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The Case of the Missing Market: The Bond Market and Why It Matters for Financial Development

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1. Introduction

Over the last decade interest in the role of finance in economic growth has revived. Building from the pioneering work of Goldsmith (1965) and the insights of Shaw (1973) and McKinnon (1973), the more recent work exams the role of financial institutions and financial markets in corporate governance and the consequent implications for economic growth and development. Levine (1997) and Stulz (2000) have provided excellent reviews of this literature and Allen and Gale (2000) have extended it by developing a framework for comparing bank-based financial systems with market-based financial systems.[1] Although the literature addresses "capital markets," on closer inspection the main focus is really equity markets. Bond markets are almost completely overlooked.[2]

Although the omission of the bond market is not defended in the literature, one could argue that it does little violence to reality. As Table 1 shows, in most emerging economies in Asia, bond markets are very small relative to the banking system or equity markets. Moreover, the most striking theoretical results flow from a comparison of debt contracts with equity contracts and at a high level of abstraction bank lending can proxy for all debt. In any event, data are much more readily available for equity markets and the banking system than for bond markets, even in the United States.

[1] Hoontrakul (1996) provides a case study for Thailand.
[2] Exceptions include Boot and Thakor (1997) and Hakansson (1999).

Table 1. The Financing of Corporations

	Domestic credit provided by banking sector		Stock market capitalization		Domestic corporate debt securities	
	amount (% GDP)	change (% GCF)	total (% GDP)	equity raised (% GCF)	outstanding (% GDP)	net issues (% GCF)
Hong Kong	162.4	70.8	244.8	N/A	0.6	0.0
Indonesia	55.4	31.9	34.8	8.0	N/A	N/A
Korea	65.7	29.5	33.5	4.0	17.4	10.9
Malaysia	93.1	43.9	269.2	14.0	23.3	18.9
Philippines	49.0	68.5	84.8	8.0	0.0	0.0
Singapore	97.3	36.1	161.6	N/A	2.7	0.0
Taiwan	142.2	35.8	84.7	N/A	N/A	N/A
Thailand	100.0	31.3	65.8	6.0	3.9*	1.9
Average	95.64	43.48	122.4	8.0	8.0	5.3
Australia	74.5	28.3	94.2	15	12.0	9.2
Japan	115.2	4.5	73.9	N/A	11.7	4.0
UK	122.9	72.5	137.9	17	5.0	2.7
US	65.6	23.2	100.5	17	25.3	9.6
Average	94.55	32.13	101.63	8.5	13.5	6.38

1996, end of year data. The banking sector includes monetary authorities, deposit money banks, and other banking institutions for which data are available (including institutions that do not accept transferable deposits but do incur such liabilities as time and savings deposits). Examples of other banking institutions include savings and mortgage loan institutions and building and loan associations. The data are as reported on line 32d in the IFS. GDP is the gross domestic product as reported on line 99b in the IFS. GCF is the gross fixed capital formation as reported on line 93e in the IFS. Corporate debt securities are debt securities that were issued in domestic currency by residents of the country indicated, including short-term paper (e.g. commercial paper).

Sources: IMF International Financial Statistics, IMF World Economic Outlook Database, World Bank (IFC), FIBV, Bank for International Settlements, Hong Kong Securities and Futures Commission, Bank of Indonesia, Central Bank of China, Thai Bond Dealing Center, Reserve Bank of Australia, Beck (1999), Rajan and Zingales (1999)

* Includes financial institution bonds.

In contrast to the academic literature, however, policymakers have become increasingly concerned about the absence of broad, deep, resilient bond markets in Asia. The World Bank (Dalla et al, 1995, p. 8) has published a study of emerging Asian bond markets urging that Asian economies "accelerate development of domestic … bond markets," and has launched another major study aimed at helping countries develop more efficient bond markets. Along with Malaysia, Hong Kong has led the way. Hong Kong has succeeded in fostering development of an active fixed-income market in Exchange Fund Bills and Notes even though the government has not run significant deficits (Sheng (1994) and Yam (1997)). In 1998 the Asian-Pacific Economic Cooperation (APEC 1999) formed a study group to identify best practices and promote the development of Asian bond markets. Much of this official concern stems from the perception that the absence of bond markets made several Asian economies more vulnerable to financial crisis. The Governor of the Bank of Thailand (Sonakul (2000)) reflected this view when he observed, "If I [could] turn back the clock and have a wish [list]…high in its ranking would be a well-functioning Thai baht bond market."

In this paper we consider why bond markets are so underdeveloped relative to equity markets and the banking sector. In addition, we investigate what the absence of a well-functioning bond market may imply for savings, the quality and quantity of investment and for risk management. Our analysis leads us to conclude that the absence of a bond market may render an economy less efficient and significantly more vulnerable to financial crisis.

If a government wishes to enhance efficiency and financial stability by nurturing the development of a bond market, what are the appropriate policy remedies? We review

the key requirements for developing a broad, deep resilient bond market and conclude with an analysis of recent financial development in Thailand, which is broadly representative of the wide range of countries that have highly developed equity markets and a large banking sector, but until very recently, only the most rudimentary bond market.

2. Overview of the financial sector and flow of funds analysis

The impact of the financial sector on the real economy is subtle and complex. What distinguishes financial institutions from other firms is the relatively small share of real assets on their balance sheets. Thus, the *direct* impact of financial institutions on the real economy is relatively minor. Nonetheless, the *indirect* impact of financial markets and institutions on economic performance is extraordinarily important. The financial sector mobilizes savings and allocates credit across space and time. It provides not only payment services, but more importantly products that enable firms and households to cope with economic uncertainties by hedging, pooling, sharing, and pricing risks. An efficient financial sector reduces the cost and risk of producing and trading goods and services and thus makes an important contribution to raising standards of living.

The structure of financial flows can be captured in flow of funds analysis, a useful analytical tool for tracing the flow of funds through an economy. This device has been used for evaluating the interaction between the financial and real aspects of the economy for nearly half a century (Copeland (1955) and Goldsmith (1965, 1985)). The basic building block is a statement of the sources and uses of resources for each economic unit over some period of time, usually a year.

Our analysis of the relationship between the financial sector and economic performance will proceed in stages. In the first stage we consider how an economy would perform without a financial sector in order to provide a clear benchmark for comparison. The second stage introduces direct financial claims in an environment with severe information asymmetries. The third stage considers financial intermediaries that transform the direct obligations of investors into indirect obligations of financial intermediaries that have attributes which savers prefer. The fourth stage introduces the government sector and the international sector.

2.1. Savings and investment without financial markets or institutions

In order to understand the role of the financial sector in enhancing economic performance, it is useful to begin with a primitive economy in which there is no financial sector. Without financial instruments each household would necessarily be self-financing and would make autonomous savings and investment decisions without regard for the opportunity cost of using those resources elsewhere in society.

In this case households are the fundamental economic unit of analysis and the sources and uses of resources accounts (Table 2) reflect the changes in each household's balance sheet over the year. Since, at this point financial instruments do not exist, all assets are real and there are no liabilities. (Other categories of financial instruments that will be introduced later are shaded in gray.) Changes in real assets, here the accumulation of goods, reflect savings or changes in net worth; dissaving results in corresponding declines in real assets.

Table 2. Sources and Uses of Funds
for the Household Sector

Uses (U)	**Sources (S)**
Δ Real Assets	Δ Net Worth (Savings)
Δ Equity Δ Direct Financial Assets Δ Indirect Financial Assets Δ Claims on Government Δ Foreign Financial Assets	Δ Financial Liabilities Δ Foreign Financial Liabilities
Δ Total Assets	ΔTotal Liabilities & Net Worth

The fundamental decisions that influence economic performance – (1) how much to consume and save; (2) how to allocate the flow of savings; and (3) how to allocate the existing stock of wealth – depend on each autonomous household's opportunities, present and expected future income, tastes, health, family composition, the costs of goods and services, and confidence in the future. Although barter transactions among households would permit some specialization in production, the extent of specialization would be severely limited by the necessity for each household to be self-financing.

By aggregating sources and uses accounts for each economic unit, a matrix of flows of funds can be constructed for the entire economy. For illustrative purposes we present a primitive economy with two households in Table 3. Although other sectors are listed, they are irrelevant at this stage of the analysis because we have assumed that there are no

financial instruments that can link one sector to another. These parts of the matrix (which will be introduced later) have been shaded gray.

Table 3. The Flow of Funds Matrix for an Economy without a Financial Sector

Sectors	Household 1		Household 2		Non-financial Firms		Financial Institutions		Rest of World		Total	
FLOWS OF REAL INCOME	**U**	**S**	**U**	**S**	**U**	**S**	**U**	**S**	**U**	**S**	**U**	**S**
Savings		80		40								120
Real Assets	80		40								120	
FINANCIAL FLOWS												
Equity												
Fixed Income Instruments												
Indirect Financial Instruments												
Financial Instruments Issued by Foreign Residents												
Totals	80	80	40	40							120	120

In this example, we have inserted arbitrary entries for each household. Household 1 is saving 80 units of current income, while household 2 saves only 40. If productive opportunities were fortuitously distributed across households in such a way that each household earned precisely the same rate of return on its stock of real assets, this economy could prosper without a financial sector. Such an outcome is highly unlikely, however, because investment opportunities and desired savings are apt to differ markedly across

households. Moreover, there is no assurance that households with high savings have commensurately greater or more profitable real investment opportunities.

If, for example, household 2's desired investment exceeded its current savings, its investment would have to be postponed until it could accumulate sufficient savings. This would be true even if its investment opportunities offer substantially higher returns than the investment opportunities available to household 1. Assume further that household 1's investment opportunities are less productive than household 2's. Since household 1 does not have access to the superior investment opportunities of household 2, it may undertake inferior investment projects or save less. Society's flow of savings is inefficiently allocated and the stock of investment is less productive than it might otherwise be. Both the quality of capital formation and the quantity of future output suffer, and the standard of living in this society is less than it would be if household 1 could be induced to transfer some of its resources to household 2 in exchange for a financial claim.

A "financial claim" is a contractual agreement entitling the holder to a future payoff from some other economic entity. Unlike a real asset, it does not provide its owner with a stream of physical services. Rather it is valued for the stream of payoffs it is expected to return over time. The financial claim is both a store of value and a way of redistributing income over time which may be much more attractive to savers than the stream of services that savers could anticipate from their own investment opportunities in real assets.

Given the assumptions in our simple case it is conceivable that a bargain could be arranged between household 1 and household 2. In exchange for household 1's real assets, household 2 could issue a financial claim to household 1 that would promise a more attractive pattern of payoffs than the investment opportunities available to household 1.

This reallocation of assets between household 1 and household 2 could increase the return on capital formation for this society. Indeed, the possibility of investing in financial claims that are more attractive than household 1's own real investment opportunities might even increase the savings of household 1 and thus increase the total quantity as well as the quality of capital formation.[3]

2.2. Flows with direct financial claims but no secondary market

To examine how a financial sector affects the economy we will introduce the direct financial claims suggested above. The exposition is further simplified by introducing a second sector in the economy. Assume that firms specialize in investing in real assets financed by issuance of direct financial claims, while households specialize in saving and investing in these direct financial claims. Financial claims are reflected in the flow of funds accounts as *sources* of funds for firms and as *uses* of funds for households. Households continue to hold real assets, but most real assets appear on the balance sheets of firms. At this stage we will assume that direct claims cannot be traded in well-organized secondary markets. Issues of direct claims are, in effect, private placements that will be held by households until they mature or the firm is liquidated.

The flow of funds matrix in Table 4 illustrates such a system and reflects the sort of qualitative changes that occur when an economy first begins to specialize in production. It differs from the flow of funds matrix in Table 3 in three respects: (1) firms hold most of the

[3]Higher returns on financial instruments may encourage saving; but higher returns also enable savers to achieve a target stock of wealth with a lower rate of saving. Thus in theory the impact of expected returns on the overall savings rate is ambiguous. Empirical studies across a number of countries have not been able to resolve the question. Nonetheless, higher returns on financial instruments will induce households to allocate more savings to financial instruments than to real assets such as jewelry and precious metals that do not contribute to productive investment (and, in an open economy, to shift from foreign to domestic assets). Efficient financial markets will allocate financial claims to projects that offer the highest, risk-adjusted returns and so income and total savings are likely to rise even though the savings rate may not.

real assets; (2) households hold direct financial claims on firms in lieu of most of their previous holdings of real assets; and (3) household savings have increased by (an arbitrary) 10 units to reflect the enhanced level of income which could be gained from reallocating real assets to more productive uses. Generally, the higher an economy's per capita income, the higher the ratio of financial assets to real assets.

Table 4. The Flow of Funds Matrix for an Economy with Private Placement of Direct Claims

Sectors	Household 1		Household 2		Non-financial Institutions		Financial Institutions		Rest of World		Total	
FLOWS OF REAL INCOME	**U**	**S**	**U**	**S**	**U**	**S**	**U**	**S**	**U**	**S**	**U**	**S**
Savings		87		43		10						140
Real Assets	7		2		131						140	
FINANCIAL FLOWS												
Equity	60		31			91					91	91
Fixed Income Instruments	20		10			30					30	30
Indirect Financial Assets												
Financial Instruments Issued by Foreign Residents												
Totals	87	87	43	43	131	131					261	261

What makes this reallocation of resources possible? What induces households to exchange real assets for direct financial claims on firms? The simple answer is that the direct financial claims which firms offer promise more attractive rates of return than households could expect to earn from investing in real assets themselves. In short, they shift from real investment to the purchase of financial claims because they expect it to be profitable to do so. But this superficial answer ignores several important obstacles that must be overcome in order to induce savers to give up real assets in exchange for direct financial claims.

The fundamental problem is that once savers no longer invest in real assets directly, they must worry about the performance of those who act as their agents and undertake the real investments to determine the returns on their financial investments. Households are confronted with a principal/agent problem in which they must deal with the possibility of hidden actions and hidden information (Arrow (1979)). They must be concerned about "adverse selection" – the possibility that they may inadvertently invest in incompetent firms with poor prospects instead of competent firms with good productive opportunities. And they must be concerned with "moral hazard" – the possibility that firms may not honor their commitments once they have received resources from investors. In order to protect against adverse selection and moral hazard, households must spend resources in deciding how to allocate savings. The activities involved include: (a) collecting and analyzing information about firms; (b) negotiating a contract that will limit the firm's opportunities for taking advantage of the saver; (c) monitoring the firm's performance; and, if necessary, (d) enforcing the contract. In the absence of strong accounting standards, good disclosure practices, strong legal protections for holders of direct claims and an efficient judiciary and

enforcement function, the information and transactions costs may be so great that direct financing is not feasible.

In economies where the financial infrastructure – accounting and disclosure practices, the legal framework, and clearing and settlement arrangements – is not sufficiently well developed to support arms-length direct financial transactions, other, nonmarket mechanisms for allocating savings are likely to arise. Households may be linked together with firms through family groups rather than in the marketplace.

Family ties may substitute for a strong financial infrastructure in two ways. In the absence of strong accounting and disclosure practices, information is likely to flow more readily within families than between unrelated parties. Moreover, reputation within the family may substitute for information. Thus the adverse selection problem is likely to be mitigated for investment in direct claims within the family group. Moreover, in the absence of strong legal protections for creditors and minority shareholders, families have enforcement mechanisms such as the threat of disinheritance, withholding of affection, or expulsion from the family that may mitigate moral hazard.

In the absence of efficient capital markets, family groups may serve as a quasi-financial system pooling the savings of several related households to finance a family-controlled firm in which the governance structure of the family substitutes for capital market discipline. As the family enterprise succeeds, it will accumulate retained earnings that can be used to finance new family enterprises. To some extent the growth of family-controlled industrial conglomerates in emerging economies can be viewed as an adaptation to the absence of efficient capital markets. In several of the emerging markets of Asia, more than

fifty percent of publicly traded corporations are family controlled (Claessens, Djankov, and Lang (1998a)).

This mode of allocating capital has several potential disadvantages relative to that which would take place in a well-functioning capital market. Firms are not confronted with the true opportunity cost of funds in the economy and so investment may be too great or too small. Similarly firms lose the aggregation of information that takes place in a well-organized capital market and may pursue inefficient investment projects far too long in the absence of market discipline. Finally, the economy's reliance on financial flows within family groups raises high barriers to entry by unaffiliated firms, which may have more attractive investment opportunities.[4]

As the family financial conglomerate grows in complexity, it is likely to form an enterprise that will coordinate financial flows within the group. This financial enterprise may also offer services to non-family members and become a bank.

2.3. The financial sector with financial intermediaries

Banks and other financial intermediaries purchase direct financial claims and issue their own liabilities; in essence they transform direct claims into indirect claims. The fundamental economic rationale for such institutions is that they can intermediate more cheaply than the difference between what the ultimate borrowers would pay and the ultimate saver would receive in a direct transaction. Financial intermediaries enhance the efficiency of the financial system if the indirect claim is more attractive to the ultimate saver and/or if the ultimate borrower is able to sell a direct claim at a more attractive price to the financial intermediary than to ultimate savers.

[4] Rajan and Zingales (1999) suggest that family groups may oppose financial development because improvements in capital markets would undermine the value of entrenched positions and increase competition.

Table 5. The Flow of Funds Matrix for an Economy with Private Placement and Financial Institutions

Sectors	Households		Non-financial Firms		Financial Institutions		Government		Rest of World		Total	
FLOW OF REAL INCOME	**U**	**S**	**U**	**S**	**U**	**S**	**U**	**S**	**U**	**S**	**U**	**S**
Savings		145		12		5					0	162
Real Assets	12		148		2						162	0
FINANCIAL FLOWS												
Equity	10			34	28	4					38	38
Fixed Income Instruments	25	7		105	87						112	112
Indirect Financial Instruments	105		3			108					108	108
Financial Instruments Issued by Foreign Residents												
Totals	152	152	151	151	117	117					418	418

A comparison of the flow of funds matrix for an economy with only direct financial claims (Table 4) with the flow of funds matrix for an economy with both direct and indirect financial claims (Table 5) reveals a more complex pattern of financing,[5] characteristic of the financial deepening which usually accompanies economic

[5]Yet much of the complexity is obscured by the convention of aggregating flows by sector. Financial flows among financial firms are often very large relative to flows vis-a-vis other sectors. For example, interbank trading in the foreign exchange markets is roughly 90% of total volume and interbank transactions in the Eurocurrency markets are virtually two-thirds of the total.

development (Goldsmith (1965)). The household sector has substituted much of its holdings of direct financial claims for "indirect financial claims" well-functioning claims on financial firms. Correspondingly, financial firms hold most of the direct financial claims on non-financial firms. Also, the household sector has a better opportunity to borrow from financial institutions because the scale of borrowing by individual households seldom warrants the heavy fixed costs of issuing a direct financial claim.

But how can financial institutions link some savers and investors more efficiently than direct market transactions between the household sector and non-financial firms? Several factors may explain the relatively greater efficiency of financial intermediaries. First, financial intermediaries may be able to collect and evaluate information regarding creditworthiness at lower cost and with greater expertise than the household sector. And, when some information regarding creditworthiness is confidential or proprietary, the borrower may prefer to deal with a financial intermediary rather than disclose information to a rating agency or to a large number of individual lenders in the market at large.

Second, transactions costs of negotiating, monitoring and enforcing a financial contract may be lower for a financial intermediary than for the household sector since there are likely to be economies of scale which can be realized from investment in the fixed costs of maintaining a specialized staff of loan monitors and legal and workout experts. In addition, by handling other aspects of the borrower's financial dealings, the financial intermediary may be in a better position to monitor changes in the borrower's creditworthiness.

Third, the financial intermediary can often transform a direct financial claim with attributes that the borrower prefers into an indirect claim with attributes that savers prefer.

Borrowers typically need large amounts for relatively long periods of time, while savers prefer to hold smaller-denomination claims for shorter periods of time. By pooling the resources of many savers, the financial intermediary may be able to accommodate the preferences of both the borrower and savers.

Fourth, the financial intermediary often has a relative advantage in reducing and hedging risk. By purchasing a number of direct claims on different borrowers whose prospects are less than perfectly correlated, the financial intermediary is able to reduce fluctuations in the value of the portfolio of direct claims, given the expected return, relative to holdings of any one of the direct claims with the same expected return. Diversification reduces the financial intermediary's net exposure to a variety of risks and thus reduces the cost of hedging.

The upshot is that the introduction of bank deposits is likely to mobilize additional savings that can be used to finance investment since some households will now substitute bank deposits for holdings of precious metal, jewelry and other durable assets that are traditionally used as a store of wealth. The increase in the pool of savings available to finance investment and the reduction in transactions costs in linking ultimate savers and investors will lead to an increase in the quantity of investment. Improved evaluation and monitoring of loans made possible by the specialization of banks may lead to better screening and implementation of investment projects and thus improve the return on investment. These changes are reflected in Table 5 where both household sector savings and real assets have risen. Total household savings has risen from 130 units to 145 units and that retained earnings have risen from 10 units to 17 units.

Although the bank loans introduced in this section and the private placements introduced in the preceding section are forms of debt, it is important to note that they have strikingly different properties than marketable debt securities. A "pure loan" is a credit contract between a borrower and a single lender. The contract is custom-tailored to meet the borrower's financial requirements and the lender's need for assurances regarding the borrower's creditworthiness. Because the contract involves only one lender, it may be renegotiated at relatively low cost should the borrower's circumstances change. Often the lender has specialized expertise regarding the business of the borrower that enables the lender to monitor the borrower's performance at relatively low cost. The pure loan is usually part of a relationship between the borrower and lender in which the borrower may draw down and repay loans over time, the lender monitors the activities of the borrower, and the borrower may purchase other services from the lender. A pure loan is likely to be an illiquid asset because, relative to a pure security of equal maturity, only a small percentage of the full market value of the asset can be realized if it is sold on short notice. The fundamental problem is that it is difficult for a potential buyer to evaluate the credit standing of the debtor. Moreover, the transactions costs of finding a counterparty and executing a transaction are likely to be very high because the idiosyncratic features of a pure loan preclude the development of dealer markets.

A "pure security" in contrast is a contract between the borrower and many investors who may be unknown to the borrower and need have no other relationship to the borrower. The investor need not have any specialized knowledge of the borrower's business. Each investor is issued an identical type of claim on the borrower, which is readily transferable. A pure securities contract is much simpler than a loan agreement, containing fewer

covenants and contingent clauses because after the security is issued it is impractical to renegotiate terms of the contract with the borrower; the costs of coordinating collective action among a large number of (often anonymous) investors are prohibitive.

A pure security of a given maturity is likely to have a much more liquid secondary market than a pure loan of equal maturity. The issuance of securities in primary markets is directed to many investors, all of whom hold identical claims and none of whom is necessarily privy to information about the borrower not available to the others. The standardization of claims facilitates the development of dealer markets and leads to lower transactions costs in selling securities. Since buyers in the secondary market need not fear that sellers know more than they do about securities being offered in the market, buyers can safely ignore the identity of the seller. In contrast, loan contracts may be highly idiosyncratic, and the originating lender may have information about the borrower, or specialized expertise about the borrower's business, not available to potential buyers. The loan contract may also have contemplated some degree of monitoring by the lender that the purchaser would be obliged to perform unless the loan were serviced by the seller. These features severely limit the marketability of conventional loans. Unless a buyer receives a full guarantee from the original lender or some trusted third party, the buyer must make the same investment in information that the original lender made, and/or monitor the loan agreement, perhaps without the expertise of the original lender.

2.4. The government and international sector

In order to complete the flow of funds matrix we need to introduce two additional sectors. First, the government sector affects the flow of funds in two distinct ways. It issues direct claims to banks that serve as the reserve base for the money supply. It also issues

direct claims to finance its own spending when desired government expenditures for purchases of goods and services and the redistribution of income exceed current tax revenues.

Table 6. The Flow of Funds Matrix for a Closed Economy
With a Government Sector

Sectors	Households		Non-financial Firms		Financial Institutions		Government		Rest of World		Total	
FLOWS OF REAL INCOME	**U**	**S**	**U**	**S**	**U**	**S**	**U**	**S**	**U**	**S**	**U**	**S**
Savings		150		12		5	33				33	167
Real Assets	7		118		2		7				134	0
FINANCIAL FLOWS												
Equity	10			34	28	4					38	38
Fixed Income Instruments	30	10		77	97		5	45			132	132
Indirect Financial Assets	113		5			118					118	118
Financial Instruments Issued by Foreign Residents												
Totals	160	160	101	101	127	127	45	45			423	423

Table 6 shows the flow of funds matrix that incorporates the government sector. The government is shown with a deficit of 33 units that causes a corresponding reduction in net savings for the economy. Some economists argue that current deficits lead to a one for one increase in household savings in anticipation of higher future tax burdens (Barro (1974)). Other economists regard this view as too extreme in light of the empirical evidence (Hausman and Poterba (1987)). Table 6 depicts a case in which households make a partial response to the government deficit: household savings rise from 145 units to 150 units. The government issues 45 units of financial liabilities to fund its current and capital expenditures as well as its subsidies to favored private sector borrowers. In our example, real sector investment declines in spite of subsidies from the government to the private sector. Total real sector assets decline from 162 units in Table 5 to 134 units in Table 6, indicative of the "crowding out" of private sector investment by government funding demands.

Second, to complete the flow of funds, we add the international sector. As national economies have become increasingly interdependent, cross-border financial transactions of all kinds have become commonplace. Opening a country to trade in financial assets offers advantages similar to those that we observed in introducing financial instruments in the primitive economy. World savings may be allocated more efficiently so that national income in all countries is increased. International specialization on the basis of comparative advantage in financial services, like international specialization in production, is likely to enhance efficiency. Competition from foreign institutions also stimulates innovations to cut costs and expand the range of products. Moreover, the broader range of financial instruments available enhances the scope for diversification to reduce country-specific risks.

Table 7. The Flow of Funds Matrix for an Open Economy

Sectors	Households		Non-financial Firms		Financial Institutions		Government		Rest of World		Total	
FLOWS OF REAL INCOME	**U**	**S**	**U**	**S**	**U**	**S**	**U**	**S**	**U**	**S**	**U**	**S**
Savings		155					33			28	33	183
Real Assets	7		134		2		7				150	0
FINANCIAL FLOWS												
Equity	13			41	28	5			5		46	46
Fixed Income Instruments	27	10		98	81		5	45	40		153	153
Indirect Financial Assets	116		5			136			15		136	136
Financial Instruments Issued by Foreign Residents	2				30					32	32	32
Totals	165	165	139	139	141	141	45	45	60	60	550	550

Table 7 shows the complete flow of funds matrix. In this example the national economy is running a current account deficit of 28 units. This deficit is financed by net financial inflows that provide both debt and equity investment to the domestic economy and by drawing down some of the domestic economy's holdings of foreign assets. Household savings reflect the benefits of opening the economy to the world capital market by increasing to 155 units. The non-financial sector also benefits from the net inflow of capital. Net domestic real investment increases from 134 in Table 5 to 150 in Table 7.

3. The role of financial infrastructure and efficient financial markets

The economy that we have sketched in the preceding section has a banking system, but only a rudimentary capital market. The absence of an adequate financial infrastructure meant that direct claims tended to be allocated through extended families rather than through arm's-length-transactions in the marketplace. Most corporate borrowing was in the form of bank loans.

The underdevelopment of capital markets in this economy limits risk-pooling and risk-sharing opportunities for both households and firms. It also robs the economy of a crucial source of information that helps coordinate decentralized decisions throughout the economy. Interest rates and equity prices should be used by households in allocating income between consumption and savings and in allocating their stock of wealth. And firms should rely on financial markets for information about which investment projects to select and how such projects should be financed (Merton (1989)). Efficient financial markets help to allocate, transfer, and deploy economic resources across time and space in an uncertain environment (Merton (1990)). Without efficient financial markets, these functions are likely to be performed less well and living standards will be lower than they might otherwise have been.

The infrastructure to support a corporate bond market includes an appropriate legal framework, strong accounting and disclosure standards, and efficient and reliable clearing and settlement arrangements. It is also useful to have a community of bond analysts and ratings agencies who can help investors evaluate bonds. And, as we will emphasize in Section 4, it is essential to develop a broad, deep resilient secondary market.

In order for potential investors to be willing to accept a claim on future cash flows for the repayment of principal and interest, they must be confident that their right to collect the promised debt payments are well defined and enforceable. La Porta, Lopez-de-Silanes, Shleifer & Vishny (1998) have identified six measures of creditor rights that are shown in Table 8A for the countries in Table 1 along with a measure of contract enforceability. The measures focus on creditors' rights in the event of a default and include reorganization procedures, priority rules, and the scope for autonomous action by managers to evade creditors. On average the four industrialized countries score better on these indices of creditor rights than do the eight Asian emerging economies.

La Porta et al have also identified five indicators of the effectiveness of the judiciary system since, in principle, strong enforcement by the courts could compensate for weak laws. These measures (shown in Table 8B) include proxies for the efficiency of the judicial system, and commitment to the rule of law as well as indicators of the government's attitude toward business. Kane (2000a) also includes a measure of the quality of a country's bureaucracy since administrative efficiency may also affect the speed with which rights are enforced. Again, on average the four industrialized countries score better on these measures of the effectiveness of the judicial system than do the eight Asian emerging economies.

In addition to assurances regarding the legal right to the promised cash flows and the enforceability of such rights in the event of default, a potential investor will need to form an estimate of the probability of default and the expected recovery in the event of default. This depends of the availability of reliable and relevant data about the firm's current condition and prospects as well as the availability of expert advice. La Porta et al (1998) have identified an index of accounting standards, which is reported in Table 8C. In addition Kane

Table 8. Indicators of Quality of Financial Infrastructure

A. Creditor Rights

	Contract enforceability	No automatic stay on secured assets	Secured creditors paid first	Restrictions on autonomous reorganization	Management doesn't stay in reorganization	Creditor rights	Legal reserves required to continue operation
Hong Kong	N/A	1	1	1	1	4	0
Indonesia	1.76	1	1	1	1	4	0
Korea	2.19	1	1	0	1	3	0.5
Malaysia	2.26	1	1	1	1	4	0
Philippines	1.75	0	0	0	0	0	0
Singapore	3.22	1	1	1	1	4	0
Taiwan	N/A	1	1	0	0	2	1
Thailand	2.23	1	1	0	1	3	0.1
Average	2.24	0.88	0.88	0.5	0.75	3	0.2
Australia	3.04	0	1	0	0	1	0
Japan	3.16	0	1	0	1	2	0.25
UK	3.43	1	1	1	1	4	0
US	3.55	0	1	0	0	1	0
Average	3.30	0.25	1	0.25	0.5	2	0.06

Data definitions and sources:

Contract Enforceability: Measures the "relative degree to which contractual agreements are honored and complications presented by language and mentality differences." Scored 0-4, with higher scores for superior quality. Source: *Business Environmental Risk Intelligence*, Kane (2000b).

No automatic stay on secured assets: Equals one if the reorganization procedure *does not* impose an automatic stay on the assets of the firm upon filing the reorganization petition. Automatic stay prevents secured creditors from gaining possession of their security. It equals zero if such restriction *does* exist in the law. Source: Bankruptcy and Reorganization Laws, LaPorta et al (1998).

Secured creditors paid first: Equals one if secured creditors are ranked first in the distribution of the proceeds that result from the disposition of the assets of a bankrupt firm. Equals zero in non-secured creditors, such as the government and workers are give absolute priority. Source: Bankruptcy and Reorganization Laws, LaPorta et al (1998).

Restrictions on autonomous reorganization: Equals one if the reorganization procedure imposes restrictions such as creditors' consent to file for reorganization. It equals zero if there are no such restrictions. Source: Bankruptcy and Reorganization Laws, LaPorta et al (1998).

Management doesn't stay in reorganization: Equals one when an official appointed by the court, or by the creditors, is responsible for the operation of the business during reorganization. Equivalently, this variable equals one if the debtor does not keep the administration of its property pending the resolution of the reorganization process, and zero otherwise. Source: Bankruptcy and Reorganization Laws, LaPorta et al (1998).

Creditor rights: An index aggregating different creditor rights. The index is formed by adding 1 when: (1) the country imposes restrictions such as creditors' consent or minimum dividends to file for reorganization; (2) secured creditors are able to gain possession of their security once the reorganization petition has been approved (no automatic stay); (3) secured creditors are ranked first in the distribution of the proceeds that result from the disposition of the assets of a bankrupt firm; and (4) the debtor does not retain the administration of its property pending the resolution of the reorganization. The index ranges from 0 to 4. Source: Bankruptcy and Reorganization Laws, LaPorta et al (1998).

Legal reserves required to continue operation: It is the minimum percentage of total share capital mandated by Corporate Law to avoid the dissolution of an existing firm. It takes a value of zero for countries without such restrictions. Source: Company Law or Commercial Code, LaPorta et al (1998).

Table 8. Indicators of Quality of Financial Infrastructure (cont'd.)

B. Effectiveness of judicial system

	Efficiency of judicial system	Rule of Law	Corruption	Bureaucratic Quality	Risk of expropriation	Risk of contract repudiation
Hong Kong	10.0	8.22	8.52	4.14	8.29	8.82
Indonesia	2.50	3.98	2.15	1.50	7.16	6.09
Korea	6.00	5.35	5.30	4.18	8.31	8.59
Malaysia	9.00	6.78	7.38	3.54	7.95	7.43
Philippines	4.75	2.73	2.92	1.46	5.22	4.80
Singapore	10.00	8.57	8.22	5.11	9.30	8.86
Taiwan	6.75	8.52	6.85	N/A	9.12	9.16
Thailand	3.25	6.25	5.18	4.39	7.42	7.57
Average	6.53	6.3	5.82	3.47	7.85	7.67
Australia	10.00	10.00	8.52	6.00	9.27	8.71
Japan	10.00	8.98	8.52	5.89	9.67	9.69
UK	10.00	8.57	9.10	6.00	9.71	9.63
US	10.00	10.00	8.63	6.00	9.98	9.00
Average	10	9.39	8.69	5.97	9.66	9.26

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Data definitions and sources:

Efficiency of Judicial System: Assessment of the "efficiency and integrity of the legal environment as it affects business, particularly foreign firms" produced by the country risk-taking agency *Business International Corporation*. I "may be taken to represent investors' assessments of conditions in the country in question." Average between 1980-1983. Scale from 0 to 10, with lower scores for low efficiency levels. (LaPorta et al, 1998).

Rule of law: Assessment of the law and order tradition in the country produced by the country-risk rating agency International Country Risk (ICR). Average of the months of April and October of the monthly index between 1982 and 1995. Scale from 0 to 10, with lower scores for less tradition for law and order. Source: *International Country Risk Guide*. (LaPorta et al, 1998).

Corruption: ICR's assess of corruption in government. Lower scores indicate "high government officials are likely to demand special payments" and "illegal payments are generally expected throughout the lower levels of government" in the form of "bribes connected with import and export licenses, exchange controls, tax, assessment, policy protection, or loans." Scale runs from 0 to6, with lower scores indicating higher levels of corruption. Source: *International Country Risk Guide*. (LaPorta et al, 1998)

Bureaucratic quality: Average of "bureaucratic quality" assessment values assigned by ICRG between 1982-19995. Scored 0-6, with higher scores for superior quality. (Kane, 2000b)

Risk of expropriation: ICR's assessment of the risk of "outright confiscation" or "forced nationalization." Average of the months of April and October of the monthly index between 1982 and 1995. Scale from 0 to 10, with lower scores for higher risks. (LaPorta et al, 1998)

Risk of contract repudiation: ICR's assessment of the "risk of modification in a contract taking the form of a repudiation postponement, or scaling down" due to "budget cutbacks, indigenization pressure, a change in government, or a change in government economic and social priorities." Average of the month of April and October of the monthly index between 1982 and 1995. Scale from 0 to 10, with lower scores for higher risks. (LaPorta et al, 1998)

Table 8. Indicators of Quality of Financial Infrastructure (cont'd.)

C. Quality of Economic information

	Accounting standards	Index of restrictions on the press
Hong Kong	73	32.75
Indonesia	N/A	71.40
Korea	68	26.40
Malaysia	79	61.00
Philippines	64	44.60
Singapore	79	63.60
Taiwan	58	28.40
Thailand	66	39.80
Average	69.6	45.99
Australia	80	8.80
Japan	71	20.20
UK	85	22.20
US	76	12.80
Average	78	16

Data definitions and sources:

Accounting standards: Index created by examining and rating companies' 1993 annual reports on their inclusion or omission of 85 items. These items fall into 7 categories (general information, income statement, balance sheet, funds flow statement, accounting policies, stockholders' information and supplementary information). A minimum of five companies in each country was studied. There are 1,000 industrial companies from 41 countries. The companies represent a cross-section of various industry groups. Scores are from 0-100. Higher scores indicate better accounting standards. Center for International Financial Analysis and Research, Inc.,1995, *International Accounting & Auditing Trends,* 4th ed.

Index of restrictions on the press: Assessment of repressive actions and laws, regulations, controls, and political pressures that influence media content. Score reported is the average index assigned by Freedom House staff *Annual Press Freedom Reports*, 1994-1998. Scale runs from 0 to 100, with lower scores indicating greater freedom. Kane (2000b)

(2000b) has identified an index of restrictions on the press as an indication of the openness of the society and the scope for manipulating flows of information. Again, on average, the four industrialized countries have much better scores than the eight Asian emerging economies, although the average masks wide variations across the eight countries.

Finally, a potential investor must have confidence in arrangements for the clearing and settlement of bond trades. Creditor rights, judicial efficiency and good information will be of little use if the investor cannot be certain of receiving the bond when payment is made.

Ideally, the clearing and settlement system should offer delivery against payment. Many of the emerging markets in Asia are adopting such systems.

Generally countries that rate higher on indices of creditor rights, judicial efficiency, and quality of information have larger bond markets. As we will see in Section 4, there are many useful things that a government can do to nurture development of a strong bond market, but these indices measure issues of fundamental importance. Indeed, Kane (2000a) has suggested that the international financial institutions should help countries improve their rankings on such indices and that the managers of international financial institutions should be evaluated and compensated on the basis of their success in encouraging such improvements.

3.1. Why equity markets may exist where bond markets fail to thrive

What are the main obstacles to developing an efficient bond market? Why, in environments with weak financial infrastructures, do equity markets appear to flourish while bond markets flounder? Part of the answer is inherent in the difference between debt and equity contracts. Debt claims promise repayment of principal and interest, while equity claims promise payment of a pro rate share of profits and usually convey a proportionate vote in important corporate governance matters.

The maximum return on a bond[6] purchased at par value is the promised interest payments. But the downside may include loss of the principal amount as well as promised interest payments. The bond contract defines the obligations of the borrower and remedies in the event of default. Usually, the key remedy in the event of default is that the bondholders may seize collateral or control of the enterprise from its owners.

The main challenge in pricing a bond is setting an interest rate that will compensate for the opportunity cost of funds, default, purchasing power and liquidity risk as well as whatever idiosyncratic features the bond may have such as a call option or sinking fund. In the absence of an active secondary market in risk-free debt of a comparable maturity, it will be difficult to identify the appropriate opportunity cost of funds. Estimating the probability of default and the expected recovery from the liquidation or sale of the firm in the event of default will also prove difficult in an economy with a weak financial infrastructure. In the absence of credible accounting practices, good disclosure practices or reliable bond ratings, it may be very difficult to estimate a probability of default or expected loss in the event of default. This challenge is still more difficult in the absence of clear laws setting out the bondholder's rights in the event of default, or an efficient judiciary that will oversee enforcement of such rights and a reliable enforcement mechanism. If households are concerned about a high probability of default or the expected loss in the event of default, it may not be possible to establish a viable bond market. Borrowers may not be able to offer credibly a sufficiently high interest rate to compensate for the perceived risk of loss (Stiglitz and Weiss (1981)).

In contrast to a bond in which the upside is limited by the promised interest rate, an equity claim has an unlimited upside return which can compensate for the perceived riskiness of the claim. Although minority shareholders will experience the same frustrations as bondholders in evaluating a firm's current condition and its earnings prospects, they can take comfort in the fact that they share an interest with the controlling shareholders and management in a rising share price. Thus if there is an active secondary market and reliable

[6] We shall use the term "bond" in the broadest sense to include all tradable fixed income instruments such as bills and commercial paper (usually with maturities of less than 1 year), notes (with maturities of 1 to 5

clearing and settlement procedures for buying and selling equity claims, an active market may develop for a firm's equity even though investors would not be willing to buy its debt.

What are the consequences of operating a financial system with a banking sector and equity market, but no bond market? The implications are profound and far ranging. We will analyze the impact on other markets, savers, investors, banks and financial development more broadly.

3.2. Absence of bond markets: implications for other markets

In the absence of a bond market, the economy will lack a market-determined term structure of interest rates that accurately reflects the opportunity cost of funds at each maturity. Without a term structure of interest rates, it will be difficult to develop efficient derivatives markets that enable economic agents to manage financial risks. Forward markets trade forward contracts that obligate the owner to buy a given asset on a specific date at a price specified at the origination of the contract. Since market participants always have the option of buying the asset on the spot market and holding it until the maturity of the forward contract, the forward price is linked to the current price by the interest cost of holding the asset until the forward contract matures. In the case of forward foreign exchange contracts, the relationship is a bit more complex because it involves both foreign and domestic interest rates. The forward foreign exchange rate is related to the spot foreign exchange rate by the ratio of (1 +) the home country interest rate relative to (1 +) the foreign interest rate, both corresponding to the maturity of the forward contract. If there is no market determined domestic interest rate, it may still be possible to buy a forward contract, but the market will be very thin and transactions costs will be heavy because market makers will not be able to hedge their positions using the bond market.

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years) and bonds (usually with maturities greater than 5 years).

Futures markets trade futures contracts that obligate the owner to purchase a specified asset at a specified exercise price on the contract maturity date. Futures markets differ from forward markets in that changes in the value of a futures contract are settled day by day as they occur rather than at the maturity of the contract. Thus Black (1976) has described futures contracts as a series of forward contracts that are settled day by day. Again, however, a key link between spot and futures prices is the interest rate corresponding to the maturity of the contract. Futures contracts are exchange-traded instruments that require a significant volume of trading to warrant the substantial fixed costs of organizing and running an exchange. Countries without a bond market are unlikely to generate enough activity to support development of an active futures exchange. Although Hong Kong, Singapore, Malaysia, the Philippines, and China all have futures exchange, active trading has been confined mainly to Singapore's International Monetary Exchange (SIMEX).

Swap contracts obligate two parties to exchange, or swap, some specified cash flows at specific intervals. The most common form is an interest rate swap in which cash flows are determined by the two different interest rates specified in the swap agreement. But, the swap contract can be decomposed into a portfolio of forward contracts (Smith, Smithson and Wakeman (1986)) in which at each settlement date throughout the term of the swap contract part of the change in value is transferred between the counterparties. In contrast to the forward contract in which the change in value is transferred between the counterparties at the maturity of the contract or the futures contract in which the change in value is transferred between the counterparties day by day over the term of the contract, part of the value of the change in a swap contract is conveyed between the counterparties at each

settlement date specified in the swap contract. Again, the key link between spot and forward rates is the corresponding interest rate.

In contrast to the owners of forward, futures or swap contracts who have an *obligation* to perform as specified in the contract, the owner of an option contract has the *right*, but not the obligation to perform as specified in the contract. Just as futures and swaps can be viewed as a portfolio of forward contracts, options can be viewed as portfolios of forward contracts and risk-free bonds. Black and Scholes (1973) have shown that a dynamic portfolio of forward contracts on the underlying asset and riskless bonds can replicate a call option. As the price of the asset rises, the call-option-equivalent portfolio contains an increasing proportion of forward contracts on the asset. As the price of the asset falls, the replicating portfolio contains a decreasing proportion of forward contracts on the asset. Like the forward, futures and swap markets, the options market depends critically on the bond market for pricing and hedging positions.

In the absence of a well-functioning bond market, it may be possible to obtain forward, swaps and options contracts that are specially tailored for a client. But they will be very expensive relative to what they would cost in an economy with a well-functioning bond market because they cannot be hedged as efficiently. The consequence is that market participants will be exposed to more financial risk than they would choose to accept if they had access to well-functioning derivatives markets. The events of 1997 showed that many market participants had accepted excessive exposures to foreign exchange risk.

The absence of a risk-free[7] term structure of interest rates also makes it difficult to price credit risk by comparing a risky asset with a risk-free asset that is alike in all other

[7] Technically, it isn't essential that the term structure be default risk free. It is necessary, however, that the benchmark bonds that price the term structure share the same risk of default. In most markets, government

characteristics. Although inefficiencies caused by mispricing credit risk may be second order relative to inefficiencies that result from mispricing the risk-free rate, they nonetheless cause distortions in the economy. Without a government bond market that establishes benchmark risk free rates at critical maturities, it will be very difficult to establish a corporate bond market, much less a market for high yield debt or securitized assets. Partly this is a consequence of the microeconomics of market making. It is easier to start a new market if the activity must cover only the marginal cost of the new market rather than the full costs of setting up and maintaining a market. If institutions have already invested in trading in government bonds, then the marginal cost of introducing another fixed income market will be relatively slight.

The absence of a broad, deep, resilient bond market also causes a loss of information to society. The differential yield between a risky bond and a risk free bond that is alike in all other characteristics reflects a market consensus about the appropriate credit risk (and possibly liquidity risk) premium. This market information can be used to price comparable bank loans and it is likely to extend the range of credit risk that is priced in the market rather than quantity rationed.

Although, as noted above, an equity market may flourish in the absence of the bond market, it may not be very efficient in the sense of aligning prices with fundamental economic values. Ideally, share prices should reflect the present discounted value of expected future earnings. But in economies that lack the infrastructure to support a bond market, investors are likely to have considerable doubt about what past earnings have been and what current earnings are, much less what expected future earnings will be. Moreover,

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issues, which are approximately default risk free in domestic currency terms, provide the benchmarks for estimating the term structure of interest rates.

in the absence of a bond market it is not clear how the appropriate discount rate should be determined. Thus shares are likely to be priced on the basis of expectations that are often shallowly held and subject to considerable volatility and the usefulness of share prices in allocating resources and corporate governance is correspondingly vitiated.

3.3. Absence of bond markets: implications for savers

Without a well-functioning bond market savers face a diminished array of assets. They will hold more substitute assets such as bank deposits and possibly, but less likely, equity and probably more non-financial assets such as gold or jewelry that reduce the supply of savings that can be mobilized for productive investment. They will be forced to accept a lower return for any given level of risk or a higher level of risk for a given level of return relative to an economy with a well-functioning bond market. As Hakansson (1999) has argued with respect to the corporate bond market, "we can expect that a large number of these securities will be such that we will be unable to find *any* portfolio of other securities in the market which can replicate their payoff patterns across contingencies or states." Applying his earlier theoretical work Hakansson (1982, 1992) compared equilibria with and without a well-developed bond market, and concluded that under fairly general conditions "the financial market richer in bonds will constitute a Pareto-improvement over the financial market in which banks do most of the lending."

In the absence of a well-functioning bond market, specialized financial institutions with long-term liabilities such as life insurance companies and pension funds will find it more difficult to acquire long-term assets that match the maturity of their liabilities. And consequently, the insurance they provide against future contingencies will be more costly.

3.4. Absence of bond markets: implications for investors

Without a well-functioning bond market, firms will lack a clear measure of the opportunity cost of funds. From society's perspective this may lead to overinvestment if the firm's internal rate is too low or underinvestment, if the firm's internal rate is too high. Evidence from the mid-1990s in several dynamic Asian economies suggests that that the internal discount rate may have often been too low because returns on investment fell markedly.

Firms will be entirely reliant on banks for debt financing. The same weaknesses in the financial infrastructure that impede development of a bond market – inadequate accounting and auditing, weak disclosure laws and uncertain enforcement of contracts – also lead banks to prefer short-term credit. As Diamond (1991) has shown, short-term credit is an important way to control borrowers when there are hidden action and hidden information problems since it limits the time an opportunistic firm can exploit its creditors without being in default.

Since banks typically lend for periods much shorter than the maturity of long-term bonds, this may affect the firm's preferred leverage. Any given leverage structure will be riskier the shorter the maturity of the debt outstanding. Firms may attempt to compensate for this risk by attempting to control the bank lender. As noted earlier corporate conglomerates will attempt to affiliate with a bank in part to form an internal capital market that will substitute for the absence of an external capital market. If the subsequent loans should go bad, this sort of relationship can give rise to the charge of crony capitalism.

Another consequence of the reliance on short-term bank lending may be a bias in firms' investment decisions. Based on Hart and Moore (1995), Caprio and Demirgüç-Kunt,

(1997) have argued that firms will tend to match the maturity of their assets and liabilities. This tendency has been documented in the United States and Caprio and Demirgüç-Kunt (1997) report on World Bank studies that affirm the pattern of matching maturities of assets and liabilities holds for developing countries as well. This suggests that reliance on short-term bank lending will bias investment toward short-term assets. As a result there may be too little investment in longer-term assets such as infrastructure, public utilities, housing and capital intensive industries.

Exclusive reliance on bank lending may bias investment in another more subtle way. Access to the bond market may play a role in encouraging entrepreneurial ventures by limiting the ability of banks to extract rents from successful ventures. Black and Gilson (1998) have argued that a dynamic venture capital sector will not thrive in a bank-based financial system because successful venture capitalists need the option of exiting from the project through issue of bonds or equity.

Some recent evidence for the bank-centered Japanese system (Weinstein and Yafeh (1998)) suggests banks do extract rents from their dependent corporate customers. The consequence is that the effective cost of funds is higher than it would have been if the firm had access to a well-functioning bond market.

The largest, best-known firms may attempt to compensate for the lack of a domestic bond market by issuing bonds in the international market. Table 9 shows corporate issues outstanding as a percentage of GDP in 1998 for several Asian economies and a benchmark group of high-income economies. In general reliance on international issuance of bonds was higher in this group of Asian economies than in the benchmark group (apart from the

United Kingdom). While this behavior is easily explained as an accommodation to the inadequacies of domestic bond markets, it subjects the borrowers to a heavy potential cost.

Table 9. Corporate Borrowings in Domestic and International Markets

	Domestic corporate debt securities outstanding (%GDP)	International corporate debt securities outstanding (%GDP)
Hong Kong	1.2	8.9
Indonesia	N/A	13.5
Korea	32.2	5.7
Malaysia	33.7	15.3
Philippines	0.0	9.4
Singapore	2.5	4.7
Taiwan	1.5	2.5
Thailand	3.8*	5.2
Average	10.7	8.2
Australia	15.9	4.7
Japan	17.9	4.2
UK	8.2	9.1
US	27.4	3.2
Average	17.4	5.3

1998, end of year data.
Sources: IMF International Financial Statistics, IMF World Economic Outlook Database, Bank for International Settlements

In general issues on international bond markets are denominated in foreign currency, usually US dollars or euros. Thus, to the extent that borrowing firms use this source of financing to fund activities that will have returns in the domestic currency, they will be increasing their exposure to foreign exchange risk. As already noted, opportunities for hedging this risk in derivatives markets are limited and generally quite expensive.

3.5. Absence of bond markets: implications for banks

* Includes data for financial institution.

Without competition from the bond market, the banking sector will be larger than it would otherwise be. Banks will have more deposits at lower cost because their customers will have very few other alternative, fixed-income investments and they will have more corporate loans because their borrowers will have few other sources of debt financing. If the banking market were highly competitive, the distortions from bank dominance of debt finance might be relatively slight, but in most countries without a bond market the banking system is highly concentrated. The deposit rate is not likely to reflect the true opportunity cost of funds for the economy because of cartel pricing in some countries and because in most countries, banks benefit from access to an implicit, if not an explicit safety net. The perception that claims on the bank will receive some degree of protection from the government, means that depositors will not be an effective source of discipline on bank risk taking.

It is generally argued that bank monitoring of a borrower is superior to monitoring by bondholders because bank lenders have lower costs of collective action and can renegotiate a loan contract at lower cost in the event that the borrower cannot meet the original repayment schedule. This may be true in general, but recent experience has shown that if a bank is weakly capitalized so that it cannot make a write down in a loan renegotiation without violating capital adequacy standards, the bank may let the borrower continue negative present value projects by funding these activities to avoid declaration of default (Herring 1989). In this circumstance monitoring by bondholders may be preferable since they will have no motive to sustain uneconomic activity.

The absence of a bond market precludes banks from issuing bonds, which might reduce their exposure to liquidity risk and provide another source of market discipline.[8] The virtual absence of market discipline from debt markets places a heavier burden on bank supervisors to curb risk taking. Like their counterparts in the industrialized world, however, bank supervisors in emerging markets have seldom been up to the challenge. Thus, the main restraint must come from shareholders of the bank. But in a world of implicit deposit guarantees, they have an incentive to take greater risks. This tendency is exacerbated if the bank is controlled by interests who are also heavy borrowers from the bank.

Even without this distortion of the incentives for risk taking, a bank that operates in an economy without bond markets has a diminished capacity to manage risks. The thinness of derivatives markets means that most hedging activities must involve transactions on the balance sheet. It will be particularly challenging to deal with concentrations of credit risk since in the absence of a well-developed bond market it will be difficult to sell or securitize loans or negotiate credit derivatives. And without access to a liquid bond market, banks will be more vulnerable to a liquidity shock because they will not have the option of selling bonds in a liquid secondary market and thus are more likely to be obliged to accept fire-sale losses on the sale of bank loans.

Viewed from a broader perspective, the economy is at risk of crisis due to excessive reliance on bank lending. Because banks are highly leveraged institutions, the economy is much more vulnerable to a financial crisis than if more corporate borrowing had taken place in the bond market and the claims were held in well-diversified portfolios. In the event of a shock that cripples the banking system, there will be an enormous impact on economic

[8] See, for example, the recent proposal by the Shadow Financial Regulatory Committee to require that all internationally active banks be required to issue subordinated debt (Calomiris et al, 2000).

activity because borrowers will not be able to substitute issuance of bonds for bank borrowing. Instability in the banking system can halt investment projects and reduce aggregate demand. Economic activity may be depressed until the banking system can be recapitalized. As experience in Asia since 1997 has shown, this can be a very painful process.

The absence of bond markets also inhibits efforts to clean up bank balance sheets in the wake of a crisis. From Scandinavia to the United States, Japan and several emerging economies in Asia, governments have issued debt in exchange for non-performing loans. In the absence of well-organized bond markets, the government debt issued is less liquid and therefore less useful in resuscitating bank lending. More importantly, in the absence of an active fixed-income market, it is more difficult to securitize non-performing loans so that resources can be redeployed as rapidly as possible to restructure the economy.

3.6. Absence of bond markets: summary

An economy that relies exclusively on banks for debt financing faces several major costs. First is the loss of information that is contained in market determined interest rates. This impedes the development of derivatives markets and may lead to inefficiencies in the pricing of equities. Without a clear measure of the opportunity cost of capital firms may invest to little or too much and the allocation of capital will be less efficient than if the economy had the advantage of a well-functioning bond market.

Second is the loss of welfare to savers who are less well off than they would be with the option of investing in a well-functioning bond market. Because financial investment is less attractive than it would otherwise be, fewer savings may be mobilized in the financial system to fund investment.

Third, firms may face a higher effective cost of funds than if they had access to the bond market and their investment policies may be biased in favor of short-term assets and away from entrepreneurial ventures. If firms attempt to compensate for the lack of a domestic bond market by borrowing in international bond markets, they may be obliged to accept excessive exposure to foreign exchange risk. In any event, the underdevelopment of domestic derivatives market will make it more difficult to manage financial risks.

Fourth, the banking sector will be larger than it would otherwise be. Since banks are highly leveraged, this may render the economy more vulnerable to crisis. Certainly, in the event that a banking crisis occurs, the damage to the real economy will be much greater than if investors had access to a well-functioning bond market and the financial restructuring process will be more difficult.

If the economy would be better off with a well-functioning bond market, what can the government do to nurture it? What policies will facilitate development of a bond market? We turn to that topic in the next section.

4. The role of government as issuer

The first major bond market to develop is usually the market in government obligations. In many countries the government has the largest stock of issues outstanding. In general, it is easier for bond traders to price government issues where credit risk is not an important consideration. Government bond prices can then serve as a basis for pricing the issues of other borrowers who are subject to credit risk.

In most countries governments issue debt to fund the gap between tax receipts and current expenditures, and sometimes to finance some extraordinary current expenditure. (See Table 10 that shows government borrowing and government borrowing relative to

borrowing by other issuers in the eight Asian emerging economies and the four industrialized countries.) The US bond market took flight after the issuance of Liberty Bonds to finance US participation in World War I. Rajan and Zingales (1999) note that people who would otherwise not buy a financial security, bought these bonds for patriotic reasons. The favorable experience investors had with these bonds left them willing to invest in securities issued by corporations. This gave liquidity to the corporate securities market and made possible the significant expansion of these markets during the 1920s.

Does this mean that fiscally conservative governments that do not run deficits cannot nurture a robust bond market? Hong Kong has shown that this need not be true. After all, it is *gross* debt that matters for the development of the market, not the *net* debtor position of the government. Hong Kong developed a benchmark yield curve in Hong Kong dollars through issues of Exchange Fund Bills and Notes, the proceeds of which are used primarily to invest in international markets, not to fund government spending.

If the government's objective is the nurturance of a robust bond market, then it should aim at establishing a benchmark yield curve that can serve as the risk-free rate for the pricing of other securities. This means committing to a program of regular issues at the appropriate maturities – usually three months, six months, one year, three years, five years and ultimately ten years. It must be recognized at the outset that the goal of developing a robust bond market may conflict with the goal of minimizing the cost of government borrowing.[9]

[9] The US, for example, is currently reducing the effective maturity of its outstanding debt. Because the US has a highly developed bond market with abundant issues by government-sponsored enterprises that serve as close substitutes for government debt, it may be able to reduce gross debt without undermining the efficiency of the bond market. This would not be a wise policy in an emerging market, however.

Table 10. Public and Total Borrowings in Domestic and International Markets

	Domestic debt securities outstanding (%GDP)		International debt securities outstanding (%GDP)	
	public	all issuers	public	all issuers
Hong Kong	3.3	17.4	4.7	19.5
Indonesia	N/A	1.5	0.7	18.2
Korea	16.2	75.7	7.2	16.8
Malaysia	31.3	85.4	1.4	17.5
Philippines	32.3	32.3	3.7	16.6
Singapore	20.8	23.3	0.1	6.5
Taiwan	11.7	13.2	0.0	2.8
Thailand	16.5	20.3	2.0	12.7
Australia	25.2	68.3	8.0	25.0
Germany	40.3	93.3	0.6	23.4
Japan	97.2	136.9	0.7	8.3
UK	33.1	60.8	0.9	25.8
US	88.8	159.5	1.5	9.6

1998, end of year data.

Sources: IMF International Financial Statistics, IMF World Economic Outlook Database, Bank for International Settlements

The design of government securities should be as simple as possible without complicated covenants and the design should be consistent across the maturities that comprise the benchmark yield curve. This will facilitate pricing of the risk-free rate without the distraction of special features such as sinking funds, call options or other features.

It is crucial that the interest rate on government bonds be market-determined, not administratively determined. If the government attempts to manipulate the bond market to reduce the cost of government borrowing, important information will be lost which may lead to distortions in the allocation of capital. This means that the government should not require certain institutions to hold its debt or devise special tax treatment of government debt that differs from that for other securities. Here again there is a natural tension between

the objectives of nurturing the development of a robust bond market and minimizing the cost of government borrowing.

Generally the price discovery process is enhanced by combining competitive auctions of new issues with issuance through a set of primary dealers who act as underwriters. It is useful to invite foreign firms to become primary dealers on the same basis as domestic firms. This is likely to speed the adoption of world-class best practices in the local bond market and enhance the access of domestic borrowers to longer-term foreign sources of funds. Primary dealers should be required to make markets in the issues by continuously quoting a bid-ask spread and standing ready to buy or sell at the stated rates.

Although the government will find a natural constituency for its longer-term issues in the portfolios of institutions with longer-term liabilities, such placements will not facilitate the development of a liquid secondary market because these institutions are likely to buy and hold bonds until they mature. Thus, it is important to attract other investors who will have a trading mentality. Mutual funds, for example, should be encouraged to enter the market.

4.1. Nurturing a strong secondary market

The liquidity of an asset is enhanced if it is traded in a liquid secondary market. Even if the asset is not sold, the liquidity of the secondary market increases its value as collateral for a loan because its worth can be more easily verified. Liquid secondary markets also raise the value of primary securities.[10] Confidence in the liquidity of secondary markets provides a valuable option to investors. Even if the investor does not plan to sell the

[10]When Citibank introduced the Certificate of Deposit, it was careful to make arrangements with dealers to establish active secondary markets in which CDs could be traded.

primary claim before maturity, the investor's future portfolio allocation preferences are inevitably subject to uncertainty and thus the availability of a deep, broad secondary market enhances the investor's willingness to buy the initial, primary claim.

Empirical evidence suggests that this option may be very valuable indeed. Pratt (1989) reports comparisons of the value of letter stocks that are identical in all respects to the freely traded stock of public companies except that they are restricted from trading on the open market for a specified period.[11] Pratt (1989, p.241) concludes that "compared to their free-trading counterparts, the discounts on the letter stocks were the least for NYSE-listed stocks, and increased in order for AMEX-listed stock, OTC reporting companies, and OTC nonreporting companies." This ranking of discounts corresponds roughly to perceptions of the liquidity of these secondary markets. Using the midpoints of the discount range for letter stocks relative to their freely traded counterparts, Pratt found that the discount was 25.8%.[12]

The "liquidity of a secondary market" is usually described in terms of its depth and breadth. "Depth" connotes the quantity that can be sold without moving prices against the seller. "Breadth" connotes the diversity of participants and the heterogeneity of their responses to new information. Both qualities are usually positively correlated with the size of the secondary market. Deep, broad markets are generally more resilient against

[11]Publicly traded corporations issue letter stock frequently in making acquisitions or raising capital when the time and cost of registering the new stock with the SEC would make the transaction impractical. Even though such stock cannot be sold to the public on the open market, it may be sold in private transactions under certain circumstances. Such transactions must be reported to the SEC where they become a matter of public record. Pratt (1989, p.240)

[12]Fernando (1990) derives an analytic expression for the magnitude of the liquidity premium (the return discount investors will accept in equilibrium) in which the liquidity premium increases with market size, converging to a limit as the size of the market approaches infinity. The limit depends on the variance of the personal subjective shock distribution and the coefficient of absolute risk-aversion.

disturbances of any given size than thin, narrow markets; they tend to display greater price stability in response to a shock of a given magnitude.

Liquid secondary markets are also "transactionally efficient" in the sense that the cost of a round-trip (the bid-asked spread) is low (Guttentag and Herring (1986)). Dealer markets are usually regarded as especially transactionally efficient because in addition to providing information and matching buyers and sellers, dealers also provide immediacy by buying and selling from inventory. The bid-asked spread charged by dealers in secondary markets must cover the opportunity cost of maintaining an inventory of securities, operating costs, and the risk of holding an inventory of securities. Greater price stability, which is associated with deep, broad markets, reduces the risk of inventorying securities and thus reduces transactions costs.

A government can track its progress in fostering a liquid secondary market by tracking the spreads quoted by dealers. The smaller the spread and the larger the size of the transaction that dealers are willing to undertake at the quoted spread, the more liquid the secondary market.

The liquidity of an asset also depends on the reliability of arrangements for exchanging the asset for cash. Heightened perception of "settlement risk" – the risk that one party in a transaction will fulfill its settlement obligation while the counterparty does not – can undermine the liquidity of an asset. In these respects the liquidity of an asset depends on the liquidity of its secondary market. In this instance emerging markets may have an advantage over some well-established markets with legacy clearing and settlement systems. They have the opportunity to leap frog traditional arrangement by adopting modern technology to facilitate clearing and settlement of secondary market trading. Hong Kong,

for example, has established a computerized book-entry system for bonds to reduce clearing and settlement risk. This book-entry system is linked to a real time gross settlement payment system so that it can provide real time delivery against payment for Hong Kong dollar debt securities.

While there are many measures a government can implement to enhance the liquidity of its secondary markets, the scope for success is inherently constrained by the size of the economy. Most European economies have not been of sufficient size to foster broad, deep, resilient bond markets like those found in the United States. Early experience within the euro area, however, indicates that the combined bond market denominated in euros may indeed grow to rival US-dollar-denominated markets. This raises the interesting question of whether Asia might be able to achieve similar gains through the development of a regional bond market.

5. Concluding comment: the example of Thailand

The Thai economy is illustrative of both the problems we identified in Section 3 and the solutions we outlined in Section 4. Before the crisis of 1997, Thailand had a highly developed banking sector and a buoyant stock market, but a moribund bond market. (See Table 11.)

Table 11. Size of Thai Financial Markets

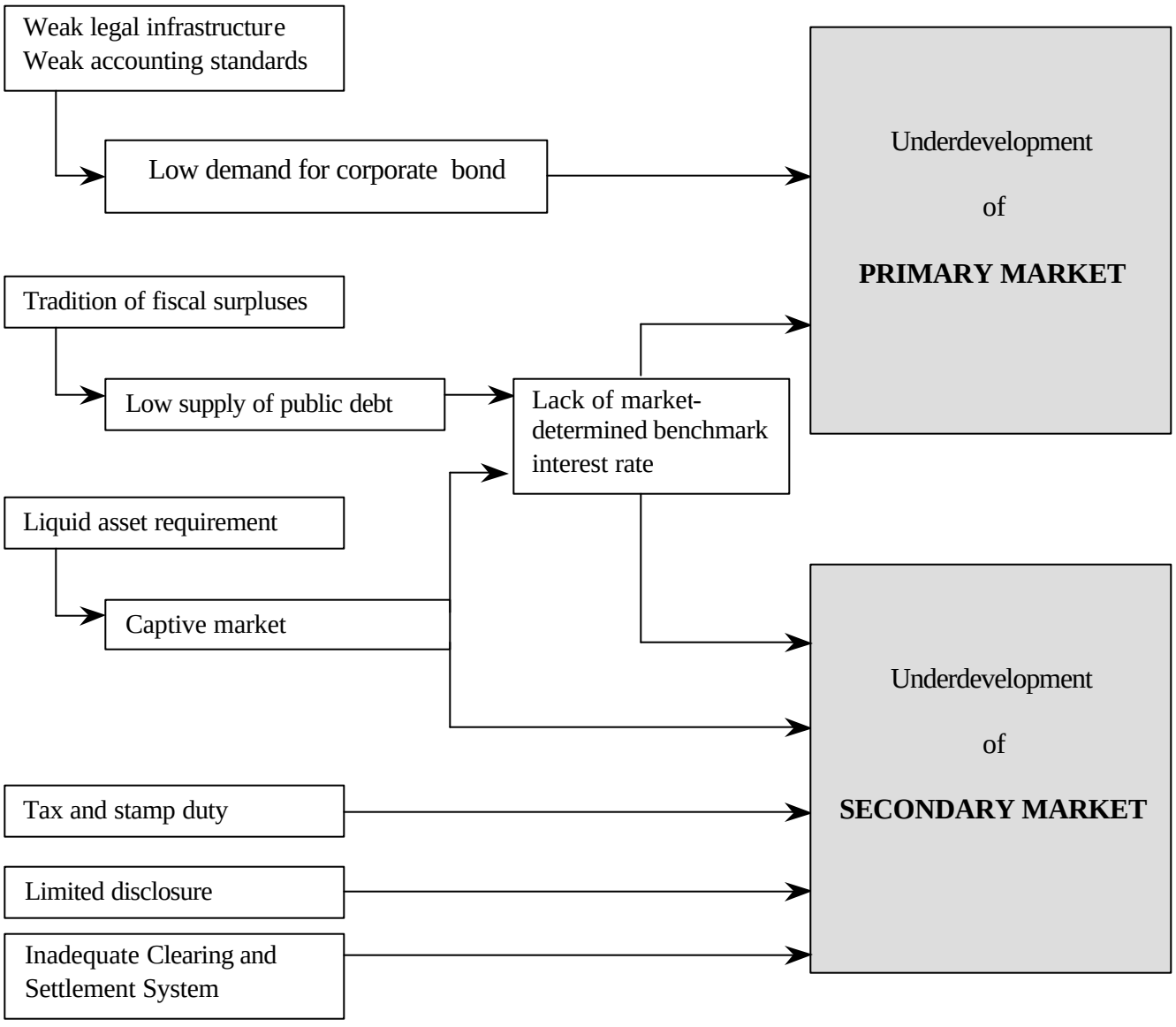
Unit: billion baht

	Bank loans	Stock market capitalization	Bond outstanding (domestic)	GDP
1992	2,161.9	1,485.0	215.1	2,830.9
1993	2,665.2	3,325.4	262.0	3,170.3
1994	3,430.5	3,300.8	339.0	3,634.5
1995	4,230.5	3,564.6	424.4	4,185.6
1996	4,825.1	2,559.6	519.3	4,608.5
1997	6,037.5	1,133.3	546.8	4,727.3
1998	5,372.3	1,268.2	941.3	4,636.0
1999	5,119.0	2,193.1	1,388.6	4,688.3

Source: Thai Bond Dealing Center

The underdevelopment of the Thai bond market can be attributed to several causes. (See Table 12.) First is the lack of a benchmark, market-determined yield curve. Until the crisis, the Thai government had a tradition, dating from 1988, of fiscal surpluses. No government bonds were issued from June 1990 until 1998, when the government was forced to run significant deficits in an effort to rebuild the economy. Prior to the crisis, the government viewed issuance of bonds solely as a means of financing deficits rather than as a way of nurturing the development of a bond market.

Table 12. Thailand's Structural Problems and Consequences on the Development of the Bond Market



Second, the Thai government had constructed a captive market for its securities. Banks and finance companies were required to hold substantial reserves in the form of national government securities. Most of these securities were held to maturity. This discouraged secondary market trading and meant that the interest rate did not reflect the true opportunity cost of funds.

Third, tax laws impeded the development of the secondary market. Until 1995 Thailand imposed a stamp duty on transfers of bond ownership. Although the rate was low, approximately 0.1 percent of the value of the bond,[13] it was a powerful deterrent to secondary market trading.

Fourth, a weak legal infrastructure created doubts about creditor rights in the event of default. The Asian Development Bank has observed that "certain aspects of Thai culture that will make it difficult to eliminate corruption, such as strong deference to hierarchy and authority, a general aversion to confrontation, the expectation of rewarding followers, and a belief that wealth and position are naturally and intrinsically linked."[14] Although Thailand ranked relatively well in terms of creditor rights (see Table 8.A), it ranked poorly in terms of judicial effectiveness. There have been drastic recent improvements in the legal infrastructure of Thailand, however. The National Assembly approved the new constitution on September 27, 1997 and the amended Bankruptcy Act became effective in April 1998. Earlier this year, creditors won a landmark victory in the bankruptcy case of Thailand's biggest corporate debtor.

Fifth, weak accounting and disclosure standards impeded the evaluation of credit risk and made it difficult for external investors to value risky debt. Table 8.C shows that

[13] Emery (1997)
[14] Asian Development Bank (1999)

accounting standards in Thailand rank below average among the eight Asian emerging economies. Again, there have been recent efforts to correct this weakness. Based on a study funded by the Asian Development Bank, Thailand launched its first credit rating agency, the Thai Rating and Information Services Company Limited (TRIS) in 1993. The ownership of TRIS is widely spread among commercial banks, finance companies, securities companies, the Thai government, and multilateral agencies. TRIS rates both debt securities and companies. All public debt offerings with a maturity greater than one year, require a rating from TRIS.[15]

The underdevelopment of the bond market may have caused serious distortions in the Thai economy. Without a market-determined interest rate that reflected true opportunity cost of funds, and with bank loan rates marked-up over deposit rates that were administratively determined, there was a tendency for Thai firms to overinvest. As a result, the efficiency of investment declined. Claessens, Djankov, and Lang, (1998) report that the median return on assets for Thai firms declined steadily from 11.7 percent in 1990 to 7.4 percent in 1996. Alba, Claessens, and Djankov (1998) report four indicators of enterprise performance, using data for all firms listed on the Stock Exchange of Thailand, that indicate Thai corporate performance had been deteriorating well before the 1997 financial crisis. (See Table 13.)

The inadequacies of the bond market may have contributed to the heavy reliance of Thai firms on family group corporate structures. Claessens, Djankov, Fan, and Lang, (1998) documented that 46.85 percent of Thai firms were affiliated with corporate groups in 1996.

[15] In 1999, the Securities and Exchange Commission passed a resolution requiring private placement debt of more than 100 million baht to be rated.

In the absence of an efficient bond market, firms relied heavily on foreign borrowing. Table 14 shows the evolution of foreign debt of the Thai private sector from 1987-1999. Between 1988-1995 it grew at rates ranging from 20 to 65 percent per annum. With limited access to relevant derivatives markets and risk management tools,

Table 13. Deteriorating Corporate Performance of Thai Firms

	Profits over interest expenses	No. of firms with profits < interest expenses (%)	Loans of firms with profits < interest expenses (%)	Profits over liabilities (%)	Leverage
1997:Q4	1.49	32.0	36.4	7.3	2.95
1997:Q3	2.59	23.3	30.8	10.2	2.95
1997:Q2	3.18	19.9	18.4	NA	2.12
1997:Q1	3.66	15.3	16.2	NA	2.01
1996:Q4	3.11	13.8	11.8	14.9	1.90
1995:Q4	4.01	9.6	7.6	18.1	1.67
1994:Q4	5.78	5.1	1.4	24.0	1.50

Profit is defined as earnings before interest, taxes, depreciation, and amortization (EBITDA). Leverage is debt over equity.

Source: Alba, Claessens, and Djankov (1998)

Table 14. Foreign Debt of Thai Private Sector

Unit: $ million

	Long-term	Short-term	Total	Growth
1987	3,175	2,894	6,069	-2.7%
1988	3,282	4,492	7,774	28.1%
1989	4,966	5,777	10,743	38.2%
1990	7,633	10,160	17,793	65.6%
1991	10,382	14,686	25,068	40.9%
1992	12,189	18,364	30,553	21.9%
1993	15,302	22,634	37,936	24.2%
1994	20,153	28,999	49,152	29.6%
1995	25,155	41,011	66,166	34.6%
1996	36,172	37,559	73,731	11.4%
1997	34,855	34,238	69,093	-6.3%
1998	31,293	23,373	54,666	-20.9%
1999	25,506	13,546	39,052	-28.6%

Source: Bank of Thailand

foreign borrowing led to excessive build up of foreign exchange risk that contributed to the 1997 financial crisis.

One consequence of the underdeveloped state of the bond market was that the Thai economy was heavily reliant on bank lending. Table 1 shows in the year before the crisis, bank lending accounted for nearly all external funding of investment. The consequence of this dependence on bank lending was catastrophic for the economy. When the banks suffered heavy losses, new lending ceased and firms were forced to halt investment projects. The result was a prolonged and painful economic contraction.

The Thai authorities have learned a costly lesson about the dangers of over-reliance on banks. They have begun to implement reforms designed to stimulate

development of both the primary and secondary bond markets. The Bank of Thailand has made an effort to introduce a quarter-ahead calendar of regular issuance of government bonds in the primary market and with the government taking on responsibility for many of the costs of financial sector restructuring there is likely to be no shortage of supply. The Bank of Thailand has succeeded in developing a yield curve for government bonds that extends from less than one year out to fifteen years.

In June 1999, the Bank of Thailand allowed financial institutions to conduct Securities Borrowing and Lending (SBL) business, which should help promote risk management and market liquidity. It will also institute a code of conduct for market participants, which will include the establishment of a Market Committee to settle any disagreements between participants in the secondary market.

The Bank of Thailand is developing a primary dealership system to facilitate the conduct of open market operations. Primary dealers will eventually make a market for both government and private securities. Thailand will also introduce an Inter-dealer Broker System (IDB) to facilitate transactions between dealers, and the Repurchase Market will be expanded.

In addition, the Bank of Thailand plans to launch a fully automated delivery versus payment (DVP) settlement system in 2001. It will be supplemented by the intra-day liquidity facilities and queuing mechanism, employing digital signature technology to ensure secure and smooth real-time delivery and payment transaction.

As the Thai example shows, bond markets matter for financial development. Certainly, an economy can grow rapidly without an active bond market. But the cost is an increased vulnerability to a financial crisis and a loss of information to guide savings and

investment decisions. Heavy reliance on banks means a correspondingly heavy exposure to banking crises. And the consequence can be catastrophic for the real economy. But the example of Thailand also shows that it may be possible to rebuild the financial system with an expanded role for the bond market.

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