Finance and Growth: Some Theoretical Considerations and a Review of the Empirical Literature

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ABSTRACT/RÉSUMÉ

This paper aims at providing an overview of the theoretical considerations and a review of the empirical literature on the relationship between finance and growth. Section I describes the role of financial development in economic growth at the macro level, both theoretically and empirically. Section II examines the role of corporate finance in firm-level performance, especially focusing on the role of "internal funds" and "internal capital markets". Section III presents a comparative analysis of financial systems, and analyses both the Asian crisis and the US venture capital phenomenon from this perspective. Section IV presents some policy implications and conclusions.

JEL classification: E22, E44, G10, G21, G24, G30
Keywords: financial development, growth, financial constraint, financial system, Asian crisis, venture capital

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L'objectif de ce document est de présenter une vue génerale des considérations théoriques et d'étudier les effets de la littérature empirique sur la relation entre finance et croissance. La section I décrit le rôle du développement financier dans une économie de croissance à un niveau macroéconomique, à la fois théoriquement et empiriquement. La section II examine le rôle des sociétés financières au niveau des performances de l'entreprise en mettant particulièrement l'accent sur le rôle des "marges brutes d'autofinancement" et des "marchés de capitaux internes". La section III présente une analyse comparative des systèmes financiers et des analyses concernant à la fois la crise asiatique et le phénomène américain de de capital-risque selon cette perspective. La section IV traite de certaines implications politiques et des conclusions.

Classification JEL : E22, E44, G10, G21, G24, G30
Mots-Clés : développement financier, croissance, contraintes financières, système financier, crise asiatique, capital-risque

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I. MACROECONOMIC ASPECTS: FINANCIAL DEVELOPMENT AND ECONOMIC GROWTH

I.1 Introduction

1.   The issue addressed in this paper is whether or not the type of financial system or the level of financial development affect long-run growth. There has been a considerable debate on this issue dating far back into the 19th century at least. Walter Bagehot (1873) and Joseph A. Shumpeter (1912) stressed the importance of the banking system on the level and growth rate of national income, via the identification and funding of productive investment, whereas Joan Robinson (1952) asserted that economic growth creates a demand for financial services ("where enterprise leads, finance follows"). This view implies that financial development is just a "side-show" of economic development. The relationship between finance and growth has also taken on a new importance. Recent turbulent economic developments in dynamic Asian countries and Japan and continuing strong steady growth in the US economy have renewed interest in the importance of financial systems and their impact at the macro and firm-level on performance and productivity.

2.   The analysis of this issue has been accompanied by several important developments over the past decade. First of all, "new growth theories" and related empirical studies using a large cross-country data set have established more rigorous and systematic foundations for this relationship. Second, recent development in the economics of information and contract theory has led to more detailed analysis of the functions of banks, stock markets and other corporate financing, and thus improved our knowledge at microeconomic and institutional levels. Third, recent research on the relationship between law and finance in an international perspective (La-Porta *et al*., 1997, 1998) has provided another important approach in the analysis of the relationship between finance and growth.

3.   This paper aims at providing an overview of theoretical considerations and a review of the empirical literature on the relationship between finance and growth. Section I describes the role of financial

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development in economic growth at the macro level, both theoretically and empirically. Section II examines the role of corporate finance in firm-level performance, especially, focusing on the role of "internal funds" and "internal capital markets". Section III presents a comparative analysis of financial systems, and analyses both the Asian crisis and the US venture capital phenomenon from this perspective. An annex considers the relationship between legal quality, financial systems and economic development, especially for OECD countries and some selected Asian countries. Section IV presents some policy implications and conclusions.

I.1.1 Early work

4. The relationship between financial development (especially financial intermediation) and economic growth was extensively analysed more than two decades ago by Goldsmith (1969), McKinnon (1973), Shaw (1973) and others. They found strong and positive correlations between the degree of financial market development and the rate of economic growth.

5. However, their research had some fundamental weaknesses. First, they failed to develop a theoretical foundation for such a relation. Some earlier work had stressed the link between financial development and the *level* of productivity, but not the *rate* of growth. Second, their empirical research could not establish that the direction of causality went from financial development to growth. The relationship could be coincidental, because other contemporaneous shocks affect both variables. Or, the causality could be reversed since high growth may lead to the emergence of more developed financial intermediaries and markets. Recent research in this area has taken steps to overcome these weaknesses.

I.1.2 Theoretical considerations

6. Postulating a link between financial development and economic growth entails relaxing some neo-classical assumptions. First, in an Arrow-Debreu model with no information or transaction costs, there is no need for a financial system. Hence, it is the costs of getting information and making transactions that create incentives for the emergence of financial markets and institutions. Second, in a neo-classical growth model, only the exogenous technology factor affects the steady-state per capita growth rate. Hence, in this theoretical framework, the level or type of financial development could affect the long-term growth rate only via a very limited route if it directly affected the *rate* of technological progress.[2]

I.1.3 Basic endogenous model

7. A recent surge of interest in the link between financial development and economic growth has resulted mainly from the development of endogenous growth models, which raise the possibility of an influence of institutional arrangements on growth rates. These models could thus offer important insights to the impact of financial development on economic growth.

8. First, consider the simplest type of endogenous growth model "AK", in order to understand the several routes via which financial development affects economic growth (Pagano, 1993*a*).

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2. Even in this framework, an increased efficiency of the financial system could result in a higher effective investment rate for a given savings rate. This would lead to faster growth for a while until the economy converged back on to the underlying growth path, but at a higher level. Thus, financial development can increase the level of income in more wide-ranging growth models. The Annex examines a relationship between financial development and the level of income for OECD and selected Asian countries.

If it is assumed that a certain portion (φ) of saving is used for investment, the steady-state growth rate can be expressed by the following equation:

$$g = A \phi s - \delta$$

g: the steady-state growth rate
A: Productivity of capital
s: Saving rate
δ: depreciation rate

Thus, financial development could influence the economic growth rate by changing either the productivity of capital (A), or the efficiency of financial systems (φ), or the saving rate (s).

I.2   Finance and growth: the channels

I.2.1   *More efficient allocation of capital*

9.   A financial system is efficient when it allocates funds to those projects with the highest marginal product of capital. In the above framework, by allocating capital more efficiently, a financial system could improve the productivity of capital (A), and hence economic growth.

10.   However, this process is costly. First, in order to find the most profitable project, financial systems need to monitor or screen alternative projects. Even if high-return projects are detected, their possible high risks might discourage individuals from investing in these projects. Thus, financial systems must play a role of risk-sharing and induce individual investors to invest in riskier but higher-return projects.

11.   The role of information acquisition and risk-sharing by financial intermediaries was explored by Greenwood and Jovanovic (1990). In their model, there are two production technologies, a safe and low-return one and a risky and high return one. A risky technology has two disturbances: an aggregate and a project-specific shock. Financial intermediaries can eliminate project-specific shocks completely by managing their portfolios and can detect the existence of an aggregate shock by noting simultaneous disturbances involving more than one project. Hence financial intermediaries can allocate resources to the place where they earn the highest return, while individuals without financial intermediaries cannot select the appropriate technology for the realisation of a shock.

12.   Another important role of financial intermediaries is to provide liquidity to individual investors (Diamond and Dybvig, 1983). Unless financial intermediaries (or financial markets) exist, households can invest only in illiquid assets (for production). However, their precautions against an idiosyncratic liquidity shock might discourage them from investing in higher-yield, but more illiquid assets. Financial intermediaries can reduce such inefficiency by pooling the liquidity risks of depositors and invest funds in more illiquid and more profitable projects. Bencivenga and Smith (1991) showed that financial intermediaries, by allocating funds to more illiquid and productive assets and reducing the premature liquidation of profitable investments, could enhance the productivity of capital, and thus the growth rate.

13.   The role of pooling rate-of-return and liquidity risks could also be played by security markets, especially stock markets. Individual investors can sell shares in the stock market when they face liquidity problems and diversify their rate-of-return risks by devising appropriate portfolios. Thus, the introduction of a stock market with two insurance functions could enhance the productivity of capital in the same way that financial intermediaries can (Levine, 1991). Portfolio diversification via stock markets might have an

additional growth-enhancing effect, by encouraging specialisation of production by firms, as stressed in Saint-Paul (1992), since such diversification could reduce risks resulting from sectoral shocks and enable firms to specialise further.[3] If we assume production externalities (Romer, 1986), more specialisation improves capital productivity and hence the long-term economic growth rate.

I.2.2 *More efficient transformation of saving into investment*

14.   Financial intermediaries or securities markets channel household saving to investment but absorb some fraction of resources (1-ϕ) since their activities are costly in the presence of information and transaction costs. These costs absorbed by financial systems include the spreads between deposit and lending rates, commissions and transaction fees. Indeed, they are indispensable for these systems to function properly, but may be set at inefficiently high levels due to monopoly power, regulations or other reasons. If the quasi-rents extracted by financial systems are spent on private consumption or inefficient investment, the loss of resources depresses the growth rate.

15.   One good example is "financial repression", typically seen in many developing countries. In these countries, governments "repress" the financial sector, from which they collect seigniorage via inflation taxes, and spend them on public consumption. If governments allow for more financial development, (which can be understood as a reduction in the transaction costs of converting illiquid to liquid assets), the need for people to carry money, and thus the base of inflation taxes is reduced and this should have positive effect on economic growth (Roubini and Sala-i-Martin, 1995).

16.   Another example is an information based model of a monopolistically competitive banking industry, proposed by Harrison, Sussman and Zeira (1999), which focuses on the feed-back relationship among banking specialisation, the cost of monitoring and growth. In their model, economic growth increases banks' activity and profits, and promotes entry of more banks. This entry shortens the average distance between banks and borrowers, facilitates regional specialisation and thus lowers the cost of financial intermediation ("the specialisation effect"). This in turn boosts investment and economic growth.[4]

I.2.3 *The effect on the saving rate*

17.   There are at least four routes via which financial development could affect saving rates, involving 1) idiosyncratic risks; 2) rate-of-return risks; 3) interest rates and 4) liquidity constraints. First, a reduction in idiosyncratic risks (*e.g.* endowment and liquidity risks) by insurance and finance markets might lower the level of precautionary saving by households, and hence the growth rate (Leland, 1968; Sandmo, 1970; Kimball, 1990 and Caballero, 1990). Devereux and Smith (1994) consider the implication of global risk-sharing on economic growth. In their model, if country-specific endowment risks are shared via international capital market, saving rates and economic growth would be lower than otherwise[5]. Second, however, a cut in rate-of-return risks by portfolio diversification has ambiguous effects on saving (Levhari and Srinivasan, 1969). In their model with constant relative risk-aversion utility (CRRA), if the risk aversion coefficient is greater than one, saving responds negatively and positively otherwise. Devereux and

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3.   Saint-Paul (1992) assumes that there are two regions, each of which has firms and consumers which own their shares. In his model, portfolio diversification means that consumers in one region can have shares in firms in the other region.

4.   However, economic growth can increase the cost of monitoring by raising wages, since monitoring is a labour-intensive activity ("the wage effect"). Using cross-state US banking data, they show that the wage effect is dominated by the specialisation effect.

5.   They assume constant relative risk-aversion utility (CRRA).

Smith (1994) also shows that diversifying rate-of-return risks will reduce saving and growth rate if relative risk aversion exceeds one. Thus, a reduction in two kinds of risk by financial development can have different effects on savings rates.

18.   Third, financial development, for example, by reducing "financial repression" might increase the interest rates paid to households, but its effect on saving is theoretically ambiguous due to its well-known income and substitution effects. Fourth, Jappelli and Pagano (1994) shows that easing liquidity constraints on households by liberalising consumer credit and mortgage markets may lower the saving rate, since younger generations in their overlapping generation model would dissave much more in the absence of liquidity constraints. Thus, the overall effect on saving rate is still ambiguous and financial development could reduce growth rates via the effect on the saving rate.

I.2.4   Conclusion

19.   To sum up, in an endogenous growth framework, financial development can promote economic growth via its positive impact on capital productivity or the efficiency of financial systems in converting financial resources into real investment. However, its effect on the saving rate is ambiguous and could affect the growth rate negatively. In net terms, the impact on welfare is likely to be positive, since increased efficiency of investment in the long term can offset any reduction in the propensity to save.

I.3   Empirical studies

20.   The earlier work had some weaknesses and recent research has addressed them:

- The size of financial intermediaries or financial markets may not be an appropriate indicator to measure the degree of financial development or the functioning of financial markets. Goldsmith (1969) used the value of financial intermediary assets divided by GNP.

- The empirical link between the indicators of financial development and economic growth might be coincidental. It is uncertain that this relationship will still hold when other important variables for growth are controlled for.

- The close statistical relationship between financial development and growth may not necessarily imply causality from financial development to economic growth. Financial development may well be led by economic growth. In addition, this relationship might be driven by common omitted variables mentioned above and thus, the observed positive association may not imply a causal link.

- The earlier work did not examine whether the growth-enhancing effects of financial development come from an increase in productivity growth [the efficiency of investment (A)]or an increase in the rate of investment affected by the saving rate (s) and the proportion of saving invested (ϕ).

I.3.1   A resurgence of empirical research - King and Levine

21.   The first attempt toward comprehensive empirical research to solve these problems was initiated by by King and Levine (1993). They introduced four measures for the development level of financial

intermediaries, which may measure the functioning of the financial system more precisely,averaged over the period 1960-1989.

- DEPTH : the liquid liabilities of the financial system [(currency plus demand and interest-bearing liabilities of banks and nonbanks)/GDP];

- BANK : the importance of the role of banks (relative to the central bank) for allocating credit, (bank credit / (bank credit + central bank domestic assets);

- PRIVATE : the ratio of credit allocation to private business to total domestic credit (excluding credit to banks);

- PRIVY : the ratio of credit to private business to GDP.

They also employed three growth indicators averaged over the same period:

- real per capita GDP growth (economic growth);

- real per capita capital growth (capital accumulation);

- TFP growth (productivity growth).

22.   They ran 12 regressions on a cross-section of 77 countries, controlling for other variables associated with economic growth (*e.g.* income per capita, education, political stability, indicators of exchange rates, trade, fiscal and monetary policy). They found statistically and economically significant coefficients of financial development in all 12 regressions and confirmed a very strong relationship between each of the four financial development indicators and each of the three growth variables.

23.   For example[6], the coefficient of DEPTH on real per capita GDP is 0.024. Thus, if a country increased DEPTH from the average of the slowest growing quartile of countries (0.2) to that of the fastest growth quartile of countries (0.6), its real GDP growth per capita would have increased by about 1 per cent per year (0.024 x (0.6 - 0.2) = 0.0096). The average growth difference between two groups was about 5 per cent per year over the thirty years and the rise in DEPTH could shorten 20 per cent of this growth difference. Therefore, financial development can have a large impact on growth rate.

24.   In order to investigate whether growth results from financial development, they also considered how well the degree of financial depth in 1960 is correlated with the three growth indicators averaged over 1960 -1989. Their regressions suggested that the initial level of financial development could predict well the subsequent rates of economic growth, capital accumulation and productivity growth, even after controlling for important core factors of economic growth.

I.3.2   *Other empirical work*

25.   The work by King and Levine was a first important step in the direction of eliminating some of the weaknesses in previous work. For a sample of a larger number of countries, they 1) construct more functioning-related indicators of the level of financial development and 2) systematically control other variables affecting long-run growth. They also 3) investigate the causality issue, by asking whether the development can predict long-run growth, and 4) examine the effect on economic growth via capital

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6.   The following calculation is taken from Levine (1997).

accumulation and productivity growth channels. However, there still remain some drawbacks in their analysis. First, their work was indecisive on the relative importance of productivity growth and the rate of investment. In addition, they did not examine differences in the roles of the various financial markets (*e.g.* the stock market, the bond market, the insurance market and the consumer credit market). Subsequent empirical work has gone some way in addressing these criticisms:

– Jappelli and Pagano (1994), focusing on household credit markets, found that their development (represented, for example, by the ratio of consumer credit to GDP) was negatively correlated with saving and growth rates and that some types of financial development could affect growth rates negatively, as predicted by theoretical models.

– Levine and Zervos (1998) also made some progress in this direction. They studied empirical links between various measures of stock market development and banking development and economic growth, for a cross-section of 49 countries over the period 1976-1993. They presented the following six indicators associated with financial development in the initial year (1976):

– Capitalisation: the value of domestic listed shares/GDP, measuring stock market size.

– Turnover: the value of trades of domestic shares/ the value of listed domestic shares, measuring stock market liquidity.

– Value traded: the value of trades of domestic shares/GDP, also measuring stock market liquidity.

– Volatility: the volatility of stock returns, as a 12 months rolling standard deviation.

– Bank credit : PRVY measuring banking development.

– APT integration: the degree of international capital market integration based on international arbitrage pricing theory (APT).

– CAPM integration: the degree of international capital market integration based on the international capital asset pricing model (CAPM).

26.   Even after controlling for many factors related to long-run economic growth, both measures of stock market liquidity and banking development were positively and robustly correlated with future rates of economic growth, capital accumulation and productivity growth. In turn, they found no evidence that stock market size, international integration, and stock return volatility were robustly linked with growth indicators. Moreover, none of the six financial indicators were closely correlated with private saving rates.

I.3.3   *Causality problems*

27.   Another weakness of King and Levine (1993) is that their causality test was in fact inconclusive. For example, Rajan and Zingales (1998*a*) stressed that the initial level of financial development may be a leading indicator rather than a causal factor, if financial markets step up their lending in anticipation of faster economic growth. One way to solve causality problems is to find an indicator that is unlikely to be affected by economic growth but measures some aspect of financial development. Roubini and Sala-I-

Martin (1995) found that growth was negatively correlated with the bank reserve ratio as a proxy for financial repression, that was not likely to be affected by economic growth.[7]

28.   More recent work on this area has focused on the causality issue. To mitigate the problem, Rajan and Zingales (1998*a*) took a different approach, focusing on a more disaggregated relationship between finance and growth. They stressed that financial development reduces the costs of external finance to firms and promotes their growth. Assume that different industries have their own efficient demand for external finance (investment minus internal cash flow) and that the distribution of the need for external finance by industry are very comparable across countries. In this setting, an industry with more demand for external finance should grow faster in countries with more developed financial markets. They used the US as a benchmark country with relatively frictionless financial markets, and found that industries more dependent on external finance grow faster in countries with more developed banks (as measured by PRIVY) or stock markets (stock market capitalisation).

29.   Jayaratne and Strahan (1996) examined a specific episode, the impact of relaxed bank branch regulation in the United States on regional growth in individual states, and found a positive effect on real per capita growth rates via improvements in the *quality*[8] of bank lending. They stressed that states did not deregulate their banks in order to accommodate future growth opportunities, since they found only weak evidence that bank lending increased after banking branch reform, and no evidence that the rate of investment increased following reform, implying a more convincing causality from financial development to growth.

I.3.4   *The role of legal aspects determining financial development*

30.   To examine the issue of causality, the use of instrumental variables can be used for controlling the simultaneous bias that may arise from the joint determinant of financial development and growth sources. It is important to find relevant instrumental variables for financial development, which can extract the exogenous component of financial development. Levine (1998, 1999) and Beck, Levine and Loayza (1999) focused on the work by LaPorta *et al.* (1998) (henceforth, LLSV), which presents comprehensive and systematic research on legal aspects of corporate finance for 49 countries and their links with legal origins. By using information derived from LLSV and others, Levine (1998, 1999) constructed the following legal determinants of financial development:

1. Creditor rights:

    –   CREDITOR = SECURED1 - AUTOSTAY - MANAGERS, ranging from -2 (low) to 1(high).

    –   SECURED1 = -1, if secured creditors are ranked first in the distribution of the proceeds that result from the disposition of the assets of a bankrupt firm.

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7.   Haslag and Koo (1999), using cross-country data for 119 countries for the period of 1980-89, show that the reserve ratio is systematically related to growth, but this relationship is dependent on the choice of growth measures (the relationship is not "robust"). On the other hand, reserve requirements are strongly and robustly related to several indicators of the development of financial intermediaries. They conclude that financial repression is empirically linked with growth at least in part through the level of financial development.

8.   They include three measures of loan quality: ratio of non-performing loans to total loans, net charge-offs (gross charge-offs minus recoveries), and ratio of loans to insiders to total loans.

- AUTOSTAY: = 1, if a country's laws impose an automatic stay on the assets of the firm upon a reorganisation petition, and = 0, otherwise.

- MANAGERS: = 1, if the firm continues to manage its property pending the resolution of the reorganisation process, and = 0, otherwise.

2. Enforcement:

- RULELAW: an assessment of the law-and-order tradition of the country, ranging from 1 (weak) to 10 (strong).

- CONRISK: an assessment of the risk that a government will modify a contract after it has been signed, ranging from 1(high) to 10 (low).

3. Accounting standards:

- ACCOUNT: an index of comprehensiveness of company reports, ranging from 0 (minimum) to 90 (maximum).

31.   Levine (1999) examined the relationship between these legal determinants and the indicators of financial development presented in King and Levine (1993). All these variables were significantly correlated with the indicators of financial development, having expected signs, despite a difference in their significance levels. Thus, countries with legal and regulatory systems assuring a high protection of creditors tend to have more-developed financial intermediaries.

32.   Then, they selected different instrumental variables for the different financial intermediary indicator based on the degree of their correlation (all included CREDITOR and CONRISK). Generalized Method of Moments (GMM) methods revealed a strong link between the exogenous component of financial development and economic growth (real per capita GDP growth), after controlling for other important growth sources. (The coefficient on financial intermediary development is significant at the 5 per cent level in seven out of eight regressions.) In addition, the legal and regulatory factors affect growth only through their effect on financial development, since the data do not reject the hypothesis that the instrumental variables for financial developments (*e.g.* various combinations of the legal and regulatory determinants of financial development) are uncorrelated with the error term of the equation in King and Levine (1993). These results are robust to changes in 1) the instrumental variables; 2) growth sources to control for; 3) the measures of financial intermediary development and 4) the sample periods.

33.   Levine (1998)[9], focused on the variable of bank development (BANK) and examined its effect on capital accumulation growth and productivity growth as well as economic growth, using the same methodology as Levine (1999). Another important difference with Levine (1999) was that he used legal origins as well as several legal determinants of financial development for the instrumental variables. In fact, a German dummy applied to German-tradition countries has a positive and significant correlation with banking development. The two sets of instruments gave similar results, producing a strong connection between banking development and the growth indicators.

34.   Beck, Levine and Loayza (1999) is another variant that used the same econometric method. They considered the effects of several financial intermediary development indicators on the growth indicators including some variations of productivity growth and private saving rates. They also found a significantly positive causal impact of financial development on real per capita growth and per capita productivity

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9.   Levine (1998) was written after Levine (1999), even though it was published earlier.

growth, but a more ambiguous effect on physical capital growth per capita, and saving. While there tends to be a positive link between banking development and both capital accumulation growth and private saving rates, these results are not robust: they are sensitive to changes in estimation methods and measures of banking development.

35.   Demirguc-Kunt and Maksimovic (1998) provided a micro-level support for the proposition that financial and legal development facilitate economic growth, using firm-level data from 30 developing and developed countries. They estimated a predicted growth rate if a firm depends on retained earning and short-term credit only, for each firm and each country. Then, they estimated the proportion of firms growing at rates exceeding the predicted rate in each country. This proportion should be associated with institutional difficulties for firms in obtaining long-term finance, and be linked with the level of financial development in each country. Indeed, in the cross-country regressions, the indicator of law enforcement, the stock market turnover and the size of banking have a significant negative correlation with the indicator of dependence on long-term finance. This result implies that firms in countries that have an easier access to external funds, (*e.g.* active stock markets and high confidence on legal compliance) and thus grow faster.

Conclusions

36.   Although in a pure neoclassical framework the financial system is irrelevant to economic growth, in practice an efficient financial system can simultaneously lower the cost of external borrowing, raise the returns to savers, and ensure that savings are allocated in priority to projects that promise the highest returns, all of which have the potential for affecting economic growth rates. And the empirical literature reviewed above shows that there does indeed appear to be a causal link between the level of financial development and the rate of accumulation of capital, or of multifactor productivity. Even though an efficient financial system can (and apparently does) reduce the level of household savings, by easing access to consumer credit, the welfare implications remain positive, unless there is a significant gap between private and social time discount rates.

37.   The empirical literature also supports the hypothesis that there is a relationship between the legal framework of a country, and the form of its financial system. Broadly speaking, countries with a common-law tradition that support stockholders' rights tend to have a more highly developed and varied financial system. Other countries, whose legal frameworks are based on the continental European tradition, tend to have more bank-based financial systems. The consequences of this for growth and financial stability are explored further in Part III and the Annex.

II. MICROECONOMIC ASPECTS: CORPORATE FINANCING PATTERNS AND THEIR IMPLICATION FOR FIRM-LEVEL PERFORMANCE

II.1 Type of corporate financing and investment

II.1.1 Introduction

38.   The previous section explored the relationship between the level of development of financial systems in individual countries, and their link with macroeconomic outturns for investment, growth and savings. The subject-matter of this section is the interaction between financial systems, and the performance of individual firms. Firm-level analysis is important because in an imperfectly competitive world comprising newly-created enterprises operating in new technological areas, as well as established firms operating in a predictable environment, the availability of external finance, and the terms on which it can be obtained, can potentially influence the dynamics of growth at the micro level.

39.   In a frictionless world in which the Modigliani-Miller theorem holds, the financing pattern does not matter for a firm's value or its investment decisions. However, in the presence of capital market imperfections resulting from information asymmetries and agency costs, internal finance is often less costly than external finance. Myers and Majluf (1984) stressed that equity raising is very costly since less informed market participants correctly anticipate that managers acting for existing shareholders are willing to issue new shares when they are overvalued. Similar problems can be found in debt finance. Managers maximising the welfare of shareholders (*e.g.* owner managers) have incentives to engage in excessively risky investment projects from the creditors'point of view, which make debt finance more costly by an increase in its premiums (Jensen and Meckling, 1976), which may further attract riskier firms (adverse selection) and thus introduce credit constraints (Stiglitz and Weiss, 1981).

40.   Thus, the availability of internal funds as well as firms' opportunities may be an important determinant for investment. The importance of internal funds for financing investment has been detected in financing patterns in major OECD member countries (Mayer, 1988). But, how important is internal funding as a determinant of capital investment in different groups of firms? Does this show the extent of capital market imperfection? These questions opened a door to a vast empirical literature investigating the relationship between financial constraints and firm-level investment.

II.1.2 Empirical studies: the first-generation research

41.   The seminal paper by Fazzari, Hubbard and Petersen (1988) (hereafter FHP) first examined the role of "financial constraints" and firm's investment behaviour by using firm-level panel data on 427 US manufacturing firms from 1970 to 1984. They group firms into three fixed categories by the level of dividend payout, which is assumed to be a proxy of the financial constraints: low, medium and high dividend payout firms. Then, they estimated investment functions with cash flow and Tobin's Q as explanatory variables in each group. They found significantly larger estimated coefficients of cash flow for the low-dividend-payout firms than the high-dividend-firms. As long as Q adequately controls for firm's

investment opportunities, a sensitivity of investment to cash flow could suggest a rejection of a perfect capital market and importance of the financial constraints.

42.   The correlation of investment with cash flow in "financially-constrained" firms had been confirmed by several studies with different cross-sectional criteria or with different countries' panel data. For example, Hoshi and Kashyap (1991) focused on the affiliation to Japanese industrial groups ("financial keiretsu"), which could, by establishing a close relationship with main banks, mitigate financial constraints and thus lower the responsiveness of investment to cash flow. Schaller (1993) used age and concentration of ownership as a criteria for the Canadian panel data (see Table 1).

II.1.3   *Weaknesses of the first-generation research and subsequent improvements*

43.   Subsequent research has addressed several problems involved in this empirical method. There are (at least) two important issues. First of all, average Q might be a very poor proxy for controlling for underlying investment opportunities. Theoretically, marginal q, the present value of expected future marginal returns to capital, is a sufficient indicator for representing investment opportunities. If one cannot control for investment opportunities correctly, the responsiveness of investment to cash flow could be due to content of information for firm's profitability. (Another problem is that Tobin's Q, by indicating the firm's financial health, can affect investment by mitigating financial constraints). Second, the classification of firms is *a priori*. These groupings might be imperfect proxies for the extent of financial constraints. In addition, the assumption that only a fixed group of firms are financially constrained during a certain period is analytically convenient but sometimes implausible, since firms can switch between different financial situations, responding to, for example, external shocks.

II.1.3.1   *Controlling for investment opportunities*

44.   To deal with the problems of controlling for investment opportunities, at least three broad approaches have been adopted. One way to address this issue is to estimate the Euler equation, which is a first-order condition describing the firm's decision for its optimal capital stock. The advantage of the Euler equation is that it avoids using imperfect financial variables as proxies for marginal q. Based on US panel data on manufacturing firms, the frictionless investment model is easily rejected for firms with low-dividend-payouts prior to the estimation period. However, it cannot be rejected for firms with higher dividend payouts (Whited, 1992, Hubbard, Kashyap and Whited, 1995).[10]

45.   Another way to test the relationship is to observe an independent change in internal funds (cash flow), which is unrelated to the firm's investment opportunities.[11] One possible source of such an independent change arises from a variation in tax payments induced by policy changes. Calomiris and Hubbard (1995) use a tax experiment, the Surtax on Undistributed Profits during 1936-37. In perfect capital markets, it would be reasonable for firms to change their dividend payout policies when retained

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10.   The Euler equations tests, however, have several drawbacks. First, they do not estimate investment behaviour directly, and thus cannot be compared with other reduced form tests. Second, they are sensitive to specifications and tend to have poor small sample properties. Third, as pointed in the literature of consumption (*e.g.* Zeldes), the Euler equation imposes only the period-to-period restriction derived from the first order conditions and may fail to detect the presence of financing constraints if their tightness is approximately constant over time.

11.   Fazzari and Pertersen (1993) focus on the role of working capital, which can be drawn down to mitigate an adverse shock on cash flow and thus on investment. They find a negative response of investment to working capital for the US low dividend payout firms.

earnings are more heavily taxed than distributed profits. However, "financially constrained" firms with good profits opportunities might choose to pay the undistributed profits tax to keep sufficient retentions for their investment. In fact, 66 of the 273 publicly-traded manufacturing firms in their sample retained more than 40 per cent of their earnings and paid the highest marginal rates of surtax. And their investment was correlated to changes in cash flow after controlling for investment opportunities by Tobin's Q. On the other hand, no sensitivity could be detected for firms with higher dividend payout and lower surtax charges.

46.   More recently, there has been an attempt to construct more plausible proxies for the marginal value of capital. Following Abel and Blanchard (1986), Gilchrist and Himmelberg (1995) construct the expected value of marginal q conditional on observed fundamentals including cash flow ("Fundamental Q"), by estimating a set of VAR forecasting equations. Since cash flow is explicitly included in observed fundamentals, "Fundamental Q" should fully capture the information, if any, about future returns to capital contained in cash flow. Thus, any additional sensitivity of investment to cash flow in their regression models should result from capital market frictions. As predicted, they find no excess sensitivity of investment to cash flow for Commercial Papers (CPs) or bond rating firms, which have easy access to financial markets, but a large responsiveness of investment to cash flow for firms without a bond rating or CP rating. They also confirm that the use of Tobin's Q, compared with their "Fundamental Q", tends to overstate the excessive sensitivity of investment to cash flow, in particularly, for "unconstrained" firms.

47.   In a follow-up paper, Gilchrist and Himmelberg (1998), focus on another identification problem, that a proxy for marginal q can be a good measure of the firm's financial health and thus, affect investment in the presence of capital market imperfections. They introduce financial friction into their model and consider two variables to affect investment, "Fundamental Q" [the expected present value of future marginal productivity of capital (MPKs)] and "Financial Q" (the expected present value of a future financial state variable of the firm) by constructing from the VAR approach. They find that investment is significantly correlated to both measures for the average firm in their sample and detect no sensitiveness of investment to liquidity for bond rating firms but find the liquidity effects for unrated firms, small firms or low-dividend-payout firms.

48.   Cummins *et al.* (1999), by using earning forecasts from securities analysts, construct more direct measures of the fundamentals that represent future profitability.[12] Their surprising result is that internal funds are not correlated to investment spending even for selected firms, for example, those without bond rating or dividend payout, which have been found to be "financially constrained" in other studies.

II.1.3.2   The classification problems

49.   Moving to the issue of a priori grouping of firms,[13] Kaplan and Zingales (1997) question the relevance of the grouping by FHP (1988) and their results. They re-examine 49 firms that are grouped as low-dividend-payout firms from FHP and further divide those firm into five categories, by their own operational classification criteria, based on statements contained in annual reports of these firms. They assumed that a firm does not face "financing constraints" if it can invest more at a given point in time. By using this definition, they find that in 85 per cent of firm years of FHP's sample, the firms are not "financially constrained", since they could have increased their investment, financed by either unused line of credit or cash stocks. They also show that the less "financially constrained" group exhibits a

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12.   These measures ("real Q") are comparable to marginal q, but constructed by the firm's expected net income derived from the analysts' forecasts.

13.   In order to solve a dynamic misclassification problem, Hu and Schiantarelli (1998) developed a switching regression model of investment, in which the probability of a firm facing financing constraints is endogenously determined.

significantly greater investment-cash flow sensitivity than those firms classified as more "financially constrained".

50.   Kaplan and Zingales (1997) was refuted by the original authors (FHP, 1996). They point out a difficulty in distinguishing the extent of financing constraints in such a small sample. In addition, firms with high cash flow, which are grouped as "not financially constrained" in KZ might have incentives to maintain precautionary cash stocks against the possibility of financing constraints in future. A conclusion is that there is still no perfect operational definition of financing constraints and all of them are subject to misclassification problems.

II.1.3.3   Empirical studies on other OECD countries

51.   There are some studies investigating panel data of countries other than the United States. Table 1 presents a selection. Most of them used reduced form regressions with Tobin's Q, which has the defects mentioned above. In addition, it is difficult to compare results across different countries, since each has different data set and specification. Bond *et al*, (1997) construct firm panel data sets for manufacturing firms in Belgium, France, Germany and the United Kingdom for the period 1978-1989 and estimate a range of investment equations (accelerator, error correction and Euler equation specifications) including additional financial variables (cash flow and profits) by using GMM methods which control for biases due to both correlated effects and lagged dependent variables. Their main aim is to compare results for the same investment model across different countries. They find that financial variables play an important role in France, Germany and the United Kingdom. More robustly, cash flow and profits term are found to be both statistically and quantitatively more significant in the United Kingdom than in other European countries, implying that financial constraints may be more severe in the more market-oriented UK financial system.

II.1.3.4   Financial constraints and R&D investment

52.   A large proportion of the literature in this area has concentrated on analysing the effect of financial variables (cash flow) on fixed capital investment. Another type of investment, which is also affected by asymmetric information and capital market imperfection, is R&D investment. Himmelberg and Pertersen (1992), using panel data for 179 US small firms in high-tech industries, find economically large and statistically significant correlation between R&D investment and cash flow in several econometric specifications. Hall (1992) reports a statistically significant elasticity of profits to R&D investment for a sample of much larger firms (1247 US manufacturing firms from 1976 to 1987).

53.   In a more recent paper, Hall *et al*. (1998) construct more comparable panel data of firms in the high-tech sectors in the United States, Japan and France. Using a VAR methodology, they test for causal relationship between liquidity variables (sales and cash flow) and investment variables (capital investment and R&D), and find that both capital investment and R&D are more sensitive to cash flow and sales in the United States than in Japan and France. This result is quite comparable to that of Bond *et al*. (1997) and hints that financial constraints might be more severe in the United States or the United Kingdom, with a market-based financial system.

54.   The general conclusion that can be drawn from the literature received above is that the actual level of investment (in physical capital or R&D) undertaken by a firm is influenced, among many other things, by their cashflow. This implies that investment can be finance-constrained, to a greater or lesser extent. It is interesting and suggestive that financial constraints, when they bite, bite harder in economies characterised by market-oriented financial systems, such as the United States and the United Kingdom. This could imply either that the marginal cost of capital is excessive in market-oriented economies, or that

for some firms at least, their level of investment is excessive in less market-oriented economies. The next section explores this further.

II. The disciplinary role of financing patterns on firms

II.2.1 Introduction

55.   For financially constrained firms, internal funds are important to finance their investment and improve their performance. However, are they also important for much less financially constrained firms? The "free cash flow" theory, proposed by Jensen (1986) stresses that excessive internal funds tend to induce inefficient over-investment. This implies that internal cash flow is a double-edged weapon for a firm.

56.   When firms have more internally generated funds than positive net present value investment opportunities, these funds might be invested in negative net present value projects. Managers have both incentives and opportunities to invest in wasteful projects, as they could be rewarded for expanding the turnover, or the market share of the firm at the expense of the shareholders.

57.   In this context, financial pressure generated from debt financing might play an important role in motivating organisational efficiency and growth. Managers who commit to debt financing have strong incentives to maintain a high level of efficiency, in order to avoid the consequences of bankruptcy. Bankruptcy is a serious threat for managers, since they lose their jobs, associated quasi-rents and reputation.[14] Thus, for firms with more internally generated funds than investment opportunities, high levels of debt or high interest rate payments can act to discipline managers and have a positive effect on the value of the firm.

II.2.2 Empirical studies

58.   The literature on the relationship between financial pressures and firm's performance is relatively scarce. Among them, Nickell and Nicolitsas (1995, 1999), using panel data for 670 manufacturing firms from 1973 to 1986, find that interest payments relative to cash flow have a small positive impact on capital productivity of the firms in their sample. In their subsequent paper, updating their data [580 UK manufacturing firms from 1982 to 1994, Nickell, Nicolitsas, Dryden (1997)], the same indicator of "financial pressures" (interest payments normalised on cash flow) is found to be positively related to future productivity growth (TFP).

59.   Among studies using the US panel data, Lang, Ofek and Stultz (1996) (1970-89, 142 firms with one billion dollars or more in sales in 1989 dollars) found a negative relation between leverage and future growth using data at the firm level. Leverage was defined as the ratio of debt to total assets in book value term, and firm growth as the growth rate of real capital expenditure and the growth rate of employees. Moreover, this negative relation between leverage and growth held for low Tobin's q (q<1), but not for high-q (q>1) firms or firms in high-q industries. Thus, this result is consistent with the "free cash flow" theory that leverage discourages managers of firms with poor investment opportunities from over-investing.

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14.   On the other hand, limited liability makes bankruptcy a lesser threat to the owners of the firm.

60.   McConnell and Servaes (1995), using the US panel data (during the years of 1976, 1986, 1988), divide their sample firms into "high-growth" firms with many profitable growth opportunities and "low-growth" firms with few, by using the three types of criteria, the price-to-operating-earning ratio (P/E), sales growth forecasts, and five-year historical average growth rate in sales. In each case, corporate value (Tobin's Q) is negatively correlated with leverage (the estimated market value of long-term debt divided by the replacement value of assets) for "high-growth" firms, but positively correlated for "low-growth" firms. Their result also support the "free cash flow" theory.

61.   Some authors focused on leveraged buyouts (LBOs) or management buyouts (MBOs), which involved a large level of debt financing and were very active in the late 1980s in the United States. Lichenberg and Siegel (1990) (US, 81-86, 12895 manufacturing plants) find that LBOs, and in particular, MBOs that occurred during 1983–1986, had a strong positive impact on total factor productivity in the pre and post-buyout years. Plant productivity increased from 2 per cent above the industrial average in the three pre-buyout years to 8.3 per cent above the industrial average in the three post-buyout years. Smith (1990), focusing on 58 cases of management buyouts of public corporations from 1977 to 1986, shows that operating returns (gross cash flows per worker or per asset) increased significantly from the year before to the year after.

II.3   The role of internal capital markets

II.3.1   Introduction and theoretical perspectives

62.   The last two sections, have explored the double-edged role of cash flow, which is "cheap" capital because of zero agency costs, but which potentially promotes over-investment when investment opportunities are few. The double-edged nature of cash flow is also related to a question of how a firm can efficiently allocate its funds within the firm. In the case of a diversified conglomerate, there has been extensive discussions on whether corporate headquarters, by forming "internal capital markets", can allocate capital across divisions efficiently or not (for a survey, see Bolton and Scharfstein, 1998).

63.   One view stresses the efficiency of internal capital markets. Corporate headquarters has information advantages over outside financiers, and agency problems are much more mitigated. Thus, these divisions would be less financially constrained than otherwise. In addition, because corporate headquarters own and control assets of the division, they have greater monitoring incentives than external capital markets, since they will get all or most of the rents from the improvement of the division's performance (Gertner *et al*., 1994). Relying on information advantages, headquarters could take scarce resources from capital-rich sections with poor investment opportunities and give them to capital-poor divisions with high investment opportunities.

64.   More recently, Stein (1997) presents a theoretical model in which headquarters, even with incentives to engage in empire-building over-investment, nonetheless, efficiently allocate capital across divisions given the overall capital budget. "Valuable empires", as well as "large empires", also increase their private benefits through efficient allocation, holding the size of the firm fixed.

65.   The opposite view stresses the inefficiency of internal capital markets. Just as a manager who has discretionary control over a large cash flow will tend to misallocate investment, so might corporate headquarters who have discretion in the allocation of capital in internal capital markets will tend to misallocate the distribution of their funds. They might engage in inefficient cross-subsidisation, spending relatively too much in some divisions and too little in others, for example.

66.   Scahrfstein and Stein (1997) provide a theoretical explanation for the systematic inefficiency associated with cross-subsidies in internal capital markets and stress that conglomerates practice a kind of "socialism" in capital budgeting, namely, under-investing in divisions with relatively good investment opportunities and over-investing in divisions with relatively poor investment opportunities. In their model, the marginal return to productive activity is lower in divisions with poor investment opportunities, leading their managers to spend more time trying to capture corporate rents and private benefits for themselves (rent-seeking behaviours). Headquarters try to persuade these managers not to rent-seek by allocating them an excessive fund. Headquarters prefer to bribe managers by misallocating capital rather than giving up some of their own private benefits. In this model, contrary to Stein (1997), capital misallocation is related to agency problems at the headquarters level: corporate headquarters can appropriate rents that arise because of agency problems between headquarters and outside investors. Rajan *et al*., (1997) present a similar model for inefficient cross-subsidies, which however are intended to correct biased incentives for divisional managers to choose investments that enhance their power more directly rather than those that have positive spill-over to other divisions.

II.3.2   *Empirical evidence*

67.   Whether internal capital markets perform well or not is thus an empirical question which has been extensive in the case of US firms. One interesting question is how markets perceive the formation of internal capital markets by diversified conglomerates. The existing research find that markets rewarded diversification in the 1960s-70s, but have penalised it over the past two decades.

68.   Schipper and Thompson (1983) find significant positive abnormal returns associated with the announcement of acquisition programs by diversified firms in the 1960s and 1970s. Matsusaka (1993) analyse the announcement effects of mergers undertaken in the three years of 1968, 1971 and 1974 and find that diversified bidders earned positive abnormal returns. On the other hand, Servaes (1996) find value loss from diversification even in the 1960s but, much lesser extent, in the 1970s.

69.   However, by using a sample of the past two decades various empirical evidence supports the view that corporate diversification is value-reducing. For example, diversified firms apparently trade at lower stock values than comparable portfolios of specialised firms. Lang and Stulz (1994) find that Tobin's Q and firm diversification are negatively related throughout the 1980s. Berger and Ofek (1995) find that the average value loss from diversification amounts to 13 to 15 per cent during 1986 -1991, compared with industry-adjusted stand-alone values.

70.   In addition, diversified conglomerates that were assembled during the 1960s and the 1970s were dismantled in takeovers and related corporate restructurings of the 1980s (Comment and Jarrell, 1995). Moreover, acquisitions of companies unrelated to the bidder's core business were much more likely to be divested than related acquisitions (Kaplan and Weisbach, 1992). Finally, non-core businesses, which were divested following hostile takeovers, were often sold to firms in the same line of business (Bhagat *et al*., 1990). Thus, during the 1980s, corporate raiders systematically dismantled diversified firms with the expectation that divisions would be more efficiently run as stand-alone firms, which argues for corporate focus.

71.   The significant difference in market evaluation of American corporate diversification between the 1960s-70s and the 1980s-90s calls for an explanation? Hubbard and Palia (1999) provide one explanation for it, stressing the existence of less developed capital markets, in the earlier period and, especially in the 1960s. By examining a sample of 392 acquisitions that occurred during the period from 1961 through 1970, they find:

- Diversifying acquisitions generally earned positive abnormal returns.

- Highest returns were earned when "financially unconstrained" buyers (which have high-dividend payout or high investment rate) acquired "constrained" target firms.

- Bidders generally retained the management of the targeted firms, suggesting that the bidder, while getting company-specific information from the incumbent management, provided capital budgeting expertise.

These results mean that the external capital markets assessed information benefits from the formation of the internal capital markets. As external capital markets developed, this informational advantage likely became less important.

72.   In fact, recent studies on corporate diversification find supporting evidence of inefficient cross-subsidies via internal capital markets. Lamont (1997) shows that the sharp drop in oil prices in 1986 led diversified oil companies to reduce investments in their non-oil divisions. This implies that there is cross-subsidisation across divisions in these conglomerates. Shin and Stulz (1998), by using a much larger sample of firms operating in multiple business segments, also show some evidence of cross-subsidisation in diversified conglomerates. They find that capital expenditures of small segments are positively correlated to the cash flow of other segments, while this is not the case for large segments. They also find that this cross-subsidisation does not depend on the investment opportunities of the subsidised firms and is thus inefficient, since a reduction in the cash flow of other segments does not reduce the capital expenditure of low-Q segments more than they reduce the capital expenditures of high-Q segments. This evidence is strengthened by the finding that the diversification discount is related to the sum of capital expenditures made by a firm in segments with low Tobin's Q (Berger and Ofek, 1995).

73.   In order to test the empirical implications of a theoretical model of Scharfstein and Stein (1997), Scharfstein (1998) examines capital allocation in sample of 165 US diversified conglomerates in 1979. He find that divisions in high-Q manufacturing industries tend to invest less than their stand-alone industry peers, while divisions in low-Q manufacturing industries tend to invest more than their stand-alone industry peers. This effect is more pronounced for the relatively small divisions of conglomerates. He also shows that the observed differences between conglomerates and stand-alones is less pronounced in firms where management has a large equity stake, implying that conglomerate's investment behaviour stems, at least in part, from agency problems between headquarters and outside investors, stressed by Scharfstein and Stein (1996). Although Scharfstein (1998) does not test the existence of cross-subsidisation directly, Rajan *et al.*, (1997), by using a panel of US diversified firms during the 1979-1993 period, find that capital misallocation of this type is likely to be more pronounced in firms with very different investment opportunities across divisions.

II.3.3   *Conclusions*

74.   In summary, the efficiency of internal capital markets might depend on several external factors. Among them, the development of external capital markets might be an important one, at least as seen in the case of the United States. In fact, conglomerates in some form or other have also been seen in Asia, Latin America and much of Western Europe for a long time (Rajan and Zingales, 1998*b*). For example, Khanna and Palepu (1997) find that large diversified groups in India outperformed smaller unaffiliated firms between 1989 and 1995.[15] Fauver, Houston and Naranjo (1999), by examining conglomerates in 35

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15.   In their recent paper, Khanna and Palepu (1999) find that accounting and stock market (Tobin's Q) measures of performance of affiliates of diversified Indian business groups initially decline with group

countries in 1998, find that the relative value of diversification in a country is correlated to the country's income level. There exists either a diversification premium or no discount in low-income countries, while there is a significant diversification discount in high-income countries. These findings reinforce the potential trade-offs between the efficiency of conglomerates and the development of capital markets.[16]

75.   Internal funds or internal capital markets have double-edged effects. Under severe financial constraints due to capital market imperfections, the availability of internal funds could promote "necessary" investments (positive NPV projects) and internal capital markets might help allocate funds to divisions that could not get them externally because of these imperfections. However, when internal funds are excessively abundant or there are fewer capital market imperfections thanks to the development of the financial system, the availability of internal funds or internal capital markets could well lead to unproductive investment and resource allocation. The double-edged effects of internal funds and internal capital markets is discussed further in the context of the comparative analysis of financial systems.

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diversification and subsequently increase once group diversification exceeds a certain level. In particular, affiliates of the most diversified business groups outperform unaffiliated firms.

16.   Lins and Servaes (1999*a*) examine the effect of diversification for large samples of firms in Germany, Japan and The United Kingdom. They find a significant diversification discount of 15 per cent in the United Kingdom, 10 per cent in Japan, but no significant discount in Germany. For Japan, only firms that have strong relationships with an industrial group ("Keiretsu") have a diversification effect. Lins and Servaes (1999 b) also investigate a sample of large number of firms from seven emerging markets (Hong Kong, India, Indonesia, Malaysia, Singapore, Korea and Thailand). They find a diversification discount of about 8 per cent in these markets and approximately 15 per cent for firms that are member of industrial groups. These results are also consistent with a possible trade-offs between the efficiency of diversification and the development of capital markets (see also the Annex).

III. COMPARATIVE FINANCIAL SYSTEMS AND THEIR IMPLICATIONS FOR GROWTH: LESSONS FROM ASIAN CRISES AND THE SUCCESS OF THE US VENTURE CAPITAL MARKET

III.1   Introduction

76.   The previous sections surveyed a wide-ranging literature concerning the relationship between financial development and growth, but few have investigated how different types of financial development can affect economic growth. Among them, Levine and Zeros (1998) stressed the complementary role of banking and stock market for economic growth. Bond *et al.* (1997) and Hall *et al.* (1998) find a systematic international difference in the sensitivity of investment to cash flow, which might result from a difference in financial systems.

77.   This section first discusses two prototypes of financial systems, the "relationship-based" system and the "arm's length system" and their advantages and disadvantages, mainly based on several recent studies (Allen and Gale, 1999, Berglof, 1995, Hellmann and Murdock, 1998, Rajan and Zingales 1998*b*, 1999*a*, *b*, and Thakor, 1996).[17] The section then explores how pros and cons in their financial systems could explain a marked difference in recent economic performance between Asian countries and the United States.

III.2   Comparative analysis of financial systems

78.   A financial system has two main goals: to channel resources to the most productive uses (allocation function) and to ensure an adequate return flow to financiers (governance functions). Allocation functions have already been reviewed in Section I. However, when each financial system is examined, the greatest difference lies in the governance function. This function characterises the relationship between financiers and clients, and thus they influence allocation functions including 1) easing financial constraints, 2) re-negotiation, 3) risk sharing, and 4) information aggregation for capital allocation.

III.2.1   Relationship-based financial system

79.   Whatever the system, the providers of financial capital must have mechanisms to monitor the users of their capital, and intervene, if necessary, due to agency costs associated with financial transactions. The relationship-based system ensures a return to the financier by giving him some control power over the firm being financed. Such power can arise from being a large shareholder or a major lender to the firm. Prominent examples are the Japanese main bank system (Aoki and Patrick, 1994) and the German house

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17.   The terms of "bank-based" or "market-based" are often used to describe two different financial systems. This definition seems to be based on corporate financing pattern in each system, however, internal funds are the most important financing source in most of major countries. In addition, Germany, as a typical example of bank-based system, has a relatively small share of bank lending in corporate financing sources (Mayer (1988)). Thus, the financing pattern might not well distinguish between two financial systems.

bank system (Edwards and Fischer, 1993). Monitoring functions could be integrated in a single bank (as a "delegated monitor" in the sense of Diamond, 1984)[18], which is involved in all three monitoring stages: the ex-ante selection of clients and investment projects, the monitoring of the projects on an ongoing basis, and intervention in case of poor management performance.

80.   The relationship between financiers and firms in a relationship-oriented system is long term and supported by implicit self-enforcement contracts or reputation concerns. The relationship between banks and firms is only credible if both sides have developed a good reputation over time ("reputation capital", see Diamond, 1989, 1991; Hellman and Murdock, 1998). A repeated and long-term relationship can well reduce informational asymmetries and thus agency costs.

81.   However, this type of relationship needs quasi rents that can be shared by the two parties and fewer outside opportunities for them. Thus, this relationship is consistent with a less competitive environment including some entry barriers. Moreover, the relationship-based system has less disclosure requirements, since only a single financier need acquire firm's information and thus, public information is less important. Informational advantage and related rents ("information rents") give a good incentive for integrating monitoring functions and maintaining a long-term relationship.

III.2.2   *Arm's length financial system*

82.   The prominent example of an arm's length system is the US financial system. Under this system, a large number of liquid and thick financial markets (*e.g.* stock markets and corporate bond markets) provide wide-ranging financial instruments required by different economic agents. Monitoring functions are provided by different specialised institutions such as venture capital, commercial banks, investment banks and rating agencies. They provide different monitoring services for different financial products and at the different development stages of firms.

83.   An arm's length relationship is akin to spot transactions, more short-term and less control-oriented. Financiers are protected only by explicit contracts. Thus, this system relies much more on legal enforcement. This means that financiers have strong incentives to intervene only at the stage of liquidation. To facilitate the relationship, financial markets need to be competitive, liquid and thick. In addition, public information and disclosure requirements are more important and necessary to ensure legal enforcement and achieve allocation efficiency.

84.   In the real world, however, such a dichotomy of financial systems is much too simple and in practice the two types of financial systems coexist in the same country, although their relative importance is different across countries. In Japan, capital markets are much more developed than in Germany or France, although all three countries are basically considered to have relationship based financial systems (see Annex). In addition, relationship based financing prevails even in the United States for small businesses (Petersen and Rajan, 1994 and Berger and Udell, 1995). Given these differences in the characteristics of the financier-firm relationship, both systems have advantages and disadvantages. Several dimensions are examined below.

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18.   Diamond (1984) stresses the bank's role of monitoring delegated from lenders (depositors). However, his argument can be extended to the situation in which a single bank plays the role of a delegated monitor among the syndication of banks and other investors.

III.2.3   *Legal and institutional infrastructure*

85.   A market-based system can work only when the quality of legal enforcement is very high and property rights are well defined. Thus, developing countries or transition economies, where legal and institutional infrastructure are significantly underdeveloped, have no alternative but to adopt relationship-based financial system, with banks as main financiers (Rajan and Zingales, 1998*b*). This prediction is also consistent with the observation that French civil law countries have both the weakest investor protection and the least developed capital markets, especially as compared to common law countries (LLSV, 1997; see also the Annex to this document).

III.2.4   *Reduction in agency costs and free cash-flow problems*

86.   Relationship-based systems are very good at mitigating agency costs and/or economising monitoring costs, which could lower the cost of capital (*e.g.* Hoshi *et al.*, 1991). This system is in particular beneficial for young and small firms whose fund-raising is constrained by capital market imperfections.[19] Arm's length systems make fund-raising very costly for some firms with severe information problems (*e.g.* Myers and Majluf, 1984).

87.   When a relationship-based system reduces agency costs significantly, the funds supplied by this relationship are much closer to "internal funds" for firms. As we have seen in Section 2, this has a double-edged effect. If these "cheap" funds are provided beyond the level of firm's investment opportunities, they are easily misused for "*ex-post*"unprofitable projects. By contrast, there exists strong mechanism such as take-overs to correct the misuse of funds in arm's length systems.

III.2.5   *Re-negotiation and soft -budget constraint problems*

88.   A relationship-based system, by facilitating re-negotiation of the contracts, can be beneficial for firms, especially those experiencing liquidity problems. But, ex-post discipline on clients is weaker than in a market-based system, since financiers incurring sunk monitoring costs have an incentive to extend their loans to unprofitable projects, leading to "soft-budget constraints" (Dewatripont and Maskin, 1995). Arm's length systems, with no commitment to long-term monitoring, can credibly stop unprofitable projects but make re-negotiation more difficult due to co-ordination failures among many different investors (Berglof and von Thadden, 1994 and Bolton and Scharfstein, 1996).

III.2.6   *Risk-sharing: Cross-sectional risk sharing vs. inter-temporal risk sharing*

89.   As seen in Section I, one of the major functions of financial markets is to provide opportunities for risk sharing among different individuals. Markets allow them to diversify their portfolios, hedge idiosyncratic risks and adjust the riskness of portfolios according to their levels of risk-tolerance. Thus, under a market system, different individuals are exchanging risks at a given point in time. This can be termed "cross-sectional risk-sharing".

90.   If markets were complete in the Arrow-Debreu sense, it would be possible to obtain insurance against all risks, but in the real world, participation and available markets are incomplete. One form of risk-sharing that is not available in a market system, is "intergenerational risk sharing". If one generation

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19.   If these firms have a large degree of uncertainty, it is venture capital rather than banks that provide financial backing.

wants to liquidate its holdings of assets, another generation must be willing to buy. However, in a market system, different generations participate in the market at different points in time and thus participation is incomplete. This difficulty in matching may make the price at which this exchange takes place very volatile and this price variation may induce large consumption risks. In this case, an intermediary can provide insurance against these swings in asset prices by averaging gains and losses over time (see, for example, Qi, 1994, Fulghieri and Rovelli, 1998).

91.   Another example is "inter-temporal risk sharing". Consider external shocks, which can affect the whole economy (*e.g.* oils shocks, financial crises). These risks cannot be diversified away by holding a large portfolio with many stocks. These nondiversifiable risks can be reduced by a relation-based financial system (*e.g.* banks committed to long-term loans). Allen and Gale (1997), in the context of an overlapping generation model, contrast a market economy, in which individuals invest directly in a safe asset and a risky asset, with an intermediated economy, in which a long-lived intermediary holds all the assets and offers deposit contracts to each generation. In their model, asset accumulation plays an important role. An intermediary can pool inter-temporal risks by using the accumulation of large reserves of the safe assets as a way of building up in good times and drawing down in bad times. On the other hand, individuals in a market economy do not value the role of safe assets in contributing to future generations' welfare, thus, have no safe assets.

III.2.7   *Diversity of opinions and allocation efficiency*

92.   The merits of a relationship-based system rest mainly on its monitoring and control mechanism. The importance of the governance role implicitly assumes that financiers know very well how firms should be run. In such a case, a consensus on the firm's opportunities among financiers can be reached easily and an intermediary can play the role of a delegated monitor (Diamond, 1984).

93.   However, when a firm belongs to an entirely new industry, or its technology is rapidly changing, there might be a lack of common knowledge about the optimal strategy of the firm, including by its manager. There would exist a diversity of opinion even among well informed financiers. Thus, placing a firm in the hands of a manager may be the only way to determine whether a particular strategy of management will be successful. Governance functions by financiers would be less important and co-ordination failures among financiers prevent them from reaching a consensus and delegating their monitoring role to a particular institution.

94.   Stock markets, however, are very good at dealing with the diversity of opinion, since stock prices aggregate diverse information obtained by investors. This allows stock prices to reflect the true value of the firm given current management policies and thus provide efficient signals for the allocation of resources (Grossman, 1976); Grossman and Stiglitz, 1980, and Diamond and Verrecchia 1981).

95.   As a result, an arm's length system especially characterised by stock markets work relatively well in the development of new industries or technologies, when there is little consensus on how a firm should be run. On the other hand, relationship-based system is good at traditional industries, in which production technology is relatively stable and well-understood.

96.   This theoretical pediction has been consistent with comparative and historical episodes stressed by Allen (1993) and Allen and Gale (1999). In the second half on the nineteenth century, the stock market (the London Stock Exchange) was an important financial source for industry, such as the railways.[20]

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20.   The industrial revolution of the late 18th and early 19th centuries was led by industries such as textiles in which there was a large number of small firms. They were mainly financed by an arms-length type of banking (see Baliga and Polack, 1995).

Similarly, the New York Stock Exchange played a crucial role in the development of the major industries such as the automobile, electronics, computer and recently IT industries in the 20th century. In nineteenth century, Germany experienced a rapid industrial development, but the technologies were not new. The same has been true for Japanese success in automobile and electronics industries in the 1970-1980s.

III.3   Lessons from the Asian crisis

III.3.1   *How can the analysis of comparative financial system explain the onset of the Asian crisis?*

97.   Does the analysis of comparative financial systems above help explain the onset of the Asian crisis? Rajan and Zingales (1998*b*) stressed the free cash flow problems in Asian countries. They contrast a relationship-based system with an arm's length system in two dimensions, legal infrastructure and relative capital abundance. In Asian countries, where the quality of legally enforceable contracts is relatively low, a relation-based system is preferred and has been dominating.[21] Another dimension is capital availability relative to investment opportunities. As noted above, in a situation of capital scarcity, a reduction in agency costs and financial constraints by relationship-based finance can promote "right" investments with positive net present values. However, when there is abundant capital seeking few profitable opportunities, free cash-flow problems might arise. In this case, an arm's length system, where price signals help to guide "right" investment, might do better than a relationship-based system.

98.   In this context, massive short-term capital inflows to Asian countries, associated with their financial liberalisation and international portfolio diversification motives by other countries, had made their financial system very fragile. Before the onset of financial liberalisation, investment opportunities might well have exceeded the availability of capital, and relationship-based finance worked well. However, in conditions of substantial capital abundance because of large capital inflows, and low legal contractability, neither system could work effectively. Thus, the allocation of capital might easily become sub-optimal.

99.   Table 2 shows capital inflows and outflows in five Asian countries (Indonesia, Korea, Malaysia and Thailand), over the past decade (Institute of International Finance, 1999). Private capital inflows almost tripled between 1992 and 1996. This large increase cannot be explained by an improvement in investment opportunities in these countries. The magnitude of massive capital flows may well support the free cash-flow hypothesis in these countries. In particular, commercial bank lending played a main role on large inflows and outflows of capital.

100.   In addition, the relationship based system became much more fragile, since the suppliers of funds to these countries were motivated by the logic of an arm's length finance system. Their short-term oriented funds to Asian banking sectors were not compatible with a long-term bank-customer relationship in those countries. Indeed, once funds were drawn out from these countries, the relationship-based financial system could easily collapse, and did so.

101.   In this framework, the policy implications for Asian countries are relatively simple. In the short run, they can restrict the short-term capital inflows which give rise to excessive capital abundance and make intermediaries more fragile to liquidity problems. In addition, some controls on short-term capital

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21.   Among Asian countries that experienced financial crises, Korea, Indonesia and Thailand have relationship based financial systems. On the other hand, Hong-Kong, Malaysia and Singapore have more arm's length oriented financial systems, since their stock markets and legal infrastructure have been well developed. Seethe Annex to this document.

outflows can be understood as a similar function of "suspension of convertibility" comparable to the case of "bank runs". In the long term, they can improve their legal contractability so that a market-based system is able to coexist.

III.3.2 *Which system can deal with crises better?*

102.   The Asian crisis is well-understood as one variant of a banking crisis, but which was exacerbated by currency crises ("twin crises", Kaminsky and Reinhart, 1999). Given the large negative impact of these crises on the economies of Asian countries and Japan, it is natural to ask whether arm's length systems are more immune to financial crises and cope better with them when they occur.

103.   In a market-based system, households have a relatively large proportion of shares in their portfolios. This means that households bear major losses in a stock market crash, and firms face greater financial constraints, due to a loss in their net worth. However, the fundamental functions of stock markets might be less affected by the crash, and resume normal working afterwards.

104.   In the case of relationship-based systems, a large loss would be initially concentrated on banks. Deposits owned by households are protected explicitly or implicitly by the government, and direct negative effects on households would probably be much smaller. Banks can accommodate relatively small shocks and play a role of inter-temporal risk pooling. However, once a large part of their assets become non-performing due to crises, both the allocation and governance functions of the financial system would be paralysed, and no alternative institutions performs either function, since all functions are concentrated in banks in a relationship-based system.[22] Thus, the normalisation of the financial system depends on how fast the banking sector can be restructured, and in practice its speed is not very fast, due to the forbearance policies of authorities (*e.g.* Boot and Thakor, 1993), and other reasons, according to past experiences, especially the recent experience in Japan (Hutchison and McDill, 1999).

105.   There is also another mechanism that slows down the restructuring process in a relationship-based system. Once a financial crisis occurs, many investment projects are found to be unprofitable. Large conglomerates and large banks, in order to recoup their monitoring costs, have little incentive to stop unprofitable projects, and thus bad loans accumulate further (see the section of "re-negotiation and the soft-budget constraints problem"). The deterioration in their assets further encourages risk-taking behaviour by the banks.

106.   In summary, in an arm's length system, the negative effect of a stock market crash is widely distributed especially among households, but the functions of financial system might be less affected. On the other hand, the initial costs of banking crises are concentrated disproportionately on banks, and, the malfunction of the financial system would last much longer, and this would provoke lingering negative effects on the whole economy.

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22.   The Economist (23 October, 1999) cites the Chairman of the FED, Mr. Greenspan, as stressing the importance of a diversified financial system, which helps to cushion an economy in times of stress (see, pp. 118).

III.4 Venture capital as a hybrid financial system: The US experience

III.4.1 Introduction

107.   In contrast to the stagnant economic performance in Asian countries including Japan due to financial crises, the United States has shown a remarkable economic performance over the decade. Strong economic growth combined with booming stock markets is related to the fast-growing IT industries. Why have these new industries been disproportionately developed in the United States? There exist many factors, but, among them, the US capital markets have played an important role since, as noted above, a stock market based system is better for financing new industries or new technologies, where opinions of investors differ.

108.   Venture capital industries have been the most developed in the United States.[23] They specialise in financing high-risk, but potentially high reward projects, and have channelled funds to present-day companies, such as Apple Computer, Microsoft, Netscape and others at the time of their start-ups. Moreover, about 60 per cent of funds are provided to high-tech related industries like software services (19.7 per cent), computer hardware & systems (4.7 per cent), telephone & data communication (10.3 per cent), biotechnology (5.3 per cent), and medical & health care related (14.2 per cent)(VC Year Book, 1995).[24]

109.   Some new studies consider how venture capital stimulates innovation or start-ups. Kortum and Lerner (1998) examine the impact of the provision of venture capital funds on the rate of patenting for twenty US manufacturing industries over a three decade period and find a 5-18 per cent increase in the rate of patents by venture disbursements. In addition, Hellmann and Puri (1998) find that using a sample of 173 high-tech oriented start-ups located in Silicon Valley, venture-backed firms can significantly reduce the time taken to bring their products to market.

110.   Aoki (1999) emphasises another important aspect of the venture capitalist as a catalyst of technological innovation. Entrepreneurial start-up firms in the Silicon Valley specialise in the development of innovative products (niche markets) that may constitute useful modules in the evolving industrial framework. In a highly uncertain and competitive technological and market environment, entrepreneurial firms need to continually process and share general information associated with the evolving industrial frame. But they also need to integrate and encapsulate specific information crucial to their own module-product to retain competitiveness. These dual requirements may result in the intense information exchanges and sharing across firms clustering in Silicon Valley and venture capitalists play an important role as a mediator of these informational flows and sharing.

111.   This section is not intended to provide an extensive overview of venture capital, but, to examine the role of venture capital from the viewpoint of comparative financial systems. The main point is that venture capital is a variant of relationship-based financing (*e.g.* Gompers, 1998), but one which strongly depends on a well-functioning arm's length financial system (*e.g.* Black and Gilson, 1998). This implies that venture capital is a well-designed combination of a relationship-based system and an arm's length one, in other words, a hybrid system. The material in this part is based on especially, Barry (1994), Berlin

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23.   The amount of venture capital raised in 1996 exceeded 10 trillion dollars in the United States, while a much smaller amount was raised in the United Kingdom (3776), France (1078), and Germany (908) (figures in millions of dollars) (Venture One, 1997, European Venture Capital Association Yearbook, 1997.)

24.   A common misperception is that venture capital funds only high technology companies. Low-tech companies also received significant amounts of venture capital money in the United States.

(1998), Fenn, Liang and Prowse (1995), Gompers (1998), Gompers and Lerner (1999) and Sahlman (1990).

III.4.2 *Agency costs and control mechanisms*

112.   Venture capitalists are professional investors who raise money from third parties (*e.g.* wealthy individuals and institutional investors) to invest in promoting start-up companies. How different are start-ups from other companies? Start-ups or young small firms, who have not yet established a reputation in capital markets, might be the most severely affected by agency conflicts associated with informational asymmetries between borrowers and lenders. In particular, adverse selection problems could lead to a credit rationing in a sense of Stiglitz and Weiss (1981). Thus, typical start-ups do not involve much finance, but often use their internal funds, borrowing from family and friends or sources of personal finance. But, when they do not have sufficient funds to finance projects themselves, they must seek outside financing and venture capital could alleviate the financial constraints faced by these companies.

113.   To mitigate agency problems related to information asymmetries (*e.g.* adverse selection and moral hazard), relationship-based financing can do better since it can provide a good incentive for screening, monitoring and controlling borrowers. However, banks are unlikely to lend their money to companies which lack substantial tangible assets and have a large degree of uncertainty about their future. They might face many years of negative earnings and are unable to make interest payments or meet principal repayments.

114.   In this sense, venture capital has many unique control mechanisms, as an active intermediary to providing strong and close monitoring mechanisms (Gompers, 1998 and Sahlman, 1990). A typical venture capital is a limited partnership run by general partners who are experienced at bringing up start-ups firms and have good knowledge of their portfolio company's or related industries. Hence, with this expertise, they can provide management assistance to the start-ups, for example, by recruiting management and technical personnel they need. This means that a venture capitalist is a more informed investor than other intermediaries.

115.   Venture capitals have strong incentives to monitor the firm, stemming from their equity holdings in the firm that they finance, sharing in both upside and downside risks. In addition, they usually sit on the boards of directors, having effective control rights to appoint or remove the managers or design their compensation packages. However, the most important control mechanism that a venture capitalist employs comes from the staged timing of capital infusion (Gompers, 1995, Sahlman, 1990). The venture capitalist does not invest in one go. Instead, funds are always provided in stages, and the entrepreneur receives only enough funding to reach the next stage. By reassessing the prospect of the firm's projects periodically, venture capitalists can maintain their option to terminate funding, thus imposing a credible threat and discipline on the portfolio firm. Thus, staged capital infusion prevents soft-budget-constraint problems, which are typically pronounced in other types of relationship-based financing. This kind of discipline is also provided by the syndication of venture capital investments, which may not only allow venture capitalists to diversify away idiosyncratic risks, but also to facilitate multiple checks by venture capitalists in their common portfolio firm (Lerner, 1994).

116.   Another important control mechanism is the use of convertible securities as a contractual arrangement between a venture capital and a portfolio firm. A venture capitalist usually receives convertible preferred stock. In many ways, preferred stock is more like debt than equity and can play the same disciplinary role of debt. It requires the firm to make fixed payments to the stock's holder and has a fixed liquidation value per share. And the promised payments can be delayed, but must be made before any common stock holder gets dividend payments.

III.4.1 Exit mechanisms

117. All these unique control mechanisms can reduce the agency costs associated with financing start-ups or young companies, and significantly improve resource allocation process. However, the most important concern for a venture capitalist is an exit strategy, namely, how they can successfully cash in their investments. There are three mechanisms, 1) acquisition by another firm (private sale), 2) share repurchase by the portfolio company, and most importantly, 3) issuing stocks via an initial public offering (IPO). In the case of the United States, successful venture capital investments are often realised by making an IPO in the NASDAQ, the best known of the second-tier markets for trades in young and innovative companies. In the United States venture capital market, the portfolio firm that goes public generates most of the returns (70-80 per cent in the United States).

118. The financial challenges to start-ups are their agency costs and high risks. Agency costs can be reduced by various control mechanisms by venture capitalists. These mechanisms are partly similar to those of main banks in Japan, but staged financing in particular appears to give more control power to venture capitalists. High risks associated with these companies can be diversified only by a well-developed arm's length system ("cross-sectional" risk sharing), by facilitating the use of IPOs as an exit route.

119. Another issue is, who provides funds to venture capitalists. US pension funds are now of overwhelming importance (about 38 per cent in 1996) as a capital provider to venture capital industries, after pension fund investment in venture capital was permitted in 1979, provided that it did not endanger the entire portfolio. These and other regulatory changes led to a large increase in the flow of funds into venture capital. Pension funds have a strong demand for high-risk, high-return investment as a part of their portfolios. The active role of pension funds is also dependent on the development of stock markets, which allows them to diversify their portfolios.

120. Hence, fund raising, interim-control and exit mechanisms are equally important and complementary for venture capital finance. In fact, the venture capitalists control mechanisms by reducing informational problems, can facilitate an efficient exit via IPOs and mitigate underpricing problems at the time of IPOs due to adverse selection (Akerlof, 1970). For example, Megginson and Weiss (1991) find that venture capital-backed IPOs are less under-priced than non-venture-backed IPOs. Barry *et al*. (1990) find that the degree of under-pricing is negatively related to the amount of venture capital ownership. In addition, a successful exit by an IPO can establish a venture capitalist reputation ("reputation capital"), and further attract investors and the organising of new funds. When the IPOs are "hot", new funds flow into the venture capital industry (Gompers, 1994).

121. The nature of venture capital can well explain why venture capital has been poorly developed in other countries that lack well-developed public equity markets or active institutional investors like pension funds, who are allowed to diversify their funds for their high-risk, high-return investment. For, example, in the case of Japan (Milhaupt, 1997), most venture capital funds are affiliated to banks or securities companies. Employees in these funds, who are usually seconded from the parent's bank, are unlikely to have special expertise for start-ups or high-technology industries. In addition, Japanese venture capitalists provide funds mainly through bank loans, unlike American counterparts providing primarily equity financing.

122. Equally, Germany venture capital funds, which are only a fraction of the size of the US counterparts, are different from the US ones in several ways (Black and Gilson, 1998). Only a small part of German venture capital funds go to start-ups (8 per cent in 1994) or high-technology-related investments (11 per cent in 1994). The exit of venture capital usually comes through repurchase by portfolio companies and sales of them, because active IPO markets are absent. Thus, to promote venture capital industries, the US experience suggests that other countries may wish to consider public policies initiatives that encourage

the establishment of well-functioning stock markets, especially IPO markets, and at the same time, the development of pension funds and their regulatory flexibility to invest in venture capital.

123.   The comparative analysis of financial systems tells us that each system has advantages and disadvantages and that Asian crises and Japan's long economic stagnation as well as the US economic successes related to high-tech entrepreneur firms could be partly understood in this context. However, it may be ambiguous to answer which financial system is more important for economic growth. Two different system could coexist in a country and they should be complementary, as seen in the role of venture capital, corporate financing pattern by size or age or, in times of financial crisis.

IV.   Conclusion and policy implications

124.   In a macroeconomic context, financial development is found to be important for growth. Some recent studies find that an improvement in the legal and regulatory structure, exclusively affecting financial development, can also enhance economic growth. This could imply that civil law countries could enhance growth by improving their legal and institutional infrastructure. Too much emphasis on legal origin, nonetheless, is inadvisable. Legal performance is also associated with the level of income, and countries with different legal origins have different advantages in their legal and institutional structure. For example, common law countries have the highest scores on shareholder rights, while Germanic-origin countries have a higher quality of creditor rights and Scandinavian-origin countries enjoy particularly high scores on law enforcement and accounting standards (see Annex).

125.   An important agenda for future research in this area is to understand what kind of financial development is the most crucial for economic growth: the bank-based or stock-market based system, or both. Legal origin may well influence the importance of stock markets relative to the banking system in a given country (Annex). But, again, different systems have different merits and demerits in terms of economic growth, and more microeconomic and institutional approaches are needed to examine this issue further, as shown in Section II and Section III.

126.   In a microeconomic context, internal funds, which are "cheap", are an important determinant of the "quantity" of investment and thus, growth. However, the "quality" of investment is not always guaranteed by the availability of internal funds when capital is abundant relative to investment opportunities. By being invested in negative NPV projects, "free cash flow" can lead to inefficient resource allocation and the same is also true for internal capital markets. Thus, internal funds have a double-edged effect on the real economy.

127.   Microeconomic analysis throws some light on the proper choice of financial systems. When capital is relatively scarce, relationship-base financing or internal capital markets, by alleviating agency costs and financial constraints, can provide finance akin to "internal funds" and raise the level of investment, and spur economic growth. An arm's length system is not good at reducing agency costs, and could do poorly when capital is scarce, while it can alleviate free-cash-flow problems and guide "right" investment decision when investment opportunities are relatively fewer. Thus, each system has merits and demerits and it is important to understand which can perform better and when.

128.   A comparative analysis of financial systems is useful to understand the cause of the Asian crisis and the US stock market boom and development of venture capital markets that resulted in new global high-tech industries. The Asian crises can be understood as a conflict between two systems, and the success of the US venture capital industry can be explained as a happy marriage between two systems. There are policy lessons from these events.

129.   One of the fundamental problems posed by the Asian crisis is whether different financial systems can coexist under global capital market integration. Recently, the global financial architecture has been extensively discussed (see, for example, Eichengreen, 1999; Rogoff, 1999; and Stiglitz and Bhattacharya, 1999). However, these arguments are more fruitful when examined through the lens of a comparative financial system.

130.   The conflict between short-term global money and domestic relationship-based financing is analogous to the maturity mismatch between liabilities and assets of banks, which potentially leads to "bank runs". Thus, to prevent global financial crises, it is desirable to consider the international version of 1) lender of last resort, 2) deposit insurance, 3) supervisory and regulatory institutions. However, these arrangements are insufficient to prevent bank runs, and the establishment of the international versions would involve political problems. On the other hand, some controls on short-term capital flows and outflows, though distrusted by neo-classical macroeconomists, might be a more realistic solution, since they allow relationship-based systems to coexist with a global capitalism that is mainly backed by arm's length systems.

131.   Another important issue is whether Japan and European countries should adopt (or intensify) arm's length financial systems. If these countries wish to create very active venture capital markets in their own countries, the development of stock markets is highly important but it might take a long time to come about. There are thick market externalities in stock markets (Pagano, 1993b) and complementarity among several functions of venture capital. There could exist multiple equilibria and a country might be trapped in a poorer equilibrium, where stock markets, institutional investors and venture capital industries are underdeveloped. European countries and Japan which have already committed to European integration and "big bangs" respectively, have no alternative but to introduce more characteristics of an arm's length system. In this case, they need to understand the pros and cons of each system. For example, inter-temporal risk sharing, which is only possible under the relationship-based system, can not be maintained due to growing arbitrage behaviour by markets. Hence, the next step is to consider how these different systems can coexist in a country and seek another chance of a "happy marriage" like the example of the US venture capital markets.

Table 1. Empirical studies of the relationship between internal funds and investment: Selected OECD countries

Country:	Japan	Germany	United Kingdom (1)	United Kingdom (2)	Canada:	The Netherlands:
Author:	Hoshi *et al*. (1991)	Elston (1998)	Devereux and Schiantarelli (1990)	Bond and Meghir (1994)	Schaller (1993)	Van Ees and Garretsen (1995)
Sample:	145 Japanese firms	Panel data for 150 German firms	Panel data the UK 720 manufacturing firms	626 UK manufacturing firms	Panel data for 212 Canadian firms	76 Dutch firms
Period:	1977-82	1964-72, 1973-84	1969-86	1974-86	1973-86	1984-90
Classification criteria:	Affiliation with industrial groups	Ties with banks (113 independent firms and 26 firms owned directly by banks)	Size, age, and growth	Dividend payouts	Age, concentration of ownership, and association with industrial groups	Ties with banks through exchange of CEOs and board members
Method:	Reduced form estimation controlled by Tobin's Q	Reduced form estimation controlled by Tobin's Q	Reduced form estimation controlled by Tobin's Q	Euler equation tests	Reduced form estimation controlled by Tobin's Q	Reduced form estimation controlled by Tobin's Q
Result:	Independent firms have higher sensitivity to cash flow than affiliated firms	The sensitivity of investment to cash flow is relatively smaller for bank owned firms for both estimation periods	Mixed. By the criteria of size, the sensitivity shows U-shaped pattern, however, when classified by age, cash flow appears to be somewhat more important for newer firms.	The violation of the frictionless model is detected for the whole sample and most prominent for low-dividend-payout firms	Firms with younger maturity or ones owned dispersely exhibit higher sensitivity of their investment to cash flow	The responsiveness of investment to cash flow is greater for independent firms rather than bank-affiliated firms

Table 2. Capital Flows to Five Asian Economies[1]

(billions of dollars)

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000 (Forecast)
Current account balance	-16.8	-25.4	-16.1	-13.7	-23.4	-40.6	-54.4	-26.8	69.4	46.3	28.8
External financing, net	31.6	31.3	32.7	54.5	51.6	89.0	103.2	27.5	-12.9	10.8	6.6
Private flows, net	25.0	29.0	25.0	49.5	44.4	86.4	106.4	-0.8	-38.6	5.1	-2.0
Equity investment, net	5.5	4.1	10.9	25.0	14.7	15.3	18.6	4.4	14.2	25.2	22.1
Direct investment, net	2.7	4.5	4.5	4.1	4.7	4.2	4.7	5.9	9.9	11.9	14.8
Portfolio investment, net	0.7	-0.3	6.4	20.9	10.0	11.0	13.9	-1.5	4.3	13.2	7.3
Private creditors, net	19.5	24.8	14.1	24.5	29.7	71.2	87.8	-5.2	-52.7	-20.0	-24.1
Commercial banks, net	19.8	19.2	10.6	8.7	26.0	58.6	59.9	-17.2	-48.3	-18.7	-22.3
Nonbanks, net	-0.3	5.6	3.5	15.8	3.7	12.6	27.8	12.0	-4.4	-1.3	-1.8
Official flows, net	6.6	2.4	7.7	5.1	7.2	2.6	-3.2	28.3	25.6	5.7	8.6
International Financial Institutions	1.1	0.7	0.4	1.0	-0.5	-0.4	-2.0	22.5	19.4	-3.3	3.2
Bilateral creditors	5.5	1.6	7.3	4.0	7.7	3.0	-1.3	5.7	6.3	9.0	5.4
Resident lending/other, net[2]	-8.3	3.9	2.6	-21.0	-23.6	-34.3	-31.9	-31.3	-15.1	-13.5	-9.9
Reserves (- = increase)	-6.5	-9.8	-19.3	-19.9	-4.6	-14.1	-16.9	30.7	-41.3	-43.6	-25.5

1. Indonesia, Malaysia, Philippines, South Korea and Thailand.
2. Including net lending, monetary gold, and errors and omissions.

Source : "Capital flows to Emerging Market Economies", September 25, 1999, Institute of International Finance (IIF).

ANNEX:

BANK-BASED AND STOCK MARKET-BASED FINANCIAL SYSTEMS AND ECONOMIC DEVELOPMENT

132.   Demirguc-Kunt and Levine (1999) and LLSV (1997, 1998) provide various indicators of financial systems and related legal aspects for a large number of countries. This annex, using their data, but, focusing especially on OECD Member countries and some selected Asian countries (India, Indonesia, Hong Kong, Malaysia, the Philippines, Singapore, Thailand), considers how financial systems, legal origin and economic development are interconnected and shows how these countries can be classified into two financial systems, bank based and stock market based systems.

1.   Legal origins

133.   The relationships between investors' rights and legal origins in OECD countries are broadly in agreement with the results of LLSV (1998) including non-OECD countries. The quality of shareholder and credit rights are lowest in French-origin OECD countries and that of shareholder rights are highest in English-origin OECD countries (Tables A1 and A2). However, For credit rights, German-origin OECD countries have higher scores than English-origin OECD ones. The quality of shareholder and creditor rights is very much higher in English-origin Asian countries.

134.   On average, legal enforcement (*e.g.* rule of law, risk of contract repudiation) is weaker in French-origin countries among OECD countries, but these indexes seem to be much more related to the level of economic development (GDP per capita) rather than to legal origin (Tables A1 and A2). Scandinavian countries enjoy particularly high scores. Accounting standards are highest in English-origin OECD, some Scandinavian-origin OECD (Finland, Norway and Sweden) and some English-origin Asian countries (Hong-Kong, Malaysia and Singapore) (Table A2).

2.   Bank-based vs. stock market-based systems

135.   Among OECD countries, the relative size of stock markets (the ratio of market capitalisation to GDP) is highest in English-origin ones (Tables A1 and A3). This result is also consistent with that of LLSV (1997) including a sample of non-OECD countries. The Netherlands, Japan, Switzerland and Sweden have an exceptionally large size of stock market in their own legal group. Within each legal group, the relative size of stock markets appears to be related to economic development, but three English-origin Asian countries (Hong-Kong, Malaysia and Singapore) have a significantly large relative size of stock market.

136.   Within the exception of Korea, German-origin OECD countries have the highest relative size of banking system (in terms of domestic assets of deposit money banks) (Tables A1 and A3). The within-group relationship between the relative size of banking sector and economic development is not very strong.

137.   One measure of the importance of stock markets relative to banking system is the ratio of market capitalisation to domestic assets of deposit money banks (Demirguc-Kunt and Levine (1999), Table A3). English-origin countries have the highest level of this ratio. In particular, among English-origin OECD countries, the relative importance of stock markets is strongly correlated with the level of economic development. French, German and Scandinavian-origin countries tend to have the lowest ratios, but with important exceptions: Mexico, the Netherlands, Turkey and the Philippines (French-origin), Japan, Korea, Switzerland (German-origin), Denmark, Sweden (Scandinavian origin).

138.   Thus, the origin of the legal system appears to be related to the relative importance of stock markets among the more advanced OECD countries. However, non-European, less-developed OECD countries and some Asian countries, have a much larger size of stock markets than is predicted by their level of economic development, reflecting financial liberalisation at an earlier stage of their development. In some countries (India, Indonesia, Malaysia, Mexico, Philippines, and Thailand), an abnormally rapid development of their stock markets could be a good predictor of financial crises (Table A3).

139.   Another measure of stock markets is the trading value of stock markets relative to that of banking system [Demirguc-Kunt and Levine (1999), Table A3]. The pattern is very similar to that of the first indicator, but the United States, Korea, and Turkey have significantly high scores in terms of this indicator.

140.   Other important indicators of stock market development are the number of listed companies (stock data, Table A3) and initial public offerings [flow data (Table A3), LLSV (1997)]. On average, English-origin OECD countries and three English-origin Asian countries (Hong-Kong, Malaysia and Singapore) enjoy high numbers of listed firms and IPOs. On the other hand, French-origin and German-origin countries have very low levels of these indicators.

3.   Classification of OECD and some Asian countries into two financial systems

141.   Based on the above analysis, these countries can be classified into different financial systems. The outcome of a partition is dependent on a classification standard. This annex adopts a more discretionary approach, considering different standards in well-balanced way. In practice, the group of the stock market-based system (the bank-based system) includes only countries that can not be classified into the bank-based system (the stock market system) by any classification standards mentioned above. If a country can be grouped in the stock market or bank based system, depending on classification criteria, it is included in the intermediate system.

  – 1) *Stock market-based system*

     The United States, United Kingdom, Canada, and, Australia (English-origin OECD countries)

     Mexico, Turkey (French-origin OECD countries)

     Hong-Kong, Malaysia and Singapore (English-origin Asian countries)

  – 2) *Bank-based system*

     Belgium, France, Greece, Italy, Portugal, Spain (French-origin OECD countries)

     Austria, Germany (German-origin OECD countries)

     Finland, Norway (Scandinavian-origin OECD countries)

India (English-origin Asian countries)

Indonesia (French-origin Asian countries)

- 3) *Intermediate system*

  The following countries might be classified into bank based or stock market based systems depending on the definition.[25]

  Ireland, New Zealand (English-origin OECD countries)

  Thailand (English-origin Asian countries)

  The Netherlands (French-origin OECD countries)

  Japan, Korea, and Switzerland (German-origin OECD countries)

  Denmark, Sweden (Scandinavian-origin OECD countries)

  Philippines (French-origin Asian countries)

142.   Ireland and New Zealand, which are relatively less developed countries in terms of GDP per capita, are heading for a more fully developed stock market based system. Denmark, Japan, The Netherlands, Sweden Switzerland, have been in a transitional process to moving from a fully developed bank-based system toward a more stock market oriented system. Korea and Thailand are basically classified as having a bank based system, but with rapidly liberalising financial markets.

4.   Concluding remarks

143.   Legal origin might be an important factor influencing the importance of stock markets relative to the banking system. However, too great an emphasis on legal origin might be misleading.

- Among OECD countries, the French-origin group has the lowest legal quality (shareholder and creditor rights, law enforcement, and accounting standards) on average, in part related to its lower average level of GDP per capita (Tables A1 and A3). English-origin countries have the highest scores on shareholder rights, while German-origin countries have higher quality of creditor rights and Scandinavian-origin countries enjoy particularly high scores on law enforcement and accounting standards.

- Historical analysis gives a quite different picture of financial systems in OECD countries before World War I (Rajan and Zingales (1999*b*). In 1913, the United Kingdom (4.29), Japan (2.56), and Germany (1.93) had highest estimated ratio of market capitalisation to GDP. At that time, however, the United States had a relatively low ratio (0.69). The market capitalisation ratio in these OECD countries declined during World War I and II and started

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1.   Demirguc-Kunt and Levine (1999) classify these countries into bank based or stock market based systems by using a composite index constructed by two indicators showing the relative importance of stock markets to banking system mentioned above. According to their composite index, Japan, Ireland, New Zealand have "bank-based system", while Denmark, Korea, The Netherlands, Sweden, Switzerland, Philippines and Thailand have a "market based system".

increasing after World War II. However, the ratio has not regained the pre-war level except for the United States.[26]

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2. Rajan and Zingales (1999 b) stress the role of political interference in markets during war times (*e.g.* anti-market forces, centralised and co-ordinated decision process for national security) in Civil law countries. They argue that Civil Law with the centralisation of legal system is more vulnerable to political pressures than Common Law with the decentralisation of legal system.

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Table A1. Legal quality, financial system and the level of economic development in OECD and non-OECD countries

	Shareholder rights[1]	Creditor rights[2]	Rule of Law[3] (1982-95)	Accounting standards[4] (1990)	Market capitalisation / GDP (1990-95)	Domestic assets of money deposit banking / GDP (1990-95)	GNP per capita (thousands $, 1994)
English-origin average	4.0	3.1	6.5	70	0.71	0.65	9.4
OECD average[5]	4.5	1.8	9.4	74	0.66	0.76	17.6
Non-OECD average[6]	3.8	3.8	5.0	67	0.73	0.60	5.2
French-origin average	2.3	1.6	6.0	51	0.27	0.51	7.1
OECD average[7]	2.0	1.3	7.8	58	0.29	0.74	13.5
Non-OECD average[8]	2.6	1.8	4.7	33	0.26	0.34	2.3
German-origin average	2.3	2.3	8.7	63	0.43	1.22	22.1
OECD average[9]	2.2	2.4	8.7	62	0.43	1.22	24.4
Non-OECD (Taiwan)	3.0	2.0	8.5	65	n.a.	na	10.4
Scandinavian-origin average[10]	3.0	2.0	10.0	74	0.38	0.63	24.2

1. Shareholder rights: An index aggregating shareholder rights. The index is formed by adding 1 when:

1. the country allows shareholders to mail their proxy vote;
2. shareholders are not required to deposit their shares prior to the General Shareholders' Meeting;
3. cumulative voting is allowed;
4. an oppressed minorities mechanism is in place; or
5. when the minimum percentage of share capital that entitles a shareholder to call for an Extraordinary Shareholders' Meeting Meeting is less than or equal to 10 per cent (the same median). The index ranges from 0 to 5.

2. Creditor rights: An index aggregating creditor rights. The index is formed by adding 1 when:

1. the country imposes restrictions, such as creditors' consent or minimum dividends, to file for reorganisation;
2. secured creditors are able to gain possession of their security once the reorganisation petition has been approved (no automatic stay);
3. the debtor does not retain the administration of its property pending the resolution of the reorganisation;
4. secured creditors are ranked first in the distribution of proceeds that result from the disposition of the assets of a bankrupt firm. The index ranges from 0 to 4.

3. Rule of law: Assessment of the law and order tradition in a country (International Country Risk, ICR)
The index ranges from 0 to 10, with higher scores for more tradition for law and order.

4. Accounting standards: Index created by examining and rating companies' annual reports (1990) on their inclusion or omission of 90 items.
The index ranges from 0 to 90.

5. English-origin OECD countries: Australia, Canada, Ireland, New Zealand, United Kingdom and United States

6. English-origin non-OECD countries: Hong Kong, India, Israel, Kenya, Malaysia, Nigeria, Pakistan, Singapore, South Africa, Sri Lanka, Thailand, Zimbabwe

7. French-origin OECD countries: Belgium, France, Greece, Italy, Mexico, Netherlands, Portugal, Spain, and Turkey

8. French-origin non-OECD countries: Argentina, Brazil, Chile, Columbia, Ecuador, Egypt, Indonesia, Jordan, Peru, Philippines, Uruguay, and Venezuela

9. German-origin OECD countries: Austria, Germany, Japan, South Korea, and Switzerland

10. Scandinavian-origin countries: Denmark, Finland, Norway, and Sweden

Source : LLSV (1998), Demirguc-Kunt and Levine (1999).

Table A2. Law and finance in OECD and selected Asian countries

	Shareholder rights	Creditor rights	Rule of law (1982 - 1995)	Risk of contract repudiation[1] (1982-95)	Accounting standards (1990)	GDP per capita (thousands $, 1990-95)
1. OECD						
English Origin						
Australia	4	1	10.00	8.71	75	14.3
Canada	4	1	10.00	8.96	74	17.3
Ireland	3	1	7.80	8.96	n.a.	9.0
New Zealand	4	3	10.00	9.29	70	9.5
United Kingdom	4	4	8.57	9.63	78	11.8
United States	5	1	10.00	9.00	71	19.4
Average	**4.0**	**1.8**	**9.40**	**9.09**	**74**	**13.6**
French Origin						
Belgium	0	2	10.00	9.48	61	14.5
France	2	0	8.98	9.19	69	15.2
Greece	1	1	6.18	6.62	55	6.6
Italy	0	2	8.33	9.17	62	11.5
Mexico	0	0	5.35	6.55	60	3.0
Netherlands	2	2	10.00	9.35	64	14.0
Portugal	2	1	8.68	8.57	36	4.8
Spain	2	2	7.80	8.40	64	7.3
Turkey	2	2	5.18	5.95	51	2.3
Average	**1.2**	**1.3**	**7.83**	**8.14**	**58**	**8.8**
German Origin						
Austria	2	3	10.00	9.60	54	13.2
Germany	1	3	9.23	9.77	62	16.6
Japan	3	2	8.98	9.69	65	15.7
Korea	2	3	5.35	8.59	62	3.9
Switzerland	1	1	10.00	9.98	68	19.5
Average	**1.8**	**2.4**	**8.71**	**9.53**	**62**	**13.8**
Scandinavian Origin						
Denmark	3	3	10.00	9.31	62	17.0
Finland	2	1	10.00	9.15	77	15.9
Norway	3	2	10.00	9.71	74	20.1
Sweden	2	2	10.00	9.58	83	19.0
Average	**2.5**	**2.0**	**10.00**	**9.44**	**74**	**18.0**
2. Asia						
English Origin						
India	2	4	4.17	6.11	57	0.4
Hong Kong	4	4	8.22	8.82	69	10.5
Malaysia	3	4	6.78	7.43	76	2.6
Singapore	3	3	8.57	8.86	78	11.2
Thailand	3	3	6.25	7.57	64	1.5
Average	**3.0**	**3.6**	**6.80**	**7.76**	**69**	**5.2**
French Origin						
Indonesia	2	4	3.98	6.09	n.a.	0.6
Phillipines	4	0	2.73	4.80	65	0.7
Average	**3.0**	**2.0**	**3.36**	**5.45**	**65**	**0.7**

1. Repudiation of contracts by government.

ICR's assessment of the risk of a modification in a contract taking the form of a repudiation, postponement, or scaling down. The index ranges from 0 to 10, with higher scores for lower risks.

Source: LLSV (1998).

Table A3. Financial development in OECD and selected Asian countries

	Market capitalization / GDP (= M) (1990-95)	Domestic assets of deposit money banks / GDP (= B) (1990-95)	The importance of stock markets relative to the banking system (= M/B)	Stock market orientation relative to economic development [= (M/B)/(GDP per capita/1000)]	The value of the trades of domestic equities on domestic exchages / Claims of deposit money banks on private sector (1990-95)	Domestic listed firms / Population (millions) (1994)	The number of IPOs / Population (millions) (1995-96)	GDP per capita (thousands $, 1990-95)
1. OECD								
English Origin								
Australia	0.71	0.77	0.93	0.06	0.48	63.6	n.a.	14.3
Canada	0.59	0.66	0.90	0.05	0.52	40.9	4.9	17.3
Ireland	0.26	0.36	0.73	0.08	0.48	20.0	0.8	9.0
New Zealand	0.49	0.85	0.58	0.06	0.18	69.0	0.7	9.5
United Kingdom	1.13	1.16	0.97	0.08	0.48	35.7	2.0	11.8
United States	0.80	0.73	1.09	0.06	0.96	30.1	3.1	19.4
Average	**0.66**	**0.76**	**0.87**	**0.07**	**0.52**	**43.2**	**2.3**	**13.6**
French Origin								
Belgium	0.36	1.18	0.30	0.02	0.09	15.5	0.3	14.5
France	0.33	1.02	0.32	0.02	0.19	8.1	0.2	15.2
Greece	0.15	0.41	0.36	0.05	0.32	21.6	0.3	6.6
Italy	0.17	0.74	0.22	0.02	0.15	3.9	0.3	11.5
Mexico	0.32	0.24	1.32	0.45	0.58	2.3	0.0	3.0
Netherlands	0.69	1.12	0.61	0.04	0.47	21.1	0.7	14.0
Portugal	0.13	0.79	0.17	0.04	0.09	19.5	0.5	4.8
Spain	0.30	0.96	0.31	0.04	0.34	9.7	0.1	7.3
Turkey	0.14	0.19	0.74	0.33	1.18	2.9	0.1	2.3
Average	**0.29**	**0.74**	**0.48**	**0.11**	**0.38**	**11.6**	**0.3**	**8.8**
German Origin								
Austria	0.12	1.26	0.10	0.01	0.08	13.9	0.3	13.2
Germany	0.24	1.21	0.20	0.01	0.29	5.1	0.1	16.6
Japan	0.79	1.31	0.60	0.04	0.24	17.8	0.3	15.7
Korea	0.37	0.55	0.68	0.17	0.82	15.9	0.0	3.9
Switzerland	0.98	1.77	0.55	0.03	0.46	33.9	n.a.	19.5
Average	**0.50**	**1.22**	**0.43**	**0.05**	**0.38**	**17.3**	**0.2**	**13.8**
Scandinavian Origin								
Denmark	0.34	0.48	0.72	0.04	0.42	50.4	1.8	17.0
Finland	0.29	0.80	0.37	0.02	0.15	13.0	0.6	15.9
Norway	0.26	0.69	0.37	0.02	0.25	33.0	4.5	20.1
Sweden	0.62	0.54	1.16	0.06	0.72	12.7	1.7	19.0
Average	**0.38**	**0.63**	**0.66**	**0.04**	**0.39**	**27.3**	**2.1**	**18.0**
2. Asia								
English Origin								
India	0.28	0.34	0.81	2.10	n.a.	7.8	1.2	0.4
Hong Kong	1.96	1.49	1.32	0.13	0.76	88.2	5.2	10.5
Malaysia	2.01	0.82	2.47	0.94	1.52	25.2	2.9	2.6
Singapore	1.37	0.95	1.43	0.13	0.85	80.0	5.7	11.2
Thailand	0.57	0.82	0.69	0.46	0.51	6.7	0.6	1.5
Average	**1.24**	**0.88**	**1.34**	**0.75**	**0.91**	**41.6**	**3.1**	**5.2**
French Origin								
Indonesia	0.18	0.49	0.37	0.61	0.17	1.2	0.1	0.6
Phillipines	0.52	0.37	1.40	1.91	0.54	2.9	0.3	0.7
Average	**0.35**	**0.43**	**0.89**	**1.26**	**0.36**	**2.0**	**0.2**	**0.7**

Source : Demirguc-Kunt and Levine (1999), LLSV (1997).

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