

How Do Financial Systems Affect Economic Performance?

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Abstract

This paper examines the relation between financial, corporate and legal systems, and economic performance in different countries. It reviews international comparisons that undertake detailed analyses of individual, developed countries and studies that use large, cross-country data banks, including developing countries. While the former do not provide evidence of a clear relation between different types of systems and economic performance, the latter report a strong association of financial development with economic growth. A recent theoretical literature offers a way of reconciling these two sets of studies. It points to a relation between financial/ corporate systems and *types* of activity with some systems favouring high risk, short-term investments and others promoting long-term, relatively low risk investments. These theories also suggest that systems may be related to stages of economic development. The paper summarizes a first empirical study that reports an association between financial/ corporate systems, types of activity and stages of economic development. The paper concludes that these relationships have important implications for the design of regulation and legal systems in different countries.

Key words: financial systems, corporate control, growth, investment
JEL classification: E2, G3, O4

1 Introduction

There have been debates about the role of financial systems in corporate activity for the best part of a century. A consensus view is yet to emerge as to whether cross country differences in the structure of financial, corporate and legal systems have any causal influence on cross-country economic performance. But interest in this question has stimulated attempts to assemble data banks on financial and corporate systems that allow international comparisons to be performed. The objective of this paper is to review these debates, to present additional empirical evidence and to put forward some new interpretations of this evidence.

We begin in section two with the debates about the comparative merits of different financial, corporate and legal systems for economic performance. These debates have a long history. Until recently, they primarily took the form of bilateral country comparisons on, for example, the role of banks in comparative British and German industrial performance since the late nineteenth century. The positive role of the German banking system in promoting German industrialization through the provision of external finance frequently acquired the status of a ‘stylized fact’ in the discussion of comparative performance. The influence of ‘bank’ versus ‘market’-based financial systems was revisited in the examination of the post-war ‘Golden Age’ growth of the West European and Japanese economies. But more detailed empirical work, using individual firm and institution data, has frequently failed to identify the source of advantage of the German and Japanese systems. Skepticism has been heightened by the comparative performance of Anglo-American and Continental European/ Japanese systems during the 1990s.

The debate about the merits of different systems has been widened to include cross-country differences in ownership structures. Only recently has there been a systematic attempt to document differences in ownership structures across countries. The finding that the classic ‘Berle-Means’ corporation with widely dispersed ownership is not typical of large firms in most countries has encouraged studies of the impact of ownership concentration on performance. As in the ‘bank versus market’ debates, analysis has been

conducted at the level of countries and individual firms and institutions. In the former, the question is whether concentrated ownership contributes to or detracts from country performance. In the latter, the variation in ownership concentration across firms within a country is exploited to identify the mechanisms through which ownership structure affects performance. The final aspect of comparative structures that is examined in section two is that of legal codes. The significance of legal codes for corporate performance derives from the observation that investor and creditor protection varies appreciably across countries depending on the nature and origin of legal codes, and in particular whether they derive from common law (essentially English speaking) or civil law (Continental European) systems.

The evaluation of the debates on comparative financial, corporate and legal systems in section two indicates that while there are clear differences in structures, the impact of these differences on performance is much harder to establish. In particular, the mechanisms that are often hypothesized to provide the link from structural differences to performance are rarely present in firm-level data sets.

In section three, we move from the comparative systems to the growth literature where there is a well-developed body of analysis focusing on the role of financial *development* in comparative growth. The aim is to disentangle the question of whether economic growth leads to the development of a more mature financial system or whether the maturity of the financial system promotes economic growth. Such studies use large samples of countries at widely differing levels of per capita GDP. They invariably record that financial development measured by the size and depth of banking sectors and securities markets promotes economic growth.

While there is therefore considerable evidence that financial development – bank or market-based – is good for economic growth, there is no clear evidence from studies of advanced countries that one kind of financial or corporate system is better for growth than another. Institutional differences between advanced countries appear to be very persistent over the last century during which performance measured by GDP per capita

first diverged and then converged. This opens up the question of whether institutional differences in financial systems, ownership structure and legal systems may create a form of comparative rather than absolute advantage, i.e. whether they influence the *type* of activity in which a country specializes, rather than its aggregate performance.

This possibility is explored from a theoretical perspective in section four and empirically in section five. Why might financial or ownership structure be related to the type of economic activity? The reason is that different forms of economic activity may have quite different characteristics associated with them that make the provision of particular forms of finance or certain types of governance arrangements desirable. For example, activities may differ in their degree of uncertainty or in the extent to which cooperation from stakeholders in the firm (employees, suppliers and purchasers) is required for successful performance. Section 4 will describe theoretical models in which stock markets support activities where there is a high degree of uncertainty in production. By contrast, banks may be beneficial for activities in which uncertainty is low (because, for example, technology is relatively stable and well understood) but gestation periods are long. In addition, only concentrated owners may be able to offer the commitments required for stakeholders to invest in training or dedicated plant and machinery.

The models discussed in section four suggest that there is a matching of institutional structure with the characteristics of different economic activities. In section five, we provide empirical support for this from an empirical study of 14 OECD countries: we record a strong inter-relation between type of financial and corporate system, the characteristics of different industries and their growth rates in different countries. In addition, we report that the channel through which this effect occurs is expenditures on research and development rather than fixed capital formation. We also report that the interaction between country structures and industrial activity is sensitive to stages of economic development.

In the conclusion, we discuss the implications for economic policy of the view that there may be an inter-relation between institutional structure and type of activity.

2 Financial and corporate systems and economic performance

In 1912, Joseph Schumpeter described how the granting of credit was central to entrepreneurship and innovation: “while granting credit is not essential in the normal circular flow...it is certain that there is such a gap to bridge in the carrying out of new combinations. To bridge it is the function of the lender, and he fulfils it by placing purchasing power created ad hoc at the disposal of the entrepreneur”. Thorstein Veblen saw the process of judging firms as being a matter of “standardized bureaucratic routine” undertaken by the intermediaries which he dubbed “the lieutenants of finance” while “the captaincy has been taken over by the syndicated bankers” (Veblen (1919), p.81). However, others, most notably Robert Lucas, argue that economists “badly over-stress” the significance of financial considerations in economic performance (Lucas (1988), p.6).

While the role of financial systems is debated, the performance of different types of financial systems is even more heavily disputed. Clapham (1936) approvingly quoted a principal officer of one of the German Great Banks when he said: “In Germany our banks are largely responsible for the development of the Empire, having fostered and built up its industries. ... To them, more than any other agency may be credited the splendid results thus far realized”. “If his historical summary was not literally accurate,” Clapham said, “it was accurate in substance.” (Clapham (1936), p. 118). Kennedy (1987) talks in somewhat more measured but still supportive tones about the role of German banks: “With all their documented imperfections, (capital markets in Germany), by making resources available to a large group of technologically progressive industries on a scale unequalled in Britain, account for much of the difference in the economic growth performance between (Germany) and Britain in the half century after 1865” (Kennedy (1987), p. 120). The withdrawal of British banks in the second half of the 19th century was prompted by a series of bank failures: “the banks were by the ’eighties no longer showing such a readiness to act as partners in industrial concerns. They were moving further and further away from the concept of long term loans and were concentrating on an efficient national short term credit system” (Jefferys (1938), p. 119).

But others question this interpretation of German banking. Edwards and Fischer (1994) find that “the commonly-held view of the merits of the German system of finance for investment, in terms of the supply of external finance to firms and corporate control, receives no support from the analysis of the available evidence” (Edwards and Fischer (1994), p. 240). Edwards and Ogilvie (1996) go on to argue that, not only is the current role of German universal banking overstated, it probably never was as significant as suggested, even at its zenith at the turn of the century. “The picture which emerges is not consistent with the claim that German universal banks exerted substantial control over industrial companies and provided significant amounts of finance. Although there were some cases of this, these were the exceptions to the general rule, which was for companies to finance themselves internally to a very great extent” (Edwards and Ogilvie (1996), p 441).

There have been similar debates about Japanese banks. Hoshi, Kashyap and Scharfstein (1990) find that “firms with financial structures in which free-rider and information problems are small perform better than other firms after the onset of distress. In particular, we show that firms in industrial groups – those with close financial relationships to their banks, suppliers, and customers – invest more and sell more after the onset of distress than non-group firms”. But this view has been challenged. Weinstein and Yafeh (1998) find that, even prior to the liberalization of financial markets in Japan, main bank clients did not exhibit higher profitability or growth than their industry peers. Moreover banks could use their monopoly power to squeeze their clients’ profits and inhibit their growth through conservative investment policies.¹

The negative impression of banking systems has been reinforced by recent experience of financial distress in the Far East. Instead of performing the active monitoring and governance function that financial intermediation theory ascribes to them, banks are perceived to have been at the centre of corrupt, crony systems. General perceptions have swung markedly from admiration for systems that have been associated with sustained

¹ See also Caves and Uekusa (1976) and Nakatani (1984).

high levels of investment and growth rates to severe criticism for their lack of openness and transparency.

In the last decade, the debate in the comparative systems and finance literature has widened to include other cross-country differences. Franks and Mayer (1998a) reported marked differences across countries in concentration of ownership. “The United Kingdom and the United States have large quoted sectors, with share ownership dispersed across a large number of investors. In the case of the United Kingdom, the dominant shareholding group is institutional investors; in the United States, it is individual investors. In contrast, France and Germany have small quoted sectors. More significantly, even the largest quoted companies in general have at least one shareholder owning more than 25 percent of the equity and frequently a majority shareholding. These large shareholdings are in particular associated with family and other corporate investors” (Franks and Mayer (1998a), p. 730).

These differences have recently been confirmed in two sets of studies that investigate concentration of both share ownership and voting power. The first, a large international comparison of ownership in 27 countries, “finds that the Berle and Means corporation is far from universal, and is quite rare on some definitions of control. Similarly, the so-called German model of bank control through equity is uncommon. Instead, controlling shareholders – usually the State or families – are present in most large companies. These shareholders have control rights in firms in excess of their cash flow rights, largely through the use of pyramids, but they also participate in management” (La Porta, Lopez-Silanes, Shleifer (1998), p. 5). The second is a more detailed study of nine European countries, which concludes, “the most striking fact about blockholdings in Europe is that they are so much higher than in the U.S.A. ... Within Europe, the level of concentration of voting power is by no means uniform; and these differences are rooted in differences in customs and the legal environment. ... In the UK, the largest 250 listed companies report a very modest median value (of size of share blocks) of 9.9%; while at the other extreme, Germany, Austria and Italy all exceed 50%” (Becht and Roell (1999)).

Ownership may affect corporate performance in several ways. Firstly, principal-agent models emphasize the significance of equity ownership for incentives. Higher-powered incentive arrangements for managerial remuneration might be expected in the dispersed stock market economies of the UK and US because of the weak incentive for any individual shareholder to incur the costs of monitoring management. Large owners in Continental Europe may have more incentive and capacity to monitor corporate performance directly instead of using schemes relating pay to stock market performance to align managers' incentives with those of owners. However, to the extent that there is evidence on executive pay in different countries, it fails to reveal pronounced differences. In a comparison of the response of executive remuneration to performance (share price, earnings, changes in earnings and sales growth) in Japan and the US, Kaplan (1994) concludes that Japanese "compensation responds to all four performance measures, and the responses are generally similar to those in the United States.... Cash compensation is positively related to earnings, stock and sales performance. In most cases, the sensitivities in the two countries are not statistically different" (Kaplan (1994), p. 512).

Concentrations of ownership are likely to affect corporate control. The separation of ownership and control in the UK and US has created free rider problems of corporate control and passive (in particular, institutional) investors. Concentrations of ownership may overcome free rider problems (Shleifer and Vishny (1986)) but may worsen incentives and create conflicts between majority and minority investors (Burkhart, Gromb and Panunzi (1996) and Shleifer and Vishny (1997)). Conflicts between majority and minority shareholders would arise, for example, in the case in which the majority owner derived benefits from their control of the firm other than those associated with value maximization.

It is therefore an empirical matter whether concentrations improve corporate control and performance. In a comparison of relations between executive board turnover and performance in Japanese and US firms, Kaplan (1994) concludes, "To a large extent, the turnover-performance relations are economically and statistically similar in Japan and the United States. The results are not consistent with Japanese managers being more highly

penalized for poor sales growth. At the level of the top several executives, the results are also not consistent with Japanese managers being less highly penalized for poor stock performance than are US managers. Because boards of directors (or the entities that control them) are responsible for hiring and firing top executives, these results suggest that boards in both countries focus on similar performance objectives” (Kaplan (1994), p 528).

In a similar vein, in a study of ownership and control in Germany, Franks and Mayer (1998b) conclude that there is “little relation between concentration of ownership and the disciplining of management of poorly performing firms and little relation between the type of concentrated owner and board turnover. The pronounced influence which might have been expected from the very high levels of concentration of ownership in Germany and the distinctive forms in which shares are held through banks and pyramids is not in evidence” (Franks and Mayer (1998b), p 28).

Whatever is the significance of the pronounced international differences in concentrated ownership, it does not appear to be associated with managerial incentives and disciplining. In fact, a common theme of many of the papers in this volume is that the standard principal-agent view of the firm is not applicable to most countries’ financial and corporate systems. The standard view sees the central problem of firm organization as aligning the interests of managers with those of the investors supplying external finance. Hellwig disputes the notion that outside financiers control firms and instead argues that concern about retaining control is a dominant influence on the way in which managers structure financial and ownership policies. Alliances between bankers, lawyers, managers and politicians help to cement insider systems of corporate control and, far from providing external investor monitoring and control, banks in Germany reinforce managerial autonomy. Allen and Gale note that the question of how managers can be best motivated to act in shareholder interests simply does not apply in many countries’ corporate systems and, even in the UK and US, is not relevant to many legal forms, including not-for-profit organizations and mutuals.

Recently, a third factor has been introduced into international comparisons of finance and control: the variation in legal systems across countries. La Porta, Lopez-de-Silanes, Shleifer and Vishny (1997) argue that the nature and operation of financial systems are related to differences in the degree of investor protection across countries i.e. the extent of protection of minorities. Legal rules vary systematically across countries depending on whether they are of English, French, German or Scandinavian origin. Common law countries of the English tradition protect both shareholders and creditors the most, French civil law countries the least, and German and Scandinavian civil law countries somewhere in the middle. They find that “civil law, and particularly French civil law, countries, have both the weakest investor protections and the least developed capital markets, especially as compared to common law countries” (La Porta et al (1997), p. 1149). They argue that greater legal protection of minority owners implies less need for ownership concentration, which increases access of companies to external finance and reduces capital costs.

The studies referred to above from the comparative governance and finance literature have documented substantial and persistent differences in the extent of bank involvement in the corporate sector, in the extent of ownership concentration and in the legal protection of investors. Yet attempts to pin down the mechanisms linking differences in structure to performance outcomes have been less successful.

3 Financial development and economic growth

Over the last few years, a literature has begun to emerge that attempts to use data from a large number of countries to establish the relevance of financial and legal systems for economic growth. The work has its origins in Goldsmith (1969) who correlated the relation between the size of financial systems, as measured by the ratio of the value of intermediary assets to GNP, and economic growth in 35 countries over the period 1860 to 1963. He reports a positive association but there are several obvious problems with Goldsmith’s analysis. Firstly, while the period of study is long, the sample size is small; secondly, the direction of causation is unclear; and, thirdly, there is no control for other

factors that might influence growth. In a series of studies, King and Levine have attempted to address these problems.

King and Levine (1993a, b and c) examine the growth of 80 countries over the period 1960 to 1989. They use four measures of financial development. The first is the ratio of liquid liabilities to GDP, which measures the scale of financial intermediation in different countries. The second is the proportion of domestic credit outside of the central bank, which captures the development of a financial system beyond a central banking function. The third and fourth variables measure the allocation of credit to the private rather than the public sector (the ratio of claims on the non-financial private sector to domestic credit control and the ratio of gross claims on the private sector to GDP). In separate equations, three measures of growth (real per capita GDP growth, growth in capital stock per person and total factor productivity growth) are regressed on the average values of these variables over the period 1960 to 1989. The equations control for a range of other influences on growth, including initial income, education, government expenditure, inflation and trade propensities.

King and Levine report a strong positive relation between the three measures of growth and the four measures of financial development. They also examine the extent to which financial development at the start of the period in 1960 predicts growth in the subsequent thirty years. They conclude, “the initial level of financial development is a good predictor of subsequent rates of economic growth, physical capital accumulation and economic efficiency improvements over the next thirty years” (Levine (1997), p. 707).

There have been two studies that have looked at the significance of securities markets as well as bank development on economic growth. Levine and Zervos (1998) report the influence of stock markets as measured by their size (ratio of market capitalization to GDP) and value traded (as a proportion of GDP) as well as bank credit on economic growth across more than 40 countries over the period 1976 to 1993. They find that value traded is positively and significantly related to growth even when market capitalization is included in the equation. They conclude that “stock market liquidity and banking

development are both positively and robustly correlated with contemporaneous and future rates of economic growth ... and since measures of stock market liquidity and banking development both enter the growth regressions significantly, the findings suggest that banks provide different financial services from those provided by stock markets” (Levine and Zervos (1998, p. 554).

Rajan and Zingales (1998) argue that despite the inclusion of other variables, there may be a problem of controlling for omitted variables, such as saving rates, in the above regressions. Instead, they focus on one way in which financial development may affect economic growth: via external finance. They argue that financial development should be most relevant to industries that are dependent on external finance and that these industries should grow fastest in countries with well-developed financial systems. They therefore look at 36 individual industries in 41 different countries and examine the influence of the interaction between the external financial dependence of those industries and the financial development of the countries on the growth rates of those industries in the different countries over the period 1980 to 1990.

Rajan and Zingales use three measures of financial development of a country: the ratio of market capitalization to GDP, domestic credit to the private sector over GDP, and accounting standards. They measure financial dependence of an industry by the amount of external finance raised by firms in different industries in the United States. They use the US on the grounds that it has the best-developed capital markets in the world and that its firms face the least friction in raising finance. The US therefore provides the purest measure of the true financing needs of industries.

Controlling for other influences on economic growth by including dummy variables for industries and countries, Rajan and Zingales report a strong relation between economic growth in different industries and countries and the interaction of financial development of countries and the financial dependence of industries. There is a particularly strong relation when accounting standards are used as the measure of financial development of countries. They conclude that their results “suggest that financial development has a

substantial supportive influence on the rate of economic growth and this works, at least partly, by reducing the cost of external finance to financially dependent firms” (Rajan and Zingales (1998, p. 584).

Demirguc-Kunt and Maksimovic (1998a) use firm level data to evaluate the influence of financial systems on growth. They estimate the excess growth of a firm over and above that which can be internally financed (with a zero dividend distribution) and from short-term finance (assuming that the firm maintains its current short-term borrowing to asset ratio). They examine the influence of market capitalization to GDP ratios, stock market turnover and bank deposits to GDP in 30 countries over the period 1980 to 1995 on the excess growth of firms in those countries over the period 1986 to 1991. They find that both stock market turnover and the size of the banking system are positively related to excess growth. They also include a measure of law and order (the extent to which the legal system of a country allows disputes to be mediated and contracts to be enforced) and find that this variable is also positively associated with excess growth. They conclude, “an active stock market and a well-developed legal system are important in facilitating firm growth. Firms in countries that have active stock markets and high ratings for compliance with legal norms are able to obtain external funds and grow faster” (Demirguc-Kunt and Maksimovic (1998a), p. 2134).

Demirguc-Kunt and Maksimovic (1998b) provide support for Rajan and Zingales’ (1998) argument that financial development may influence economic growth through external financing. They examine the amount and maturity of debt of firms in 30 countries over the period 1980 to 1991 and relate these to turnover on stock markets, bank assets to GDP ratios, the same law and order variable described in the previous paragraph and measures of shareholder and creditor rights. They find that stock market turnover is associated with more long-term debt amongst large but not small firms and larger banking sectors are associated with more long-term debt of small but not large firms. Banks therefore appear to be particularly important in the financing of small firms and stock markets in the financing of large firms.

La Porta et al (1998) report that the better investor protection in common law countries is reflected in higher dividend payouts than in civil law countries and lower dividend payouts by high than low growth companies in common but not civil law countries. Better investor protection therefore makes dividends more responsive to the investment needs of companies.

In sum, large sample, cross-country analyses that include developing as well as developed countries record a strong relation between financial development and economic growth. The Demirguc-Kunt and Maksimovic (1998b) and La Porta et al (1998) studies suggest that financial and legal systems may affect different types of firms in different ways – an issue that we will address in the next section.

4 Financial systems, corporate systems and types of economic activity: theory

4.1 Financial systems

As noted in section two, a distinction is commonly drawn between bank and market oriented financial systems. Economic theory attributes a particular function to banks in monitoring corporate activities. Economies of scale in monitoring make banks more efficient monitors than individual market participants. On the other hand, as Allen (1993) notes, securities markets have the advantage of aggregating diverse views of a large number of market participants. Securities markets are therefore superior at promoting investment where there are legitimate grounds for differences in views. However, they are inefficient where good investment decisions require the costly accumulation of available information on, for example, the quality and performance of borrowers. This is an example of the way in which a bank-based system would be expected to benefit different kinds of activity from those promoted by a stock-market oriented system.

Dewatripont and Maskin (1995) develop a model in which the structure of financial systems affects the degree of financial discipline imposed on firms. The structural difference that they have in mind is between a decentralized banking system with many

small banks and a centralized system with one or a small number of banks. We will refer to the first as a multibank system and to the second as a single bank one.

There are ‘good’ and ‘bad’ entrepreneurs and the former can choose either a fast project which is completed in one period or a slow project which takes two. The bad entrepreneur’s project takes two periods to complete and is assumed to be poor. The type of project is only revealed in the period in which it is completed. In a decentralized banking system, an individual bank lacks the funds to refinance the project in the second period. In this case, Dewatripont and Maskin show that there is a credible mechanism through which banks can commit not to refinance poor projects even though refinancing would be worthwhile once the fixed costs of the project have been incurred. If a second bank is required to provide refinancing, and if costly monitoring of borrowers is necessary, then the first bank will anticipate that the returns to monitoring will have to be shared with the second bank and, hence, will have little incentive to monitor in the first place. This undermines the viability of a project requiring refinance and creates an incentive for entrepreneurs to choose only fast projects. Thus a multibank system will impose hard budget constraints and exclude poor projects – but at the cost of also excluding efficient projects that are slow to generate revenues and require refinancing.

Multibank systems are therefore superior in imposing tough budget constraints on inefficient projects but are too short-termist in failing to sustain efficient long-term projects. It is plausible that industries differ in terms of the balance between short and long-term projects. If so, then the Dewatripont-Maskin model suggests that an economy with many small banks will be one in which industries with more short-term projects will be fostered whereas industries characterized by longer term investment projects will fare better in an economy with a few large banks.

Huang and Xu (1998b) describe a similar model but in this case activities differ not in the gestation of investment projects (all of which are ‘slow’ in the Dewatripont-Maskin sense) but in the extent of uncertainty attached to the success of projects. In their model, there are good and bad projects, the quality of which can only be ascertained by investors

ex post. Projects can be financed by one or more banks. Huang and Xu assume that there is a choice of reorganization strategies available following a poor outcome for the project after the first period. As in the Dewatripont-Maskin model, the type of activity favoured by a multibank system hinges on the commitment not to refinance projects that turn out to be poor after the first period but which, ignoring the sunk cost, would be worth continuing. This occurs in the Huang and Xu model because each bank has access to private information that on its own is inadequate to come to a correct decision about how to reorganize a firm and where there are conflicts that discourage banks from sharing information with each other.² As a consequence, multi-banks prefer to liquidate projects seeking refinancing. Since information sharing and conflicts of interest are eliminated by a single bank system, there will be no such commitment to liquidate projects that need refinance.

Where there is considerable uncertainty about returns from projects (i.e. there is a high proportion of bad projects) then the commitment to terminate projects is valuable and multi-bank systems invest more than do those with single lenders. Where uncertainty is low then single banks have more information with which to make ex ante investment decisions and they invest more. Multi-bank systems are therefore associated with R&D intensive industries, particularly when companies are young and uncertainty is high, and single bank systems with lower uncertainty, imitative investments.

In all of the above models, financial systems are associated with different *types* of corporate activities and investments. In Allen (1993), new technologies, where there are legitimate grounds for diverse expectations, benefit from securities markets or require information pooling through venture capitalists. More traditional investments, where uncertainty primarily relates to the borrower and the quality of management benefit from the economies of monitoring that banks can provide. In Dewatripont and Maskin (1995), fragmented banking systems are associated with short-term investments and single bank

² In contrast, Aoki in this volume argues that venture capitalists in Silicon Valley play a crucial information collection and dissemination function. By running tournaments between aspiring entrepreneurs, venture capitalists can configure product systems and guide entrepreneurs in response to information about newly emerging technologies.

systems with long-term investments. In Huang and Xu (1998), multi-bank systems promote high-risk R&D investments and single banks lower risk, imitative investments.

4.2 Corporate ownership and control

The structure of corporate sectors, in particular the ownership and control of corporations, as well as the structure of financial systems may influence patterns of corporate activities. Using a model with many similarities to that discussed above for the financial system, Huang and Xu (1998a) present a theory in which they argue that multi-investor financing dominates single investor financing of R&D when there is high uncertainty. Conversely, when investment is directed to more routine, incremental innovation, their model predicts the superiority of single investor or internal financing. The central idea in the model is the trade off between the costs and benefits of finance from multiple external independent investors as compared with a single external investor or internal financing.

Huang and Xu focus on the benefits that come from having multiple independent investors financing the project because of their ability to commit not to refinance a project that is revealed *ex post* to be poor. It is assumed that conflicts of interest between the external investors prevent sharing of information that would make reorganization of a project revealed to be poor preferable to its liquidation. They assume that the entrepreneur learns the outcome of the R&D project earlier than those supplying the finance and will terminate the project if he knows that refinancing will not occur. The hard budget constraint that comes from multiple investors may therefore produce superior project selection because entrepreneurs terminate poor projects in a timely fashion. Just as in the single bank case described above, where there is no conflict of interest between investors (which is true if there is a single investor or the project is internally financed), information about the optimal reorganization strategy in the event of project failure will be shared, implying that entrepreneurs face a soft budget constraint. If there is little riskiness associated with the R&D project, this source of inefficiency may be outweighed by the lower costs of internal or single investor finance.

It is clear that the model closely parallels the one described above for multi- and single banks. Multiple investors will assist in the financing of high-risk projects where there is considerable uncertainty about quality and a significant fraction of projects will need to be terminated. Where risks are small then single investors can offer lower cost sources of finance. Huang and Xu therefore predict that single-investor financing will be observed during catch-up stages of development when R&D primarily takes the form of imitation but that multi-investor finance will dominate in economies at advanced stages of development which are undertaking higher risk R&D.

Concentration of ownership and of voting rights also affects the balance between preserving and transferring control rights. Large blockholders can preserve their control over firms, while markets in control are possible when ownership is dispersed. Incentives for owners to monitor and control are greater where ownership is concentrated and concentrated owners can display a greater degree of commitment to other stakeholders than dispersed shareholders. Unlike dispersed shareholders, large blockholders cannot anonymously withdraw from past commitments (see Franks and Mayer (1998)). Activities that require a high level of irreversible investment by other stakeholders, in, for example, human skill formation and knowledge about customer markets, therefore benefit from having large committed rather than dispersed anonymous shareholders.

Rajan and Zingales argue in this volume that the “new corporations” which rely heavily on high level human capital skills require different governance and control structures from traditional corporations that primarily employ physical assets. For example, restrictions on control by outside shareholders may be required to encourage investments by managers that shareholders would reject in favour of other options. But they also provide other examples in which the holders of human capital in the firm are so powerful that ownership by outsiders with no specific investments in the company is required for efficiency.

Flexibility in the implementation of new technologies without commitments to those associated with past production processes can be more easily implemented by dispersed anonymous shareholders than identifiable large shareholders. Stock markets will therefore be well suited to activities for which changes in control are warranted because, for instance, the qualities required for good management of established activities are quite different from those of an entrepreneurial company. The scientific knowledge required to start up a high tech firm may, for example, be quite different from the management skill needed to run the same firm at a later date.

The arguments presented in this section suggest that there will be an association between financial systems, corporate systems and corporate activities (table 1). Where active involvement and high levels of commitment of owners in corporate governance are required then private benefits of control can be preserved through concentrated ownership or single bank systems. Where activities benefit from the diverse assessments of many investors, the imposition of hard budget constraints and flexibility in changing control then market finance, a fragmented multi-bank system and dispersed ownership will be observed. The former is particularly associated with long-term investments in relatively low risk, well-established activities and with R&D focused on incremental innovation. It is therefore best suited to more traditional manufacturing activities. The latter is better suited to shorter-term investments and to high-risk activities where R&D is directed towards more radical innovation.

Table 1: The Association of Different Financial and Corporate Systems with Corporate Activities

Financial and Corporate Systems	Benefit Activities that Require
Market systems	Diverse assessments and hard budget constraints
Banking systems	Monitoring by single party
Dispersed ownership	Hard budget constraints, flexibility in control
Concentrated ownership	Active governance and commitment

Legal systems reinforce these effects. Those with the greatest degree of investor protection promote activities that are funded and controlled through the market; those with lesser investor protection encourage activities that require active corporate governance and bank finance.

5 Financial systems, corporate systems and types of economic activity: empirical evidence

Carlin and Mayer (1999) perform the first empirical analysis of the relation between the composition of economic activity and financial, corporate and legal systems. To pursue the hypothesis that different systems might favour industries with different kinds of characteristics, they examine the inter-relation between types of systems, the nature of different industries and the levels of activity in those industries in different countries.

Building on the theories described in section four, Carlin and Mayer evaluate whether there is a relationship between the growth rates of industries in different countries and the interaction between country structures (e.g. the degree of market and bank orientation of their financial systems) and industry characteristics (the dependence of industries on external equity or bank debt sources of finance and inputs of skilled labour). For example, it was suggested above that firms that are dependent on high levels of skilled labour would benefit from the commitment provided by concentrated ownership. In a cross-country context, Carlin and Mayer therefore ask whether industries identified as skill-intensive flourish in countries where ownership structures are concentrated, relative to the same industries in countries with dispersed ownership structures and relative to other industries that do not depend on high level skills.

Specifically they define:

Y = $k \times i$ matrix of i industrial growth rates in k countries

X = $s \times k$ matrix of s country structural features in k countries

Z = $c \times i$ matrix of c industry characteristics in i industries

They estimate \mathbf{B} , the sxc matrix, which relates country structural characteristics and industry financing variables to industry growth rates in particular countries in the equation

$$\mathbf{Y} = \mathbf{X}'\mathbf{B}\mathbf{Z} + \boldsymbol{\varepsilon}$$

where $\boldsymbol{\varepsilon}$ is the error term in the regression. The basic sample comprises 14 OECD countries and 27 3-digit industries over the period from 1970 to 1995.

The structure of different countries' financial systems (matrix \mathbf{X}) is measured by the size of their stock markets, accounting standards, the ratio of bank credit to GDP and the degree of bank ownership of corporate equity. The structure of corporate systems is captured by the degree of concentration of ownership and by the extent of pyramid ownership. The characteristics of legal systems are measured in two ways: first, by indicators of legal protection of investors or creditors and second, by the common or civil law origin of the legal system as indicated by its source in English, German, Scandinavian or French law.

There are positive correlations between the market capitalization/GDP ratio and a measure of accounting standards (0.29), between bank-firm ties (as measured by bank ownership of non-financial firms) and the ratio of credit to GDP (0.68), and between ownership concentration and a measure of the presence of pyramidal ownership structures (0.52). By contrast, there are negative correlations between accounting standards and the credit/GDP ratio (-0.46) and between accounting standards and ownership concentration (-0.20). There is a very low correlation between ownership concentration and the size of the banking sector (-0.04). These correlations are broadly consistent with the view that some clusters of institutional characteristics are found together in some countries and other clusters in other countries.

The characteristics of industries (matrix \mathbf{Z}) are captured by the amount of external equity and bank finance and investment in skills in different industries. In line with the ideas discussed in section four, industries may differ in their underlying characteristics such as the uncertainty associated with R&D or the tendency for investment projects to be short or long-lived or their reliance on human capital. Carlin and Mayer use as proxies for the different characteristics of industries the role of equity finance and bank loans as sources of investment finance and the use of skills (measured by the proportion of employees with off and on-the-job training) where these characteristics are measured in countries where institutional structures are thought to be most conducive to their elastic supply. In principle, one wants to establish the extent to which industries that face no institutional constraints use external sources of finance and invest in skills. In practice, one cannot observe these. Instead, Carlin and Mayer measure these variables in those countries in which institutional constraints are likely to be least binding: firms are thought to have easiest access to market sources of external finance in the US, to bank loans in Japan and to skilled labour in Germany. The scale of external finance and skills in different industries is therefore measured in these three countries. For the 27 industries, the correlation between equity dependent and bank-financed industries is 0.07, between equity dependent and skill-intensive industries is 0.17 and between bank-financed and skill-intensive industries is -0.46 .

By creating interactive variables between the country structures and industry characteristics, the paper examines whether there is any inter-relation between these variables and performance, as measured by the growth rates of industries in different countries over the period 1970 to 1995. Growth rates in 27 industries in 14 OECD countries are regressed on the product of interactive variables between country structures and industry characteristics. The initial shares of industries in different countries are included in the growth regressions to account for catch-up and regression to the mean effects. Controls are provided for other variables by taking the difference of all of the variables from their respective means across the entire samples.

The paper reports strong evidence of a relation between industry growth rates in different countries and the interaction of country structures with industry characteristics. There is a particularly strong interactive effect of the country variables accounting standards and concentration of ownership with two industry characteristics - equity finance and skills. This means that industries that are dependent on equity finance and are skill-intensive grow particularly rapidly in countries with a large number of accounting standards and high levels of concentration of ownership. Information disclosure and ownership concentrations are associated with high growth rates of industries that are dependent on market finance and skill intensive labour forces. These results are consistent with the thesis that market based financial systems are suited to activities in which there is a need for forms of finance that involve diverse assessments by a large number of participants. It is also consistent with concentrations of ownership benefiting activities that require investments to be made by other stakeholders, in this case employees.

The paper then performs similar analyses of the determinants of fixed investment shares and R&D shares (as a proportion of value added) in the 27 different industries (15 for R&D) and 14 OECD countries. The interactions between country structure and industry characteristic variables account for a far higher proportion of the variation in R&D than in fixed investment across industries and countries. The influence of country structures on industry growth rates therefore appears to come via R&D rather than FCF expenditures. This is further reflected in a similar relation of accounting standards to R&D as was reported above for growth. As in the growth equation, industries with high levels of external equity finance and that use skilled - labour intensively have high R&D shares in countries with a large number of accounting standards. The relation with skills is particularly pronounced when the skills measure is restricted to the proportion of the workforce with the highest levels of qualifications. This suggests that information disclosure assists in the financing of the advanced skill training that is required in R&D. Unlike growth, there is no relation of concentration of ownership to R&D suggesting that concentrations of ownership provide the commitment that is required to encourage investment by the labour force and firms in basic but not the more mobile advanced skills training.

Consistent with the theories of Dewatripont and Maskin (1995), and Huang and Xu (1998a), market systems that impose tight budget constraints are associated with higher growth in industries that are dependent on market sources of finance and investments in skills training. One interpretation of the finding that R&D levels are high relative to industry and country means in countries with high accounting standards in equity dependent and skill intensive industries is the superiority of hard budget constraints for promoting R&D when there is high technological uncertainty, as suggested by Huang and Xu. It is plausible that equity dependent and high-skill intensive industries are those in which technological development is characterized by high uncertainty. Concentrations of ownership are associated with growth in industries requiring investments in less advanced skills training.

The paper repeats the analysis of the relation of growth to interactive country and industry variables on a set of four countries that were at an earlier stage of development as measured by GDP per capita in 1970 than the 14 used in the above analysis. It records that the influence of concentration of ownership and banking structures is quite different from that found in developed countries. High levels of concentration of ownership are associated with *lower* rates of growth of industries that are dependent on external equity finance and skills in low GDP countries. Consistent with Huang and Xu (1998a), the potential soft budget constraints associated with high concentrations of owners therefore act to the disadvantage of these industries in countries in their early stages of development. In addition, consistent with Gerschenkron's (1962) and Huang and Xu's (1998b) theses on the role of banks in initial stages of development, there is evidence of higher rates of growth of bank dependent industries in the bank oriented developing but not developed countries.

Finally, the paper examines the influence of legal structures on industry growth rates and investment. A positive influence of investor protection is found in both the growth and R&D regressions. In the case of growth, it is associated with skill-intensive industries and in the case of R&D with equity financed industries. This supports the view that investor

protection reinforces the effects of financial and corporate structures by promoting growth in external financed and skill-intensive industries through R&D expenditures. There is also some evidence that creditor protection promotes capital expenditure in skill intensive industries.

Consistent with the theories of section four, support has therefore been found for an influence of the structure of financial, corporate and legal systems on the composition of industrial activity. Market oriented financial systems are associated with high growth of external equity financed and skill intensive industries. The effect comes through investment in R&D rather than fixed capital expenditures. High concentrations of ownership are also associated with high growth of these industries in developed countries but low growth of these industries in developing countries. Furthermore, their influence does not come via R&D even in developed countries. This suggests that, as predicted by Huang and Xu (1998a), concentrations of ownership are associated with the growth of relatively low risk activities.

6 Conclusions

This article has provided an overview of the emerging literature on the influence of financial, corporate and legal systems on economic performance in different countries. There has been considerable discussion over a long period of time of the influence of financial systems on economic performance. Nevertheless, as noted in the section two, international comparisons of financial and corporate systems in developed countries fail to reveal clear effects of financial or corporate structures on economic performance. On the basis of this, one might conclude, as Allen and Gale do in this volume, that no financial or governance system performs particularly well in controlling agency problems and that solutions have to be sought elsewhere, in, for example, product market competition.³

³ In a recent test of the impact of product market competition, financial pressure (measured by a firm's burden of interest payments) and concentrated ownership at firm level on TFP growth for a sample of

But the studies reported in the third section paint a rather different picture. There, empirical analyses pointed consistently to an important role for financial development in economic performance. There is a clear relation between economic growth across countries and the development of both banking systems and securities markets.

In the fourth section, we described the emerging theoretical literature on the relation between financial and corporate systems and types of economic activity. Market oriented financial systems and those with dispersed ownership are expected to be associated with high risk R&D type activities where the imposition of tight budget constraints are important. Bank oriented systems and those with concentrated ownership should be associated with longer-term investment of a more imitative nature, where commitments to other stakeholders are required.

Section five reported the first empirical evidence in support of these theoretical propositions. There is clear evidence of an association between different financial and corporate systems and *types* of economic activity. Market oriented systems are associated with high growth of external equity dependent and high skill industries and this effect is associated with R&D effort. High concentrations of ownership are also associated with high growth of these industries in developed but not developing countries and the effect is not associated with R&D.

While empirical analyses of the relation between financial and corporate systems and types of economic activity are at a preliminary stage, if they are supported by further evidence then they have important policy implications. In particular, they imply that there is not necessarily a dominant financial and corporate system that is appropriate to all economies or all industries within an economy. What is right for a developed economy may be quite inappropriate for a developing one. What is suited to an innovative R&D intensive economy may be ill-suited to a more imitative one. There may be important

British firms, Nickell et al. (1997) found that all three variables were individually significant with the expected positive sign and that the interaction of competition with ownership concentration was also

trade-offs in matching systems with the industrial bases of countries and their stages of economic development and regulatory and legal policies towards financial and corporate systems need to be sensitive to these potential impacts on corporate activities.

significant indicating that ownership concentration and competition were substitutes.

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