# FINANCIAL LIBERALIZATION, FINANCIAL DEVELOPMENT AND ECONOMIC GROWTH IN LDCs

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**Abstract:** The objective of this paper is to survey what is actually known about the finance–growth relationship based on theory and empirical work. We point out that traditional theoretical models linking financial development and economic growth do not pay sufficient attention to insights emerging from modern information economics. Markets with asymmetric information are not in general constrained Pareto efficient; and increased banking sector competition, following financial liberalization, will not necessarily induce efficient financial intermediation. Increased competition is likely to erode franchise values, which may, in turn, generate an unstable banking environment where gambling behaviour on the part of the banks is prevalent. Increased competition can also discourage relationship-banking, and it disturbs what may actually be a constrained efficient mode of contracting in a dynamic setting characterized by asymmetric information. We argue that these problems are further aggravated by the massive task of building an appropriate institutional and regulatory framework designed to effectively curb imprudent bank behaviour. Turning to the empirical evidence, it is shown that the alledged first-order effect whereby financial development causes growth is not adequately supported by econometric work. The empirical evidence on the finance–growth nexus does not yield any clear-cut picture. By way of conclusion, we question whether financial development, in the sense of increased formal financial sector intermediation in a deregulated environment can be expected to act as 'engine of growth' in the development process; and we argue in favour of a more cautious approach to financial sector reform. Copyright © 2003 John Wiley & Sons, Ltd.

## 1   INTRODUCTION

In a recent Policy Arena of the *JID*, Kirkpatrick and Green (2002) emphasize that there has been a long standing interest among development analysts and practitioners in the potential contribution that finance can make to the development process. They also refer to the recent finance and development research programme funded by the UK Department

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for International Development (DFID).[1] This surge of interest in financial sector liberalization and development is well justified. From the 1950s onwards, conventional policy advice held that governments in developing countries should actively promote development through massive interventions in the financial sector. By the early 1970s, this policy of socalled financial repression came under severe criticism. McKinnon (1973) and Shaw (1973) argued strongly in favour of liberalizing the financial system. Nevertheless, the actual experience with such reforms during the past two decades has been somewhat disappointing. On this background, Kirckpatrick and Green make the pertinent point that weak financial regulation, often as a consequence of over-hasty financial liberalization, has contributed directly to economic instability and decline.

As an illustration hereof, consider, first, the banking crises in Argentina and Chile in the early 1980s. They are estimated to have caused losses in the order of 20–55 and 13–42 per cent of GDP, respectively.[2] Moreover, in both cases losses appear to have been closer to the upper end of these ranges (Caprio and Klingebiel, 1996). Second, the cost of bailing out Venezuelan banks in the early 1990s is estimated to have reached 16 per cent of GDP, and the restructuring following the 'Tequila Crisis' in Mexico in 1994 probably amounted to around 12 per cent of GDP. Third, the recent Asian crisis implied bailouts for Thailand, Indonesia, and Korea in the order of 20–50 per cent of GDP (Calomiris, 1999). Finally, Caprio and Honohan (1999) report that the average cost of 59 banking crashes in developing countries during the period 1976–96 was 9 per cent of GDP.[3]

The crises in the Southern Cone, Mexico, and the Asian region are all examples of what Kaminsky and Reinhart (1999) refer to as twin crises, i.e. crises with banking and currency problems, occurring in the wake of financial liberalization. Kaminsky and Reinhart also estimate that the probability of a banking crisis beginning, conditional on financial liberalization, is higher than the unconditional probability. This certainly suggests that twin crises have something to do with deregulation of the financial sector. The Kaminsky–Reinhart findings are supported by econometric work by Demirgüz-Kunt and Detragiache (1998). They find that financial liberalization is a significant factor leading to banking sector fragility, and this effect is at work even after controlling for the state of the economy. These authors also test whether the effect of financial liberalization on banking sector fragility tends to be a transitional effect, i.e. whether it is noticeable only in the years immediately after the onset of the liberalization. This is not the case. Banking sector fragility emerges only over time.

In any case, financial liberalization remains a core element of policy reform in developing countries.[4] Among some analysts, this reflects an overall belief in the virtues

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[1]The Finance and Development Research Programme (FDRP) was managed by the Institute for Development Policy and Management (IDMP) at the University of Manchester. It included a consortium of UK research groups at the Universities of Manchester, Birmingham, Loughborough, Oxford, Bath, Sheffield, and at WIDER, Helsinki, in partnership with research groups in Sub-Saharan Africa and South Asia. Reference can also be made to a Policy Symposium in the Development Policy Review edited by Brownbridge and Kirckpatrick, 2002.

[2]If a bailout requires the government to issue new debt equal to 30 per cent of GDP, and if the interest rate is 10 per cent indefinitely, the continuing cost to the country of the bailout is 3 per cent of GDP (Cole and Slade, 1998).

[3]See Goodhart *et al.* (1986, p. 31) for a summary of the impact of bank unsoundness on the real sector in a sample of countries.

[4]Mishkin states: 'The dangers of financial liberalization do not mean that countries should not pursue a liberalization strategy. On the contrary, financial liberalization is critical to the efficient functioning of financial markets so that they can channel funds to those with the most productive investment opportunities' (1999, p. 1531). He does, however, acknowledge that liberalization has to be managed carefully, and that it is imperative that the proper bank regulatory and supervisory structures are in place before liberalization is attempted. A broadly similar view is expressed in chapter 4 of the *World Development Report*, 2002.

of free markets. More importantly, there is a widespread perception based on a fairly large body of scholarly work that financial liberalization promotes financial development, and that subsequently this deepening of the financial system stimulates economic growth. For instance, in his survey of the finance–growth nexus, Levine states: 'Although conclusions must be stated hesitantly and with ample qualifications, the preponderance of theoretical reasoning and empirical evidence suggests a positive, *first-order relationship* between financial development and economic growth' (1997, p. 688, italics added).

The objective of this paper is to survey what can in reality be said with confidence about the finance–growth relationship. In Sections 2–4, we therefore provide an overview of traditional theoretical models linking financial development and economic growth. We put these in the perspective of modern economic theory, including financial endogenous growth models and insights that have emerged from information economics. In Section 5, we summarize the implications of inappropriate institutional and regulatory structures, and Section 6 provides a critical assessment of existing empirical evidence.[5] Section 7 concludes, and we argue that a more cautious approach to financial sector reform seems pertinent.

## 2   THE McKINNON–SHAW HYPOTHESIS

Many of the theoretical arguments in favour of financial liberalization originate, as already alluded to, in the work of McKinnon (1973) and Shaw (1973).[6] The McKinnon–Shaw (MS) model challenges the policy of financial repression, including the ceilings on interest rates, high reserve requirements, administrative credit allocation, and other government induced distortions, which were so prevalent in developing countries during the 1960s and 1970s.

In particular, the MS-model puts focus on the negative effects of ceilings on deposit and loan rates. The basic argument is that financial repression in the guise of a ceiling on nominal interest rates will stall financial deepening and thereby economic growth. An interest rate ceiling, leading to low or negative real interest rates, essentially has two negative effects. First, it reduces savings and hence the amount of loanable funds intermediated through the formal financial system. Second, low real interest rates influence the marginal productivity of capital. Bankers have no incentive to ration credit according to marginal productivity considerations. Instead, they ration according to their own discretion, which in turn thwarts the efficient allocation of investible funds. High reserve requirements and directed credit programmes further intensify these detrimental effects.

In sum, the MS model considers financial repression to be a disequilibrium phenomenon, which prevents markets from clearing and serving their allocative function in an optimal way. The policy implications are straight-forward: liberalize the financial system,

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[5]Focus is restricted to banks as these institutions are the central players in the process of saving-investment intermediation in developing countries (Fry, 1997; World Bank, 2002). The reason is that the information that a bank gathers is private: it is obtained through specific relationships with individual borrowers, and it depends to a lesser extent on complementary institutions, such as accounting standards. By contrast, equity markets require strong complementary institutions: e.g. good public information and accounting systems, strong protection of minority shareholders, etc.

[6]A survey of the early literature is available in Fry (1995).

i.e. remove government induced distortions, and allow the market mechanism to determine the allocation of credit.[7]

## 3   FINANCIAL ENDOGENOUS-GROWTH MODELS

In recent years, a second generation of models addressing some of the weaknesses of the MS-model has emerged, in particular the lack of explicit modelling of the link between financial and real sector variables. The main features of these socalled financial endogenous-growth (FEG) models are the incorporation of endogenous financial structures as well as endogenous growth. By introducing a stochastic environment, FEG models can show how utility maximizing agents choose to form Pareto-improving financial-intermediary structures. Moreover, by assuming the presence of some sort of externality leading to endogenous growth, FEG-models provide a bridge from financial development to long-run economic growth.[8]

FEG models have mainly focused on the allocative role of the financial system.[9] One reason is that financial development may lead to a decrease in overall savings. The reduction in income uncertainty associated with financial development could reduce precautionary savings, and a higher real interest rate tends to depress savings via the income effect (Pagano, 1993; Levine, 1997).[10]

The main channel through which the financial system affects economic growth is normally identified as the provision of some sort of risk-sharing device.[11] For instance, relying on the seminal work of Diamond and Dybvig (1983), Bencivenga and Smith (1991) show how banks enable the economy to reduce the fraction of savings held in the form of unproductive liquid assets. In this way, banks improve on the composition of savings, which in turn affects the equilibrium growth rate.

Saint-Paul (1992) takes a related route by arguing that a developed financial system allows increased specialization in production through diversification of demand risks. A small household-enterprise producing a simple good using general-purpose tools is better suited to sudden changes in the composition of demand. So in the absence of a financial system which offers risk sharing, productive units prefer to hedge risk through their choice of a less specialized technology. Productivity remains low and economic growth is impaired.[12]

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[7]Accordingly, policy measures have included the removal or easening of interest rate ceilings and reserve requirements. Similarly, entry barriers have been lowered, and foreign banks allowed in. Government interference in credit allocation has been scaled down, and banks and insurance companies have been privatised on a grand scale. Sometimes stock markets have been promoted.

[8]Because the MS-model is implicitly couched in the neoclassical growth model, an improved financial structure relates only to levels and transitional growth rates; not to steady-state growth rates. The latter are determined by exogenous technological progress. Thus, the early literature was, strictly speaking, not able to provide a satisfactory account of the relationship between financial development and long-run economic growth.

[9]Levine (1997) stresses two channels through which the financial system can affect growth: capital accumulation and the rate of technological innovation. Capital accumulation is affected either by influencing the rate of capital formation or by reallocating capital among competing uses. In the present paper, focus is on models emphasizing the reallocation aspect.

[10]Financial savings tend to be more sensitive to interest changes than national savings. Moreover, financial savings depend on non-price factors such as the infrastructure for deposit mobilization, e.g. the bank branching network, which improves with financial development (Hellmann et al., 1997).

[11]A comprehensive survey of the theoretical and empirical literature on the finance–growth nexus is available in Levine (1997). Other surveys are Pagano (1993) and Berthélemy and Varoudakis (1996).

[12]Although focus in the Saint-Paul model is on capital markets, the results carry over to the case of banks in a straightforward manner.

Greenwood and Jovanovic (1990) develop a model in which each agent is entitled to operate either one or both of two production technologies. Technology 1 offers a safe return, whereas technology 2 is risky. It is assumed that the *ex ante* return to the risky technology is higher, and that agents only observe the composite shock to their own project, not the underlying project-specific and systemic components hereof. Since the idiosyncratic (project-specific) shock is assumed to have zero mean, there is scope for a financial intermediary making inferences about the systemic component. A financial coalition is costly to establish. There is a constant once-and-for-all lump-sum cost associated with incorporating each agent into the financial coalition and a cost associated with running the financial coalition. If these costs are not too high, some agent could potentially take on the role of financial intermediary. In exchange for a once-and-for-all fee plus the right to operate member projects, this agent can offer a contingent return per unit of capital invested into the coalition and can also absorb running costs. The intermediary-agent solves his period-by-period allocation problem between high-risk and low-risk projects by statistical inference based on a sample of high-risk projects.[13] In this manner, uncertainty is resolved and resources are allocated to the *ex post* highest-return technology, and the competitive equilibrium in the model is Pareto optimal.[14]

## 4  ASYMMETRIC INFORMATION

In comparison to the MS model, FEG models represent a methodological progression. However, to ensure tractability, FEG models are also couched in an environment of perfect competition, and the information structure assumed usually does not admit incentive conflicts. This is problematic. When the information structure is complicated by asymmetric information, the simple first-order link between financial development and economic growth is disturbed. This is a corollary of the Arrow–Debreu–Radner model. With symmetric information, the decentralized price system leads to an efficient allocation of scarce resources; but in the presence of asymmetric information, decentralization though the price system will not, in general, result in a constrained Pareto optimum (see Stiglitz, 2000).[15]

In the context of credit markets, asymmetric information is usually associated with equilibrium credit rationing in the terminology of Stiglitz and Weiss (1981),[16] where the credit rationing problem is intimately related to the structure of the debt contract. In the standard case, entrepreneurs receive the entire upside gain in states of success, whereas

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[13]There is a continuum of projects, and since test projects only form a countable set, they have measure zero. Consequently, besides serving an important information role, test projects have a negligible impact on the amount of profits earned.

[14]By allowing for agent heterogeneity (assuming that the initial endowment of agents varies), the Greenwood-Jovanovic model recognizes interesting dynamic features. In particular, not all agents will find it profitable to enter the coalition at time *t*. Only agents with a capital endowment exceeding some threshold value will choose to enter, and no member will ever leave the coalition. As the level of wealth in the economy increases, more agents join the coalition. In maturity, the economy will have a fully developed financial sector and the rate of growth will be higher than in its infancy. Hence, the model includes a two-way causal relationship between financial development and growth.

[15]A constrained Pareto-inefficient equilibrium refers to a situation where the equilibrium outcome is inefficient, even after taking account of the cost of information. In a constrained Pareto-inefficient equilibrium, there is scope for a Pareto improvement through some sort of government intervention.

[16]Jaffee and Stiglitz (1990) use the term pure credit rationing. This refers to a situation where banks deny loans to agents who cannot be distinguished by observation from those who receive loans.

downside risk is limited to loss of collateral. Hence, the expected return of the entrepreneurs may increase as the riskiness of the project increases, whereas the expected return to the bank may decrease. As a result, the Walrasian interest rate could exceed the interest rate at which the bank maximizes expected returns from making the loan. In other words, the profit-maximizing strategy of a bank may entail credit rationing in competitive equilibrium. When high-risk, high-return projects are rationed, a directed-credit pro-gramme could potentially Pareto improve the outcome. That is, the competitive equili-brium in the Stiglitz–Weiss model is constrained Pareto inefficient.

The Stiglitz–Weiss credit-rationing result is a prominent example of an information-related market failure in a competitive setting,[17] but this argument is not theoretically robust. Bester (1985), for instance, offers a solution to the problem of credit rationing by allowing banks to compete, using both the interest rate and the collateral requirement simultaneously to screen borrowers. This is not allowed in the Stiglitz–Weiss model. More specifically, low-risk entrepreneurs exhibit a higher marginal rate of substitution between interest and collateral, and, as a result, they are inclined to accept a higher increase in collateral for a given reduction in the interest rate. Taking advantage of this, banks may use collateral to reveal the riskiness of borrowers. In a credit-rationing equilibrium, good and bad risks are pooled. This self-selection mechanism therefore ensures that a pooling equilibrium can always be upset by a contract that is profitable to the bank since it separates good and bad risks. Consequently, the only equilibrium in the model is a separating equilibrium without credit rationing.

Nevertheless, Hellwig (1987) shows that minor modifications of the game-theoretic specification can have major implications for the equilibrium of the Bester model.[18] Hellwig first considers a two-stage game in a model comparable to the Bester model, where the uninformed party (the bank) moves first and offers a credit contract to the entrepreneur. In the second stage, entrepreneurs choose among available offers. The only candidate for sequential equilibrium in pure strategies in this set-up is the separating equilibrium of Bester (1985). However, if the equilibrium in this first game is non-existent, then expanding the game with a third stage, where banks may reject stage-two applica-tions, leads to a pooling equilibrium, i.e. a credit-rationing equilibrium.[19] In this three-stage game, the optimal pooling contract cannot be upset by a separating contract.[20] Thus, the Stiglitz–Weiss credit-rationing argument may still hold notwithstanding the avail-ability of a screening device.[21]

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[17]Another interesting type of market failure is addressed in a model by Mankiw (1986). In this model, asymmetric information may lead to an inefficient, precarious market equilibrium in which small changes in the risk-free interest rate, or a small increase in the perception of the riskiness of the pool of borrowers, can cause large and inefficient changes in the allocation of credit. The model actually allows for the possibility of a fully collapsed credit market in which no loans are made. At any interest rate, the population of borrowers is too risky to give banks their required return. The Mankiw model is close in spirit to that of Stiglitz and Weiss (1981) in that it is adverse selection which is the crucial feature. Moreover, the equilibrium in the model is not constrained Pareto-efficient.

[18]This is not something unique to the Bester model, but relates to models of adverse selection with sorting devices in general. The conclusions reached in these models depend fundamentally on the nature of strategic interaction between the informed and the uninformed sides of the market.

[19]Existence of equilibrium depends, *inter alia*, on the proportion of high-risk types.

[20]Hellwig also considers a standard signalling game, where the informed party moves first. At stage 1, each entrepreneur announces the amount of collateral that he wants to put forward. At stage 2, banks announce the interest rate they require on loans with an announced collateral amount. Then at stage 3, entrepreneurs choose among the competing contracts. In this game, the sequential equilibrium is a separating equilibrium.

[21]On a more practical level, the scarcity of tangible collateral in developing countries is likely to enforce the relevance of the Stiglitz–Weiss argument.

Another interesting contribution is that of de Meza and Webb (1987). They construct a model of asymmetric information in which credit rationing is not possible. In contrast, overinvestment, relative to the socially efficient level, is a likely outcome. The crucial difference between the de Meza–Webb and the Stiglitz–Weiss models is that expected mean returns on projects differ in the former model, whereas they are constant in the latter.[22] A higher interest rate in the de Meza–Webb model does not attract bad projects as in the case of Stiglitz and Weiss. When expected mean returns are the same, as suggested by Stiglitz and Weiss, a more productive project with a higher return in success states is counterbalanced by a lower success probability in order to hold constant the expected mean return. As a result of the special payoff structure of the debt contract, a higher interest rate benefits high-risk projects because the bank bears the downside risk of default. This adverse selection feature on the pool of borrowers is not present in the de Meza–Webb framework. Consequently, it is not asymmetric information *per se* that drives the credit-rationing result of Stiglitz and Weiss.

The above might be taken as an indication that the credit rationing result is subject to a disquieting lack of theoretical robustness. However, building on Gale and Hellwig (1985), Williamson (1986, 1987) shows that equilibrium credit rationing need not rely on adverse selection or the adverse incentive effect as in the Stiglitz–Weiss model. Monitoring costs in a costly state-verification framework can do the job. Williamson assumes that the entrepreneur and the bank are informed asymmetrically ex post concerning the output (the state) of the project of the entrepreneur. The bank will have to pay a verification cost in order to check whether the output reported by the entrepreneur is correct. An increase in the interest rate increases the expected return to the bank, but it also causes an increase in the probability of default, thereby increasing the expected verification cost. Hence, when failure is costly to the bank, an increase in the loan interest rate may decrease the net return. It increases the probability of default, so equilibrium credit rationing is also possible in this framework.

The basic model of Williamson differs from the models of Stiglitz and Weiss (1981) and Bester (1985) in two important respects. First, the contractual arrangement, i.e. the standard debt contract with costly bankruptcy, is derived from first principles using the costly state-verification setting, so the debt contract is optimal.[23] Second, intermediaries arise endogenously in the model, so they emerge from first principles, as in the financial endogenous growth models, and are not assumed in an *ad hoc* fashion.[24] In the Stiglitz–Weiss–Bester framework, contracts are imposed exogenously and lending institutions are

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[22]In the de Meza–Webb model, project yields are characterized by a success state $R^s$ and a failure state $R^f$, where $R^s > R^f$. All projects yield the same return in both states, but success probabilities differ between the projects. In the Stiglitz–Weiss set-up, project differences are captured by the notion of a mean preserving spread. All projects have the same mean expected return, but the dispersion of returns differ.

[23]In a costly state-verification framework, the optimal contract is the standard debt contract (SDC). The SDC has three essential features. First, when the entrepreneur (debtor) is solvent, the SDC entails a fixed payment to the bank (creditor). Second, if the debtor cannot meet this fixed payment, he is declared bankrupt. Finally, in bankruptcy states the creditor recovers as much as he can. The optimality of the SDC derives from the fact that repaying as much as possible in default states allows the fixed payment in states of contract compliance to be minimized. This in turn minimizes the probability of bankruptcy, and hence verification costs.

[24]In Williamson, as in Diamond (1984), intermediaries arise to avoid duplication of monitoring effort. However, in Williamson (1987), the equilibrium outcome will be characterized by direct lending, i.e. one lender pairs with one entrepreneur. Hence, lending is not intermediated. This is, however, only a simplifying assumption. If instead, as in Williamson (1986), one entrepreneur requires funding from many lenders, then the equilibrium will be intermediated; and the credit rationing argument is essentially unaffected.

simply referred to as banks.[25] In other words, what Williamson has shown is that credit rationing is an inextricable part of the debt contract. It is a theoretical corollary obtained from deriving the debt contract from first principles. This is extremely important, since use of the debt contract is what can be actually observed in poor developing countries.

Asymmetric information may encourage relationship banking, i.e. repeated contracting, where banks invest in obtaining customer-specific information, often proprietary in nature (see Boot, 2000, for a discussion). Relationship lending leaves room for flexibility and some discretion in contracts. In this manner, relationship banking essentially allows the utilization of subtle, noncontractable information and thereby greatly expands the set of feasible contracts. Banking competition may affect relationship banking negatively since competition will tempt borrowers to switch to other banks. When banks anticipate a shorter expected lifespan of their relationships, they may reduce relationship-specific investments. Clearly, shorter anticipated relationships inhibit the use of acquired information, and this limits the set of feasible contracts. A complementary negative effect of increased bank competition on relationship banking is that competition diminishes the ability of borrowers and lenders to share surpluses intertemporally. It becomes more difficult for banks to subsidize new borrowers in earlier periods in return for a share of the rents in future periods. Petersen and Rajan (1995) put forward a formal model of this sort of relationship lending, and they provide empirical evidence to the effect that more young firms receive credit in a concentrated market as compared to a competitive market.

In sum, introducing asymmetric information into the analysis of bank behaviour complicates the link between the financial sector and economic growth considerably. Indeed, in the presence of equilibrium inefficiency caused by information asymmetries, removing government-induced distortions and increasing banking competition does not yield a constrained Pareto efficient outcome.

## 5　BANK REGULATION

One of the major functions of banks is the transformation of illiquid assets into liquid claims. As shown in the model by Diamond and Dybvig (1983), such asset transformation is closely related to bank runs. A bank run is possible as soon as the liquidation value of the loan portfolio is less than the value of the liquid deposits. Bank runs do not require that losses in the value of underlying assets occur. A run may simply take place because the cost of liquidating assets makes this a self-fulfilling expectation. In other words, bank runs can be the consequence of rational behaviour, and they may even hit healthy banks. The lack of information among depositors about bank portfolios may create systemic runs on solvent banks as bank solvency is partly unobservable to outsiders. The costs of unwarranted runs on the banking system include declines in bank asset values, disruption in production processes and the payment system, and possibly unwarranted bank closures (Calomiris, 1999).[26]

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[25]In fact, de Meza and Webb (1987) show in the Stiglitz–Weiss setting that the equity contract is preferred to the debt contract when there is no moral hazard. However, stock markets require a very complex institutional underpinning unlikely to be present in the majority of developing countries. Stock markets are for this reason thin and underdeveloped in most emerging markets (Fry, 1997), so the Stiglitz–Weiss analysis remains valid in a developing country setting.

[26]The systemic dimension of banking distress enters since the social costs of distress, e.g. contagious effects, easily exceed the private costs to shareholders, managers, etc. (Goodhart *et al.*, 1998). When making their optimal risk-return portfolio choices, banks do not take into account the potential costs of contagion.

To eliminate the bank-run equilibrium, banking theory makes a case for a deposit insurance scheme. However, a potential incentive problem looms in the background as in any type of insurance. If banks are allowed to make unobservable project choices after receiving deposits, asset-substitution moral hazard exists (Bhattacharya *et al.*, 1998; Diamond and Dybvig, 1986). In such a setting, the bank has an incentive to invest in riskier projects. Doing so results in an *ex post* wealth transfer from depositors to bank share-holders since the deposit is, in fact, a debt contract. Market discipline partly deters banks from choosing excessive risk, but the deposit insurance tends to reduce incentives for information acquisition and control by depositors, and thus weakens market discipline.[27] In addition, there may also be an adverse selection problem at play as noted by Mishkin (1996). Those most likely to produce the outcome insured against (the bank run) are exactly those who want to misuse the deposit insurance. As depositors fail to impose market discipline in the presence of a government safety net, risk-loving entrepreneurs find the banking industry all the more attractive. Finally, deposit insurance may induce banks to hold a lower level of liquid reserves (Bhattacharya *et al.*, 1998), so regulatory restrictions aimed at reducing risk taking are necessary.

In order to address these information related problems, banking regulation principles, which have worked reasonably well in developed countries, have been widely adopted by LDCs (Brownbridge and Kirkpatrick, 2000). These principles, which are referred to as the industrial country model of bank regulation (based on the Basle Core Principles), focus on the requirement that banks should maintain a minimum level of capital in relation to its risk-weighted assets. The idea is to create a capital buffer that forces bank stockholders to bear the consequences of risky choices. This is supported by a supervisory procedure, including on-site inspections of banks as well as regular monitoring of financial reports (Caprio and Honohan, 1999).[28] Yet, as shown in the model of Hellmann, Murdock and Stiglitz (2000), the capital adequacy standards approach overlooks an important but subtle point. Increasing capital requirements will lower the franchise value of the banks.[29]

The point of departure in the Hellmann, Murdock, and Stiglitz model is a bank that operates during a number of periods. In each period, the bank offers an interest rate on deposits in competition with other banks. After deposits have been raised, banks can choose between a prudent (safe) and a gambling (risky) asset. The prudent asset has a higher expected return, so from the viewpoint of social efficiency, the prudent asset should always be preferred. Yet, gambling will earn the bank a higher private return, if successful. If the gamble yields a bad outcome, the regulator closes the bank. Clearly, banks choose to invest in the prudent asset as long as the expected return from the prudent strategy is higher than the expected return from the gambling strategy. However, when competition for deposits becomes sufficiently intense, the competitive deposit rate approaches the yield on the prudent asset. This implies that the franchise value becomes arbitrarily small, which

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[27]The public goods nature of information reduces the efficacy of market discipline. Because gathering information is very time-consuming and costly, investors will try to free-ride on other investors, the latter having incurred the information-gathering cost by carefully observing them before making their own decisions. Moreover, investors often lack the expertise to undertake appropriate monitoring. Thus, too little effort will be spent on monitoring financial institutions. Because managers know that they are not being monitored sufficiently they may take inappropriate risks or try to divert funds for their own use (Levine, 1996; Stiglitz, 1994).
[28]Goodhart *et al.* (1998) define regulation as the establishment of specific rules of behaviour; monitoring as observing whether the rules are obeyed; and supervision as the more general oversight of financial firm behaviour.
[29]In a dynamic setting, the present value of expected future profits or expected future rents would represent bank franchise values or charter values, respectively.

will induce banks to shift strategy and invest in the gambling asset. For sufficiently competitive markets, the only equilibrium is a gambling equilibrium where banks hold no capital. This equilibrium is socially inefficient and can be improved upon, but instead of relying on the imposition of minimum capital requirements, Hellmann *et al.* (1997) propose a combined policy of deposit-rate control and a minimum capital requirement. Deposit-rate control will increase per-period profits captured by each bank, so the franchise value at risk when investing in the gambling asset goes up. Once the franchise value at risk exceeds the one-period expected gain from gambling, banks will choose to invest in the prudent asset, and in this way, regulators may use the notion of a no-gambling condition to control risk-taking by banks.

When banks are sufficiently farsighted, increasing the capital requirement actually increases gambling incentives. This stands in contrast with the industrial model of banking regulation and its focus on the extent to which capital requirements internalize the cost of gambling. This is so since the dynamic effect of capital requirements on the franchise value of banks are not captured. Holding capital is costly, so increasing capital require-ments, *ceteris paribus*, lowers per-period future bank profits, i.e. the franchise value. In other words, increasing the amount of capital has both a positive capital-at-risk effect and a negative impact on franchise-values. When banks are sufficiently farsighted, the negative franchise-value effect dominates the positive capital-at-risk effect. This implies that a deposit-rate ceiling, which increases franchise values, may actually lead to a Pareto-improvement.

In sum, financial liberalization, involving increased banking sector competition and the elimination of ceilings on deposit rates, may lead to Paretoinferior outcomes. Financial liberalization reduces franchise values, increases financial fragility, and induces a socially inefficient allocation of investable funds as banks are induced to opt for the gambling strategy.

On a more practical level, implementing the industrial country model of bank regulation in developing countries is fraught with difficulties. It rests upon relatively sophisticated accounting standards and ultimately upon the threat of early closure of undercapitalized banks. Regulators must enforce regulations consistently and must avoid regulatory forbearance to maintain credibility. Other banks observing such behaviour may assume that they will avoid punishment for taking greater risk. In the case of forbearance for noncompliance with capital requirements, bank owners have nothing to loose by taking on great risks. If the bank is lucky, its risky investment will pay off and the bank returns to solvency; if not, the government is left with the bill.

Prerequisites for this regulatory model are probably beyond what many developing countries can put up with. In most LDCs, commercial banking skills are scarce and the legal framework for enforcing contracts is weak. Banking supervision is impeded by human resource constraints and there is a shortage of qualified professionals. In addition, there is competition from the private sector to attract qualified staff.[30] Poor accounting standards further obstruct the task of supervision. Regulators need to be able to measure and value bank capital, but they may not be able to rely on bank accounts.[31] Political

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[30]This phenomenon was, for example, at work in Thailand, where the central bank lost many of its most talented individuals after liberalization (Stiglitz, 2001).
[31]Troubled banks have both the incentive and the ability to delay loss recognition. They may conceal problems by rolling over bad loans or by raising the size of their balance sheets (evergreening). Under a deposit insurance scheme banks may more easily attract new deposits with the promise of a higher interest rate and thereby increase their bets with current clients, or simply look for new high-risk, high-return investments. Due to the opacity of bank loans, they are harder to sell and troubled banks may be forced to accept 'fire sale' offers. Clearly, this further accentuates the possibility of a bank run.

interference is also prevalent. Governments may be reluctant for a host of reasons to allow banks to be closed down, even when they are insolvent.[32] Political pressure to induce regulatory forbearance undermines incentives for bank managers to behave prudently (Brownbridge and Gayi, 2001; Brownbridge and Kirkpatrick, 2000; Calomiris, 1999). Bribery can also be added to the list of problems. When stakes are high enough banks may try to convince regulators or politicians to assist them in abusing the safety net at the expense of taxpayers.[33] In fact, the relationship between voters-taxpayers and regulators-politicians is a particular type of moral hazard problem. Regulators and the government are agents for the voter-taxpayer (principal) as the latter ultimately has to bear the cost of any losses when the safety net is invoked. The agency problem stems from the fact that the politicians or regulators may face other incentives than those of the taxpayers in terms of minimizing the cost of the safety net (Mishkin, 1996).[34]

In their discussion of the near-permanent banking stress in African banking during the last 20 years, Kane and Rice (2000) document the adverse consequences on the allocation of investible funds of a lax regulatory regime. What has typically happened is that by the time an African bank has become sufficiently illiquid to induce government intervention, its net worth has often fallen to the level of (explicit or implicit) government guarantees. To stay in business, banks have resorted to accounting fraud and backed deposits with credit enhancements from the government. Such insolvent banks are extremely damaging to the goal of allocating resources optimally. They engage in inefficient funding and lending strategies, and prudent investment behaviour does not provide the quick and big wins needed to restore net worth. To improve chances of becoming solvent again, insolvent banks engage in paying too high deposit rates and accepting too low interest rates on high-risk loans and investments.[35]

Building an appropriate regulatory structure suited to curb risk-taking behaviour in poor countries is a daunting task; and Brownbridge and Kirkpatrick (2000) are right when they aptly note that an important drawback of the industrial model of bank regulation in a LDC context is that it constitutes an interlocking system where overall effectiveness of the model relies on the proper working of its many different constituent components. With the ever

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[32]Bank owners may be politically influential, and governments fear the political fallout from lost jobs, lost deposits, and reduced access to credit which a banks closure will entail (the recent history of Argentina provides a case in point). Hence, the threat of early closure may simply not be time-consistent. Consider for instance the case of Chile in the second part of the 1970s, where the authorities claimed that large deposits would not be guaranteed and that banks were allowed to go bankrupt. When Banco Osorno (an important bank) ran into problems in 1977, the authorities, in an attempt to preserve confidence in the Chilean banking system, initiated a full-scale intervention rescuing all deposits and the institution itself. Despite fresh warnings that from then on intermediaries would not be rescued, investors operated under the impression that they were still fully insured. This conjecture turned out to be correct: In late 1981 and in early 1982, Chilean authorities once again intervened to bail out troubled banks and finance companies (Diaz-Alejandro, 1985).
[33]Even in the US, supervisors were bribed by bankers, and regulators were put under pressure by politicians. Moreover, excessive risk taking and fraud by banks tend to appear at the worst of times, in response to adverse shocks, when capital is low. The safety net may actually be an amplifier of risk in the face of adverse shocks, since it can be the greatest single source of financial fragility (Calomiris, 1999).
[34]Mishkin (1996) notes that in the S&L debacle in the 1980, regulators loosened bank capital requirements and ristrictions on risky portfolio holdings and pursued regulatory forbearance in an attempt to escape blame for poor performance. By pursuing this strategy of 'bureaucratic gambling' they covered-up the problem of insolvent banks in the hope that banks would come out solvent. Boot and Thakor (1993) have formulated a theoretical model in which self-interested regulators pursue a closure policy, which is more lax than what is socially optimal. This, in turn, increase the risk choices of the bank.
[35]Interest that accrue on new risky loans will sustain accounting net worth for a while, until loan payments fall into arrears.

increasing complexity of financial systems, regulation has become much more demanding.[36] In sum, to the extent that an efficient regulatory structure is a *sine qua none* for financial liberalization to work, financial liberalization combined with an inappropriate regulatory structure may well carry with it highly problematic economic consequences.[37]

## 6   EMPIRICAL EVIDENCE

There is little disagreement that a well-functioning financial sector may have an important role to play in the development process. However, the widespread presence of severe information imperfections combined with weak institutions and inadequate, or perhaps even unsound, regulatory frameworks does in reality impair the allocative role of the financial sector. The overall contribution of the financial sector to economic growth can therefore only be established through empirical testing. Some argue that econometric evidence has convincingly demonstrated that the banking sector is imperative to long-run economic growth (e.g., Levine, 1997; World Bank, 2002). We are less sanguine.

Principal among existing econometric studies is the seminal paper by King and Levine (1993),[38] which is in the tradition of cross-country empirical studies of economic growth.[39] King and Levine construct four different financial development indicators, and based on data for a number of different countries covering the period 1960–1989, they find that 'higher levels of financial development are significantly and robustly correlated with faster current and future rates of economic growth, physical capital accumulation, and economic efficiency improvements' (1993, pp. 717–718).[40] In addition, King and Levine conclude that the link between economic growth and financial development is not just a contemporaneous correlation. Instead, 'finance seems importantly to lead economic growth' (1993, p. 730).

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[36]One of the most notorious and complex financial innovations in recent years is the derivative. In the Asian Crisis, derivatives facilitated capital flows by unbundling risk and redistributing it away from those less willing and towards those willing and capable of bearing it. At the same time, derivatives facilitated unproductive activities and lowered safeguards. Particularly, use of derivatives can lead to lower levels of transparency between counterparties, and between market participants and regulators. Derivatives can be used to avoid capital requirements, manipulating accounting rules, and to raise the level of market risk exposure relative to capital in the pursuit of high-yield, high risk investment strategies. Total return swaps (TRS), for instance, were used by financial institutions in Asia to avoid prudential regulations by taking carry positions off balance sheets (Goodhart *et al.*, 1998; Dodd, 2001). As an example, a profitable carry trade exists when exchange rates are fixed and interest rate differentials persist. Borrowing in the low interest rate currency and lending in the high interest rate currency yields an arbitrage opportunity with no risk except the potential collapse of the fixed rate regime. East Asian banks were eager to capture carry profits by borrowing abroad and lending at home. A TRS has no impact on a firm's balance sheet, and, as such, derivatives distort the very meaning of a balance sheet as the basis for measuring the risk profile of a bank. In addition, when traded over-the-counter, derivatives lack adequate reporting requirements and government surveillance. The use of derivatives raises the risk of systemic failure and ensuing financial crisis (Dodd, 2001 provides a very readable primer on the role of derivatives in the Asian crisis).
[37]A final point is that developing economies are far more volatile and less diversified than developed economies. Sharp fluctuations in key variables can play havoc with the balance sheets of firms, and a sharp real exchange rate appreciation can force exporting firms into default. For a typical sub-Saharan African economy, which is highly dependent on the production and export of a few key primary commodities, such volatility may result in systemic distress. In addition, it impairs the information flow to regulators.
[38]Studies that cite the King and Levine study include Caprio and Klingebiel, 1996; Demirgüz-Kunt and Detragiache, 1998; Caprio and Honohan, 1999; Mishkin, 1999; and the *World Development Report*, 2002.
[39]See Temple (1999) for a review of this literature.
[40]The four financial development indicators are; (i) the ratio of liquid liabilities to nominal GDP; (ii) the ratio of deposit money bank domestic assets to deposit money bank domestic assets plus central bank domestic assets; (iii) the ratio of credit to the nonfinancial private sector to total domestic credit (excluding credit to money banks); and (iv) the ratio of credit to the nonfinancial sector to nominal GDP.

The analysis of the causal relationship between banking sector development and economic growth is subjected to a more advanced econometric treatment in a paper by Levine *et al.* (2000). They first examine the role of financial development in a pooled cross-section setup using averaged data spanning the period 1960–1995. Endogeneity is addressed by the construction of instruments for financial development using a legal origin dummy, where legal origin (English, French, German, or Scandinavian) is taken as an exogenous endowment. Using a GMM estimator, the authors show that the exogenous component of financial development is positive, significant, and robust in the standard growth regressions. Moreover, Levine, Loayza, and Beck exploit that unobserved country-specific effects can be controlled for in a panel data setting and that panel data models offer a way to control for the potential endogeneity bias in all the explanatory variables by using 'internal instruments' (i.e. lagged values of the explanatory variables).[41] The dynamic panel estimations of Levine, Loayza, and Beck confirm that the weakly exogenous components of financial intermediary development exert a statistically significant and positive influence on economic growth. Moreover, the results pass both specification and sensitivity checks. The authors therefore conclude that 'the data suggest a strong, positive, link between financial intermediary development and economic growth' (2000, p. 54).

Despite these seemingly robust findings, Ram (1999, p. 165) has argued that the results on the finance–growth nexus derived from the new empirical growth tradition 'are at best uncertain and ambiguous', and that 'the pre-dominance of evidence indicates the lack of a significant positive association between financial development and economic growth.' Ram puts forward two main points to underpin this assertion.

First, when considering the individual–country correlation between the commonly used financial indicator *DEPTH* (liquid liabilities to nominal GDP) and real per capita GDP growth, Ram finds a negative correlation in 56 countries of which 16 are significant at the five percent level.[42] Thirty-nine countries exhibit positive correlation of which only nine are significant. The mean correlation in the 95 countries is −0.06. As noted by Ram, this suggests a negligible or weakly negative association between economic growth and a prime financial development proxy. Moreover, in order to check the influence of cyclical factors, Ram calculates five-year average correlations in a sample of 39 countries, all having at least 25 data points. It turns out that the correlations based on the five-year averages of the variables show an almost identical pattern to that of annual data. This is in sharp contrast to the cross-country correlation in the 95-country sample between the same variables over the period 1960–1989. This correlation is positive and significant with a value of 0.33, as opposed to the −0.06 mean individual–country correlation. Finally, the individual–country pattern of a negligible or weakly negative association between economic growth and the financial development proxy is confirmed when a simple growth model is estimated for 10 different countries (picked at random from a sample of 71 countries with sufficient observations).[43]

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[41]The estimation techniques are based on two newly developed GMM estimators. The first involves first differences, which eliminate unobserved heterogeneity. This estimator is problematic when instruments are weak (i.e., when levels are persistent over time, so lagged levels are weak instruments for the regression in first differences). Consequently, Levine *et al.* (2000) also use an estimator, which combines in a system the regression in differences with a regression in levels. Instruments for the regression in differences are the same; whereas instruments for the regression in levels are lagged differences.

[42]The sample consists of 95 countries. The selection requirement is at least 10 observations over the period 1960–89.

[43]The estimated model is $\hat{y} = \alpha_0 + \alpha_1\hat{l} + \alpha_2(I/Y) + \alpha_3\hat{x} + \alpha_4 \, (DEPTH)$, where $\hat{y}$, $\hat{l}$, $\hat{x}$, denote annual rates of growth of real GDP, population (as a proxy for labour), and exports, respectively. *DEPTH* is explained in the text, and *I/Y* is the ratio of gross domestic investment to GDP.

Second, Ram argues that the fundamental assumption of structural homogeneity (parameter constancy) is untenable (see Durlauf (2000, 2001) for a similar critique). When the full cross-country sample is split into three sub-samples (low-, medium-, and high-growth), the conclusions from the King and Levine growth model cannot be sustained. In the full sample, the correlation between financial development and real per capita GDP growth is 0.027 with a $t$-value of 3.38. However, in the three sub-samples it is $-0.003$ ($t$-value $-0.11$), $-0.008$ ($t$-value $-1.70$), and 0.018 ($t$-value 2.20) in the low-, medium-, and high-growth samples, respectively. These results indicate huge parametric heterogeneity across the cross-section of countries. As emphasized by Ram, it is far from evident that low-growth countries would gain anything in terms of increased real per capita GDP growth by a higher value of the financial development proxy.

It must be recognized, however, that when Ram splits the sample into sub-samples according to growth experience, he may encounter a selectivity problem.[44] We have therefore re-estimated the part of the Levine *et al.* study, which employs the legal origin dummy as instrument for financial development. Instead of using growth experience to split the sample, we use regions as the sub-sample criterion. The data set is identical to that of Levine *et al.* (2000), and the results from the GMM estimator are reported in Table 1.

Table 1 indicates that basic reservations put forward by Ram concerning structural homogeneity stand up. While a positive and significant relationship is found in the full sample, the financial development indicators become insignificant, and eventually change sign, as we narrow the sample by taking out regions. For instance, estimations performed on the sample consisting of sub-Saharan African and Latin American countries seem to indicate that financial development was at best insignificantly related to growth during 1960–95, and at worst, it had a negative influence.[45]

These difficulties suggest that a time series approach may be worthwhile. In a time-series setting, the concepts of Granger non-causality and long-run non-causality in a cointegrated system (i.e., absence of weak exogeneity and Granger causality) provide a natural framework for exploring the causal relations between financial development and economic growth. Time-series studies can distinguish between different causal patterns in the countries studied, and this is desirable since the functioning of the financial system is particularly contingent upon the institutional setting.

Demetriades and Hussein (1996) and Luintel and Khan (1999) have on this background analyzed the causal pattern via the Johansen procedure in a cointegrated VAR. In the former paper, causality tests are conducted in a bivariate system. Variables are real GDP per capita and two financial development indicators.[46] In the latter contribution, causality tests are conducted in a four-dimensional cointegrated VAR. Variables are real per capita GDP, a financial development indicator, the real interest rate, and a measure of the capital stock per capita.[47] Demetriades and Hussein find little evidence to support that finance is a

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[44]We thank Henrik Hansen for making this point.

[45]On a more general level, Durlauf (2000, 2001) has criticized the causal explanations of growth inherent in the cross-section growth literature. He argues that the use of instruments is more problematic than one might think. The reason is that growth theories are open-ended, so asserting that one variable influences growth does not typically imply that other variables do not. In a standard regression, the error term captures the cumulated influence of unmodelled factors, and for instruments to be valid, they have to be uncorrelated with the error term. This requires that instruments should be uncorrelated with omitted growth determinants.

[46]The sample consists of Costa Rica, El Salvador, Greece, Guatemala, Honduras, India, Korea, Mauritius, Pakistan, Portugal, South Africa, Spain, Sri Lanka, Thailand, Turkey, and Venezuela.

[47]The sample consists of Columbia, Costa Rica, Greece, India, Korea, Malaysia, Philippines, South Africa, Sri Lanka, and Thailand.

Table 1. Financial intermediation and growth in cross-section regressions, 1960–1995. Dependent variable: Real per capita growth. GMM estimation with 'legal origin dummy' instrument variables

| Explanatory variables | Coefficient | Standard error | $p$-value | Number of observations | Hansen-test OIR |
|---|---|---|---|---|---|
| Regression set #1, (afr, lac) | | | | | |
| Private credit | −1.560 | 6.079 | 0.798 | 33 | 0.00 |
| Commercial-central bank | −3.239 | 14.086 | 0.818 | 33 | 0.00 |
| Liquid liabilities | −0.452 | 1.304 | 0.729 | 33 | 0.00 |
| Regression set #1, (afr, lac sas) | | | | | |
| Private credit | 3.800 | 6.945 | 0.584 | 38 | 0.00 |
| Commercial-central bank | 5.100 | 8.053 | 0.527 | 38 | 0.00 |
| Liquid liabilities | 1.093 | 1.260 | 0.386 | 38 | 0.00 |
| Regression set #1, (afr, lac, sas, eca, mna, eap) | | | | | |
| Private credit | 4.637*** | 0.4819 | 0.000 | 46 | 1.05 |
| Commercial-central bank | 7.321* | 4.420 | 0.098 | 46 | 1.26 |
| Liquid liabilities | 1.894** | 0.944 | 0.045 | 46 | 1.01 |
| Regression set #1, *full sample results from the Levine, Loayza, and Beck study* | | | | | |
| Private credit | 2.515** | 0.814 | 0.003 | 71 | 0.13 |
| Commercial-central bank | 10.861** | 3.086 | 0.001 | 71 | 1.15 |
| Liquid liabilities | 1.723** | 0.844 | 0.045 | 71 | 2.48 |

The results reported in Table 1 are from estimations similar to those of Levine *et al.* (2000) Table 3 *Journal of Monetary Economics* **46**, (2000), except that we have only used the conditioning set #1, which consists of initial schooling and log of initial GDP per capita, and we have performed regressions on regional sub-groupings. We have also used their data set, which is downloadable from www.worldbank.org. Regressions have been performed on the sub-sample consisting of Latin America (lac) and sub-Saharan Africa (afr); a sub-sample consisting of afr, lac and South Asia (sas); and a sub-sample consisting of afr, lac, sas, Eastern Europe and Central Asia (eca), Middle East and North Africa (mna), and East Asia and The Pacific (eap). The comparable results from Levine, Loayza, and Beck's study on the full sample are reported in the lower part of the table. The econometric routine employed is instrumental variables via the GMM estimator ivgmm0, which is downloadable from Stata's homepage.

leading sector in the process of economic development. They do, however, find evidence of a bi-directional causal pattern and some evidence of reverse causality. Most importantly, their findings seem to indicate that causality patterns vary across countries. In contrast, Luintel and Khan find evidence of bi-directional causality in all countries.

One advantage of using the Johansen method is that it makes it possible to extract information on the long-run relation. However, the method is based on a sequential testing procedure in which inference on the long-run relationship is conditional on inference on the cointegrating rank. This is complicated by the fact that inference on the cointegrating rank is extremely sensitive to the values of nuisance parameters.[48] Hence, such sequentially based causality tests may suffer from a severe pre-test bias (Caporale and Pittis, 1999). Moreover, when errors are not independent normal, the Johansen procedure has a tendency to find spurious cointegration (Maddala and Kim, 1998). Consequently, methods,

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[48]The results of the Johansen cointegration tests are highly sensitive to the lag length of the VAR. Consequently, in the study by Demetriades and Hussein, emphasis is placed on the results from longer lag lengths due to an argument that the Johansen test statistics are more sensitive to under-parameterisation than over-parameterisation. In contrast, Luintel and Khan, who face a problem of vanishing degrees of freedom due to the low frequency of data and the higher dimensionality of the VAR, restrict attention to a second-order VAR. Moreover, they attribute primary authority to the trace test, which has superior performance compared to the lambda-max test.

which do not require pre-testing for the cointegrating properties of the system, are important complements to the Johansen procedure. This is even more pertinent when information on the coefficients of the cointegration vector is not needed.

One approach to testing for non-causality in a levels VAR, which does not require pre-testing on the cointegrating rank, is developed in Dolado and Lütkepohl (1996). This method essentially entails augmenting the correct order of the levels VAR by the maximum order of integration in the process. The coefficients on the extra lagged vectors are ignored when testing for Granger non-causality. Only the correct order of lagged vectors is used. Moreover, standard asymptotic theory applies to a modified WALD test (MWALD). The MWALD method has a drawback. It is rather demanding in terms of the number of observations.[49]

Employing the MWALD causality test on South Korea, India, and Thailand, the only developing countries with sufficient annual observations, Andersen (2001) is unable to reject Granger non-causality between the two indicators of financial development used in Demetriades and Hussein (1996) and real per capita GDP. Moreover, this result is confirmed in a first-difference VAR. As such this stands in contrast to both the Demetriades–Hussein and the Luintel–Khan study. The causal link from finance to growth is far from clear.

Demetriades *et al.* (1998) also analyze the influence of financial sector policies on the average productivity of capital in five South East Asian economies. They estimate productivity equations for each country using an estimator proposed by Stock and Watson (1993). The dependent variable is the average productivity of capital, whereas right-hand side variables include a constant, the capital stock, financial saving (i.e., a financial development indicator), the non-financial saving ratio, the real interest rate, and a summary measure of financial repression.[50] The empirical results indicate that, after taking policies associated with financial repression into account, financial saving had a significant negative influence on the average productivity of capital in both India and Thailand. In South Korea, Sri Lanka, and the Philippines financial saving had a significant positive influence on the average productivity of capital.

In sum, the picture that emerges from different econometric studies is blurred. In cross-section studies, there is a positive correlation between financial development and growth, but in the poorest countries the correlation is negative. In individual-country studies, different causal patterns between financial development and economic growth are characteristic. In some countries, finance seems to lead growth, while there is reverse causality or no clear causal link elsewhere. Moreover, conclusions are very sensitive to the type of estimator used and slight changes in nuisance parameters often change the results.

## 7   CONCLUDING REMARKS

The financial liberalization thesis has undergone what Arestis and Demetriades (1999) have dubbed *post hoc* theoretical revisions. The disastrous results of liberalizations in the

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[49]Approximately 50 observations are needed. Consequently, it can only be applied on a small subset of developing countries.

[50]Financial saving is measured as the change in $M2$ minus $M1$, i.e., $\Delta(M2 - M1)$. It aims at capturing the real flow of bank deposits to real GDP. As this measure is identical to $(S/Y) \cdot (\Delta(M2 - M1)/S)$, non-financial saving is measured as $((S - \Delta(M2 - M1))/Y)$. Consequently, the sum of financial and non-financial saving equals total domestic saving.

1970s and 1980s induced a first round of revisions. It was argued that macroeconomic instability and inadequate bank supervision were the main culprits. Later, the optimum order of liberalization received substantial attention. Liberalization needs to be sequenced and reforms must be managed carefully in order to become successful. In view of the recent Asian crisis, arguments addressing moral hazard problems in relation to deposit insurance have now been advanced.[51] Yet, in South East Asia, initial conditions were favourable, and Arestis and Demetriades correctly note that this serves as an indication that even in the best of circumstances, financial liberalization remains a treacherous policy exercise.

Certainly, government involvement in capital markets has often resulted in widespread inefficiencies.[52] This is not in question. Nevertheless, there is ample reason to question the extent to which financial liberalization is indeed prudent policy in developing countries. In theory, financial liberalization will not necessarily improve the allocation of resources. The problems associated with asymmetric information will linger on, and financial liberalization increases the likelihood of a costly systemic crisis. Indeed, it is tempting to agree with Mathieson (1996) that no financial reform, no matter how effective or far-reaching, can generate sufficient efficiency gains to compensate losses of 10–20 per cent of GDP, and this is of course even more so when the cost is 20–50 per cent of GDP. Moreover, we do not find that the empirical evidence provides a uni-directional and clear-cut conclusion. Existing evidence does not establish convincingly that 'the preponderance of theoretical reasoning and empirical evidence suggests a positive first-order relationship between financial development and economic growth' (Levine, 1997, p. 688). For sure, financial liberalization should not be based on the premise that such a positive first-order causal relation exists.

We agree that a well-functioning financial system can play a vital role in the process of economic growth; we fully recognize that government involvement in the financial sector has had huge negative implications; and we believe that deregulation of the financial sector should be approached somewhere down the line. Nevertheless, the task of ensuring that the infrastructure needed to assure the proper working of the financial system is in place is overwhelming by the standards of almost any poor developing country. It is in this context interesting to note that the East Asian model of economic development was not associated in any significant way with a deregulated financial system.[53] Furthermore, while China and Vietnam are not exactly known for their liberalized financial systems, they are clearly front-runners in terms of economic growth. In conclusion, we would like to suggest that the opportunity cost of *not* liberalizing the financial sector has in our view often been

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[51]It is perflexing that every crisis spawns a new generation of models, and that being forced to search for a new set of policy errors every time a crisis hits, does not render us more cautious about our ability to prescribe a policy regimes that will sustain a crisis (see Rodrik, 1998).

[52]For instance, political pressures to lend to uncreditworthy borrowers caused ratios of non-performing loans to total loans of up to 60–80 per cent in Nepal, Tanzania and Uganda in the late 1980s and early 1990s (Brownbridge and Gayi, 2001).

[53]Government involvement played a large and significant role in the East Asian experience. As emphasized by Wade (1990) in connection with Taiwan, the government was able to offer risk-sharing by coordinating investment behaviour into risky sectors of the economy. In effect, the government induced a 'socialization of risk' type of risk sharing. By means of preferential credit, the government directed firms, often SOEs, into priority sectors; another word for risky and largely unknown territories with a perceived high, but long-term, payoff. As such, the government substituted the services of a well functioning financial sector for active government involvement. In fact, it did more. It solved a coordination problem, which only the government can solve. To be sure, in order to do so, a country needs a highly competent bureaucracy. Taiwan had this, Malawi does not. But in order to ensure a properly working financial system, a highly competent bureaucracy is at least as vital.

exaggerated, whereas the potential costs of increased fragility have been underestimated.[54] We believe it is sound advice to suggest that policymakers in developing countries should be granted additional time, leeway, and discretion in the search for the appropriate 'middle-way' in the process of financial sector reform rather than being pushed into urgent and haphazard action that carry very real and significant costs.

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[54] At the same time it should be noted that millions of dollars and technical assistance have been channeled into developing countries (e.g. Indonesia; see Cole and Slade, 1998) in order to improve the legal, accounting, and regulatory structure, which nevertheless has often remained weak.

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