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GROWTH AND FINANCE

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I review selectively some of the trends in research on the relationships between financial markets and economic growth. Economic theory provides many arguments as to why, given the widespread existence of moral hazard and adverse selection problems in financial transactions, more highly developed financial markets might facilitate faster economic growth. However, it is less clear that summary measures of financial development and structure, widely used in empirical research, are adequate. I review some recent empirical work in this area, and show that apparent effects of financial development on growth may be capturing regional differences, and other factors. There appears to be little empirical support for an effect of financial structure on growth. Much empirical work in this field uses data over short periods of time, of a few decades in length. Looking over longer periods, non-financial forces of increasing returns in production, increasing returns to agglomeration and falling transport costs appear more important, and the potential role of financial markets rather less. The question of whether finance plays a causal role or merely follows economic development remains an open one.

1 Introduction

There is enormous interest in the question of how an economy's financial system affects its growth—and vice versa. An extensive literature on the topic has developed in recent years. It has no doubt been fuelled by interest in endogenous growth models in which there are widespread externalities and other market imperfections, such that a change in the financial system is capable of influencing the growth rate, and not only the level of income relative to an exogenous growth path. A variety of views have long been held on the importance of finance. Walter Bagehot (1873) and J.R. Hicks (1969) argue that developments in finance, such as the joint-stock company and limited liability, enabled the industrial revolution in Britain by facilitating the mobilization of capital for large-scale investments. In the opposing camp—the finance-is-not-so-important camp—are Joan Robinson (1952,

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'where enterprise leads, finance follows') and Robert Lucas (1988). Levine (1997) concludes from his long survey in the *Journal of Economic Literature* that

> although conclusions must be stated hesitantly and with ample qualifications, the preponderance of theoretical reasoning and empirical evidence suggests a positive first-order relationship between financial development and economic growth. A growing body of work would push even most sceptics toward the belief that the development of financial markets and institutions is a critical and inextricable part of the growth process and away from the view that the financial system is an inconsequential side-show, responding passively to economic growth and industrialisation.

One of the old questions in this area is whether the Anglo-Saxon model of well-developed stock markets, with hands-off banks providing short-term finance, is worse than the German–Japanese model. Here universal banks provide long-term finance and take a more active role in the management of the firms they lend to, while the stock market is less developed as a source of funds and as a device for controlling managers. Hutton (1996) makes a great deal of Britain's alleged short-termism in *The State We're In*. He allies this view to his arguments for the need for a stakeholder economy, in which firms are responsible to more than just their shareholders.[1] The stagnation of the Japanese economy throughout the 1990s and the crisis in East Asia in 1997 may have weakened the force of arguments for the more corporatist Japanese style of financial system and restored the standing of Anglo-Saxon capitalism. This leaves open the question of what kind of financial system better promotes economic growth. Japan might be characterized as a country that is very good at mobilizing savings but weak on allocating them to profitable uses, while the USA seems hopeless at mobilizing savings but excellent when it comes to allocating them to profitable investments.

Other questions have been brought to the fore by events in East Asia, the transitional economies of Eastern Europe, and Latin America. These focus on the importance of regulation of banks and financial markets, disclosure requirements, the enforcement of regulations and the effectiveness of the legal system.

There are many routes in theory from imperfect financial markets to growth: many models have been devised. Once the model allows for asymmetrical information, all sorts of possibilities open up. The managers of the firm know more than the people financing it what the project is and what its

[1] 'We must also reform the structure and character of decision-making in Britain's firms. The in-built biases in the British system towards take-over and a general cult of short-termism have been amply demonstrated in 1995 by the rash of deals in the privatised utilities and in the pharmaceutical industry, where Glaxo took over Wellcome specifically to maintain the growth of dividends to its shareholders. After the merger, there came, all too predictably, the heavy cut-backs in research and development and investment, which have been used to free up resources to service the debt incurred to buy out Wellcome shareholders' (Hutton, 1996, Preface to the Vintage edition, p. xv).

returns are likely to be. They may be able to adjust their effort after funding for the project has been provided; they may be able to run off with the funds, leaving the investors with no return. There may in fact be no project at all. (Like the non-existent Mexican railroad in Anthony Trollope's (1875) *The Way We Live Now*. Trollope was evidently wise to asymmetrical information—particularly adverse selection—very early in the game.)

Levine (1997) sets out a list of five functions of the financial system: reducing risk; allocating resources; monitoring managers and exerting corporate control; mobilizing savings; and facilitating exchange of goods and services. Through the way these functions are carried out, it is possible to alter the growth rate of the economy either by affecting the growth rate of the capital stock or by affecting the rate of technological innovation. In passing he makes some interesting comments on omissions from the existing theory of finance and growth. He identifies as key omissions (1) study of the emergence, development and implications of different financial structures, and (2) the effects of the level and growth rate of the economy on the financial system. For indeed most of the recent research has been aimed at explaining how the financial system affects growth.

Joseph Schumpeter (1934) made an early link between financial market development and economic growth, but it is largely in the last decade or so that the field has developed rapidly. King and Levine (1993a, 1993b) base their arguments on agency costs created by imperfections in financial markets. These increase intermediation costs and thus decrease investment in risky but profitable activities (like research and development); this in turn slows growth. King and Levine provide empirical evidence to support the view that the degree of financial development (measured by the ratio of liquid liabilities to GDP and by the ratio of commercial bank paper to central bank credit) is positively related to GDP growth. These arguments may be viewed as an extension to the long run of the short-run analysis of Bernanke and Gertler (1989). Somewhat differently, Acemoglu and Zilibotti (1997) take up Greenwald and Stiglitz's (1993) emphasis on diversification costs. Their argument is that financial market imperfections reduce diversification opportunities and thus induce lenders to invest in safe activities with low rates of return, once again slowing growth.

In these analyses causation runs both ways. On the one hand more highly developed financial markets reduce monitoring costs, increase diversification and enhance growth. On the other hand higher growth makes more resources available for monitoring and diversification and therefore improves the development of the financial system.[2]

When financial markets are imperfect and agents have limited access to finance, the distribution of wealth and income may affect the economy's

[2]Related ideas are developed by Bencivenga and Smith (1991, 1993), Boyd and Smith (1992) and De Gregorio (1996).

growth. Kuznets (1955) is associated with the hypothesis that the early stages of development would be associated with a widening of the income distribution while later stages of development would be associated with its narrowing. If investment projects must be of at least a certain minimum size (the investment may be in human capital as in Galor and Zeira (1993) and Owen and Weil (1998)), then there may be a threshold level of wealth, above which people may undertake the investment while below it they may not. Agents with wealth in excess of the threshold may receive a higher rate of return than those below it. Thus the distribution of income may affect the growth rate of the economy.

It has been argued that an increase in inequality of wealth might in fact tighten the credit constraints that agents face and actually reduce the possibility of poor agents surmounting the threshold wealth level and joining the entrepreneurial class. Piketty (1997) and Aghion and Bolton (1997) propose a mechanism that operates through the capital market, while Banerjee and Newman (1993, 1994, 1998) develop one that operates through the labour market.

Because in these models the returns on wealth are non-convex (since the rich who invest earn higher rates than the poor who save), multiple equilibria may emerge. This same non-convexity can also explain the Kuznetz curve. In the initial stages of development wealth is concentrated and only a few agents can undertake investments. But as income levels rise, a greater proportion of the population may be able to escape from the development trap, and eventually inequality will decrease (Aghion and Bolton, 1997).

At the microeconomic level, the informational imperfections in financial markets described above have a number of implications for the way that the structure of markets might influence investment and growth. René Stultz (2001) surveys them.

When it comes to financing new firms or projects, Stultz argues that staged financing is very important, in the face of the investor's uncertainty about the project. Banks and other intermediaries are much better suited to providing staged financing than are capital markets (such as a stock market). How competitive should banks be? More competitive means firms get cheaper finance. But banks need to be able to extract rent from projects when successful to offset the losses they suffer when they are not. More competition means less ability of banks to extract rents. If there is too much competition, sources of funds may dry up. Good projects may be denied finance. If it is too easy for firms to walk away from the relationship banks will not invest so much in learning about the project. Banks may then provide the firms with less financing. Long-term relationships between lender and borrower are more likely to allow non-collateralized lending for firm-specific purposes. So too much or too little competition may be a bad thing.

Firms need to have an alternative to bank financing, in the form of equity, to escape the grip of the banks in some situations. The bank has

private information on the firm. If it denies the firm credit, other intermediaries may infer that the project is bad and deny finance also. So the firm is in the grip of its bank. Banks may press firms when they expand or continue a project to go for safe options, as these reduce the risk to the bank's returns, but this need not maximize the expected return on the project. Banks' views alter when they hold equity; their objectives become closer to maximizing the value of the firm. Public markets, for example those in equity, allow the firm to escape the bank. They limit the bank's ability to extract rents, make the entrepreneur's investment more liquid, and aggregate information. They make possible the emergence of intermediaries who provide equity finance and share the entrepreneur's risk.

Stultz summarizes desirable characteristics of a financial structure for the creation and growth of new firms as

1. well-defined property rights,
2. availability of staged financing,
3. stability of the financial sector,
4. availability of private equity financing,
5. availability of uncollateralized debt,
6. availability of an exit option through public equity markets.

In summary: choice of financial structure does not reduce to a choice between markets and banks. It is clear that both are required.

Monitoring of established firms raises similar though in some ways different issues. Managerial discretion allows managers to pursue their own goals rather than those of the owners of the firm. Too much discretion, for example, to invest in poor projects rather than return funds to shareholders may lead to under- or over-investment and low returns to shareholders, and may reduce the availability of funds to such firms and prevent good projects from getting funded.

Diffuse ownership may impose too little monitoring and control of management. But having large shareholders may also lead to collusion between them and the managers to expropriate small shareholders. If small shareholders are protected, large shareholders are likely to be beneficial, by inducing better monitoring and by making take-overs possible. A liquid stock market enables large shareholders to acquire and dispose of a large stake. It is not clear that German or Japanese style concentration of ownership is desirable. Japanese reciprocal share holdings prevent take-overs, and may thus sustain inefficient management, but they may induce reciprocal monitoring and improved managerial control. It is not clear which effect will dominate.

In summary, on established firms, the following characteristics of financial markets help to monitor management and prevent expropriation of minority providers of capital:

1. the existence of laws, and enforcement of them, that protect minority shareholders;
2. a market for corporate control;
3. some protection from hostile take-overs;
4. laws should not prevent the emergence of large shareholders, who may be useful monitors;
5. debt is good discipline on managers, and should not be discouraged;
6. bank debt is good (because it entails a low cost of collective action and is flexible);
7. bankruptcy should be cheap and creditors' rights well defined;
8. financial stability is necessary;
9. firms have to be able to place equity with private investors.

Again, Stultz remarks: 'the relation between economic growth and public capital markets is ambiguous. . . . both banks and markets are important. Intermediated finance has a role to play with established firms, but so do capital markets.'

It is interesting that both for new and established firms a mixture of intermediated and market finance is recommended. The issues are many, and the relationships are complex. Features of financial markets may affect growth in many different ways. No clear overall direction emerges.

2 Empirical Results on the Effects of Finance on Growth

A number of authors have found apparently persuasive results suggesting that financial market development affects growth. Levine and Zervos (1998) look at a cross-section of 47 countries over the period 1976–93. They run a regression of growth (over the period) on a set of measures of financial development (measured at the start of the period) and some country controls. The measures of financial development include bank credit, stock market capitalization, stock market turnover and stock market value traded.[3]

Re-running Levine and Zervos's regression, Manning (2002) finds the coefficient on bank credit equal to 0.013 ($t = 2.40$) and that on turnover equal to 0.027 ($t = 3.00$) on a sample of 43 countries.[4] These effects appear to be

[3]Bank credit is the stock of domestic credit given by commercial and deposit-taking banks to the private sector, over GDP. Stock market capitalization is the value of listed domestic shares on domestic exchanges divided by GDP. Stock market turnover is defined as the value of trades of domestic shares on domestic exchanges divided by the capitalization of the domestic stock market. Stock market value traded is the value of trades of domestic shares on domestic exchanges divided by GDP.

[4]The regression contains the same country variables as used by Levine and Zervos. These are the log of initial GDP per capita, log years of secondary schooling, number of revolutions and coups in the 1980s, share of government consumption in GDP in 1976, rate of inflation in 1976, and black market premium in 1976. The adjusted R^2 is 0.383. Key results from Manning's paper are contained in two tables, which are reproduced in the Appendix to this paper.

highly significant, from the economic point of view as well as the statistical. A country like Greece, at the seventy-fifth percentile in terms of turnover, would have had 0.41 per cent per annum more growth had it been at the twenty-fifth percentile like the USA. A country like Morocco, at the seventy-fifth percentile in terms of bank credit, would have had 0.68 per cent per annum more growth had it been at the twenty-fifth percentile like Italy. Adding these two factors together implies that financial development could contribute an additional 1 per cent per annum to growth, a huge and, as Manning notes, an implausibly large magnitude.

A separate regression replaces market turnover with both market capitalization and value traded as measures of stock market development, and finds both significant. The coefficients are 0.015 ($t = 2.18$) for market capitalization and 0.070 ($t = 2.17$) for value traded. In this regression bank credit ceases to be significant.

However, when Manning checks for the robustness of these results, he finds that things do not look so convincing.[5] He finds that scatter plots of residuals suggest that some of the results are heavily dependent on a few observations. Taiwan stands out as an outlier. When the regressions are re-run excluding Taiwan from the sample, the turnover variable ceases to be significant. In the other equation (that in which the explanatory variables include market capitalization and value traded), value traded ceases to be significant, although market capitalization remains significant. However, the decisive factor turns out to be the use of a dummy variable for the Asian Tigers. When this is introduced into the growth/turnover equation, turnover ceases to be significant (coefficient 0.006, $t = 1.08$) and the adjusted R^2 jumps to 0.709. The bank credit variable remains significant, but the coefficient falls slightly in size. In the other equation, the Tigers dummy is highly significant, market capitalization becomes insignificant (coefficient 0.001, $t = 0.11$) and value traded becomes less significant (coefficient 0.03, $t = 1.75$), though bank credit remains significant. When more regional dummies are introduced (Asia/Pacific, Africa, Latin America) all the financial variables become insignificant.

This suggests that the financial variables are just picking up regional differences in growth rates. This may be a reflection of the fact that financial development and growth are highly correlated with many legal, political and institutional variables, which might well be captured by the regional dummy variables.

As Manning notes, several commentators have disputed the claim that financial development played a major part in relative growth performance. Park (1993) finds no evidence that financial deepening helped mobilize savings or improve allocative efficiency in Korea or Taiwan at the height of

[5]Cunningham (1999) has found similar evidence that the results of Levine and Zervos are not robust to the exclusion of outliers and addition of regional variables.

their expansion. Park argues for causation going the other way. Landes (1998) attributes the Tigers' achievements to their culture: family structure, work values, sense of purpose and so on.

Manning goes on to explore the results of Rajan and Zingales (1998). They carried out tests on data at the industry level. They asked whether growth in industries that were more dependent on external finance was stronger in countries with better financial development. They regressed growth (in industry j in country k) on country indicators and industry indicators, industry shares (in GDP) and an interaction term between the external financial dependence of industry j and the financial development of country k. Their data were a panel for 38 industries in 45 countries for the period 1980–90. The regression is intended to reveal the extent to which there is a second-order effect on industry growth from the interaction of the industry's high dependence on external finance with high financial development of the country in which it is located, after having allowed for the independent effects of the two factors separately.

He considers the possibility that the interaction term (the interaction of high dependence on external finance with high financial development) is highly correlated with another interaction, high dependence on external finance with high initial GDP, and may also be correlated with the high growth achieved by capital-intensive industries. He finds that 33 of the 100 fastest-growing industry–country pairs were located in three Tiger economies, and of these 24 were above median on the measure of external financial dependence. External dependence also seems to be highly correlated with the capital intensity of an industry. To test this he adds an interaction term between initial GDP per capita and external financial dependence, and another interaction between a Tiger dummy and industry investment intensity. Adding these two interactions the size of the coefficient on the original financial development (alternatively private credit, stock market turnover, and market capitalization and value traded) interaction term falls and its significance disappears. The new interaction terms have positive and significant coefficients. This result suggests that the three Tiger economies explain much of the apparent impact of finance (in particular, stock market development) on growth. Manning points out that the interaction between accounting standards and dependence on external finance survives the addition of these new interaction terms.

Manning goes on, finally, to check whether financial dependence seems to be more important in less developed than in developed economies, as much theory has argued, by splitting the sample countries into two groups, OECD and non-OECD countries respectively. His results suggest that this is true. The coefficients on the key interaction terms are bigger in the non-OECD subsample. He notes: 'it is found that regional and institutional factors, interacted with industry characteristics correlated with financial dependence, dis-

place the coefficient on accounting standards in both sub-samples, again calling into question the conclusions drawn on the linkage between financial development and industry growth. . . .' His conclusion is that empirical results on the finance/growth nexus have been heavily influenced by the 'extraordinary economic performance of the newly industrialising countries of the Pacific rim during the 1980s'. He offers two explanations: one, that this extraordinary growth was not financially driven but reflected many institutional, cultural, political, organizational and environmental factors; the other, that the causal link between financial development and growth appears almost exclusively at the time of the country's most rapid industrialization, where the Asian Tigers were in the 1980s, but that better measures of financial development are needed to capture the effect robustly.

Finally, Manning expresses the view that claims that these measures of financial development capture the theoretical relationship between finance and growth are not valid. Cross-country studies suffer from high correlation between financial, institutional, legal and regional factors, which makes it difficult to identify the effect of finance on growth.[6]

3 Law and Finance

The experience of transitional economies in eastern Europe suggests that law, both the laws on the books and the enforcement of what laws there are, may be an important factor in the efficiency of financial systems. It is a notorious fact that the privatization programmes and establishment of stock markets in some countries after 1989 have had mixed success. In many cases people seemed to feel that having a stock market on which to speculate guaranteed fabulous wealth with no effort for everyone. In all cases such expectations have had a hard crash landing. The contrasting experiences of Poland, Hungary and the Czech Republic are interesting.

The Czech Republic was one of several countries that used a scheme of mass privatization following which firms were listed on the stock exchange. So the exchange had many listed securities by the early 1990s (1028 by the end of 1994, 1716 by the end of 1995, 1670 by the end of 1996, and then falling to 151 by the end of 2000) but many of these were illiquid, and stocks were de-listed as time went on. In addition, the protection given to minority shareholders was weak. It was possible for them to be expropriated by a combination of managers and large shareholders, through a technique called tunnelling, which made the Czech stock market notorious. The risks of investing in it, and the costs of raising funds on it, are such that no funds were raised through initial public offerings (IPOs) on it until at least the end of 1998 (Glaeser *et al*., 2001).

[6]Carlin and Meyer (2002) take the analysis of industry-level data further.

In Poland, the privatization programme got under way slowly.[7] A scheme called capital privatization was used in the early transition period. Shares in (corporatized) state-owned firms were offered via IPOs and off-market offerings to investors. Later a so-called bank-led restructuring programme was employed, and in 1995 there was a mass privatization. Of the three schemes, the first was the most successful by far. But as a consequence of this pattern of privatization, the stock market developed, in size at least, slowly. There were only nine listed securities by the end of 1991, rising to 44 by the end of 1994 and 225 by the end of 2000. But there have been IPOs by private firms on the Warsaw stock exchange, steadily growing in number and value. More than $1 billion was raised in 1998. The Warsaw stock exchange has proved more attractive to investors and firms raising funds than has the Czech exchange.

Glaeser *et al*. (2001) argue that effective regulation in Poland was a key to its success, and that it was lacking in the Czech Republic, where 'hands-off regulation was associated with a moribund stock market'. The contrast is between the Czech Republic where the judiciary was left to enforce the securities law and Poland where there was 'strict enforcement of the securities law by a highly motivated regulator'.[8] They argue that the judiciary did not have—in either country—the resources or the incentives to deal with complex financial cases effectively. The Czech Republic (where Vaclav Klaus was Finance Minister and later Prime Minister) pursued a more *laissez-faire* policy than Poland (where Leszek Balcerowicz guided the reform process). In Poland regulation was placed in the hands of the independent Securities Commission, whereas it was handled in the Czech Republic by an office of the Finance Ministry (the Capital Markets Supervisor's Office), which was indifferent to regulation. In Poland, intermediaries were regulated. There were elaborate licensing requirements. Brokers were required to engage in 'honest trading' as defined by the Commission on pain of loss of licence. The regulator had the right to inspect the accounts of brokerage firms. These firms had to disclose their ownership structure, not trade in securities issued by parent companies or subsidiaries, and keep financially separate from any banks that owned them. In Poland trading could only take place on the exchange. These regulations were much weaker or entirely lacking in the Czech Republic. There was much more required disclosure in Poland, and the regulator had much more freedom to act independently of the judiciary.

[7]Driffill and Mickiewicz (2003) assess in more detail the role of the order of liberalization in Poland's relatively successful transition.

[8]Glaeser *et al*. write: 'We show that in its securities law, Poland adopted a more stringent regulatory stance than did the Czech Republic. This difference was reflected not just in the general philosophies of regulation, but in the statutes and the mechanisms of law enforcement. In contrast to the Czech Republic, Poland adopted legal rules highly protective of investors, mandated extensive information disclosure by securities issuers and intermediaries, and created an independent and highly motivated regulator to enforce the rules.' The Czech Republic started to tighten its rules in 1996.

Polish law required disclosure of shareholdings, even if only minority ones, as they passed numerous thresholds (10 per cent, 20 per cent, 33 per cent and so on). There was a required mandatory bid for remaining shares when ownership reached 50 per cent. Glaeser *et al*. cite the interaction between securities law (forcing disclosure) and companies' law (shareholders being active in using their rights to change boards of directors and influence company policy) as being important. The conclusions the authors draw from their analysis are first that financial markets are helped by legal protection of outside investors; second that disclosure by issuers and intermediaries is an important part of protecting investors; and third that in some circumstances regulation is 'an attractive alternative' to judicial enforcement.

This emphasis on the importance of laws and enforcement in making stock markets work is supported in several papers, including Pistor *et al*. (2000) and Pajuste (2002). On a comparison of nine countries in central and eastern Europe, Pajuste finds that central and eastern Europe stock markets had lower returns and higher risk than those of developed economies, partly explained by the abuse of minority shareholders, since the dominant shareholders extract benefits from their holdings without maximizing share prices. Pajuste argues that enforcement of laws matters more than the strength of laws 'on the books' for returns, and finds that enforcement of financial regulation has the highest explanatory power for returns of the variables used. Protection of minority shareholders she finds has a positive effect on market activity (measured by the ratio of turnover to capitalization for the market).

4 Financial Sructure, Legal Origins, Growth

The importance of the legal system, the rule of law, protection of minority shareholders and so on seem to receive widespread support in recent work as factors that affect growth. They and (to some degree, though subject to the findings of Manning set out above) the level of financial *development* get support, whereas financial *structure* does not. A recent paper by Beck *et al*. (2001) looks at these issues using data on many countries, at the country, industry and firm level. It is important to distinguish financial structure from financial development. Financial structure refers to the mix of banks, stock markets and other institutions that make up the market. Besides what they call the *bank-based view* and the *market-based view* of financial markets, they also identify a *law and finance* view and a *financial services view* of market structure.[9] The bank-based views and the market-based views of how financial markets affect growth get no empirical support in Beck *et al*. (2001). ('Distinguishing countries by financial structure does not help in explaining

[9]The financial services view is stated as 'the financial-services view stresses that financial systems provide key financial services'.

cross-country differences in long-run GDP growth, industrial performance, new firm formation, firms' use of external funds, or firm growth.') But they find that 'countries grow faster, industries that rely heavily on external finance expand more rapidly, new firms emerge more quickly, firms' access to finance is easier, and firms enjoy greater growth in countries with higher levels of overall financial development and in nations with legal systems that more effectively protect the rights of outside investors'. This is, as they say, consistent with the law and finance view and the financial services view.

They measure financial development by the log of the product of private credit (credits by financial intermediaries to the private sector divided by GDP) and value traded (value of shares traded on the stock exchange divided by GDP).[10] They use four indicators of financial structure: structure-activity, structure-size, structure-efficiency and structure-aggregate.[11] A variable called Creditor captures the legal environment. It measures the extent to which secured creditors are protected, on a scale of 0–4. The variable Anti-director measures protection of shareholder rights, on a scale of 0–6. The Rule of law is an assessment of the strength of the law and order tradition in the country, on a scale of 1–10. The Legal origin of a country is regarded as an important variable. It takes four values: English common law, and French, German and Scandinavian civil law. It is used as an instrument for financial development and structure in controlling for simultaneity bias.

These and similar results throw into doubt the merits of the old debate about the relative merits of the German/Japanese and the UK/US models of financial structure. Not that this debate ever really had very much in it. As Beck *et al*. (2001) remark, the early work comparing those four countries was unlikely to provide interesting correlations of growth rates with structure because all four have had very similar long-term growth rates.

5 Finance and Growth in a World of Increasing Returns: Globalization and Economic Geography

The relationship between the financial system and economic growth is evidently complex. There are many influences. Many aspects of the system might affect growth in a variety of different ways. Causation obviously goes both ways. It is therefore of little surprise that there is no clear overall relationship between growth and simple indicators of financial structure or development. Once imperfect information is admitted into financial markets, and the economy exhibits increasing returns in various quarters, myriad possibilities are opened up.

Financial markets and institutions are just one of the many factors that may affect growth. The theories that postulate and articulate effects of

[10]They use some alternative measures as well as this, but this is their preferred measure.

[11]Structure-activity, for example, is the log of the ratio of value traded to bank credit. Structure-aggregate is an amalgam of the first three measures of structure.

finance on growth are useful for explaining what role financial matters might play and how they play them. But they do not constitute a theory of growth. They may explain part of it, but they are unlikely to be the whole story. There are competing, or perhaps complementary, explanations.

It is interesting to note that the empirical studies on questions of finance and growth have taken a short time horizon, at least in calendar time. Perhaps one may argue that by embracing many countries at different stages of development they take in a much longer span of developmental time. But in practice they tend to examine a couple of decades post 1945. Looking at longer spans of history shows countries developing unevenly. Britain developed rapidly through the eighteenth and early nineteenth century, but then the USA began growing fast and overtook the UK in real income per head early in the twentieth century. The countries of Asia—Japan, South Korea, Taiwan and others—have grown dramatically in the second half of the twentieth century. Financial institutions may have played a role in shaping this pattern of development. (The joint-stock company and limited liability were important in Britain; the USA instituted and constitutionally enshrined strong protection of property rights after the end of British rule. The Asian countries developed universal banking and the groupings of firms, such as the chaebol in Korea and kairetsu or zaibatsu in Japan. And there are more examples.)

But it is argued in some quarters that increasing returns at the level of the industry or economy, or economies of agglomeration, may have played a large part. Crafts and Venables (2002) argue that the pattern of growth that has been seen is better explained by these 'economic geography' ideas. Relative wages hardly fell in the USA relative to the UK in the period 1870–1910 despite the US's receiving an increase in its workforce of 24 per cent through immigration and the UK losing 11 per cent (of its 1910 workforce). Despite the big capital flows out of the UK and into the USA at the time, this is hard to explain without invoking increasing returns. Simulation models in which manufacturing firms have forward and backward linkages, where there are increasing returns, imperfect competition and significant transport costs, can generate spurts of growth in some countries while other similar countries languish, as transport costs fall (as they did in the late nineteenth century). Hence the USA may have developed while South America failed to do so. Further falling transport costs and growing markets may explain why manufacturing shifted rapidly from Europe and North America to Asia in the post-1945 period, and why it is now moving away from Japan and Taiwan to the Chinese mainland and elsewhere. The clustering of economic activities—Crafts and Venables cite microcomputers in Taiwan, electronics in Malaysia, and there is the example of software and call centres in India, and so on—gives support to these ideas.

In relation to the research on growth and finance, the ideas current in economic geography are a reminder of a bigger picture. Finance is just a part

of the story, interesting, maybe important, but not the whole show. The theoretical models that link finance and growth are useful for articulating the mechanisms at work, but not for explaining growth. (One may ask whether the empirical studies make enough allowance, through control variables, for the implications of increasing returns and agglomeration.) An examination of a brief episode in time, like 1976–93, as is used by Levine and Zervos, may suggest that rapid growth in Asia may be attributed to financial market structure or development, when from a broader perspective it may look more like growth sparked off by falling transport costs and fuelled by economies of agglomeration.

6 Conclusions

There are myriad ways in which various aspects of the financial system can in theory affect economic growth, once allowance is made for asymmetric information in financial markets and increasing returns to scale in production. Theoretical models can articulate clearly the way that individual channels of influence operate. In practice, things look a lot less clear. Some results on financial *development* look promising, but they may be just picking up legal, social and institutional features of the countries involved. The empirical results give little support to the idea that financial *structure* matters for growth. The factors that seem most likely to play a role are the rule of law, the extent of legal protection of minority shareholders, the origins of the legal tradition in the country and so on. These results are very interesting, but offer few obvious pointers for economic policy. The empirical analysis in this area is bedevilled by problems of simultaneity. It is hard to be sure that variables summarizing financial structure are exogenous with respect to growth, even if it is subsequent growth.

The theory is important for isolating and explaining mechanisms that are at work, but the theoretical models each typically give a highly incomplete view of how finance (or some aspect of the financial system) affects growth. They do not give a complete picture of how finance affects growth. *A fortiori* they do not provide a complete theory of growth.

Looking further afield, and over longer periods of time, gives strength to the economic geography view. It can explain why there are spurts of growth at different times in different places.

Appendix

This Appendix gives a summary of Mark Manning's (2002) results on the sensitivity of estimated models of financial development and growth on inclusion of an Asian Tigers dummy.

TABLE 3.2.1
ROBUSTNESS TESTS OF LEVINE AND ZERVOS'S (1998) MEASURES OF STOCK MARKET LIQUIDITY; OLS REGRESSION OF REAL GDP GROWTH PER CAPITA (1976–93) ON MEASURES OF FINANCIAL DEVELOPMENT AND OTHER COUNTRY CONTROLS

	(1) *L&Z sample*	(2) *Excluding Taiwan*	(3) *Tiger dummy*	(4) *Regional dummy*	(5) *L&Z sample*	(6) *Excluding Philippines*	(7) *Tiger dummy*	(8) *Regional dummy*
Bank credit	0.013	0.013	0.009	0.002	0.008	0.007	0.009	–0.001
	(2.40)**	(2.44)**	(2.65)**	(0.33)	(1.53)	(1.24)	(2.47)**	(–0.15)
Market capitalization	—	—	—	—	0.015	0.018	0.001	0.008
					(2.18)**	(2.44)**	(0.11)	(1.13)
Turnover	0.027	0.042	0.006	0.008	—	—	—	—
	(3.00)**	(1.44)	(1.08)	(1.25)				
Value traded	—	—	—	—	0.070	0.051	0.030	0.031
					(2.17)**	(1.17)	(1.75)*	(1.46)
Tiger	—	—	0.041	—	—	—	0.040	—
			(5.66)***				(4.51)***	
Asia/Pacific	—	—	—	0.027	—	—	—	0.026
				(3.04)***				(2.59)**
Africa	—	—	—	–0.025	—	—	—	–0.026
				(–1.23)				(–1.29)
Latin America	—	—	—	–0.022	—	—	—	–0.022
				(–2.41)**				(–2.64)**
Adj. R^2	0.383	0.333	0.709	0.670	0.383	0.394	0.706	0.677
No. of observations	42	41	42	42	42	41	42	42

The dependent variable is the growth of real GDP per capita (1976–93). Financial development variables are initial values (1976). All regressions include the set of conditioning variables employed by Levine and Zervos (1998): log of initial GDP per capita ($, 1976), log of years of secondary schooling, number of revolutions and coups in the 1980s, the share of government consumption in GDP (1976), the rate of inflation (1976) and the black market premium (1976). Heteroskedasticity-consistent standard errors were calculated, and *t* statistics are reported in parentheses. Regressions (1) and (5) are as in Levine and Zervos (1998); regression (2) drops Taiwan from the sample and regression (6) drops the Philippines from the sample; regressions (3) and (7) revert to the original samples but add a dummy variable for the Asian Tiger economies, which are defined as those growing by more than 4 per cent per annum over the period 1976–93; regressions (4) and (8) include dummies for East Asia/Pacific, Latin America and Caribbean, and Sub-Saharan Africa.

***Coefficient significant at the 1 per cent level.
**Coefficient significant at the 5 per cent level.
*Coefficient significant at the 10 per cent level.

TABLE 3.4.3
TESTING MEASURES OF BANK AND STOCK MARKET DEVELOPMENT USING RAJAN AND ZINGALES' (1998) METHODOLOGY: REGRESSION OF THE GROWTH OF INDUSTRY VALUE-ADDED ON FINANCIAL DEVELOPMENT–EXTERNAL FINANCIAL DEPENDENCE INTERACTIONS, OTHER INTERACTIONS, AND INDUSTRY AND COUNTRY FIXED EFFECTS

Interaction terms[a]	(1) *OLS*	(2) *OLS*	(3) *OLS*	(4) *OLS*	(5) *TSLS*	(6) *OLS*
Private credit	0.080	0.005	—	—	—	—
	(3.49)***	(0.20)				
Turnover	—	—	0.086	0.025	—	—
			(2.68)***	(1.00)		
Market capitalization	—	—	—	—	–0.086	0.047
					(–1.23)	(1.24)
Value traded	—	—	—	—	0.229	–0.057
					(2.49)**	(–0.90)
Initial GDP	—	0.019	—	0.019	—	0.018
		(1.82)**		(2.60)***		(2.15)**
Tiger	—	0.273	—	0.261	—	0.236
		(2.54)**		(2.60)***		(2.04)*
Scandinavian origin	—	—	—	—	0.048	—
					(3.82)***	
Adj. R^2	0.219	0.247	0.215	0.247	0.221	0.248
No. of observations	1242	1217	1242	1217	1242	1217
Over-identification test, H_0: Z valid (p value)	6.085 (0.30)	3.428 (0.63)	8.266 (0.14)	3.199 (0.67)	2.555 (0.47)	3.423 (0.49)
[restrictions]	[5]	[5]	[5]	[5]	[3]	[4]
DWH test, H_0: OLS valid (p value)	0.23 (0.64)	0.03 (0.86)	0.74 (0.39)	1.82 (0.18)	2.26 (0.10)	0.49 (0.61)

The dependent variable is the growth of industry value-added (1980–90). All regressions include as additional regressors the industry share of total manufacturing value-added and country and industry fixed effects. Heteroskedasticity-consistent standard errors were calculated, and t statistics are reported in parentheses. The final rows of the table report the results from tests for endogeneity. In each regression, financial development has been instrumented by the interaction of external financial dependence with dummy variables indicating legal origin (English, French, German, Scandinavian) and religion (Protestant, Catholic). The χ^2 statistic for the over-identification test is presented, along with the associated p value in parentheses and the number of over-identifying restrictions in square brackets. The DWH (Durbin–Wu–Hausman) test statistic is also presented, along with the associated p value in parentheses. Where the null in the DWH test has not been rejected at the 10 per cent level, the coefficients presented are those from OLS estimation of the model.

[a]All interactions are with external financial dependence, with the exception of Tiger, which is interacted with investment intensity.

***Coefficient significant at the 1 per cent level.

**Coefficient significant at the 5 per cent level.

*Coefficient significant at the 10 per cent level.

TSLS, two-stage least squares.

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