

FINANCIAL SYSTEMS, INDUSTRIAL STRUCTURE, AND GROWTH

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How does the development of the financial sector affect industrial growth? What effect does it have on the composition of industry, and the size distribution of firms? What is the relative importance of financial institutions and financial markets, and does it depend on the stage of economic growth? How do financial systems differ in their vulnerability to crisis? This paper attempts to provide an answer to these questions based on the current state of empirical research.

I. INTRODUCTION

How does the development of the financial sector affect industrial growth? What effect does it have on the composition of industry, and the size distribution of firms? What is the relative importance of financial institutions and financial markets, and does it depend on the stage of economic growth? How do financial systems differ in their vulnerability to crisis? This paper attempts to provide an answer to these questions based on the current state of empirical research. This is not, however, meant to be a comprehensive survey. Instead, we hope to present

our own point of view, bolstered by the available empirical evidence.

The first section of this paper focuses on the theoretical rationale and empirical evidence for why financial development aids industrial growth. In the second section, we compare and contrast two types of financial system: the institution-heavy relationship-based system, and the market-intensive arm's-length system. We will ask which type of system is more suitable for industrial growth. In particular, we focus on what seems to be a recent hybrid—venture capital financing. In the last section, we ask how

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each kind of system responds to macroeconomic volatility and systemic risk. We conclude with some policy conjectures.

II. FINANCIAL DEVELOPMENT AND GROWTH

There is a long literature debating the impact of finance on growth—dating at least as far back as Schumpeter (1911)—that emphasizes the positive influence of the development of a country's financial sector on the level and the rate of growth of its per-capita income. The argument essentially is that the services the financial sector provides—allocating capital and risk appropriately in the economy—are an important catalyst of economic growth. Early empirical work seemed consistent with this argument. For example, on the basis of data from 35 countries between 1860 and 1963, Goldsmith (1969, p. 48) concludes that 'a rough parallelism can be observed between economic and financial development if periods of several decades are considered' and 'there are even indications in the few countries for which data are available that periods of more rapid economic growth have been accompanied, though not without exception, by an above-average rate of financial development.'

Nevertheless, studies such as these simply suggest correlation. As Goldsmith (1969) puts it,

There is no possibility, however, of establishing with confidence the direction of the causal mechanism, i.e., of deciding whether financial factors were responsible for the acceleration of economic development or whether financial development reflected economic growth whose mainsprings must be sought elsewhere.

While Goldsmith (1969) was somewhat pessimistic about the possibility of establishing causation, other economists have expressed downright scepticism that financial development is anything but a side-show to economic development. Robinson (1952, p. 86) is representative of a school which seems to believe that institutions follow the inverse of Say's law, that demand creates its own supply, when she claims, 'Where enterprise leads, finance follows.' Others, such as Lucas (1988), argue that the importance of financial development has been overemphasized.

The importance of the role financial markets and institutions play in an economy is undisputed and fairly well documented elsewhere (see Levine (1997), for example). What is disputed is whether financial markets and institutions appear on demand. If they do not, then the underdevelopment of financial markets and institutions would prevent an immediate response to industrial needs, and would retard the growth of a country. Recent evidence suggests this may be the case.

(i) Evidence on Financial Development and Growth

The rekindling of interest in the empirical connection between financial development and growth owes much to King and Levine (1993). They study 80 countries over the period 1960–89 to see whether the pre-determined component of financial development predicts long-run economic growth. They find that beginning-of-decade measures of a country's financial development—such as the ratio of liquid liabilities of the financial system to gross domestic product (GDP), the share of domestic credit allocated by banks, or the ratio of domestic credit to private enterprises to GDP—are strongly related to the country's economic growth, capital accumulation, and productivity growth over the subsequent decade. The economic size of the effects is also large. If, in 1970, Zaire had increased the share of domestic credit allocated by banks as opposed to the central bank from 26 per cent to the mean for developing countries (about 57 per cent), Zaire would have grown about 0.9 per cent faster each year in the 1970s, and by 1980 per-capita GDP would have been 9 per cent above its actual level (King and Levine, 1993, p. 734).

While the evidence in their paper sheds additional light, it does not lay to rest all doubts about causality. The sceptic could still offer a number of counter-arguments.

First, both financial development and growth could be driven by a common omitted variable, such as the propensity of households in the economy to save. Since endogenous savings (in certain macro-economic models) affect the long-run growth rate of the economy, it may not be surprising that growth and initial financial development are

correlated. This argument is also hard to refute with simple cross-country regressions. In the absence of a well-accepted theory of growth, the list of potential omitted variables that financial-sector development might be a proxy for is large, and the explanatory variables to include a matter of conjecture.

Second, there is a potential problem of anticipation. Financial development—typically measured by the level of credit and the size of the stock market—may predict economic growth simply because financial markets anticipate future growth; the stock market capitalizes the present value of growth opportunities, while financial institutions lend more if they think sectors will grow. Thus financial development may simply be a leading indicator rather than a causal factor.²

One way to deal with the first problem, that of omitted variables, is to keep effects other than financial development constant. An ingenious paper by Jayaratne and Strahan (1996) does precisely this. Between 1972 and 1991, a number of states in the United States did away with regulations preventing banks from opening multiple branches within the state. The authors argue that deregulation was tantamount to a quantum jump in the development of the financial sector within the state, because it allowed scale economies to be realized through bank mergers, old inefficient management to be shunted out, and new management to be given better incentives. They find that annual growth rates increased by 0.51 to 1.19 percentage points a year after deregulation.

Of course, one could ask again whether financial-sector reform leads to economic growth, or vice versa. Did states liberalize anticipating a greater need for financing because of economic growth? Jayaratne and Strahan (1996) argue that if this was the case, the volume of bank lending should have exploded after deregulation. It did not! Instead, they argue that deregulation led to improvements in loan quality, which led to better growth. It is hard to make the case that state legislatures deregulated anticipating the improvement in loan quality.

Jayaratne and Strahan (1996) essentially follow a difference-in-differences approach by asking what happens in a state after deregulation. As a result, concerns about whether the states that deregulated were somehow special are mitigated. Rajan and Zingales (1998a) follow a similar approach, but with an important twist. Instead of examining the effect of changes in financial development on growth as Jayaratne and Strahan do, they examine the differential effect of a common level of financial development on different industries within a country.

Their rationale is a theoretical one. They argue that the way to make progress on causality is to document empirically the working of the theoretical mechanisms through which financial development affects economic growth. Specifically, theorists argue that financial markets and institutions help a firm overcome problems of moral hazard and adverse selection, thus reducing the firm's cost of raising money from outsiders. So financial development should disproportionately help firms (or industries) that are typically dependent on external finance for their growth. Such a finding, they argue, could be the 'smoking gun' in the debate about causality. There are two virtues to this simple test. First, it looks for evidence of a specific mechanism by which finance affects growth, thus providing a stronger test of causality. Second, it can correct for fixed country (and industry) effects. As a result, the empirical test is less dependent on a specific macroeconomic model of growth.

Rajan and Zingales (1998a) construct the test as follows. They identify an industry's need for external finance (the difference between investments and cash generated from operations) from data on US firms. Under the assumption that capital markets in the United States, especially for the large listed firms they analyse, are relatively frictionless, this method allows them to identify an industry's technological demand for external financing. Under the further assumption that such a technological demand carries over to other countries, they examine whether industries that are more dependent on external financing grow relatively faster in countries that, a priori, are more financially developed.

² Levine and Zervos (1998) attempt to deal with this by using stock-market liquidity, rather than market capitalization, as a measure of financial development. Market expectations could also be built into liquidity (see Shleifer and Vishny, 1992), though to a much lesser extent than into market capitalization.

In contrast to prior studies that have used measures of financial development that are based on actual financing—such as the quantity of domestic credit or the size of the stock market—Rajan and Zingales (1998a) use the accounting standards in that particular country as their measure of development. This has the advantage of measuring the potential of the financial infrastructure rather than its past use.

Their hypothesis would imply that, *ceteris paribus*, an industry such as drugs and pharmaceuticals, which requires a lot of external funding, should develop relatively faster than tobacco, which requires little external finance, in countries that are more financially developed. Consider, for instance, Malaysia, Korea, and Chile, which are moderate-income fast-growing countries that differ considerably in their financial development. Consistent with their hypothesis, in Malaysia, which was the most financially developed by their metric, drugs and pharmaceuticals grew at a 4 per cent higher annual real rate over the 1980s than tobacco (the growth rate for each industry is adjusted for the worldwide growth rate of that industry). In Korea, which was moderately financially developed, drugs grew at a 3 per cent higher rate than tobacco. In Chile, which was in the lowest quartile of financial development, drugs grew at a 2.5 per cent *lower* rate than tobacco. So financial development seems to affect relative growth rates of industries in the way predicted.³

Rajan and Zingales (1998a) offer two additional tests that suggest causality from finance to economic growth. First, they instrument measures of financial development with measures of the origins of a country's legal system (whether British, French, German, or Scandinavian, as classified by La Porta *et al.* (1998)), and with the efficiency of the country's judicial system. These instruments, especially the former, which are correlated with measures of financial development, are likely to be predetermined, and do not reflect development in anticipa-

tion of economic growth. The results persist after instrumenting. Second, Rajan and Zingales (1998a) drop industries that were large at the beginning of the period and are more likely to have been responsible for the country's financial development. They find that industries that are small at the beginning of the period and financially dependent grow faster in financially developed countries than do less-dependent industries. This finding, in a sample that is unlikely to be responsible for the state of development of the financial markets, suggests that financial development does indeed facilitate growth, and is not simply correlated with it.

Beck (2001) provides evidence that financial development may be a source of comparative advantage. He shows that countries with better-developed financial systems have higher export shares and trade balances in industries that use external finance. This is strong evidence that financial infrastructure can be independently important in determining a country's competitiveness. Finance matters!

(ii) Financial Development and Growth: Details

There is now a growing body of work that documents in greater detail the kinds of firms in the modern economy that financial development helps. Delving deeper into the components of growth, industry growth can be broken down into the growth in the number of firms and the growth in the average size of firms. New firms depend more on external finance than established firms. Rajan and Zingales (1998a) find that financial development has almost twice the economic effect on the growth of the number of establishments in an industry as it has on the growth of their average size. This suggests that an additional indirect channel, through which financial development could influence growth, is disproportionately improving the prospects of young firms. If these firms are typically innovators, they make possible Schumpeterian 'waves of creative de-

³ Demirgüç-Kunt and Maksimovic (1998) also use micro data to develop a test of the influence of financial development on growth. Using firm-level data, they estimate the proportion of firms whose rate of growth exceeds the growth that could have been supported only by internal resources. They then run a cross-country regression and find that this proportion is positively related to the stock-market turnover and to a measure of law enforcement. While their paper is similar in spirit to Rajan and Zingales (1998a), there are two essential differences. First, their estimate of the internal growth rate of a firm is dependent on the firm's characteristics. While it is potentially more accurate than Rajan and Zingales's measure of external dependence, it is also more endogenous. Second, they focus on between-country differences in the spirit of traditional cross-country regressions, while Rajan and Zingales's focus is on within-country, between-industry differences.

struction' that would not even get initiated in countries with less developed markets.

Wurgler (2000) provides evidence on how the financial sector may help. He finds, across a sample of 65 countries, that countries with developed financial sectors increased their investment more in growing industries and decreased their investment more in declining industries (where growth and decline are measured by change in value added) than did countries with underdeveloped financial sectors. The magnitude of the effect is big. For example, consider a positive increase in the value added by an industry of 10 per cent. Wurgler (2000) finds that investments would increase by more than 7 per cent on average if the industry were in the United States, but only by 1 per cent if the industry were in India.

In part, this ease of reallocating capital may reflect the greater ease with which growth can be financed in a developed capital market. Carlin and Mayer (1998) provide an extremely suggestive set of correlations. Using data from 27 industries in 20 OECD countries over the period 1970–95, they find that industries funding a lot of investments with equity tend to grow faster, and do more research and development, in countries that have better accounting standards. They also find that industries where workers have high skill levels tend to grow faster and do more research and development in countries with better accounting standards.⁴ Interestingly, equity-financed industries undertake less fixed-capital formation in countries with better accounting standards.

In direct contrast to equity-financed industries, bank-debt-financed industries tend to grow more slowly in countries that are more financially developed and also tend to undertake less research and development. Finally, in contrast to what happens in developed countries, bank-dependent industries in countries with low GDP grow faster as the banking system develops but are relatively unaffected by improvements in accounting standards.

What do we make of these findings? Once we think of fixed assets as collateral, then interpretation

becomes much easier. Typically, equity-financed industries tend to have few hard assets, and substantial intangible assets such as growth opportunities (see Myers, 1977). In economies with underdeveloped financial markets and institutions, collateral is essential to obtain outside financing. Thus we would expect industries that would optimally use few hard assets if financing was easy to come by, to use more of them in countries with underdeveloped financial systems. Thus the finding that as accounting standards and credit markets develop, equity-financed industries tend to use less fixed capital. In other words, the intangible assets that they typically possess in abundance become easier to finance, and they do not have to distort asset holdings towards fixed capital.

Carlin and Mayer's (1998) other findings are also consistent with the above interpretation. Because the intangible assets in equity-financed firms become easier to finance as the financial system develops (where development is measured as better accounting standards, or more bank credit), the industry grows faster, and can finance more research and development—one of the biggest sources of intangible assets. Similarly, a highly skilled workforce is an important intangible asset, and the finding that industries with highly skilled workers tend to grow more and do more research and development as financial markets develop, corroborates our interpretation. Finally, industries dependent on bank finance in Japan (which is where Carlin and Mayer (1998) measure bank dependence) tend to be physical, capital-intensive, smoke-stack industries (see Hoshi *et al.*, 1990a). When financial markets and institutions are poorly developed, these industries have excess collateral and can invest in intangible activities such as research and development that others would undertake if financial constraints were not important. As finance develops, these industries lose their comparative advantage, and tend to grow less, and do less research and development.

In sum, it appears that industries can raise finance more easily as the financial system develops because physical collateral becomes less important,

⁴ Following the methodology in Rajan and Zingales (1998a), Carlin and Mayer (1998) proxy for an industry's dependence on equity by the amount of equity that industry uses to finance investment in the United States. They measure the industry's dependence on bank finance by how much that industry uses in Japan, and they measure the industry's use of skilled workers based on how many workers in that industry in Germany are not classified as unskilled.

while intangible assets and future cash flows can be financed.

The Carlin and Mayer (1998) findings may also explain why firms in industries dependent on external finance are born more easily in countries with well-developed markets. When firms start out, many of their assets are intangible ideas and project opportunities. Thus financial development, by enabling these assets to be financed, acts as an important engine of growth.

There are also some puzzling aspects to the findings. Some developed countries have both good accounting standards (which, across countries, is strongly positively correlated with stock-market capitalization) and a high proportion of bank lending, but in general these countries are exceptions. In fact, Carlin and Mayer (1998) find the raw correlation between the two measures of financial development to be negative in their sample. Why is it that bank credit tapers off as stock markets develop?

That economies seem to emphasize either institutions or markets has led economists to classify financial systems as relationship-based (or bank-dominated) and arm's-length (or market-based). Some recent studies seem to debunk the difference between these two kinds of systems. In particular, Beck *et al.* (2001) use evidence from an assortment of firm-level, industry-level, and country-level data to suggest that, while the overall development of the financial system is important, the distinction between bank- and market-based systems is relatively unimportant in explaining growth. If anything, differences between financial systems may have more to do with the quality of the judicial system and the statutes in place than whether they are deemed to be bank-based or market-based.

Before we accept their findings, however, let us ask what distinguishes these two types of systems? Moreover, do they have different effects when countries are at different stages of growth? Could this explain why Carlin and Mayer (1998) find that bank-dependent industries grow faster in bank-dominated economies only when the economies are relatively underdeveloped? To answer these questions, we have to ask how relationship-based systems work and how are they different from

arm's-length systems. This is the subject of the next section.

III. RELATIONSHIP-BASED VERSUS ARM'S-LENGTH SYSTEMS

Let us begin with a sketch of the salient features of these two kinds of systems. Like all sketches, this one has elements of caricature, but this is the price we have to pay to avoid being distracted by the details.

A financial system has two primary goals: to place risks where they are best borne, and to channel resources to their most productive uses. If resources are to flow easily, it is important that the lender feel confident of the prospect of an adequate return.

As Rajan and Zingales (1998*b*) argue, relationship-based systems ensure a return to the financier by granting her some form of power over the firm being financed. The simplest form of power is when the financier has (implicit or explicit) ownership of the firm. The financier can also serve as the sole or main lender, supplier, or customer. In all of these forms, the financier attempts to secure her return on investment by retaining some kind of monopoly over the firm she finances. As with every monopoly, this requires some barriers to entry. These barriers may be due to regulation, or to a lack of transparency—or 'opacity'—of the system, which substantially raises the costs of entry to potential competitors.

Contrast this with the arm's-length, Anglo-Saxon, market-based system, where the financier is protected by explicit contracts and transparency. In such systems, contracts and associated prices determine the transactions that are undertaken. As a result, institutional relationships matter less and the market becomes a more important medium for directing/governing the terms of transactions.

An important distinction between these two systems is their different degree of reliance on legal enforcement. Relationship-based systems can survive in environments where laws are poorly drafted and contracts not enforced. The relationship is largely self-governing; parties intent on maintaining

their ‘reputations’ honour the spirit of the agreement (often in the absence of any written contract) in order to ensure a steady flow of future business within the same network of firms. By contrast, the prompt and unbiased enforcement of contracts by courts is a precondition for the viability of a market-based system. Moreover, since contracts are typically hard to write with the wealth of detail necessary fully to govern transactions, it is important that the law offer a helping hand.

Another distinction between the two systems is the relative importance of transparency. Market-based systems require transparency as a guarantee of protection. In the words of Justice Brandeis, as echoed by Franklin Roosevelt, ‘Sunlight is said to be the best of disinfectants; electric light the most efficient policemen’ (Seligman, 1995). By contrast, relationship-based systems are designed to preserve opacity, which has the effect of protecting the relationships from the threat of competition. This probably explains the negative correlation between accounting standards and the size of the banking sector that we noted earlier.

(i) An Example: Credit

Before going further, let us consider the example of a transaction—the extension of credit—in each of the two systems. In a relationship-based system, a bank will have close ties with a potential borrowing firm, perhaps because of frequent past contacts or because of ownership links. In assessing the borrowing needs of the firm and its ability to pay interest and principal, the bank will consider not only the firm’s current debt-servicing capability, but also its long-term ability to repay, and the various non-contractual levers the bank can push to extract repayment.⁵ The interest rate charged will be repeatedly negotiated over time, and may not have a direct relationship to the intrinsic risk of the project.

In an arm’s-length system, by contrast, the firm will be able to tap a wider circle of potential lenders because there will be more widespread financial information about it. The loan will be contracted for a specific period, and the interest rate will be a

competitive one that will compensate the lender for time and the risk of that particular loan.

Limitations on competition in a relationship-based system do not just give the financier power, but also strengthen his incentive to cooperate with the borrower. Studies of Japanese *keiretsus* show that the main banks went out of their way to help financially distressed borrowers. For example, Sumitomo Bank not only effectively guaranteed Mazda’s debts when it got into trouble after the first oil shock, but also orchestrated a rescue, in part by exhorting employees within its *keiretsu* to buy Mazda cars (Hoshi *et al.*, 1990b). Sumitomo’s incentive to help would have been considerably weaker if Mazda had had the option of giving the lion’s share of its business, once it emerged from distress, to some other bank. As this example suggests, the effective limitations on outside competition imposed by the *keiretsu* system enable lenders to ‘internalize’ a greater share of the benefits accruing to the borrowers than is possible in an arm’s-length, competitive banking environment.

The absence of competition and disclosure in a relationship-based system implies that there are really no price signals to guide decisions. Unlike an arm’s-length system, where a number of competitive lenders can give a borrowing firm independent assessments of the costs of undertaking a project, the cost a borrower faces in the relationship-based system is simply what the relationship lender and the borrower negotiate. Since there can be substantial value created in the relationship, and the negotiation and allocation of this surplus is a function of each party’s power, the effective cost of financing can deviate substantially from the true risk-adjusted cost.

(ii) Do Relationship-based Systems always Lead to Worse Investment Decisions?

Are lending and investment decisions always inefficient if the cost of funds differs from their true cost? Are there no redeeming features of a relationship-based system? The answer to these questions is no. In the real world with all its ‘imperfections,’ an

⁵ For example, the bank may refuse to extend a blanket guarantee to the firm’s other creditors, refuse to provide new financing, or even take a piece of it, etc.

imperfect cost of funds can sometimes produce the right investment decisions.

For instance, consider our previous example of a firm in distress. Taking into consideration all the value that the firm adds to society—to workers, customers, and local governments as well as shareholders—the company may be worth saving. But, *in the short run*, the true cost of funding may far exceed what the firm can pay without creating further investment distortions.⁶ And in the competitive arm's-length system, a lender may not be able to recoup or 'internalize' enough of the firm's value in the long run to be able to offer it subsidized financing in the short run. So the firm is much less likely to be bailed out in the competitive, arm's-length system. By contrast, a lender in a relationship-based system, confident in the strength of the relationship (and the protection it affords from competition), can offer a below-market rate in the short run and then recoup its losses with an above-market rate over the long run when the firm is healthy and can afford high pay-outs. In sum, relationship-based banks can be viewed as using their monopoly power to charge above-market rates in normal circumstances in return for an implicit agreement to provide below-market financing when their borrowers get into trouble (see Mayer *et al.*, 1988).

Petersen and Rajan (1995) provide evidence of the existence of such relationship-based lending practices even in the USA. In examining bank loans to small businesses in different banking 'markets' throughout the USA,⁷ their study finds that in 'concentrated' markets (those where most of the lending is done by a handful of banks)—which are likely to be more relationship-oriented for the reasons discussed earlier—more credit is available to young firms than in more competitive banking markets. To the extent young firms are more credit rationed, as many observers have suggested, the evidence suggests that the relationship-based system does a better job of ensuring that value-adding projects get funded.

The study also finds that the interest rates charged to younger firms are, on average, lower in concentrated markets than in competitive markets, with the effect reversing for older firms. This suggests that banks in concentrated markets can offer more credit on economic terms because their relationships allow 'inter-temporal cross-subsidies'; that is, below-market rates for younger firms that are compensated for by above-market rates for more mature firms that have a higher ability to pay. Such subsidies, as suggested earlier, would not be possible in more competitive markets.

Recent studies have found further evidence suggestive of the role of relationships. Cetorelli and Gambera (2001) show that while a concentrated banking system in a country has a general depressing effect on growth, it does facilitate credit access to industries where young firms need a lot of external finance, and enhances their relative growth rate. Similarly, there has been work showing relationships help in financial distress, ranging from the pioneering effort by Hoshi *et al.* (1990b) to more recent work on banking relationships in the Asian financial crisis (e.g. Ferri *et al.*, 2000).

Clearly, it is this kind of ability to 'internalize joint surplus'—that is, to trade off short-run losses for longer-run gains—that led so many observers, including many economists, to defend the efficiency of relationship-based systems. But it is also easy to see the problems that can arise in such systems.

(iii) The Distortions in Relationship-based Systems

Poor price signals

Perhaps most important, the relationship-based system does not pay much attention to market or price signals. This indifference to price signals becomes self-fulfilling. If investment decisions are not driven by prices, then prices become less effective in providing economic directions because they reflect less information.

⁶ For example, too high an interest rate could lead the firm to take riskier, negative net present value (NPV), projects (see Jensen and Meckling, 1976).

⁷ The idea of distinct banking markets makes sense in this case because small firms rarely do business with a bank outside their local banking market; the median borrower in the above-cited study is only 2 miles from its bank.

This is not to say that the arm's-length system is perfect in the allocation of resources. Because outsiders have little power, management can indulge itself far more in empire-building without triggering an intervention by outsiders. This problem has been labelled the 'agency costs of free cash flows' by Michael Jensen (1986). The arm's-length system, however, can use takeovers to rectify this problem when it gets excessive.⁸ By contrast, the problem of misallocation of resources owing to the lack of price signals in the relationship-based system is more severe, because it lacks a self-activating mechanism to correct it. In fact, even if price signals were accurate, the power structures in the relationship-based system may not allow movement in a direction indicated by the prices.

Evidence of this unwillingness to respond to market signals is provided by Hoshi *et al.* (1991). The study looked at a sample of Japanese firms in the late 1970s to mid-1980s that had close ties to banks and compared their investment behaviour with a sample that had no such ties. The investments of firms that had no bank ties were very sensitive to the cash flow the firms generated from operations; when operating cash flows decreased sharply, so did investment spending, and vice versa. By contrast, the investments of firms with strong ties to the banks were significantly less sensitive to the firms' operating cash flow.

As suggested earlier, one possible interpretation of these findings is that banking relationships make it easier for firms to obtain external funding for value-adding investments, thus making them less dependent on their own cash flows. But recent events in Japan suggest a different explanation. More often than not, the companies' continuous access to bank funding on favourable terms allowed them to ignore the signal sent by their poor cash flows, and to continue investing. By continuing to invest in these circumstances, such firms may well have been destroying long-term value rather than increasing or preserving it. Even if the banks were failing to provide the managers of these firms with the right signals, it appears that the stock market was attempting to do so. For, as the study also reports, the firms with banking relationships in their sample had

lower 'Tobin's q' (or market-to-replacement cost) ratios than firms without bank ties (consistent with our earlier conjecture that bank-dependent firms are asset-intensive, low-growth firms). And, to the extent that Tobin's q is a reliable proxy for a firm's investment opportunities, the stock market was expressing scepticism about the likely payoff from such investments.

There is a more favourable interpretation: these firms were better able to invest and thus were more successful in converting growth opportunities to assets. Weinstein and Yafeh (1998) suggest that the sceptical view is warranted. For while Japanese firms with close bank ties may have had greater access to funds when their operating cash flows declined, such access did not enable them to achieve higher profits or growth rates than their peers.

Peek and Rosengren (1998) provide additional evidence that relationships can distort the allocation of funds. In the early 1990s, Japanese banks increased their lending to the US commercial real estate market. At their peak in 1992, the US subsidiaries of Japanese banks accounted for one-fifth of all commercial real estate loans held in the US banking sector. Then, in response to a severe decline in real estate prices in Japan, the Japanese banks cut back their lending in the USA even as US prices were rising (and lending by non-Japanese banks increasing), while at the same time expanding their lending in the domestic Japanese market where prices were plummeting. Thus, rather than cutting their losses in Japan—or at least not abandoning their profitable opportunities in the USA—Japanese banks poured more money into their unprofitable Japanese relationships.

In sum, one downside of a relationship-based system is that price signals are obscured. The consequence could be a widespread and costly misallocation of resources.

By contrast, there is a virtuous circle at work in market-based economies. In the process of relying on prices for guidance, the arm's-length transactions that predominate in these economies also have the beneficial effect of making prices more informative.

⁸ If anything, managerial empire building is less severe in a relationship-based system, precisely because financiers have the power to intervene extensively and absorb free cash flows from successful firms.

Thus, the more transactions that come into the market, the more likely it is that decisions made on the basis of price are the right ones.

Before leaving this section, it is useful to comment on the criticism that managers in market-based economies are too focused on the stock price. Their attempt to massage quarterly earnings to meet the market's incessant demand, it is alleged, makes them short term in outlook. It is true that managers are, on occasion, overly focused on the short-term bottom line—the amount of attention paid to accounting for mergers to ensure that earnings are not 'diluted' far outweighs the importance the market attributes to these accounting gimmicks. Nevertheless, it is hard to make the case that managers in market economies do not invest for the long run. After all, the millions of miles of optic fibre that were placed in the ground recently by the telecommunications industry were not motivated by immediate profit, but by the anticipation that uses would be found for them. It is another matter that the market system decided the uses were not really there, forcing a restructuring of the industry. In other words, given the significant amount of R&D that goes on in the United States, it is hard to argue that the short term is all that managers are focused on.

Market power

Another consequence of prices being obscured in a relationship-based system is that the financier's information is largely private, especially when the projects being financed consist of intangible assets such as intellectual property. Since the creation of intellectual assets requires substantial endeavour on the part of a firm's human capital, the rent-sharing entailed in a relationship-based system can depress effort, making innovation, especially of the entrepreneurial kind in high-technology industries, a rare commodity.

Illiquidity

Because information is so concentrated in a relationship-based system, financial assets become very illiquid. Since the relationship is specific to the intermediary and borrower, the intermediary becomes indispensable to collecting on loans. As a result, the intermediary can extract sizeable rents from investors also (see Diamond and Rajan, 2001a) because they need the intermediary's skills to real-

ize the value of the intermediary's loan portfolio. Anticipating these rents, investors will charge the intermediary a high cost of capital. Moreover, the financial asset will be illiquid in the sense that it will trade in the market for true value (the amount that can be collected from borrowers) less the rent accruing to the intermediary because of its indispensable relationship-specific skills. The illiquidity of financial assets makes it very costly for the financial system if the intermediaries get into trouble, since outsiders cannot take over their assets easily.

(iv) The Kinds of Assets Financed by Each System

All this then suggests why pure relationship-based systems tend to have a comparative advantage in financing physical-asset-intensive industries rather than high-technology research-and-development-based industries. For one, physical-asset-intensive industries are typically more traditional and well understood. As a result, the absence of market signals about their profitability is less likely to be a problem in making investment decisions. Second, because they are well understood, it is unlikely that a large amount of rents will accrue to the financing intermediary. Moreover, the borrower has the collateral to entice fresh lenders if the existing ones prove overly demanding. Finally, since loans are well collateralized by physical assets, they are liquid, so the concentration of information in the system will not be a barrier to financing these assets.

Conversely, arm's-length systems will have a comparative advantage financing industries with intangible assets; hence Carlin and Mayer's (1998) finding that equity- and skill-based industries tend to do more research and development in economies with better-developed accounting standards.

An intriguing recent study fortifies our view that relationship-based systems are more capable of financing projects where the ratio of tangible to intangible assets is large. Houston and James (1996) study the financing arrangements of 250 public firms in the United States. They find that firms with relationships to single banks tend to use less bank debt in proportion to total debt as their market-to-book ratio (a measure of the ratio of intangible to tangible assets) increases. By contrast, when firms

have relationships with multiple banks, those with higher market-to-book ratios tend to use more bank debt in proportion to total debt. This suggests that firms tend to avoid becoming dependent on a single bank when they have high market-to-book ratios, perhaps because they fear the bank may have too much power to extract rents and direct strategies, or because the bank itself will find the asset too illiquid.

By contrast, when the firm has multiple banking relationships (effectively an arm's-length system), no single bank has too much power. Since public markets can obtain information about the firm from multiple sources, the cost of borrowing more from banks is small relative to the insurance and advice provided by relationships. Thus the revealed preference of firms, in an environment where they can choose the relationship structure that benefits them most, gives us a sense of when a relationship is onerous and when it is not.

So what is the bottom line? Do relationship-based systems help or hurt relative to market-based systems? Beck *et al.* (2001) seem to suggest the distinction does not matter. But our analysis thus far suggests there may be a more subtle relationship that Beck *et al.* (2001) may not pick up. In particular, Rajan and Zingales (1998b) hypothesize that relationship-based financing may be particularly useful when institutions are underdeveloped, and when a country is underdeveloped so that the sectors that need investments are fairly clear. In such an environment, the market may not have the necessary infrastructural support to work well; also, market signals may not be particularly informative (see Morck *et al.*, 2000) or needed.

Tadesse (2000) examines this hypothesis using the financial architecture variables employed by Beck *et al.* (2001). He finds, as we conjecture above, that a market orientation seems much more important for growth when a country is financially developed (i.e. in possession of basic infrastructure). By contrast, it seems to have a negative impact on growth when a country is financially underdeveloped.

But this leads to a final conundrum. If relationships are not an overwhelmingly superior form of trans-

acting in developed markets, then why is venture capital, which seems the quintessential form of relationship-based financing, so important in financing high technology in the most advanced arm's-length systems?

We believe that the conditions under which venture capital arises ensure that the worst problems of the relationship-based system are tempered by the close proximity of the arm's-length system. The mistake is to view venture capital as purely a form of relationship-based financing. In fact, it seems an ideal bridge between relationship and arm's-length financing, combining the best of both worlds.

(v) Venture Capital: A Bridge between Two Worlds

Relationship-based finance, as we have seen, has the virtue that the financier has substantial control over the financed, and is able to guide the borrower's moves, as well as thwart any malfeasance. How can the venture capitalist bring these virtues to financing high technology without inflicting the costs associated with relationship-based financing?

In our view, the role of the venture capitalist is to reduce the illiquidity of the financed firm—which is the source of many of the ills of the relationship-based system—and the existence of a vibrant arm's-length market is crucial for him to perform his role. His constant endeavour after financing the firm initially is to prepare to exit. He does this by making the firm's management and control processes standardized, transparent, and easy for arm's-length investors to take over. The venture capitalist also moves the firm from being an organization dependent on the founder to an organization capable of being run by professional managers. This again makes the firm easier for arm's-length investors to control, since managers are easier to replace than founders.⁹

Why does the venture capitalist not simply hold on to his stake in the firm and extract rents? The answer is that he obtains much greater returns from taking the firm public. The growth opportunities of the typical successful venture-capital-financed firm

⁹ For a theoretical analysis of the control role of venture capital, see Berglof (1994); for an empirical analysis, see Gompers (1995); and for an argument that is, in many ways, similar to ours, see Black and Gilson (1998).

are so high that the venture capitalist would not be able to finance them in entirety without severely rationing his other ventures. Since his value-added is in origination, it makes sense for him to prepare the firm for the market and to let go when it is ready. Moreover, venture-capital partnerships are structured with a limited life, which again serves as a commitment to let go of the firm. The market pays for the anticipated growth of the financed firm, which is a substantial reward to the venture capitalist for his services. Moreover, the need to exit via the market ensures that prices eventually do matter and discipline the investments that take place. Thus the incentives for innovation, the liquidity, and the price discipline provided by the market are combined through the venture capitalist with many of the benefits of control and long horizons provided by the relationship-based system.¹⁰

In sum, relationship-based systems can work very well in the early stages of industrialization where the industries to be financed are physical asset intensive, where the legal system is ineffective, and where skill-based or idea-based industries are of limited import. But as economies develop and focus more on knowledge-intensive industries as engines for growth, a hybrid is perhaps more effective. There is then the need to improve transparency, judicial efficiency, and mechanisms for speedy resolution of financial distress so that arm's-length markets can function effectively and aid the process of economic growth.

IV. RISK

In the current economic situation, where America is ascendant while Japan is mired in bad loans, it is tempting to conclude that the arm's-length system dominates other forms. We believe that is a misreading of the evidence. The United States does not have a purely arm's-length system; even so, to conclude that the system is optimal is probably as wrong as the conclusion in the late 1980s that the Japanese relationship-based system was worthy of emulation in its entirety. Nevertheless, if there is one thing the arm's-length system can do better than the

relationship-based system, it is to bear and manage macroeconomic risk. Let us understand why.

(i) Why a Relationship-based System is More Risky

We have already argued that assets financed by relationship-based systems tend to be illiquid since there is little transparency and disclosure. Diamond and Rajan (2001*a,b*) argue that intermediaries can finance such assets at low cost only by issuing a high proportion of demandable claims. Intuitively, intermediaries in relationship-based systems finance assets that only they understand. The only reason that they do not absorb a massive amount of rents as a result of their monopoly position is because they credibly commit to pay out collections to depositors. This requires them to issue hard claims; the hardest being demandable claims subject to runs. Thus, in the natural course of financing illiquid relationship-based assets, financial intermediaries have to take on financial risk.

Risk can be mitigated if the intermediation system is well capitalized, because capital acts as a buffer. Given the low levels of private capital in emerging economies, historically, the government has created capital for intermediaries by keeping the rates intermediaries pay investors low. This has become infeasible as deregulation and competition has given investors more choice. Consequently, the task of averting the collapse of the system of intermediation in the face of severe macroeconomic volatility has shifted directly to the government. Governments have had to absorb risk by promising the intermediation system capital, implicitly or explicitly, in case the system is in danger. But the promise of such contingent capital carries with it the risk that intermediaries will collectively attempt to game the system through moral hazard.

In other words, illiquid assets can only be financed by financially fragile intermediaries, who then impose risk on the system. To reduce risk, the government has to promise intermediaries contingent capital, which in turn causes them to bet on the same risks such as real estate or emerging market lending,

¹⁰ It is interesting that German banks were performing a similar role to venture capital around the turn of the century, and German public markets were vibrant (Calomiris, 1994). It would be useful to understand what changed.

knowing full well that they will be rescued only if they sink together.

Moreover, once a relationship-based system suffers a severe shock that the government is not able to counter, the flow of credit can collapse quickly. This is because, first, there is a lot of specific knowledge and trust embedded in relationships that cannot be transferred to wealthy unaffected outsiders. The illiquidity of the relationships prevents a quick takeover by, say, foreigners. Second, since property rights are not well established in relationships, it becomes hard to separate healthy unaffected parties from the walking dead. The inefficiency of the judicial system does not help. As a result, the relationship-based system tends to share the consequences of an adverse shock somewhat indiscriminately. It is no wonder then that outside capital does not flow in until the system essentially sorts itself out.

Contrast this with the arm's-length system where the accent is on providing small investors the confidence to invest directly in firms. Clearly, such a system is better able to withstand shock, first, because the healthy can be distinguished from the terminally ill after a shock and can be dealt with differently and, second, because unaffected outsiders have the ability to invest and revive the system, as they obtain confidence from the very same channels that inspire confidence in small investors.¹¹

(ii) How to Reduce Risk in a Relationship-based System

We have argued that elements of both relationship-based and arm's-length financing are needed in the modern economy. Moreover, a combination of both may serve to reduce the risk of a financial melt-down. But what if the economy is more primitive so that arm's length financing is not possible?

As Levine (1999) shows, the growth of the intermediary sector is correlated with an improvement in creditor rights and contract enforcement. Thus the reliance on relationships, even within the intermediated sector, can diminish as contracting im-

proves. But what if a country urgently needs to reduce risk? Perhaps the quickest, but politically most difficult, way of reducing the aggregate risk of the intermediated sector is to allow massive entry of foreign intermediaries. Using bank-level data across a broad cross-section of countries, Demirgüç-Kunt *et al.* (1998) show that the extent of foreign bank participation in a domestic economy (as measured by foreign bank assets to total domestic banking assets, or the number of foreign banks to total banks) is negatively related to the probability of a financial crisis in that country.

What could explain these findings? Clearly, foreign banks may influence local supervisory or risk-management practices, as also local bank efficiency. But they could have other spill-over effects. Specifically, foreign banks, because of their vast outside resources, will survive a local crisis. Not only does this give them little incentive to herd on the same risks as local banks, it also gives the government confidence that a financial crisis will not result in a total melt-down. As a result, the government will be less eager to bail out failed local banks. Moreover, the foreign banks offer an avenue for foreign investors to invest in the local economy despite the absence of safeguards necessary for arm's-length investing, thus shortening the duration of a purely financial crisis. But taken together, perhaps the most salutary effect is on domestic bank incentives. Knowing that the government will be more reluctant to bail them out, they will be more careful about herding on certain systematic risks.

We do not, however, believe that emerging markets should unquestioningly open their doors to all forms of foreign capital before developing appropriate infrastructure. In the absence of well-developed markets or foreign intermediaries, foreign capital inflows have to be intermediated into the domestic economy by the domestic banking system. Foreign capital will demand substantial safeguards such as implicit or explicit seniority, and a short maturity, in return for putting money into a relatively opaque system.

Moreover, foreign capital has access to a wide range of opportunities outside the emerging market.

¹¹ This is not to say that markets do not shut out particular firms. In fact, many banks advertise their relationship-based business as a port of safe haven for firms affected by a market storm. Nevertheless, we think it would be highly unusual for all world markets to be irrationally down on an entire country.

When coupled with their implicit seniority, the volatility in their worldwide investment opportunities can lead to volatility in the movement of foreign capital. While this may seem irrational because there may be no change in the country's fundamentals to justify the movement, the move may be completely rational in a more complete model. In opening up, countries have to estimate the risk–return trade-off from attracting capital but having to pay out on demand. The poorer a country's financial infrastructure, and the lower its international credit rating, the less it will be able to service the out-flows. But these are also situations where foreign capital may be most beneficial to supplement domestic savings. Countries need to estimate the trade-off carefully.

All this also has implications for how countries should sequence financial reforms. The discussion above suggests the risk-minimizing way is first to undertake internal reforms: make the domestic economy more transparent, expand public information availability, ensure that contracts are respected and enforced, ensure clear bankruptcy procedure, and put in place an adequate supervisory and regulatory infrastructure. However, as we argue in Rajan and Zingales (2001), such reforms may not be undertaken without the threat of foreign competition. This is why we believe that it may be necessary for a country to commit to a schedule of opening up its economy, even though there are well-known risks of opening up without undertaking internal reforms. The schedule is to ensure that there is some urgency behind the internal process, and it is not blocked by domestic interest groups.

V. CONCLUSION: AND THE WINNER IS . . .

We started this paper by documenting that there does seem to be a causal relationship between financial development and economic growth. Furthermore, financial development seems particularly to help the financing of firms that typically do not get institutional credit because they lack physical collateral. This led us to a comparative analysis of relationship-based banking systems and arm's-length market-based systems. We concluded that for the kinds of industries that are now engines of world

growth, a hybrid is probably best, though not all the best properties of each system survive in the hybrid. Finally, we argue that improvements in the accounting, legal, and supervisory infrastructure, which are necessary to sustain a large banking system or arm's-length market, also tend to diminish risk.

From a policy perspective, it would appear that a country intent on economic development should fix its financial plumbing; specifically, its accounting and disclosure system and its legal and bankruptcy codes. It is a separate and important question as to whether this is equally feasible for all underdeveloped countries. Some studies (see Laporta *et al.*, 1997, 1998) suggest that history may inflict on some countries deep structural impediments to their ever developing a good financial system. For example, the nature of the legal system may be one such impediment. Other studies are much less pessimistic, attributing differences in financial development more to the current strength of private interests opposing development than to deep structural impediments (see Pagano and Volpin (2000); or Rajan and Zingales (2001), for example). In particular, Rajan and Zingales (2001) argue that there are dramatic changes in a country's financial development that are hard to explain by unchanging factors such as its legal origin. Instead, the current state of a country's financial development is probably best explained by the strength of political forces in favour of it, perhaps modified to some degree by the country's inherited structure.

Finally, it is tempting to anoint a specific country as having the best financial system. We want to refrain from this. One reason is that we have so much to learn about how financial systems work, even though we have come a long way in recent years. But perhaps a more important reason is that even a cursory study of a sample of the richest countries in the world will reveal a variety of financial systems. Clearly, there are many paths to gold. While there are signs that indicate convergence to a hybrid (the United States using venture capital and Germany opening the New Market), these are far from conclusive. Moreover, many of the stylized facts about the effects of particular systems—such as bank-oriented economies tend to have firms with more debt—tend to be illusory on a detailed examination of the facts (see Rajan and Zingales, 1995).

At best, we conjecture that market-based systems may have an advantage when the other institutions are probably more likely to dominate in times of great industrial change, while bank-based systems in an economy are highly underdeveloped. There is, clearly, scope for future research.

REFERENCES

- Beck, T. (2001), 'Financial Dependence and International Trade', Working Paper, World Bank.
- Demirgüç-Kunt, A., Levine, R., and Maksimovic, V. (2001), 'Financial Structure and Economic Development: Firm, Industry, and Country Evidence', Working Paper, World Bank.
- Berglof, E. (1994), 'A Control Theory of Venture Capital Finance', *Journal of Law, Economics and Organization*, **10**, 247–67.
- Black, B. S., and Gilson, R. J. (1998), 'Venture Capital and the Structure of Capital Markets: Banks versus Stock Markets', *Journal of Financial Economics*, **47**(3), 243–77.
- Calomiris, C. (1994), 'The Costs of Rejecting Universal Banking: American Finance in the German Mirror, 1870–1914', Working Paper, University of Illinois, Urbana-Champaign.
- Carlin, W., and Mayer, C. (1998), 'Finance, Investment and Growth', Working Paper, University College London.
- Cetorelli, N., and Gambera, M. (2001), 'Banking Market Structure, Financial Dependence, and Growth: International Evidence from Industry Data', *The Journal of Finance*, **56**(2), 617–48.
- Demirgüç-Kunt, A., and Maksimovic, V. (1998), 'Law, Finance, and Firm Growth', *The Journal of Finance*, **53**(6), 2107–37.
- Levine, R., and Min, H. (1998), 'Opening to Foreign Banks: Issues of Stability, Efficiency, and Growth', Working Paper, World Bank.
- Diamond, D. W., and Rajan, R. G. (2001a), 'Liquidity Risk, Liquidity Creation and Financial Fragility: A Theory of Banking', *The Journal of Political Economy*, **109**(2), 287–327.
- — (2001b), 'Banks, Short-term Debt, and Financial Crises: Theory, Policy Implications, and Applications', *Carnegie Rochester Conference on Public Policy*, **54**(Summer), 37–71.
- Ferri, G., Kang, T. S., and Kim, I. J. (2000), 'The Value of Relationship Banking during Financial Crises: Evidence from the Republic of Korea', Working Paper, World Bank.
- Goldsmith, R. (1969), *Financial Structure and Development*, New Haven, CT, Yale University Press.
- Gompers, P. A. (1995), 'Optimal Investment, Monitoring, and the Staging of Venture Capital', *The Journal of Finance*, **50**(5), 1461–89.
- Houston, J., and James, C. (1996), 'Bank Information Monopolies and the Mix of Private and Public Debt Claims', *The Journal of Finance*, **51**(5), 1863–90.
- Hoshi, T., Kashyap, A., and Scharfstein, D. (1990a), 'Bank Monitoring and Investment: Evidence from the Changing Structure of Japanese Corporate Banking Relationships', in R. G. Hubbard (ed.), *Asymmetric Information, Corporate Finance and Investment*, Chicago, IL, University of Chicago Press.
- — — (1990b), 'The Role of Banks in Reducing the Costs of Financial Distress in Japan', *Journal of Financial Economics*, **27**, 67–88.
- — — (1991), 'Corporate Structure, Liquidity, and Investment: Evidence from Japanese Panel Data', *Quarterly Journal of Economics*, **27**, 33–60.
- Jayarathne, J., and Strahan, P. E. (1996), 'The Finance–Growth Nexus: Evidence from Bank Branch Deregulation', *Quarterly Journal of Economics*, **111**(3), 639–71.
- Jensen, M. C., (1986), 'Agency Costs of Free Cash Flow, Corporate Finance and Takeovers', *American Economic Review*, **76**, 323–39.
- Meckling, W. (1976), 'Theory of the Firm: Managerial Behavior, Agency Costs and Capital Structure', *Journal of Financial Economics*, **3**, 305–60.
- King, R. G., and Levine, R. (1993), 'Finance and Growth: Schumpeter Might be Right', *Quarterly Journal of Economics*, **108**(3), 717–37.
- La Porta, R., Lopez de Silanes, F., Shleifer, A., and Vishny, R. (1997), 'The Legal Determinants of External Finance', *The Journal of Finance*, **52**(3), 1131–50.
- — — — (1998), 'Law and Finance', *The Journal of Political Economy*, **106**, 1113–55.
- Levine, R. (1997), 'Financial Development and Economic Growth: Views and Agenda', *Journal of Economic Literature*, **35**(2), 688–726.

- Levine, R. (1999), 'Law, Finance and Economic Growth', *Journal of Financial Intermediation*, **8**(1), 8–35.
- Zervos, S. (1998), 'Stock Markets, Banks, and Economic Growth', *American Economic Review*, **88**(3), 537–58.
- Lucas, R. E. (1988), 'On the Mechanics of Economic Development', *Journal of Monetary Economics*, **22**(1), 3–42.
- Mayer, C., Mankiw, N. G., and Barroux, Y. (1988), 'New Issues in Corporate Finance', *European Economic Review*, **32**(5), 1167–89.
- Morck, R., Yeung, B., and Yu, W. (2000), 'The Information Content of Stock Prices: Why do Emerging Markets have Synchronous Stock Price Movements?', *Journal of Financial Economics*, **58**(1,2), 215–60.
- Myers, S. (1977), 'The Determinants of Corporate Borrowing', *Journal of Financial Economics*, **5**, 147–75.
- Pagano, M., and Volpin, P. (2000), 'The Political Economy of Corporate Governance', Harvard University, mimeo.
- Peek, J., and Rosengren, E. S. (1998), 'The International Transmission of Financial Shocks: The Case of Japan', *American Economic Review*, **87**(4), 495–505.
- Petersen, M. A., and Rajan, R. G. (1995), 'The Effect of Credit Market Competition on Lending Relationships', *Quarterly Journal of Economics*, **110**(12), 407–43.
- Rajan, R. G., and Zingales, L. (1995), 'Is there an Optimal Capital Structure? Some Evidence from International Data', *The Journal of Finance*, **50**, 1421–60.
- — (1998a), 'Financial Dependence and Growth', *American Economic Review*, **88**, 559–86.
- — (1998b), 'Which Capitalism? Lesson from the East Asian Crisis', *The Bank of America Journal of Applied Corporate Finance*, **11**(3), 40–8.
- — (2001), 'The Great Reversals: The Politics of Financial Development in the 20th Century', Working Paper, University of Chicago.
- Robinson, J. (1952), *The Rate of Interest and Other Essays*, London, Macmillan, 67–142.
- Schumpeter, J. A. (1911), *A Theory of Economic Development*, Cambridge, MA, Harvard University Press.
- Seligman, J. (1995), *The Transformation of Wall Street*, Boston, MA, Northeastern University Press, 42.
- Shleifer, A., and Vishny, R. W. (1992), 'Liquidation Values and Debt Capacity: A Market Equilibrium Approach', *The Journal of Finance*, **47**(4), 1343–66.
- Tadesse, S. (2000), 'Financial Architecture and Economic Performance: International Evidence', Working Paper, University of South Carolina.
- Weinstein, D. E., and Yafeh, Y. (1998), 'On the Costs of a Bank-centered Financial System: Evidence from the Changing Main Bank Relations in Japan', *The Journal of Finance*, **53**(2), 635–72.
- Wurgler, J. (2000), 'Financial Markets and the Allocation of Capital', *Journal of Financial Economics*, **58**(1,2), 187–214.