

The Finance and Growth Nexus

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It is difficult to overemphasize the potential benefits of economic growth for improving human welfare. For example, Bangladesh, India, and Pakistan, three of the world's lowest income nations, had real per capita GDP of \$1908, \$1633, and \$1793, respectively, in 1992. In contrast, the equivalent values for three of the world's highest income nations, Denmark, Sweden, and the United States, were \$18,730, \$18,387, and \$23,220, respectively.¹ So average per capita income in these nations was more than 11 times

that in the poorer nations. Consequently, people living in these nations could afford a dramatically higher quality of life involving, for example, the consumption of vastly superior medical care and education. Unfortunately, if income growth in the poor nations continues at its average rate of about 2.84 percent per year—its pace over the

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¹The measures of real per capita GDP reported here are taken from the Penn World Tables, which measure output across nations using a common set of international prices to value goods and services. The data are available online at <http://pwt.econ.upenn.edu>. For additional information, see the 1991 paper by Robert Summers and Alan Heston.

33 years from 1959 to 1992—these nations would not attain the average current income of the higher income group until the year 2079. If they could grow twice as fast, they would reach the current per capita income level of the richer nations in half the time.²

Economic growth is driven, in part, by firms' investments in physical plant and equipment and the research and development of new technologies. Often, investment projects are too costly for firms to finance solely with their retained earnings; in such cases, projects must be financed using the available savings of households. Differences in the information available to households relative to that available to firms and costs of transactions impede the flow of savings into investment. Information costs arise, for example, when households attempt to distinguish between investment opportunities offered by firms in order to isolate the most worthwhile projects. A firm incurs a transaction cost, for example, when its managers expend effort locating potential investors.

Financial markets and intermediaries—the financial system—can raise a household's return on investment and, thus, perhaps the total quantity of investment supplied by reducing the costs associated with lending to firms. The *extent* of the financial system describes the proportion of firms and households able to easily access the services provided by financial markets and intermediaries. The *efficiency* of the financial system refers to how effective these markets and intermediaries are in reducing information and transaction costs for their customers. Economists

refer to improvements in the extent or efficiency of the financial system as financial development. (See *The Extent of Financial Development*.)

CONTROVERSY OVER THE IMPORTANCE OF FINANCIAL DEVELOPMENT FOR ECONOMIC GROWTH

Walter Bagehot's book provides an early discussion of financial development, emphasizing its importance for economic growth. In his study *Lombard Street: A Description of the Money Market*, originally published in 1873, Bagehot argues that the distinguishing characteristic of English financial markets was the relative ease with which they were able to mobilize savings to finance a variety of long-term, illiquid investment opportunities. This easy entrepreneurial access to external finance was critical in facilitating the implementation of new technologies in England.

This early notion that financial development may play a critical role in economic growth has not been uniformly accepted. Indeed, there has been considerable debate on the direction of causation: does economic growth lead to more highly developed financial systems, or does financial development lead to greater economic growth? Adherents to the first view argue that financial markets and institutions appear when needed: when economies grow, business demand for financial services increases and the financial sector expands in response.³ An alternative view is that financial development is not only a result but also an important determinant of economic development. Researchers holding this view accept that the financial sector responds to the increased demand for financial services that occurs as an economy develops. However, they stress that there may also be independent changes in the level of financial development—for example, in response to changes in government policies—and that such changes may spur further economic growth. In particular, they ar-

²Of course, the rich group is also growing, and indeed, as a group they've grown at the slightly faster rate of 2.91 percent per year, over the same period. Hence, the poor nations described above will never actually overtake the rich group unless their rates of growth rise sufficiently. For example, if the rate of growth for Bangladesh, India, and Pakistan could be doubled to 5.68 percent a year, they would overtake Denmark, Sweden, and the United States in the year 2083.

³See, for example, the 1952 book by Joan Robinson.

The Extent of Financial Development (1976 - 93)

The United States economy has a relatively well-developed financial sector. Measures of the extent of the financial system, which provide estimates of the quantity of external finance available, are relatively high. Consider two sources of external finance. Stock markets allow firms to finance current investment by selling shares in future earnings. Loans from banks and other financial intermediaries are an alternative source of finance. For the United States, stock market capitalization, which measures the total value of all shares outstanding, was, on average, 0.57 times GDP over the period 1976–93. Domestic bank credit to the private sector, essentially loans made to nongovernment enterprises, was 0.77 times GDP over the same period. The sum of these two values yields a measure of financial development for the United States equal to 1.34. In contrast, for Bangladesh this measure is just 0.28 times GDP. Interestingly, market capitalization is only about 0.01 of this total; domestic credit comprises the remainder. While debt is generally a larger source of investment financing than equity in most countries, the predominance of debt finance in Bangladesh is extreme (see table).

Country	Bank Credit as a Fraction of GDP	+	Stock Market Capitalization as a Fraction of GDP	=	The Extent of Financial Development
Luxembourg	2.27		2.45		4.72
Singapore	1.50		1.29		2.79
Japan	1.96		0.66		2.62
Hong Kong	1.19		1.24		2.43
United States	0.77		0.57		1.34
Sweden	0.87		0.31		1.18
Denmark	0.69		0.19		0.87
India	0.46		0.10		0.55
Pakistan	0.45		0.07		0.53
Bangladesh	0.27		0.01		0.28

gue that a poorly functioning financial system may hamper development, but an efficient one can boost the rate of growth above what it otherwise would have been.

This article discusses some recent evidence that appears to support this second viewpoint: financial development may have a significant impact on a nation's rate of economic growth.⁴ Thus, poor nations, or those in transition to market economies, may be able to sustain higher rates of growth by avoiding policies that frustrate the

development of the financial system. Additionally, economies with such policies already in place may stimulate economic development by eliminating them. (See *Financial Repression*.) A stronger interpretation of the evidence—that policymakers may actually be able to boost rates

⁴For an excellent and accessible survey of this evidence, the interested reader should consult Ross Levine's 1997 paper, on which this article has drawn heavily.

Financial Repression

A famous example of economic policies that distort financial markets is the phenomenon of *financial repression* first discussed by Ronald I. McKinnon in his 1973 book. In some less developed economies, government policy sought to promote targeted industries, ones considered important for rapid development, by allowing them to borrow cheaply. This often resulted in excessive and inefficient investment in such industries. Less favored sectors of the economy could not obtain investment financing for worthwhile projects. The consequence was a misallocation of funds that reduced the overall return to investment in the economy, since many productive opportunities were left unfunded while unproductive projects in targeted industries obtained funds.

In chapter 6 of his book, McKinnon discusses the case of Ethiopia, where the government capped the nominal interest rate on bank loans at 12 percent. This interest rate was too low to clear the market for investment loans. Consequently, an arbitrary system of loan allocation arose whereby firms in strategic industries targeted by the government, such as manufacturing and hotel building, experienced excessive investment that generated poor returns for savers. At the same time, farmers were unable to obtain short-term loans from banks. Instead, they had to borrow from informal moneylenders who charged them 100 to 200 percent a year.

of growth by devoting resources to subsidizing the development of the financial system—is more controversial, and the evidence to date is not strong enough to support this interpretation.

WHAT DOES THE FINANCIAL SYSTEM DO AND HOW COULD IT PROMOTE ECONOMIC GROWTH?

To understand how the financial system might influence economic growth, we need to review the roles of the financial system in greater detail.

First, the financial system *mobilizes savings*. Since an individual saver may be unable or unwilling to completely fund a borrower, financial markets and institutions pool the savings of diverse households and make these funds available for lending. This activity reduces the transaction costs associated with external finance for both firms and households. By going directly to a financial institution, firms seeking to borrow avoid the costs of having to contact a diverse group of savers. Similarly, savers avoid the costs of evaluating every potential borrower by placing their funds with a financial institution.

Second, the financial system *allocates savings* by determining which borrowers obtain loans. Since financial institutions are specialists, they can determine worthwhile investment opportunities and judge the creditworthiness of borrowers at lower cost than the average small investor.

The third role of the financial system is to *reduce risk* by spreading investors' savings across many different investment opportunities. Spreading savings diversifies risk for households and reduces their exposure to the uncertainty associated with individual projects. This reduction in risk encourages savings.

The fourth role of the financial system derives from its ability to *generate liquidity*. Some investments with potentially high returns involve projects that require long-term commitments of capital. However, some investors may unexpectedly need access to their savings. Fortunately, when the financial system pools the investments of many households, it allocates funds to both short- and long-term projects. Thus, investors obtain higher returns on their savings than they would if their investments were limited to short-term projects, but they still have access to their savings in unforeseen circumstances. Further, mixing investments in this way ensures that worthwhile long-term projects are funded.⁵

Sixth, the financial system *facilitates trade* by extending credit and guaranteeing payments. For example, currency, demand deposits, and credit card accounts all allow individuals to ex-

change goods and services without having to resort to barter. Additionally, letters of credit help firms order the inputs for current production when they experience delays in payment for past sales.

The financial system also *exerts corporate control* and *monitors managers*. Entrepreneurs' or managers' information about the operation and outcome of their projects tends to be superior to information that outside creditors and shareholders have. Insiders' attempts to exploit this informational advantage by engaging in opportunistic behavior would tend to discourage savings. For example, managers might underreport their firms' profits to lenders and shareholders in order to raise their own earnings. To offset this information advantage, banks monitor borrowers, and equity markets allow shareholders to discipline managers by voting out poor management.

These roles suggest that a well-functioning financial system might permit a higher level of saving and investment and, therefore, economic growth.

THE EVIDENCE FOR CAUSALITY

The earliest examination of the relationship between finance and growth across countries was a 1969 study by Raymond Goldsmith. Goldsmith used the value of financial intermediary assets, relative to GNP, as a measure of financial development. Examining data on 35 countries over 103 years (1860 – 1963) he found that, in general, financial and economic development appeared to occur simultaneously. Although

Goldsmith's measure of financial development would be correlated with the *extent* of financial services, it's less likely that it would be closely related to the *quality* of those services. Unfortunately, the paucity of data on the quality of financial services makes its measurement problematic for any study of financial development. A further difficulty in Goldsmith's study is that he did not control for the many other factors that, at least in part, determine the rate of economic growth. Economic theory indicates that a nation's propensity to save, supply of human capital, fiscal and monetary policy, political and economic stability, the rule of law, the rate of population growth, and the initial level of GDP are all possible determinants of an economy's rate of growth.

Perhaps the most thorough study of finance and growth in the tradition of Goldsmith is the 1993 work of Robert King and Ross Levine. This work remedied many of the problems of the original study. Acknowledging the lack of good measures of overall financial development, the authors examined a variety of alternatives. They used four measures. Two of these measures are intended to gauge the extent of the financial sector: liquid liabilities of the financial system as a fraction of GDP; and the quantity of credit provided to private enterprises, by both private-sector banks and the central bank, as a fraction of GDP.⁶ King and Levine also used two measures of the efficiency of the financial system. The first measured the share of total credit actually provided by private-sector banks instead of the central bank. The second measured the share of total credit allocated to private nonfinancial firms. Implicit in the use of these two measures is the belief that an economy with more lending by private-sector banks and more lending to pri-

⁵In his famous and influential 1969 study, Sir John Hicks (page 144) emphasized the importance of this role of the financial system during the English Industrial Revolution. Extending Walter Bagehot's theme that financial development facilitates adoption of technology, Hicks argued that financial development, in particular the increased provision of liquidity, allowed the adoption of new technologies, such as the steam engine, that required long-term investment.

⁶Liquid liabilities of the financial system include currency held outside the banking system as well as demand and interest-bearing liabilities of banks and non-bank financial intermediaries.

vate firms will have a more efficient allocation of external finance. A private-sector bank, seeking to maximize profits, is likelier to fund worthwhile investment projects than is a government lender that may have to follow another criterion for loan evaluation.

King and Levine also used three separate measures of economic growth: the per capita growth rates of both GDP and the capital stock and the growth rate of total factor productivity.⁷ Finally, to isolate the effect of financial development, they controlled for several alternative determinants of economic development. That is, they evaluated the ability of the measures of financial development discussed above to explain that part of an economy's overall rate of growth not already explained by other factors. The authors found a positive and statistically significant relationship between their measures of financial development and economic growth; in other words, countries with higher levels of financial development tend to have higher economic growth and vice versa. (See *Financial Development and Economic Growth Across Countries*.)

The issue of causality remains. Does finance cause growth? In other words, do higher levels of financial development

independently generate economic growth? Or does financial development come about only as a result of economic development? If financial development causes economic development, policies that hinder the formation of those markets and financial intermediaries may reduce long-term growth rates. For example, such policies could include imposing disproportionately large taxes on financial firms relative to other corporations. Reforms that eliminate distortionary policies may promote growth and development to an extent that more than compensates for the revenue lost.

Goldsmith was skeptical that researchers would ever be able to resolve the issue of causality. Nonetheless, King and Levine do provide

Financial Development and Economic Growth Across Countries

For a sample of 47 countries over the period 1976 - 91, the figure on page 9 plots the unexplained component of economic growth against a measure of the contemporaneous level of the extent of financial development. Unexplained growth is the remaining component of average annual growth of per capita GDP that is not explained by a set of nonfinancial factors. The data are from the 1998 paper by Ross Levine and Sara Zervos. The nonfinancial factors are (1) initial GDP per capita, (2) secondary school enrollment, (3) a measure of political stability, (4) government spending relative to GDP, (5) inflation, and (6) the black market exchange rate premium. Financial development is measured as the sum of stock market capitalization and domestic bank credit to the private sector, each divided by GDP. This measure of financial development differs from that used by King and Levine in that it includes stock market data. Higher values of this variable indicate larger stock markets and more lending, relative to the size of the economy. This is commonly assumed to imply a higher level of external finance.

The figure clearly shows that, on average, nations characterized by higher levels of financial development, as measured along the horizontal axis, also exhibited higher growth rates than could be explained by nonfinancial factors, as measured along the vertical axis.

⁷Total factor productivity growth is the part of GDP growth that cannot be explained by changes in the capital stock or hours worked.

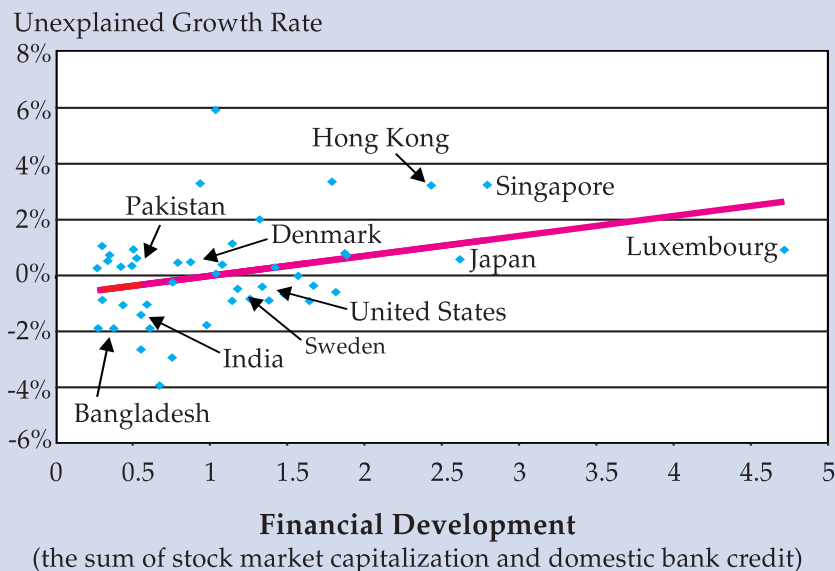
evidence to suggest a causal relationship between finance and growth. Their data indicate that the initial level of financial development in 1960 predicted the subsequent average rate of economic growth over the next 29 years across countries. In other words, economies that were more financially developed at the beginning of the period experienced, on average, more rapid growth. This finding supports the views of researchers who feel that financial development causes economic growth. (See *Financial Development Predicts Economic Growth*.) But this is not conclusive evidence of causality, since the initial level of financial development may respond to how participants in the economy expect the rate of economic growth to change in the future.

CAUSALITY REVISITED

Despite the finding by King and Levine that financial development predicts economic growth, skepticism is still justified. As discussed in the 1998 work of Raghuram Rajan and Luigi Zingales, two possible sources of error prevent researchers from using evidence that finance *predicts* growth to conclude that it *determines* growth. The first source of error involves the role of expectations; the second, the possibility of important omitted factors.

Expectations of future economic development may induce current financial development. If entrepreneurs anticipate future economic growth, which will mean higher demand for financial services, they may invest in the creation of additional financial intermediaries today in anticipation of future profits. In this scenario, finance is completely determined by growth but precedes it.

The other source of error lies in the possibility of missing factors. A variable such as the savings rate might determine both current financial development and future economic growth. Generally, an economy with a younger population, provided it is not too young, will tend to save more relative to GDP—and thus supply a greater quantity of external finance—than an economy with an older population. The financial system will expand to allocate the higher supply of savings, and so the economy will be more financially developed. Moreover, if these funds



are then invested in projects that promote growth, we will see a higher subsequent growth rate for the economy. In this case, finance does not cause growth at all. Both are driven by demographic structure; yet, the data will again indicate finance precedes growth.

Rajan and Zingales attempted to address the issue of causality and to isolate a mechanism through which finance may influence growth. Since the financial system helps reduce the information and transaction costs associated with the external financing of investment, the authors argue that if finance causes growth, financial development should disproportionately affect industries that rely more on external finance, as opposed to retained earnings, for investment. In such industries it generally takes longer for investments to yield cash flows. Thus, financial development should have a stronger impact on industries such as drugs and pharmaceuticals, plastics, and computers, which typically require large amounts of external funding for R&D, than on the tobacco industry, which requires little.⁸ Specifically, industries with a greater need for external finance should grow relatively faster in more financially developed economies than in less financially developed ones.

⁸Rajan and Zingales (1998), page 560 and Table 1.

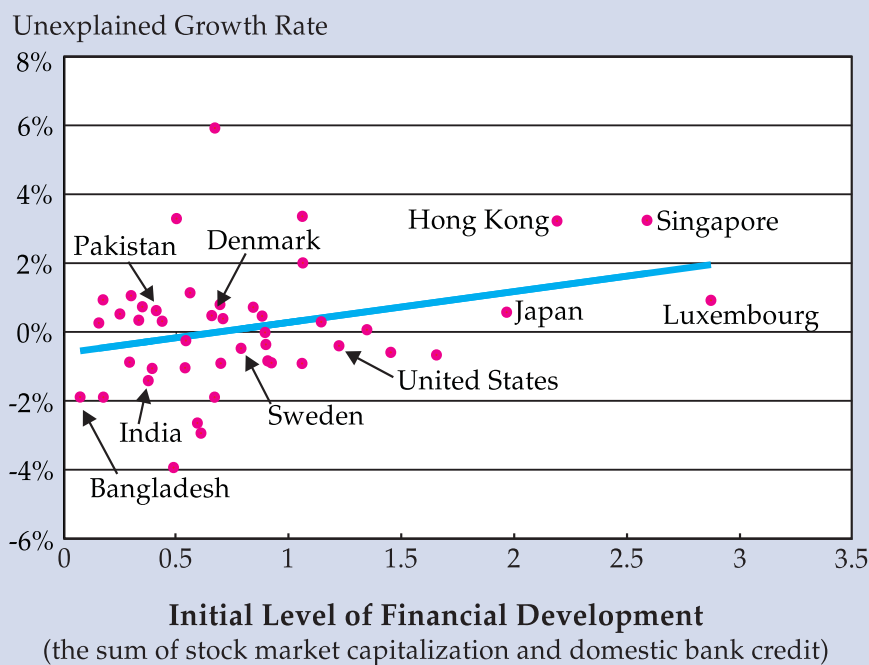
Financial Development Predicts Economic Growth

The figure on page 11 illustrates the result that the initial level of the extent of financial development helps determine future economic growth. The unexplained growth rate computed in the figure on page 9 is plotted against the initial level of financial development, in 1976. Note the positive relationship between the initial level of financial development and subsequent economic growth summarized by the regression line.

The data presented in the figure here imply a regression coefficient for financial development equal to 1.86. This means that a one-percentage-point rise in a nation's level of financial development tends to raise its annual rate of per capita economic growth by almost twice that amount. For example, Bangladesh's initial level of financial development in 1976 was 0.07. But suppose it had instead an initial value of financial development equal to that of the United States, 1.34. According to the regression, in this second scenario, Bangladesh would have grown 2 percentage points more each year over the next 17 years than it actually did. This is a short span in the history of economic development, but it would have been sufficient to allow the poor nation to raise its per capita income more than 43 percent.

The results are weaker, though still significant, when the three countries with the highest measured levels of financial development, Hong Kong, Luxembourg, and Singapore (all of which provide a large percentage of their financial services to nonresidents), are eliminated from the regression. It should be noted, however, that the model examined here is intentionally simple. As such, it abstracts from the effect of economic growth onto financial development. The absence of such effects in the model may exaggerate the importance of initial financial development on subsequent economic growth.

To test their hypothesis, the authors had to address two issues of measurement. First, they had to determine industries' need for external finance. They did this using data for U.S. firms, under the assumption that U.S. financial markets are sufficiently developed so as to provide each industry with its desired level of external finance. Second, to implement their test, Rajan and Zingales had to measure financial development. As an alternative to the measures used by King and Levine, Rajan and Zingales measured a nation's extent of financial development by the size of its stock market plus the amount of credit provided by the banking sector relative to the country's GDP.⁹ They also measured the efficiency of the financial sector using an index of



than in those that were less financially developed. Another interesting finding was that within industries, financial development was more important for young firms. Since such firms were more likely to have a need for external finance, the authors took this as additional confirmation of their thesis.

Rajan and Zingales' exercise provided evidence on a specific way that finance may promote economic growth: by reducing the costs of external finance for firms. Moreover, since they looked at particular industries across a large number of countries, they were able to eliminate the effect of country-specific and industry-specific factors that may influence economic development

the quality of accounting standards in the country. Better accounting standards help overcome the informational problems associated with providing external finance and lead to a more efficient financial system.

Rajan and Zingales used a statistical approach that ameliorated the problem of omitting explanatory variables and controlled for the size of each industry. They found that it was indeed the case that industries that were more dependent on external finance tended to grow faster in nations that were more financially developed

but are unobservable to the researcher. This approach entails difficulties, however. As an economy develops, the structure of industry evolves. In using the United States to estimate industries' need for external finance worldwide, the authors assumed that the process of production within industries was essentially invariant to the level of economic development. If this strong assumption is not true, doubt is cast on their measure of an industry's need for external finance. However, the related work of Asli Demirgüç-Kunt and Vojislav Maksimovic provides additional evidence of the importance of external finance.

Using firm-level data across a number of economies, Demirgüç-Kunt and Maksimovic es-

⁹This is the same measure we used in the figure on page 9 and the one above.

timated firms' maximum constrained growth rates—the maximum rates of growth that firms may achieve in the absence of access to external finance for investment. Demirgüç-Kunt and Maksimovic found that a larger proportion of firms grew above their constrained growth rates in economies that were more financially developed. In particular, economies with relatively efficient legal systems, active stock markets, and large banking sectors allowed more firms access to external finance.

LAW AND FINANCE: CAUSALITY RESOLVED?

A possible resolution of the causality controversy may arise from the 1998 work of Rafael LaPorta, Florencio Lopes-de-Silanes, Andrei Shleifer, and Robert Vishny. These researchers exploited the fact that legal systems worldwide originated from a small group of legal traditions: English common law, and French, German, or Scandinavian civil law. Importantly, legal traditions do not vary systematically with respect to a nation's income or GDP per capita. Rich and poor economies share similar traditions because, in many instances, a nation's colonial history predetermines its legal system. Nations also vary widely in the level of investor protection they offer—that is, the legal rights of shareholders and creditors—and in how effectively those rights are enforced.

One example of a legal right that increases investor protection is proxy voting by mail. The ability to vote by mail frees shareholders from the necessity of having to attend shareholder meetings to vote on management decisions, thereby raising the likelihood that they will be able to protect their investment. While this method of voting is allowed in 40 percent of English common law nations, it exists in only 5 percent of French civil law nations. Common law nations are also more likely to enforce one share-one vote laws that prevent businesses from raising capital by selling nonvoting shares. This ensures that shareholders' control over a corpo-

ration is proportional to their investment in that business and that no shareholder is powerless to influence decisions that affect the value of his or her investment.

Variations in investors' rights and protection across countries cannot be explained solely by differences in GDP per capita; they are systematically related to differences in legal traditions. This finding that investor protection varies with legal traditions is important because the degree of investor protection affects the availability of external finance. The lack of such protection raises the risks of investing for outsiders not directly able to control a firm's decisions—that is, small shareholders or creditors. Weak investor protection fails to reassure creditors and shareholders that a firm will not engage in opportunistic behavior that will lead to poor returns on their investment. As a result, investors may reduce their supply of external finance, which, in turn, would reduce the need for financial services. This reduced need would then most likely result in an equivalent reduction in the size of the financial system. A relatively smaller financial system would be associated with a lower level of financial development.

Thus, the legal tradition of a nation, given its implication for the rights of investors, is likely to determine, at least in part, the level of financial development. In other words, legal tradition can be used to isolate some part of an economy's overall financial development that is independent of its current level of economic development. If this component of financial development is found to determine economic growth, we finally have a firm basis for concluding that finance causes growth.¹⁰

Using measures of shareholders' and creditors' rights, the enforcement of these rights, and

¹⁰This conclusion does require us to assume that the component of financial development that is independent of current GDP per capita will also be independent of future economic growth.

data on overall legal tradition, a 1997 paper by Rafael LaPorta, Florencio Lopes-de-Silanes, Andrei Shleifer, and Robert Vishny confirms that the quantity of external finance is, in part, determined by legal tradition. Furthermore, employing their measures of creditors' rights, a 1997 paper by Ross Levine shows that these measures of investor protection can explain a component of banking-sector development. This component, part of the component of overall financial development that is independent of per capita GDP, is itself able to explain some of the observed international differences in rates of economic growth.

CAVEATS

While the law and finance approach offers us strong evidence that finance causes growth, this finding must be viewed with some caution. For example, one of the measures of creditors' rights used in these studies presumes that creditors' rights are stronger in economies that do not require an automatic stay on a firm's assets during reorganization. An automatic stay on assets, which prevents liquidation of the firm, harms secured creditors who have claims to the firm's property. However, unsecured creditors, without such claims, benefit from an automatic stay; preventing liquidation of the firm increases the probability of their obtaining repayment on their loan. Thus, it is unclear whether the absence of an automatic stay on assets is a positive creditors' right as the authors assume. Moreover, deficiencies in commercial law need not constrain external financing, since creditors and shareholders may have contractual rights not required by law, and firms would have an interest in honoring such agreements to protect their reputation and thereby their ability to borrow in the future. Another potential difficulty with the research discussed here is its failure to account for the role of financial services provided from abroad. One nation with a relatively underde-

veloped financial system, perhaps due to poor investor protection, may make extensive use of the financial services available in another nation. Some economies with unusually high levels of financial development, for example, Hong Kong, Singapore, and Luxembourg, provide exactly such services for other nations.

CONCLUSION

Over the course of an economy's development, its financial sector grows in size relative to the rest of the economy. But whether financial development *causes* economic growth has been difficult to determine. Recent efforts have accumulated compelling evidence that it does.

The finding that the development of an economy's financial system can positively influence its subsequent rate of economic growth has implications for economic policy. In particular, it indicates a potentially high cost of pursuing policies that deter financial development.

While the sheer volume of complementary evidence makes it difficult to reject the thesis that finance causes growth, there exists, to date, little work indicating exactly which roles of the financial system are most relevant. In fact, although researchers have developed formal theories of financial development over the last decade, there has been no empirical evaluation of these theories.¹¹ Thus, we do not yet have a clear understanding of the mechanism through which improvements in the extent and efficiency of the financial system speed economic growth. A clearer understanding of this causal mechanism would, of course, be a valuable addition to our knowledge of the process of economic development.

¹¹For formal economic theories that explain the observed interaction between financial and economic development, see the 1990 work of Jeremy Greenwood and Boyan Jovanovic and my 1999 paper.

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