup> It is easy to think of counter-examples. Foreign expertise about export sectors can easily be superior to domestic information. Investors in recently deregulated or emerging sectors may benefit from foreign experience, providing an informational advantage to foreigners. And foreigners may find governments and judicial systems more sympathetic to their claims than domestic residents.

<sup>xxvii</sup> Table 2 contains data on the outstanding stocks and new issues of domestic debt in the OECD countries; Table 3 contains the analogous data on international debt. While there are technical problems involved in a direct comparison, there seems to be little doubt that the overwhelming amount of financial activity is purely domestic in nature.

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<sup>xxviii</sup> Foreign capital may also be supplied at a more elastically than domestic capital if systemic risks vary by country, so that international diversification effects are important.

<sup>xxix</sup> In particular, the foreigners can reduce the “agency” problems—e.g., insufficient screening and monitoring by the domestic intermediary, mis-allocation of funds, etc.—that could arise in an “arms-length” relationship. It is, however, reasonable to expect that even *within*-intermediary agency problems could be exacerbated by geographic distance (consider, e.g., Nick Leeson and Barings Bank). For more on agency issues see Williamson (1985).

<sup>xxx</sup> In a theoretical sense, sovereign risk can be viewed as an enforcement problem.

<sup>xxxi</sup> External payments arrears include arrears that have been caused by exchange restrictions on current payments or transfers, as well as overdue arrears on financial obligations of which the obligor is the government or a resident in the country in question.

<sup>xxxii</sup> A “common-pool” problem could also exist: If there is more than one creditor, a given creditor can be frozen out if other creditors attach the overseas assets first. Although this does not affect the deterrent effect of seizure for the debtor nation, it does increase the risk for its creditors.

<sup>xxxiii</sup> The limiting case would be for the creditor country to make political threats; i.e., sovereign default can be met by gunboat diplomacy. For various reasons, this limit is rarely reached these days.

<sup>xxxiv</sup> Important to this discussion is the assumption that the debtor nation wishes to remain in the international financial community. The literature has also considered the

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situation in which a debtor nation has the alternative of entering into financial autarky. In our analysis, we assume that no debtor nations would actually find it in their interest to enter into such a state.

<sup>xxxv</sup> At a more abstract level, Bulow and Rogoff (1989) have shown that it is not generally worthwhile for small countries to establish a reputation for repayment.

<sup>xxxvi</sup> A so-called “grim strategy.” For more on the game theory behind reputation effects see Fudenberg and Tirole (1991).

<sup>xxxvii</sup> Another, technical point, is that much of the early reputation models predicted that there would be no transgressions in equilibrium. More recent work on “trigger strategies” (see, e.g., Green and Porter, 1984) has developed models in which, due to uncertainty, some transgressions occur in equilibrium.

<sup>xxxviii</sup> Actually, given the rules of Chapter 11, it could be argued that the managers/shareholders of a company in debt have some ability to frustrate their creditors’ attempt to seize assets in the case of default. After default, a company coming out of Chapter 11 is often like a defaulted debtor nation, both are allowed to return to the capital markets. In this way, sovereign risk might not be so different than the risk faced in the domestic context.

<sup>xxxix</sup> We assume that the monetary authority cannot alter real interest rates in the long run.

<sup>xl</sup> A number of Latin and South-East Asian countries have been in this situation in the 1990s.

<sup>xli</sup> The first assumption is made purely for convenience; the second is far from uncommon. For instance, the reduction of capital flows to Mexico resulting from



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increases in American interest rates, are often viewed as an underlying cause of the 1994 Mexican crisis.

<sup>xlii</sup> See Chapter IV of Ito and Folkerts-Landau (1996) for references on this issue.

<sup>xliii</sup> Deficits have comparable problems but are usually even less sustainable, since international reserves are smaller than domestic credit for most countries.

<sup>xliv</sup> The apparent trend towards increased collateralization with real estate may be misleading. Following the savings and loan (S&L) crisis of the 1980s, FSLIC, the deposit insurer of S&Ls was eliminated and FDIC took over insuring S&L deposits. Since S&Ls have a higher proportion of their lending on real estate than banks, the apparent trend could be due to this change in the population mix, rather than to any trend in lending.