

## FINANCIAL DEVELOPMENT AND GROWTH: WHERE DO WE STAND?

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### Abstract

*In spite of the recent theoretical and empirical work that suggests that financial systems exert a first-order, causal impact on economic growth, economists are still not very able of providing policy makers with detailed blueprints of how to create growth-promoting financial systems. The profession has only recently assembled broad cross-country data on financial structure and taken initial steps on comparing bank-based and market-based systems.*

*This paper selectively reviews evidence on banks, markets, and financial structure. In terms of banks, the paper discusses why banks emerge, what they do, and how they affect economic performance. Next, it discusses evidence on the legal, accounting, and regulatory determinants of healthy banking development. The evidence suggests that legal and regulatory reforms that strengthen creditor rights, contract enforcement, and accounting practices boost banking sector development and accelerate economic growth.*

*The paper next examines the impact of stock markets on economic growth. Finally, the debate on financial structure is reviewed. Is a bank-based or a market-based financial system better for promoting economic development? New research finds that establishing a legal environment that rigorously protects the rights of investors is fundamentally more important than any considerations involving comparisons between bank-based or market-based systems. Both banks and markets provide complementary services to the economy with positive implications for economic performance.*

### Resumen

*A pesar que la literatura reciente, teórica y empírica, sugieren que el sistema financiero ejerce un impacto causal de primer orden sobre el crecimiento económico, los economistas aún no podemos ofrecer con confianza recomendaciones acerca de cómo diseñar y crear sistemas financieros que promuevan el crecimiento.*

*En este trabajo se revisa de manera selectiva la evidencia acerca de bancos, mercados y estructura financiera. Respecto a los bancos, primero se discute*

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\* I would like to thank Maria Carkovic and Rodrigo Fuentes for helpful comments.

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*porqué surgen, qué hacen y cómo afectan el desempeño económico. Después se revisan los determinantes legales, contables y regulatorios de un desarrollo bancario sano.*

*La evidencia sugiere que las reformas legales y regulatorias que fortalecen: los derechos de los que prestan, el cumplimiento de contratos, y las prácticas contables sanas, incentivan el desarrollo del sector bancario y aceleran el desarrollo económico.*

*El trabajo también examina el impacto de los mercados de valores sobre el crecimiento económico.*

*Finalmente, se revisa el debate actual sobre la estructura financiera. ¿Es mejor sistema financiero aquel basado en bancos que aquel basado en el mercado para promover el desarrollo económico?*

*La evidencia sugiere que ninguna de las dos visiones está correcta. El tema no es si bancos o mercado. Ambos, mercado y bancos prestan servicios complementarios a la economía con implicancias positivas para el desempeño económico.*

## 1. INTRODUCTION

Why do countries grow at astonishingly different rates, and what reforms can policy makers implement to accelerate economic progress? Economists advance numerous explanations of cross-country growth differences, including macroeconomic stability, openness to international trade, educational attainment, resource endowments, institutional development, legal system effectiveness, and ethnic diversity. Concomitant with these different explanations, analysts propose an array of policy reforms to boost economic growth rates. Recent financial crises have focused the policy spotlight on the financial sector. Emerging evidence suggests that this focus is well deserved.

Cross-country differences in financial sector development explain an economically meaningful proportion of the cross-country differences in long-run economic growth rates. A growing body of theoretical and empirical work suggests that banks and stock markets are an inextricable part of the growth process [Levine 1997]. Indeed, recent work suggests that financial systems exert a first-order, causal impact on economic growth. Thus, poorly functioning financial systems help account for the devastatingly slow growth rates of many countries. This evidence should motivate policy makers to improve financial sector policies, and researchers to design effective financial sector reforms.

Although economists can confidently advertise the importance of well-functioning financial systems for economic growth, we are embarrassingly less capable of providing policy makers with detailed blueprints of how to create growth-promoting financial systems. We are still in the nascent stages of assembling rigorous cross-country empirical evidence concerning the core legal and regulatory determinants of healthy banks and securities markets. Furthermore, a long debate persists on the proper structure of the financial system, where "structure" refers to the relative importance of banks and markets in the economy. The classic controversy involves comparisons between bank-based financial systems, such as those in Germany and Japan, and market-based

systems, such as those in the United Kingdom and the United States. The profession has only recently assembled broad cross-country data on financial structure and taken initial steps on comparing bank-based and market-based systems.

This paper selectively reviews evidence on banks, markets, and financial structure. In terms of banks, I first discuss why banks emerge, what they do, and how they affect economic performance. By acquiring and processing information about firms, exerting corporate control, providing risk management services, and facilitating resource mobilization, banks influence resource allocation and economic growth. Empirically, Levine, Loayza, and Beck (1999) show that the banking system exerts an economically large impact on long-run growth after controlling for endogeneity, country-specific effects, and a wide-array of other growth determinants. Next, I discuss evidence on the legal, accounting, and regulatory determinants of healthy banking development. LaPorta, Lopez-de-Silanes, Shleifer, and Vishny (1997, 1998, 1999a,b; henceforth LLSV) and Levine, Loayza, Beck (1999) show that countries with (1) laws that give a high priority to secured creditors getting the full present value of their claims against firms, (2) legal systems that rigorously enforce contracts, including government contracts, and (3) accounting standards that produce high-quality, comprehensive and comparable corporate financial statements tend to have better developed financial intermediaries. The evidence suggests that legal and regulatory reforms that strengthen creditor rights, contract enforcement, and accounting practices boost banking sector development and accelerate economic growth. Furthermore, Barth, Caprio, and Levine (1999, 2000) show that banks are more efficient and stable in regulatory systems that permit banks to engage in a wide array of activities (securities underwriting, insurance, real estate, and ownership of nonfinancial firms).

The paper next examines the impact of stock markets on economic growth. Theory suggests that markets can enhance incentives to acquire information about firms, since individuals can profit from first obtaining good information and then trading in liquid markets. Furthermore, well-developed markets make it easier to takeover firms, which may help discipline managers to act in the best interests of owners. Also, well-developed securities markets lower the costs of custom designing risk-hedging devices, which can improve welfare and resource allocation. The data support this view. Levine (1999b) and Levine and Zervos (1998) show that liquid stock markets exert a big, positive impact on economic growth. There is also a growing body of research on the legal and accounting determinants of stock market development. LLSV (1997, 1998) show that the protection of minority shareholders and the quality of corporate financial statements exert a major influence on stock market development. Moreover, Latin America stands out. It has relatively weak accounting standards and Latin America's legal system is comparatively lax in enforcing the rights of minority shareholders.

Finally, I review the debate on financial structure. Is a bank-based or a market-based financial system better for promoting economic development? Proponents of bank-based systems note that in highly liquid markets, information is quickly revealed to investors at large. This creates a free-rider problem. Individuals may be dissuaded from spending much time and money researching

firms and exerting corporate control since the fruits of these labors will be publicly revealed in markets to those who do not undertake the costly activities of researching firms and overseeing managers. Furthermore, proponents of bank-based systems question the real-world ability of small outside investors to exert corporate control. Outsiders generally have less information than insiders, so there is little reason to believe that outsiders can effectively peer over the shoulders of managers and then swoop down to takeover firms and fire incompetent managers. Further, the incestuous relationship between boards of directors and management increases the likelihood of golden parachutes, poison pills, and other measures that thwart takeovers and give power to corporate managers. Also, liquid markets make it easy for worried stockholders to simply sell their shares rather than coordinate pressure against management. All of these market failures combine to reduce the efficiency of markets in allocating society's savings. Champions of bank-based systems argue that large banks with long-term relationships with particular firms mitigate these market failures.

Proponents of market-based systems focus on the weaknesses of bank-based systems. Big banks exert a controlling hand. In practice, big banks tend to encourage firms to undertake very conservative investment strategies and big banks extract large rents from firms as shown by Weinstein and Yafeh (1998). Thus, banks may lower corporate profits and reduce incentives for new and innovative products. Furthermore, Wenger and Kaserer (1998) show that managers of huge banks in a bank-based system (Germany) effectively rest control of banks from the owners of banks. Since big banks control big industry, this means that bank managers control both banks and industry, with deleterious effects on investment and growth. Finally, market-based systems provide a richer array of financial instruments that permit greater customization of risk management techniques than in a more standardized bank-based system.

Emerging evidence suggests that neither the bank-based nor the market-based view is right. New research finds that establishing a legal environment that rigorously protects the rights of investors is fundamentally more important than any considerations involving comparisons between bank-based or market-based systems [LLSV 1999b; Levine 2000]. The issue is not banks *or* markets. Rather, both banks and markets provide complementary services to the economy with positive implications for economic performance. Thus, given the importance of overall financial development for economic growth, an efficient use of scarce research talent lies in improving the policy recommendations we can give to boost the performance of both financial intermediaries and financial markets.

## **2. BANKS AND ECONOMIC GROWTH**

### **A. Concepts: How Banks Affect Economic Performance<sup>1</sup>**

The costs of acquiring information, enforcing contracts, and making transactions create incentives for the emergence of financial intermediaries to mitigate the negative repercussions of these market frictions. Put differently, in a

<sup>1</sup> For more citations supporting this section's discussion, see Levine (1997).

world with no information, enforcement, or transactions costs, there is no need for financial intermediaries—coalitions of agents—to form and expend resources researching projects, scrutinizing managers, and easing risk management. In arising to ameliorate market frictions, financial intermediaries may facilitate the efficient allocation of resources across space and time. This subsection briefly discusses how three frictions encourage the emergence of financial intermediaries.

First, financial intermediaries may reduce the costs of acquiring and processing information about firms and managers and thereby improve resource allocation [Diamond 1984; Boyd and Prescott 1986]. Specifically, there are large costs associated with evaluating firms and managers. Without intermediaries, each investor would face these high costs, which could lead to duplication of effort in terms of acquiring and processing information about firms and managers. Moreover, small investors might attempt to free-ride off of large investors, who have greater incentives to pay the large costs associated with evaluating firms and managers. This free-rider problem can lead to too little effort being expended toward acquiring information and monitoring managers, which adversely affects resource allocation. Instead of this inefficient situation, financial intermediaries can evaluate firms and managers for a large group of investors. By reducing duplication and free-riding problems, financial intermediaries promote better information about firms.

Second, financial intermediaries may ease risk sharing and pooling by lowering transactions costs. Traditional financial theory focuses on cross-sectional risk sharing, where individuals hold a very small amount of lots of different assets. Financial intermediaries may lower the costs of holding a standardized portfolio of assets if there are fixed costs to each purchase. Moreover, financial intermediaries may facilitate the intertemporal smoothing of risk [Allen and Gale 1999]. Risks that cannot be diversified at a particular point in time, such as macroeconomic shocks, can be diversified across generations. Long-lived intermediaries can facilitate intergenerational risk sharing by investing with a long-run perspective and offering returns that are relatively low in boom times and relatively high in slack times. While this type of risk sharing is theoretically possible with markets, intermediaries may increase the feasibility of intertemporal risk sharing by lowering contracting costs. Finally, intermediaries can eliminate liquidity risk [Diamond and Dybvig 1983; Bencivenga and Smith 1991]. Many profitable investments require a long-term commitment of capital, but investors are often reluctant to relinquish control of their savings for long periods. Intermediaries make long-term investment more attractive by pooling savings and engaging in liquidity transformation. Specifically, banks invest just enough in short-term securities to satisfy those with liquidity needs. At the same time, banks make a long-run commitment of capital to firms. By facilitating longer-term, more profitable investments, well-functioning financial intermediaries improve the allocation of capital and thereby boost productivity growth.

Third, financial intermediaries facilitate savings mobilization—pooling—by economizing on the transactions costs associated with mobilizing savings from many disparate agents and by overcoming the informational asymmetries associated with making savers comfortable in relinquishing control of their savings

[Sirri and Tufano 1995; Lamoreaux 1995]. By effectively mobilizing savings, financial intermediaries not only ease capital accumulation. Financial intermediaries also improve resource allocation by permitting the exploitation of economies of scale. For example, Bagehot [1873, pp. 3-4] argued that a major difference between England and “all rude countries” was that in England the financial system could mobilize resource for “immense works.” Bagehot was very explicit in noting that it was not the national savings rate per se, rather it was the ability to pool society’s resources and allocate those savings toward the most productive ends.

Thus, an assortment of theories outline intuitively appealing reasons for how better intermediaries –intermediaries that are better at researching firms and exerting corporate control, providing mechanisms for pooling and managing risk, and facilitating the mobilization of savings– will positively influence economic performance. The data support this perspective.

## **B. Evidence: Intermediaries exerts a first-order, causal impact on growth**

A growing body of evidence suggests that the level of financial intermediary development has a large, causal effect on long-run economic performance. The evidence emerges from firm-level studies [Demirguc-Kunt and Maksimovic 1998], industry-level studies [Rajan and Zingales 1998], country-case studies [Cameron 1967; McKinnon 1973; Haber 1991, 1996], time-series [Neusser and Kugler 1998; Wachtel and Rousseau 1995], simple cross-country studies [King and Levine 1993a,b], and more recent instrumental variable and panel examinations [Levine 1998, 1999a; Levine, Loayza, and Beck 1999; Beck, Levine, and Loayza 1999]. Since I have already reviewed much of this literature [Levine 1997], I will instead focus on recent work that (1) rigorously addresses the issue of causality and (2) discusses some underlying causes of cross-country differences in financial intermediary development.

### *B.1. Methodology*

Levine, Loayza, and Beck (1999), henceforth LLB, use new data and new econometric procedures to (a) shed additional light on the issue of causality and (b) illuminate the close association between key legal and accounting characteristics and financial intermediary development. In terms of causality, LLB use two econometric procedures. First, they use a pure cross-sectional approach, where data for 71 countries are averaged over the period 1960-1995, with one observation per country. As in much of the cross-country growth literature, the dependent variable is the growth rate of the real per capita Gross Domestic Product (GDP). The regressors include a variable of particular interest, in this case financial intermediary development, along with a set of conditioning information.

Unlike much of the literature, LLB use instrumental variables to extract the exogenous component of financial intermediary development. Specifically, LLSV (1998) note that most countries can be divided into countries with predominantly English, French, German, or Scandinavian legal origins and that countries typically obtained their legal systems through occupation or coloni-

zation.<sup>2</sup> Thus, LLB view legal origin as an exogenous “endowment.” After extending the LLSV sample from 49 to 71 countries, LLB use the legal origin indicators as instrumental variables to extract the exogenous component of financial intermediary development.

The second method for examining causality uses panel data and exploits the cross-country and time-series dimensions of the data. LLB assemble a panel dataset, with data averaged over each of the seven 5-year intervals composing the period 1960–1995. LLB use a Generalized Method-of-Moments (GMM) dynamic panel estimator that corrects some inherent problems with the purely cross-sectional estimator. Specifically, this procedure addresses the econometric problems induced by country-specific effects, endogeneity, and the routine use of lagged dependent variables in growth regressions.

In conducting this research, LLB focus on a new measure of financial intermediation called PRIVATE CREDIT, which measures the extent to which financial institutions funnel credit to private sector activities. PRIVATE CREDIT equals the value of credits by financial intermediaries to the private sector divided by GDP. This measure of financial development is more than a simple measure of financial sector size. PRIVATE CREDIT isolates credit issued to the private sector, as opposed to credit issued to governments, government agencies, and public enterprises. Furthermore, it excludes credits issued by the central bank. While PRIVATE CREDIT does not directly measure the amelioration of information and transaction costs, LLB interpret higher levels of PRIVATE CREDIT as indicating higher levels of financial services and therefore greater financial intermediary development.

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<sup>2</sup> Glendon, *et al.* (1982) and Berman (1983) describe how Roman law was compiled under the direction of Byzantine Emperor Justinian in the sixth century. Over subsequent centuries, the law was interpreted and adapted throughout Europe. Eventually, individual countries formalized legal codes. The Scandinavian countries developed their Civil Codes in the 17<sup>th</sup> and 18<sup>th</sup> centuries. These countries have remained relatively unaffected from the far-reaching influences of the English, German and French legal traditions. The English legal tradition is not a Civil law heritage, where legal scholars heavily shape laws. Instead, in the English –common law– legal tradition, laws are heavily influenced by judges trying to revolve particular cases. The French Civil Code was written in 1804 under the direction of Napoleon, who saw the permanence of the Code as more important than the fleeting nature of his military conquests. He had the Code adopted in all conquered territories, including Italy, Poland, the Low Countries, and the Habsburg Empire. Through conquest and colonization, France extended her legal influence to parts of the Near East, Northern and Sub-Saharan Africa, Indochina, Oceania, French Guiana, and the French Caribbean islands during the colonial era. Furthermore, since the French Civil Code exerted a major influence on the Portuguese and Spanish legal systems, this helped spread the French legal tradition to Central and South America. Following the unification of Germany under Bismarck in 1871, the German Civil Code was completed in 1896. The German Code exerted a big influence on Austria and Switzerland, as well as China, Czechoslovakia, Greece, Hungary, Italy, and Yugoslavia. Also, the German Civil Code heavily influenced the Japanese Civil Code, which helped spread the German legal tradition to Korea.

## B.2. *Causality Results*

The simple, cross-sectional instrumental variable procedure and the dynamic-panel econometric technique produce very consistent findings regarding causality: **financial intermediary development exerts a large impact on economic growth**. Econometrically, the results indicate that the close empirical association between finance and growth is not the result of simultaneity or omitted variable bias (LLB 1999). The exogenous component of financial intermediary development is positively correlated with economic growth. Economically, the impact of finance on growth is large. For example, the estimated coefficients suggest that if Argentina had enjoyed the level of financial intermediary development of the average developing country during the 1960-95 period they would have experienced about one percentage point faster real per capita GDP growth per annum over this period.

## B.3. *Legal Determinants of Intermediary Development*

Since well-functioning financial systems promote economic growth, this emphasizes the need to identify the determinants of well-functioning financial systems. LLSV (1998) search for potential legal and accounting determinants of financial intermediary development. They focus on three indicators to characterize differences in national legal and regulatory systems: (1) the legal rights of creditors, (2) the soundness of contract enforcement, and (3) the level of corporate accounting standards. LLB (1999) then show that the component of the financial system determined by the legal/regulatory environment importantly influences long-run economic growth.

*Creditor rights:* LLB (1999) use four measures of the legal rights of banks from the LLSV (1998) data set.

AUTOSTAY equals one if a country's laws impose an automatic stay on the assets of firms upon filing a reorganization petition. AUTOSTAY equals 0 if this restriction does not appear in the nation's legal codes. The restriction would prevent creditors from gaining possession of collateral or liquidating a firm to meet a loan obligation.

MANAGES equal one if firm managers continue to administer the firm's affairs pending the resolution of reorganization processes, and zero otherwise. In some countries, management stays in place until a final decision is made about the resolution of claims. In other countries, a team selected by the creditors replaces management. If management stays pending resolution, this reduces pressure on management to pay creditors.

SECURED1 equals one if secured creditors are ranked first in the distribution of the proceeds that result from the disposition of the assets of a bankrupt firm. SECURED1 equals zero if non-secured creditors, such as the government or workers get paid before secured creditors. In cases where SECURED1 equals zero, this certainly reduces the attractiveness of lending secured credit.

CREDITOR is a cumulative index of these creditor rights indicators and equals  $CREDITOR = SECURED1 - AUTOSTAY - MANAGES$ . CREDITOR takes on values between 1 (best) and -2 (worst). One would expect countries with higher values of CREDITOR to have stronger creditor rights and better-developed financial intermediaries, all else equal.

Brazil, Colombia, France, Mexico, Peru, and the Philippines (all countries with a French legal origin) are countries where CREDITOR = -2, indicating that their legal systems do not stress the rights of creditors. In contrast, the legal codes of Egypt, Hong Kong, India, Indonesia, Israel, Korea, Malaysia, Nigeria, Pakistan, Singapore, Thailand, United Kingdom, and Zimbabwe stress the rights of creditors, such that CREDITOR = 1. CREDITOR does not incorporate information regarding enforcement.

*Enforcement:* The laws governing secured creditors will affect secured creditors only to the extent that the laws are enforced. Consequently, LLSV (1998) use measures of the efficiency of the legal system in enforcing contracts in examining the determinants of financial development.

RULELAW is an assessment of the law and order tradition of the country that ranges from 10, strong law and order tradition, to 1, weak law and order tradition. This measure was constructed by International Country Risk Guide (ICRG) and is an average over the period 1982-1995.

CONRISK is an assessment of the risk that a government will – and therefore can – modify a contract after it has been signed. CONRISK ranges from 10, low risk of contract modification, to 1, high risk of contract modification. Specifically, “modification” means repudiation, postponement, or reducing the government’s financial obligation. This measure was constructed by ICRG and is an average over the period 1982-1995

ENFORCE equals the average of RULELAW and CONRISK. The empirical analyses focus on this aggregate index of the efficiency of the legal system in enforcing contracts, ENFORCE, and the aggregate index of creditor rights, CREDITOR.

The countries with very high values of enforcement, values of ENFORCE greater than 9, are Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Japan, Netherlands, New Zealand, Norway, Sweden, and Switzerland. In contrast, countries where contract enforcement is poor, values of ENFORCE less than 5, include Colombia, Nigeria, Pakistan, Philippines, Peru, and Zimbabwe.

*Accounting standards:* Information about corporations is critical for exerting corporate governance and identifying the best investments. ACCOUNT is an index of the comprehensiveness of company reports. The maximum possible value is 90 and the minimum is 0. The Center for International Financial Analysis and Research assessed general accounting information, income statements, balance sheets, funds flow statement, accounting standards, and stock data in company reports in 1990. The maximum value is 83, Sweden, while the minimum value in LLB’s sample is Egypt (24). The United States has a value of 71, which is well above the mean value of 61.

*Results on determinants of intermediary development:* LLSV (1998) and LLB (1999) show that cross-country differences in creditor rights, enforcement quality, and accounting standards help explain cross-country differences in financial intermediary development. The basic message that emerges from the analysis is that countries with (i) laws that give a high priority to secured creditors, (ii) legal systems that rigorously enforce contracts, and (iii) accounting standards that produce comprehensive and comparable corporate financial statements tend to have better developed financial intermediaries. Furthermore, the

component of financial intermediary development determined by creditor rights, enforcement quality, and accounting standards positively affects economic growth.

These findings are consistent with the view that countries with particular legal origins tend to create particular types of laws, regulations, and enforcement mechanisms. It is these laws, regulations, and enforcement mechanisms that help determine the level of financial intermediary development and thus long-run economic growth. While it is difficult to change legal origin, the results offer a strategy for boosting financial development and accelerating long-run growth. Countries can target reforms that ensure that lenders have confidence that the legal system will quickly, transparently, and effectively enforce their claims against borrowers and that outside investors have easy access to high-quality, comprehensive, and comparable information about firms.

#### B.4. *Regulatory Determinants of Financial Performance*

Besides the legal system, regulations may influence bank performance. Significant theoretical disagreement exists on how much power banks should have. Specifically, should banks be permitted to engage in investment banking activities, compete in the insurance business, participate in the real estate business, and invest in nonfinancial firms? The profession is just starting to piece together cross-country information on these questions.

Barth, Caprio, and Levine (1999, 2000) examine the ties between regulatory restrictiveness of the activities of banks and financial sector performance. They collect information on a cross-section of 60 countries on the degree to which a country's regulatory system allows banks to engage in the following four nontraditional activities:

- **Securities:** the ability of banks to engage in the businesses of securities underwriting, brokering, dealing, and all aspects of the mutual fund business.
- **Insurance:** the ability of banks to engage in insurance underwriting and selling.
- **Real Estate:** the ability of banks to engage in real estate investment, development and management.
- **Nonfinancial Firm Ownership:** the ability of banks to own and control nonfinancial firms.

After reviewing regulatory documents, a number between one and four is assigned to each of the four activities – Securities, Insurance, Real Estate, and Nonfinancial Firm Ownership – that indicates the degree of regulatory restrictiveness for that activity in each country. The assigned numbers are interpreted as follows:

1. —indicates “unrestricted”: banks can engage in the full range of the activity directly in the bank.
2. —indicates “permitted”: the full range of those activities can be conducted, but all or some of the activity must be conducted in subsidiaries.
3. —indicates “restricted”: banks can engage in less than full range of to activity, either in the bank or subsidiaries.
4. —indicates “prohibited”: the activity may not be conducted by the bank or subsidiaries.

While much work remains, Barth, Caprio, and Levine (2000) conclude that restricting the ability of banks to (a) engage in securities activities, and (b) own nonfinancial firms is closely associated with lower bank efficiency (as measured by interest margins) and greater banking sector instability (as measured by a reduced likelihood of systemic banking failure).<sup>3</sup>

Furthermore, restricting nonfinancial firms from owning commercial banks tends to enhance banking sector fragility. Thus, restricting the mixing of banking and commerce does not promote bank stability. The analyses do not reveal countervailing positive ramifications from restricting banking activities. That is, greater regulator restrictions on the activities of banks do not boost banking sector competition, industrial competition, or the development of securities markets. These results hold after controlling for an array of other factors potentially associated with the probability of a country experiencing a crisis (deposit insurance, credit growth, the quality of government, macroeconomic stability, etc.). Thus, existing cross-country evidence suggests that fewer regulatory restrictions on the activities of banks are associated with greater banking sector efficiency and lower risk of systemic failure.

### C. Cautionary Notes

In assessing where we stand on finance and growth, it is important to emphasize what existing work does not show. Existing work does *not* reject the hypothesis that economic growth influences financial development. The results do not contradict theories by Patrick (1966) and Greenwood and Jovanovic (1990), which suggest that causality runs in both directions; banking development influences economic growth, and economic growth influences banking sector development. Rather, existing evidence is consistent with the hypothesis that the exogenous component of banking development promotes economic growth.

Furthermore, we do not yet have good cross-country information on an array of potential issues associated with the development of healthy banking systems. Existing work is not yet able to identify the effects of various financial regulations and supervisory issues in a cross-country context. Rather, existing evidence makes a more limited point: the legal environment influences the banking sector; and, the component of banking sector development explained by the legal environment is strongly linked with long-run rates of economic growth. Finally, recent work on the regulatory environment suggests that regulatory restrictions on the activities of banks have negative ramifications, with no countervailing benefits.

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<sup>3</sup> More specifically, to assess the impact of regulatory restrictiveness on bank fragility, Barth, Caprio and Levine (1999, 2000) use across-country probit regression. The dependent variable takes on a value of one if the country experienced a systemic banking crises and zero otherwise. The explanatory variables include a wide array of country and financial sector characteristics, including the measures of regulatory restrictiveness defined in the text. Classification of systemic crisis countries is taken from Caprio and Klingebiel (1999).

### 3. MARKETS AND ECONOMIC GROWTH

#### A. Concepts: How Stock Markets Affect Economic Performance<sup>4</sup>

First, well-functioning stock markets may stimulate the acquisition and dissemination of information. As markets become larger and more liquid, agents may have greater incentives to expend resources in researching firms because it is easier to profit from this information by trading in big and liquid markets. Moreover, this improved information about firms should enhance resource allocation substantially with corresponding implications for economic growth.

Besides influencing the acquisition of information *ex ante*, well-developed stock markets may help in exerting corporate control *ex post*, i.e., after financing as occurred. Stock markets may stimulate greater corporate control by facilitating takeovers and by making it easier to tie managerial compensation to performance. Thus, if well-functioning stock markets facilitate takeovers, then outsiders can purchase poorly operating firms, change management, and set the stage for greater profitability. Similarly, if well-functioning stock markets make it easier to link managerial compensation with stock price performance, then this helps align the interests of managers with those of firm owners.

Second, well-functioning stock markets ease risk diversification and the ability to avoid liquidity risk. Stock markets are best designed for traditional, cross-sectional risk sharing, where individuals can create a tailor made portfolio of assets. In better-developed markets –markets where it is easier to trade securities– it is easier for agents to construct portfolios with a minimum of middlemen. Markets can also ease liquidity risk [Levine 1991]. Many profitable investments require a long-term commitment of capital, but investors are often reluctant to relinquish control of their savings for long periods. Liquid equity markets make long-term investment more attractive because they allow savers to sell equities quickly and cheaply if they need access to their savings. At the same time, companies enjoy permanent access to capital raised through equity issues. By facilitating longer-term, more profitable investments, liquid markets improve the allocation of capital and thereby boost productivity growth.

Third, well-developed securities markets can assist resource mobilization. Mobilizing the savings of many disparate savers is costly because it involves (a) overcoming the transaction costs associated with collecting savings from different individuals and (b) overcoming the informational asymmetries associated with making savers comfortable with relinquishing control of their savings. Well-developed securities markets, out of necessity, tend to encourage the development of effective accounting standards, information disclosure procedures and contracting systems that lower impediments to resource mobilization. Also, “market makers” are generally very concerned about establishing stellar reputations, so that savers feel comfortable about entrusting their savings to others.

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<sup>4</sup> See Levine (1997) and Levine (1999c) for more references on the links between markets and economic activity.

## B. Evidence: Stock markets exert a first-order, causal impact on growth

The body of empirical evidence on the relationship between stock market development and growth is less extensive than that on financial intermediation and growth. Nonetheless, substantial research suggests a positive link between stock market liquidity and growth, whether this analysis is conducted in a pure cross-section of countries, using time-series procedures, or firm-level data. Instead of discussing these papers in detail, I will summarize some recent research that I have conducted which again attempts to (a) evaluate the causal link between stock market development and growth and (b) identify some of the legal underpinnings of equity markets.

### B.1. *Data on stock market liquidity*

Levine (1999b) uses the following measure of stock market liquidity: the total value of the trades of domestic stock on domestic stock exchanges divided by GDP and calls this measure **Value Traded**.<sup>5</sup> While not a direct measure of trading costs or the uncertainty associated with trading on a particular exchange, theoretical models of stock market liquidity and economic growth directly motivate Value Traded (Levine 1991; Bencivenga *et al.* 1995). Value Traded measures trading volume as a share of national output and should therefore positively reflect liquidity on an economy-wide basis. The value-traded ratio is likely to vary with the ease of trading: if it is costly and risky to trade, there will tend to be less trading.

### B.2. *Data on the legal environment*

Consider the connection between the legal protection of minority shareholders and the liquidity of equity markets. Conceptually, legal systems that protect shareholders, especially minority shareholders, encourage greater participation. Shareholders exercise their power by voting for directors. Thus, to quantify the legal treatment of shareholders, Levine (1999b) use five measures of the voting rights of shareholders from LLSV (1998).

PROXY equals 1 if shareholders can vote either by showing up in person, sending an authorized representative, or mailing in their vote. PROXY equals 0 if shareholders cannot vote by mail. This can impede shareholder participation because they must either attend the meeting or go through the legal procedure of designating an authorized representative.

CUMULATIVE equals 1 if the Company Law or Commercial Code allows shareholders to cast all of their votes for one candidate, and 0 otherwise. The ability to vote all one's shares for one candidate may make it easier for minority shareholders to put their representatives on boards of directors.

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<sup>5</sup> For a discussion of results using other measures of stock market development, see Levine and Zervos (1998) and Levine (1999b).

BLOCKED equals 1 if the Company Law or Commercial Code does *not* allow firms to require that shareholders deposit their shares prior to a General Shareholders Meeting, thus preventing them from selling those shares for a number of days, and 0 otherwise. When shares are blocked in this manner, the shares are kept in custody until a few days after the meeting. This practice prevents shareholders who do not bother to go through this arduous exercise from voting.

MINOR equals 1 if the Company Law or Commercial Code grants minority shareholders either a judicial venue to challenge the management decisions or the right to step out of the company by requiring the company to purchase their shares when they object to certain fundamental changes, such as mergers, assets dispositions and changes in the articles of incorporation. The variable equals 0 otherwise.

MEETING equals 1 if the minimum percentage of ownership share capital that entitles a shareholder to call for an Extraordinary Shareholders' Meeting is less than 10 percent, and 0 otherwise. The minimum percentage of ownership share capital that entitles a shareholder to call for an Extraordinary Shareholders' Meeting ranges from one to 33 percent with a median of 10 percent. Mexico has the highest value in the sample of countries. Presumably, the harder it is for minority shareholders to call a meeting and contest management the less attractive it will be for agents to participate in equity markets.

SRIGHTS sums these five indicators into a conglomerate index of shareholder rights.

### B.3. *Summary statistics on the legal and accounting environment*

Belgium, Italy, and Mexico (all countries with a French legal origin) are countries where SRIGHTS equals the minimum value of zero, indicating that their legal systems do not stress the rights of minority shareholders. In contrast, the legal codes of the United States stress the rights of shareholders, such that SRIGHTS = 5. The French legal tradition is clearly evident in Latin America. This region's legal system places comparatively less emphasis on the legal rights of shareholders, particularly minority shareholders, than other regions. There is, however, important cross-Latin America variation.

The legal codes of Argentina, Brazil, and Chile actually place a comparatively high priority on minority shareholder rights, while Colombia, Mexico, and Venezuela are far below the international average. In terms of ACCOUNT, Latin America tends to provide less comprehensive and comparable information about corporations to investors as measured by the low value of ACCOUNT. Moreover, Latin America's (overall) comparatively weak legal protection of shareholders and its relatively uninformative accounting systems have a price: comparatively poor stock markets.

### B.4. *Regression of stock market liquidity on accounting variables*

Levine (1999b) finds a strong link between stock market liquidity and the availability of high quality information about firms. In contrast, shareholder rights do not have a very robust link with stock market liquidity after control-

ling for ACCOUNT. These findings stress the importance of good regulations governing information disclosure. Furthermore, the relationship between ACCOUNT and liquidity is economically meaningful. For example, a one standard deviation increase in ACCOUNT (12) increases Value Traded by 0.058 ( $0.058 = 0.0048 * 12$ ), which is about the median value of Value Traded in the sample (0.054).

### B.5. Causality: *The legal and regulatory environment, liquidity, and growth*

Levine (1999b) also uses instrumental variables procedures to determine whether the exogenous component of stock market development is linked with long-run growth. The basic regression takes the form:

$$\text{GROWTH} = \alpha + \beta \text{SMI} + \gamma X + \varepsilon,$$

where the dependent variable, GROWTH is real per capita GDP growth over the 1976-1993 period, SMI is Value Traded, and  $X$  represents a matrix of conditioning information that controls for other factors associated with economic growth. I use SRIGHTS and ACCOUNT as instrumental variables for each of the SMI indicators and use a Generalized Method of Moments estimator.

The results indicate a strong, positive relationship between the exogenous component of stock market development and economic growth. After controlling for a wide array of factors, the exogenous component of Value Traded enters the growth regression with a significant coefficient (at the 0.05 level). Moreover, the strong link between the exogenous component of stock market development and growth holds using alternative instrumental variables. Specifically, the results hold using the dummy variables for legal origin, either English, French, or German, as instrumental variables without using SRIGHTS and ACCOUNT. The exogenous component of stock market development –*the component of stock market development defined by the legal and accounting regime*– is positively associated with long-run economic growth.<sup>6</sup>

The linkages from the regulatory regime through stock market liquidity to long-run growth are economically meaningful. For example, the results imply that if Argentina implemented regulatory changes that improved the quality of corporate financial statements from the recorded value of 45 to the average for OECD countries (65), Argentine GDP per capita growth would be 0.6 percentage points faster per year. This is quite large, considering that Argentina's real per capita GDP growth averaged only about 0.2 percentage points per year over this period. Furthermore, after a decade, 0.6 percentage points faster per capita GDP growth implies that each Argentinean would be earning 6 percent more *per year*. This is meant to be illustrative. Since the analysis does not consider

<sup>6</sup> Furthermore, the data do not reject the orthogonality conditions in any of the regressions. The data do not reject the overidentifying restriction, which creates confidence in the instrumental variables. Thus, the results are consistent with the statement that the shareholder rights (SRIGHTS) and information (ACCOUNT) indicators influence growth only through their impact on stock market development.

any country in detail, the coefficients should not be applied to any individual country. Instead, the example serves to demonstrate the large potential costs, in terms of slower long-run growth, of permitting poor information disclosure to persist.

### C. Cautionary Note

It is important to be clear about what these results do not show.

First, the results in Levine and Zervos (1998) and Levine (1999b) do *not* contradict the argument that financial development also influences economic growth. Rather, existing work provides evidence consistent with the hypothesis that the exogenous component of stock market development promotes economic growth.

Second, the LLSV (1998) used by Levine (1999b) does not include measures on a range of factors that may influence the operation of stock markets. For instance, a wide range of regulations influences stock market activity beyond those summarized by SRIGHTS and ACCOUNT. These range from listing requirements, to requirements governing the trading of securities, to supervision of broker/dealers, etc. Market microstructure may importantly influence stock market development. These factors were omitted due to data availability, not to potential relevance. Rather, existing work makes more limited points: legal heritage is closely linked to the legal rights of shareholders and the quality of corporate financial statements; legal and accounting characteristics influence stock market size and liquidity; and the exogenous component of stock market development is strongly linked with long-run rates of economic growth.

Third, the empirical results in conjunction with the theoretical overview do not imply that every country needs its own active bourse. Conceptually, firms and savers benefit from easy access to liquid stock markets. It is the ability to trade and issue securities easily that facilitates long-term growth, not the geographical location of the market. Thus, capital control liberalization may improve the ability of firms to raise capital both by improving the liquidity of domestic exchanges and by providing greater access to foreign exchanges.

Fourth, these analyses use cross-country comparisons. They do not examine any single country in depth. Nonetheless, the results –and therefore the policy implications– jump-out. Particular characteristics of the legal and regulatory environment are strongly linked with how well the stock exchange operates, with important spillovers for economic development.

## 4. IS A BANK-BASED OR MARKET-BASED FINANCIAL SYSTEM BETTER?

The classic controversy about financial structure involves comparisons between Germany and Japan's bank-based systems versus England and the United States more market-based financial systems. This section first discusses arguments in favor of the bank-based system. Then, I review arguments that contradict this view. Next, I review emerging evidence on the implications and determinants of financial structure. Finally, I conclude by arguing that (1) there exists considerable debate, with sparse evidence, about the relation-

ship between financial structure and economic growth; and (2) new research suggests that the issue is not banks or stock markets. The real issue is creating an environment in which both banks and stock markets flourish and provide financial services to the economy. ***The crucial policy implication from recent research is the following: Rather than focusing bank-based versus market-based tradeoffs, we need to more clearly identify the laws, regulations, and policies that foster overall financial sector development.***

### **A. The Case for a Bank-Based System**

As noted above, financial intermediaries can improve the acquisition of information on firms, the intensity with which creditors exert corporate control, provision of risk-reducing instruments, and mobilization of capital by reducing information and transactions costs. In contrast, market-based systems might not provide these financial services as well as bank-based systems.

Stiglitz (1985) argues that since well-developed markets quickly reveal information to investors at large, this will dissuade any individual investor from spending much time and money researching firms. There is a basic free-rider problem that reduces incentives for investors to expend resource acquiring information when this information is revealed in the market to others how have not spent time and money carefully investigating investment opportunities. This problem is less severe in bank-based systems since banks can make investments without revealing their decisions immediately in public markets.

Furthermore, many argue that the market for corporate control is ineffective, so that the threat of outsiders taking over the firm is a poor way of exerting corporate control and convincing managers to act in the best interests of firm owners. First, insiders probably have better information about the corporation than outsiders. This informational asymmetry mitigates the potential effectiveness of takeovers since it is less likely that ill-informed outsiders will outbid relatively well-informed insiders for control of firms (unless they pay too much!). Second, liquid equity markets may facilitate takeovers that while profiting the raiders, may actually be socially harmful [Shleifer and Summers 1988]. Third, more liquidity may reduce incentives to undertake careful –and expensive– corporate governance. By reducing exit costs, stock market liquidity encourages more diffuse ownership, such that each owner has fewer incentives to oversee managers actively [Shleifer and Vishny 1986]. Fourth, if an outsider expends lots of resources obtaining information, other market participants will observe the results of this research when the outsider bids for shares of the firm. This will induce others to bid for shares, so that the price rises. Thus, the original outside firm that expended resources obtaining information must, therefore, pay a higher price for the firm than it would have to pay if “free-riding” firms could not observe its bidding. The rapid public dissemination of costly information reduces incentives for obtaining information and making effective takeover bids. Fifth, existing managers often take action –poison pills– that deter takeovers and thereby weaken the market as an effective disciplining device. There is some evidence that, in the United States, the legal system hinders takeovers and grants considerable power to management.

Shareholder should be able to control management through boards of directors. However, an incestuous relationship may blossom between boards of directors and management. Members of a board enjoy their lucrative fees and owe those fees to nomination by management. Thus, boards are more likely to approve golden parachutes to managers and poison pills that reduce the attractiveness of takeover. Thus, this incestuous link may further reduce the effectiveness of the market for corporate control [Allen and Gale 1999].

In sum, proponents of bank-based systems argue that there are fundamental reasons for believing that market-based systems will not do a good job of acquiring information about firms and overseeing managers. This will hurt resource allocation and economic performance. Banks do not suffer from the same fundamental shortcomings as markets; they will do a correspondingly better job at researching firms and overseeing managers. Furthermore, while markets may potentially provide the best tailor made products for hedging risk, markets are imperfect and incomplete. Thus, in some circumstances—particularly involving intertemporal risk sharing—bank-based systems may offer better risk ameliorating services than market-based systems [Allen and Gale 1999].

## **B. The Case for a Market-Based System**

The case for a market-based system is essentially a counterattack focusing on the practical efficacy of bank-based systems. Bank-based systems may involve intermediaries with a huge influence over firms and this influence may manifest itself in negative ways. For instance, once banks acquire substantial, inside information about firms, this allows banks to ease financing constraints but it also allows banks to extract rents from firms; firms must pay for their greater access to capital. In terms of new investments or debt renegotiations, banks with power can extract more of the expected future profits from the firm (than in a market-based system). This ability to extract part of the expected payoff to potentially profitable investments may reduce the effort extended by firms to undertake innovative, profitable ventures [Rajan 1992]. Also, banks (as debt issuers) have an inherent bias toward prudence, so that bank-based systems may stymie corporate growth. Weinstein and Yafeh (1998) find evidence of this in Japan. While firms with close ties to a “main bank” have greater access to capital and are less cash constrained than firms without a main bank, the main bank firms tend to (i) employ conservative, slow growth strategies and do not grow faster than firms without a “main bank,” (ii) use more capital intensive processes than non-main bank firms holding other features constant, and (iii) produce lower profits, which is consistent with the powerful banks extracting rents from the relationship. Allen and Gale (1999) further note that although banks may be effective at eliminating duplication of information gathering and processing, which is likely to be helpful when people agree about what needs to be gathered and how it should be processed, bank may be ineffective in non-standard environments. Thus, banks may not be effective gatherers and processors of information in new, uncertain situations involving innovative products and processes.

Another line of attack on the efficacy of bank-based systems involves corporate governance. Bankers will act in their own best interests. Bankers may become captured by the firm, or collude with firms against other creditors. Thus, influential banks may prevent outsiders from removing inefficient managers, thereby eliminating one avenue of corporate control [Black and Moersch 1998]. Wenger and Kaserer (1998) provide convincing evidence for the case of Germany. In Germany, bank managers voted the shares of a larger number of small stockholders. For instance, in 1992, bank managers exercised on average 61 percent of the voting rights of the 24 largest companies and in 11 companies this share was higher than 75%. This control of corporations by bank management extends to the banks themselves! In the shareholder meetings of the three largest German banks, the percentage of proxy votes was higher than 80 percent, much of this voted by the banks themselves. For example, Deutsche Bank held voting rights for 47 percent of its own shares, while Dresdner votes 59 percent of its own shares [Charkham 1994]. Thus, the bank management has rested control of the banks from the owners of the banks and also exerts a huge influence on the country's major corporations. Wenger and Kaserer (1998) also provide examples in which banks misrepresent the accounts of firms to the public and systematically fail to discipline management.

Finally, market-based financial systems provide a richer set of risk management tools that permit greater customization of risk ameliorating instruments. While bank-based systems may provide inexpensive, basic risk management services for standardized situations, market-based systems provide greater flexibility to tailor make products. Thus, as economies mature and need a richer set of risk management tools and vehicles for raising capital, they may concomitantly benefit from a legal and regulatory environment that supports the evolution of market-based activities, or overall growth may be retarded.

### **C. Financial Structure and Economic Development: Evidence**

Here, I want to make two points. First, there are good reasons for believing that the issue is not banks or stock markets, but that both banks and stock markets provide complementary services to the economy that promote economic progress. Second, new results suggest that focusing on market-based versus bank-based financial differences is analytically less useful than focusing on overall financial development. Creating a legal, regulatory, and policy environment that facilitates financial contracting of all types boosts financial development and accelerates economic growth.

#### *C.1. Complementarities between banks and markets*

Traditionally, development specialists have focused on banks and viewed stock markets as unimportant sideshows. They note that much more corporate capital is raised from banks than from equity issues. Similarly, traditional finance theory, strongly influenced by Modigliani-Miller, views debt and equity—and through this prism, banks and equity markets—as substitute sources of finance. These traditional views, therefore, either give little role to markets or view banks and markets as competing components of the financial system.

This traditional view, however, ignores an important point: stock markets may provide different financial services from banks. Put differently, stock markets may positively affect economic development even though not much capital is raised through them. For instance, stock markets may play a prominent role in facilitating custom-made risk management services and boosting liquidity. In addition, stock markets may complement banks. For instance, by spurring competition for corporate control and by offering alternative means of financing investment, securities markets may reduce the potentially harmful effects of excessive bank power.

While the theoretical literature is making progress in modeling the co-evolution of banks and markets [Boyd and Smith 1996; Allen and Gale 1999], there is already some empirical evidence. For instance, Levine and Zervos (1998) show that greater stock market liquidity implies faster economic growth no matter what the level of banking development. Similarly, greater banking development implies faster growth regardless of the level of stock market liquidity. Moreover, even after controlling for other country characteristics, such as initial income, schooling, political stability, monetary, fiscal, trade, and exchange rate policies, the data still indicate that both banking development and stock market development exert a positive influence on growth. Using firm-level data, Demircug-Kunt and Maksimovic (1996) show that increases in stock market development actually tend to increase the use of bank finance in developing countries. Thus, these two components of the financial system may act as complements during the development process. While still in need of additional research, the scattered pieces of evidence that currently exist suggest that we may not want to view bank-based and market-based systems as representing a tradeoff. Policymakers may instead want to focus on providing a legal and regulatory environment that allows both banks and markets to flourish without tipping the playing field in favor of either banks or markets.

### *C.2. New evidence on financial structure and growth*

Demircug-Kunt and Levine (1999) use newly collected data –from Beck, Demircug-Kunt, and Levine (1999)– on a cross-section of countries to illustrate how financial systems differ around the world. They find that banks, other financial intermediaries, and stock markets all get larger, more active and more efficient as countries become richer. Thus, financial sector development tends to be greater at higher income levels. Demircug-Kunt and Levine (1999) then classify countries as market-based or bank-based using measures of the relative size, activity, and efficiency of banks and stock markets. They find that countries with a Common Law tradition, strong protection for shareholder rights, good accounting standards, low levels of corruption and no explicit deposit insurance tend to be more market-based.

Levine (2000) uses the Demircug-Kunt and Levine (1999) measures of financial structure to examine the importance of financial structure for economic growth. Thus, Levine (2000) investigates the linkages between economic growth and a variety of measures of whether countries are bank-based or market-based. He finds no relationship between financial structure and economic growth in a cross-section of 48 countries over the period 1980-95. While measures of over-

all financial development are positively, and robustly linked with growth, none of the measures of financial structure is significantly related to growth.

These findings contradict both the market-based and bank-based approaches to financial development. The findings are much more consistent with LLSV (1999b, p. 25) claim that (a) "... bank- versus market-centeredness is not an analytically useful way to distinguish financial systems." The findings support LLSV (1999b) legal-approach to financial development that focuses on creating and enforcing the rights of outside investors in firms as the key to growth-promoting financial development.

## 5. CONCLUSIONS

This paper reviewed some recent findings on the relationship between financial development and economic growth. While the paper is long, the basic points are simple. First, considerable evidence suggests that banks and stock markets influence economic growth. This conclusion emphasizes the importance of uncovering the laws, regulations, and policies that foster financial sector development. Second, the legal system is critical for promoting well-functioning intermediaries and markets. Legal systems that (a) include codes protecting the rights of creditors and minority shareholders and (b) enforce those rights encourage the development of banks and securities markets. Third, the regulatory environment also plays an important role in financial development. Accounting rules that foster the dissemination of high quality, comparable information about corporations positively influence the functioning of both securities markets and financial intermediaries. Also, bank regulations that impede the ability of commercial banks to engage in securities market activities or to invest in nonfinancial firms tend to reduce bank efficiency and boost financial fragility with no compensating positive ramifications. Finally, new evidence suggests that we should avoid the century-old debate regarding the comparative merits of bank-based versus market-based financial systems. Rather, researchers should focus on identifying additional legal, regulatory, and policy characteristics associated with growth-enhancing financial development.

## REFERENCES

- Allen, Franklin and Gale, Douglas (1999). *Comparing Financial Systems*. Cambridge, MA: MIT Press.
- Atje, Raymond and Jovanovic, Boyan (1993). "Stock Markets and Development", *European Economic Review*, April, 37 (2/3), pp. 632-40.
- Bagehot, Walter (¿AÑO?). *Lombard Street*. Homewood, IL: Richard D. Irwin, 1873 (1962 Edition).
- Barth, James R.; Caprio, Gerard Jr.; Levine, Ross (1999). "Financial Regulation and Performance: Cross-Country Evidence", in *Banking, Financial Integration, and Macroeconomic Stability*, Eds: Leonardo Hernández and Klaus Schmidt-Hebbel. Santiago, Chile: Central Bank of Chile.
- Barth, James R.; Caprio, Gerard Jr.; Levine, Ross (2000). "Banking Systems Around the World: Do Regulation and Ownership Affect Performance

- and Stability?" in *Prudential Supervision: What Works and What Doesn't*, Ed: Frederic Mishkin, Cambridge, MA: NBER Press.
- Beck, Thorsten; Demirgüç-Kunt, Asli; Levine, Ross (1999). "A New DataBase on Financial Development and Structure" Washington, D.C.: World Bank, mimeo.
- Beck, Thorsten; Levine, Ross; Loayza, Norman (1999). "Finance and the Sources of Growth", *Journal of Financial Economics*, forthcoming.
- Bencivenga, Valerie R., and Smith, Bruce D. (1991). "Financial Intermediation and Endogenous Growth", *Review of Economics Studies*, April, 58 (2), pp. 195-209.
- Bencivenga, Valerie R.; Smith, Bruce D., and Starr, Ross M. (1995). "Transactions Costs, Technological Choice, and Endogenous Growth", *Journal of Economic Theory*, October, 67 (1), pp. 53-177.
- Berman, Harold J. (1997). *Law and Revolution: The Formation of the Western Legal Tradition*. Cambridge, MA: Harvard University Press
- Black, Stanley W. and Moersch, Mathias (1998). "Financial Structure, Investment and Economic Growth in OECD Countries" in *Competition and Convergence in Financial Markets: The German and Anglo-American Models*, Eds: Stanley W. Black and Mathias Moersch, New York: North-Holland Press, pp. 157-174.
- Boyd, John H. and Prescott, Edward C. (1986) "Financial Intermediary-Coalitions", *Journal of Economics Theory*, April, 38 (2), pp. 211-32.
- Boyd, John H. and Smith, Bruce D. (1996). "The Co-Evolution of the Real and Financial Sectors in the Growth Process", *World Bank Economic Review*, May, 10 (2), pp. 371-396.
- Cameron, Rondo; Crisp, Olga; Patrick, Hugh T. and Tilly, Richard, eds. (1967). *Banking in the Early Stages of Industrialization: A Study in Comparative Economic History*. New York: Oxford University Press
- Caprio, Gerard and Klingebiel, Daniela (1999). "Episodes of Systemic and Borderline Financial Crises", Washington, D.C.: World Bank, mimeo, May.
- Charkham, Jonathan (1994). *Keeping Good Company: A Study of Corporate Governance in Five Countries*. Oxford: Clarendon Press.
- Diamond, Douglas W. (1984). "Financial Intermediation and Delegated Monitoring", *Review of Economic Studies*, July, 51 (3), pp. 393-414.
- Diamond, Douglas W. and Dybvig, Philip H. (1983). "Bank Runs, Deposit Insurance, and Liquidity", *Journal of Political Economy*, June, 91 (3), pp. 401-19.
- Demirgüç-Kunt, Asli and Levine, Ross (1999). "Financial Structures Across Countries: Stylized Facts" Washington, D.C.: World Bank, mimeo.
- Demirgüç-Kunt, Asli and Maksimovic, Vojislav (1998). "Law, Finance, and Firm Growth", *Journal of Finance*, December, 53 (6), pp. 2107-2137.
- Easterly, William and Levine, Ross (1997). "Africa's Growth Tragedy: Policies and Ethnic Divisions", *Quarterly Journal of Economics*, November.
- Glendon, Mary Ann; Gordon, Michael; and Osakwe, Christopher (1982). *Comparative Legal Tradition in a Nutshell*. St. Paul: West Publishing Co.
- Greenwood, Jeremy and Jovanovic, Boyan (1990). "Financial Development, Growth, and the Distribution of Income", *Journal of Political Economy*, October, 98 (5, Pt. 1), pp. 1076-1107.

- Gurley, John G. and Shaw, Edward S. (1955). "Financial Aspects of Economic Development", *American Economic Review*, September, 45 (4), pp. 515-38.
- Haber, Stephen H. (1993). "Industrial Concentration and the Capital Markets: A Comparative Study of Brazil, Mexico, and the United States, 1830-1930", *Journal of Economic History*, September, 51 (3), 559-80.
- King, Robert G. and Levine, Ross (1993a). "Finance and Growth: Schumpeter Might Be Right", *Quarterly Journal of Economics*, August, 108 (3), pp. 717-38.
- King, Robert G. and Levine, Ross (1993b). "Finance, Entrepreneurship, and Growth: Theory and Evidence", *Journal of Monetary Economics*, December, 32 (3), pp. 513-42.
- Kyle, Albert S. (1984). "Market Structure, Information, Futures Markets, and Price Formation", in *International Agricultural Trade: Advanced Readings in Price Formation, Market Structure, and Price Instability*, eds. Gary G. Storey, Andrew Schmitz and Alexander H. Sarris, Boulder, CO: Westview.
- Lamoreaux, Naomi (1995). *Insider Lending: Banks, Personal Connections, and Economic Development in Industrial New England*, New York: Cambridge University Press.
- Laporta, Rafael; Lopez-de-Silanes, Florencio; Shleifer, Andrei; and Vishny, Robert W. (1999b). "Investor Protection and Corporate Governance", mimeo.
- Laporta, Rafael; Lopez-de-Silanes, Florencio; Shleifer, Andrei; and Vishny, Robert W. (1999a). "The Quality of Government", *Journal of Law, Economics, and Organization*, 15 (1), pp. 222-279.
- Laporta, Rafael; Lopez-de-Silanes, Florencio; Shleifer, Andrei; and Vishny, Robert W. (1998). "Law and Finance", *Journal of Political Economy*, 106 (6), pp. 1113-1155.
- Laporta, Rafael; Lopez-de-Silanes, Florencio; Shleifer, Andrei; and Vishny, Robert W. (1997). "Legal Determinants of External Finance", *Journal of Finance*, July, 52 (3), pp. 1131-1150.
- Levine, Ross. (1991). "Stock Markets, Growth, and Tax Policy", *Journal of Finance*, September, 46(4), pp. 1445-65.
- Levine, Ross. (1997). "Financial Development and Economic Growth: Views and Agenda", *Journal of Economic Literature*, June, 35(2), pp. 688-726.
- Levine, Ross. (1998). "The Legal Environment, Banks, and Long-Run Economic Growth", *Journal of Money, Credit, and Banking*, August.
- Levine, Ross. "Law, Finance, and Economic Growth", *Journal of Financial Intermediation*, 1999a, 8 (1/2), pp. 36-67.
- Levine, Ross. (1999b). "Napoleon, Bourses, and Growth: With A Focus on Latin America", in *Market Augmenting Government*, Eds. Omar Azfar and Charles Cadwell. Washington, D.C.: IRIS, forthcoming.
- Levine, Ross. (1999c). "Bank, Markets, and Structure: Implications and Determinants" in *Banks and Capital Markets: Sound Financial Systems for the 21st Century*, Ed: Augusto de la Torre, Washington, D.C.: World Bank, forthcoming.

- Levine, Ross. (2000). "Market-Based Versus Bank-Based Financial Systems and Economic Growth", paper prepared for the World Bank conference, *Financial Structure and Economic Development*.
- Levine, Ross; Loayza, Norman; Beck, Thorsten. (1999). "Financial Intermediation and Growth: Causality and Causes", *Journal of Monetary Economics*, forthcoming.
- Levine, Ross and Renelt, David. (1992). "A Sensitivity Analysis of Cross-Country Growth Regressions", *American Economic Review*, September, 82 (4), pp. 942-63.
- Levine, Ross and Zervos, Sara (1998). "Stock Markets, Banks, and Economic Growth", *American Economic Review*, June.
- McKinnon, Ronald I. (1973). *Money and Capital in Economic Development*. Washington, DC: Brookings Institution
- Neusser, Klaus and Kugler, Maurice (1998). "Manufacturing Growth and Financial Development: Evidence from OECD Countries", *Review of Economics and Statistics*, November, 80, pp. 636-46.
- Patrick, Hugh. (1966). "Financial Development and Economic Growth in Underdeveloped Countries", *Economic Development Cultural Change*, January, 14 (2), pp. 174-89.
- Rajan, Raghuram G. (1992). "Insiders and Outsiders: The Choice Between Informed and Armslength Debt", *Journal of Finance*, September, 47 (4), pp. 1367-1400.
- Rajan, Raghuram G. and Zingales, Luigi (1998). "Financial Dependence and Growth", *American Economic Review*, June.
- Rousseau, Peter L. and Wachtel, Paul (1998). "Financial Intermediation and Economic Performance: Historical Evidence from Five Industrial Countries", *Journal of Money, Credit, and Banking*, November, 30 (4), pp. 657-78.
- Sirri, Erik R. and Tufano, Peter (1995). "The Economics of Pooling", in *The Global Financial System: A Functional Approach*, eds. Dwight B. Crane, et al., Boston, MA: Harvard Business School Press, pp. 81-128.
- Shleifer, Andrei and Vishny, Robert W. (1986). "Large Shareholders and Corporate Control", *Journal of Political Economy*, June, 96 (3), pp. 461-88.
- Shleifer, Andrei and Summers, Lawrence (1988). "Breach of Trust in Hostile Takeovers", in *Corporate Takeovers: Causes and Consequences*, ed. A. Auerbach, Chicago: University of Chicago Press, pp. 33-56.
- Stiglitz, Joseph E. (1985). "Credit Markets and the Control of Capital", *Journal of Money, Credit and Banking*, May, 17 (2), pp. 133-52.
- Weinstein, David E. and Yafeh, Yishay (1998). "On the Costs of a Bank-Centered Financial System: Evidence from the Changing Main Bank Relations in Japan", *Journal of Finance*, 53 (2), pp. 635-672.
- Wenger, Ekkehard and Kaserer, Christoph (1998). "The German System of Corporate Governance: A Model Which Should Not Be Imitated", in *Competition and Convergence in Financial Markets: The German and Anglo-American Models*, Eds: Stanley W. Black and Mathias Moersch, New York: North-Holland Press, pp. 41-78.