Financial Intermediation and Growth: Causality and Causes

Ross Levine, Norman Loayza, Thorsten Beck

- Levine: University of Virginia; Loayza: World Bank; Beck: University of Virginia and World Bank. We thank seminar participants at the University of Illinois, the Federal Reserve Bank of Richmond, the University of Minnesota, and Jonathan Wright for helpful comments.

Introduction

Do better functioning financial intermediaries – financial intermediaries that are better at ameliorating information asymmetries and facilitating transactions – exert a causal influence on economic growth? If they do, what determines the level of financial intermediary development? Providing evidence on *causality* will influence the degree of urgency attached to policy reforms designed to promote financial intermediary development. Providing evidence on the *causes* of financial intermediary development will help policymakers design reforms that indeed promote growth-enhancing financial sector development. Furthermore, evidence on causality will help resolve a long debate among economists. A rich literature emphasizes the causal role of intermediaries in spurring growth [Bagehot 1873; Schumpeter 1912]. For instance, Alexander Hamilton (1781) argued that "banks were the happiest engines that ever were invented" for creating economic growth. Others, however, question whether finance exerts a first-order, causal impact on economic activity [Robinson 1952; Lucas 1988]. President John Adams (1819) even asserted that banks harm the "morality, tranquility, and even wealth" of nations.

This paper rigorously addresses the issue of causality and also provides suggestive evidence concerning the determinants of financial development. Specifically, we evaluate (1) whether the level of financial intermediary development exerts a causal influence on economic growth and (2) whether cross-country differences in particular legal and accounting system characteristics (e.g., the legal rights of creditors, the efficiency of contract enforcement, and accounting standards) explain cross-country differences in the level of financial intermediary development. While past work shows that the level of financial development is a good predictor of economic growth, these results do not settle the issue of

causality.[1] Financial development may simply be a leading indicator, rather than an underlying cause of economic growth. This paper uses new data and new econometric procedures to shed considerably more light on the issue of causality while also illuminating a close empirical association between key legal and accounting characteristics and financial intermediary development. In conducting this analysis, we evaluate the predictions that emerge from an array of theoretical models.[2]

Methodologically, the paper uses two econometric techniques to study causality. First, we use a pure cross-sectional estimator, 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 our case financial intermediary development, along with a set of conditioning information. Unlike much of the literature, we use instrumental variables to extract the exogenous component of financial intermediary development. Specifically, LaPorta, Lopez-de-Silanes, Shleifer, and Vishny (1997, 1998; henceforth LLSV) 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 colonization. Thus, we view legal origin as an exogenous "endowment." After extending the LLSV sample from 49 to 71 countries, we use the legal origin indicators as instrumental variables to extract the exogenous component of financial intermediary development.

---

[1] King and Levine (1993a,b) and Levine and Zervos (1998) show that measures of financial intermediary development predict economic growth over the next 18 to 30 years in a broad-cross section of countries. Further, Neusser and Kugler (1998) and Rousseau and Wachtel (1998) find that financial development Granger-causes economic performance in time-series studies of growth and financial development.

[2] See, for instance, Diamond (1984), Boyd and Prescott (1986), Greenwood and Jovanovic (1990), Bencivenga and Smith (1991), and King and Levine (1993b).

The second method for examining causality uses panel data and exploits the cross-country and time-series dimensions of the data. We assemble a panel dataset, with data averaged over each of the seven 5-year intervals composing the period 1960-1995. We use two Generalized Method-of-Moments (GMM) dynamic panel estimators that correct inherent problems with the purely cross-sectional estimator. Specifically, these estimators address the econometric problems induced by country-specific effects, endogeneity, and the routine use of lagged dependent variables in growth regressions [Arellano and Bond 1991; Holtz-Eakin, Newey, and Rosen 1990]. In the first GMM panel estimator, the strategy for addressing possible omitted variable bias created by country-specific effects is to difference the regression equation. Thus, we first take differences to eliminate country-specific effects and thereby remove omitted variable bias. Next, we instrument the right-hand-side variables (the differenced values of the original regressors) using lagged values of the original regressors (measured in levels) as instruments. This last step removes the inconsistency arising from simultaneity bias, including biases induced by the differenced lagged dependent variable. This *difference* dynamic-panel estimator has increasingly been used in studies of growth. [Caselli, Esquivel, and LeFort 1996; Easterly, Loayza, and Montiel 1997].

The second GMM dynamic panel estimator goes beyond the *difference* dynamic-panel estimator. The problem with the *difference* estimator is that it generally suffers from weak instruments, which yields large biases in finite simples and poor precision even asymptotically [Alonso-Borrego and Arellano 1996; Bond, Hoeffler, and Temple 1977]. Specifically, lagged values of the levels of the original regressors frequently make weak instruments for the differenced values of the regressors used in the dynamic-panel equation. This occurs in the current setting if lagged values of financial development do not forecast *changes* in financial development. To mitigate this problem, we use a *system* estimator. Besides the difference dynamic-panel equations where the instruments are lagged

levels of the original regressors, we simultaneously estimate the original, levels equation where the instruments are lagged values of the differenced regressors [Arellano and Bover 1995]. By mitigating the weak instruments problem, this *system* estimator offers dramatic improvements in both efficiency and consistency in Monte Carlo simulations [Blundell and Bond 1997]. Thus, this paper uses two procedures to address causality: a pure cross-sectional estimator and a GMM dynamic panel technique, with both a *difference* and a *system* estimator.

While subject to some qualifications, the two methods produce very consistent findings regarding causality: financial intermediary development exerts a large, causal impact on economic growth. In conducting this research, we construct a new dataset and focus on three measures of financial intermediation. One measures the overall size of the financial intermediation sector; the second measures whether commercial banking institutions, or the central bank, is conducting the intermediation, and the third measures the extent to which financial institutions funnel credit to private sector activities. Our financial development indicators improve on past measures by (i) more accurately deflating nominal measures of intermediary liabilities and assets, (ii) more comprehensively measuring the banking sector, and (iii) more carefully distinguishing who is conducting the intermediation and to where the funds are flowing. While the financial intermediary indicators are still imperfect measures of how well financial intermediaries research firms, monitor managers, mobilize savings, pool risk, and ease transactions, these three measures provide more information about financial intermediary development than past measures and together they provide a more accurate picture than if we used only a single measure. Moreover, they produce similar conclusions. Econometrically, the results indicate that the close empirical association between finance and growth is not the result of simultaneity or omitted variable bias. 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.

Next, the paper searches for legal and accounting determinants of cross-country differences in financial intermediary development. The data show that cross-country differences in legal systems and accounting standards help determine cross-country differences in financial development. While every legal/accounting indicator is not significantly correlated with every financial development indicator, the legal/accounting indicators taken together are jointly significant at the 0.01 level with all of the financial intermediary development measures. The data suggest that countries with legal and regulatory systems that give a high priority to creditors receiving the full present value of their claims on corporations have better functioning financial intermediaries than countries where the legal system provides weaker support to creditors. Moreover, contract enforcement seems to matter even more than the formal legal and regulatory codes. Countries that efficiently impose compliance with laws tend to have better developed financial intermediaries than countries where enforcement is more lax. Finally, the paper shows that information disclosure matters for financial development. Countries where corporations publish relatively comprehensive and accurate financial statements have better developed financial intermediaries than countries where published information on corporations is less reliable. Taken together, this paper's findings suggest that legal and regulatory changes that strengthen creditor rights, contract enforcement, and accounting practices will boost financial intermediary development and induce a rapid acceleration in economic growth.

This paper complements recent microeconomic efforts aimed at reconciling whether financial development is simply a good predictor of economic growth. Rajan and Zingales (1998) show that, in

countries with well-developed financial systems, industries that are naturally heavy users of external finance grow relatively faster than other industries. Alternatively, in countries with poorly developed financial systems, industries that are naturally heavy users of external finance grow more slowly than other industries. Using firm-level data, Demirgüç-Kunt and Maksimovic (1996) show that firms in countries with better developed financial systems grow faster than they could have grown without this access. While these microeconomic studies must respectively identify (a) the "natural" tendency of industries to use external funding and (b) how fast firms would have grown in different financial environments, the results support the conclusion that better financial systems facilitate economic development.[3]

The rest of the paper is organized as follows. Section II presents the results on causality, using purely cross-sectional data, while Section III discusses and presents the differenced and system dynamic panel results. Section IV provides information on how the legal and accounting environment explain cross-country differences in financial development. Section V concludes.

[3] Furthermore, this paper complements an innovative event study by Jayaratne and Strahan (1996). They show that when individual states of the United States relaxed intrastate branching restrictions the quality of bank loans rose and per capita GDP growth accelerated.

II. Finance and Growth: Causality Using Purely Cross-Sectional Analyses

To examine whether financial intermediary development exerts a causal impact on economic growth, we need measures of financial intermediary development. We also need instrumental variables to extract the exogenous component of financial development. This section discusses the measures of financial intermediary development and then describes the indicators of national legal system origin, which we use as instrumental variables in the purely cross-sectional analysis. Finally, the section examines the causal relationship between financial intermediary development and growth.

A. Financial intermediary development

Numerous theoretical models show that economic agents may form financial intermediaries to mitigate the costs of acquiring information and conducting transactions.[4] More specifically, financial intermediaries emerge to lower the costs of researching potential investments, exerting corporate control, managing risk, and mobilizing savings. Theory further suggests that, by providing these services to the economy, financial intermediaries influence savings and allocation decisions in ways that may alter long-run growth rates.[5] Thus, modern economic theory provides an intellectual framework for understanding how, ceteris paribus, countries with "better" financial intermediaries – financial intermediaries that are better at acquiring information, exerting corporate control, managing risk, and mobilizing savings – would grow faster than countries with less developed financial systems.

To evaluate the empirical predictions advanced by a variety of theoretical models regarding the relationship between finance and growth, therefore, we would ideally like to construct measures of the ability of different financial systems to research and identify profitable ventures, monitor and control managers, ease risk management and facilitate resource mobilization. It is impossible, however, to construct accurate, comparable measures of these financial services for a broad cross-section of

countries over the past 35 years. Consequently, to measure the provision of financial services, this paper constructs three indicators of financial intermediary development. While each has particular strengths and weaknesses, we improve upon past measures of financial intermediary development. [6]

LIQUID LIABILITIES equals liquid liabilities of the financial system (currency plus demand and interest-bearing liabilities of banks and nonbank financial intermediaries) divided by GDP. This is a typical measure of "financial depth" and thus of the overall size of the financial intermediary sector [King and Levine 1993a]. LIQUID LIABILITIES, however, does not consider the allocation of capital; it is just an indicator of size. Thus, LIQUID LIABILITIES may not accurately reflect the provision of financial services in an economy.

COMMERCIAL-CENTRAL BANK equals the ratio of commercial bank assets divided by commercial bank plus central bank assets. COMMERCIAL-CENTRAL BANK measures the degree to which the banks versus the central banks allocates society's savings. The intuition underlying this measure is that banks are more likely to identify profitable investments, monitor managers, facilitate risk management, and mobilize savings than central banks.

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

---

[4] See Boyd and Prescott (1986), Diamond (1984) and the reviews by Gertler (1988) and Levine (1997).
[5] For example, see Greenwood and Jovanovic (1990), Bencivenga and Smith (1991), and King and Levine (1993b).
[6] One way this paper improves upon past measures of financial intermediary development is by accurately deflating nominal measures of financial intermediary liabilities and assets. Specifically, while financial intermediary balance sheet items are measured at the end of the year, GDP is measured over the year. Some authors try to correct for this problem by using an average of financial intermediary balance sheet items in year t and t-1 and dividing by GDP measured in year t [King and Levine 1993a]. This, however does not fully resolve the distortion, especially in highly inflationary environments. This paper deflates end-of-year financial balance sheet items by end of year consumer price indices (CPI) and deflates the GDP series by the annual CPI. Then, we compute the average of the real financial balance sheet item in year t and t-1 and divide this average by real GDP measured in year t. This is described more fully in the data appendix.

by the central bank. PRIVATE CREDIT is our preferred indicator because it improves on other measures of financial development used in the literature. For example, King and Levine (1993a,b) use a measure of gross claims on the private sector divided by GDP. But, this measure includes credits issued by the monetary authority and government agencies, whereas PRIVATE CREDIT includes only credits issued by banks and other financial intermediaries. Also, Levine and Zervos (1998) and Levine (1998) use a measure of deposit money bank credits to the private sector divided by GDP over the period 1976-1993. That measure, however, does not include credits to the private sector by non-deposit money banks and it only covers the period 1976-1993. PRIVATE CREDIT is a broader measure of credit issuing financial intermediation and its time dimension is twice as long, 1960-1995. While PRIVATE CREDIT does not directly measure the amelioration of information and transaction costs, we interpret higher levels of PRIVATE CREDIT as indicating higher levels of financial services and therefore greater financial intermediary development.

Table 1 provides summary statistics on the financial intermediary development indicators. The values are computed as averaged over the period 1960-95. There is considerable variation across countries. For example, PRIVATE CREDIT ranges from a low of 4 percent of GDP in Zaire to a high of 141 in Switzerland.

B. Legal origin

Comparative legal scholars place countries into four major legal families, either English, French, German, or Scandinavian, that descended from Roman law [Reynolds and Flores 1996]. As described by Glendon et al. (1982), Roman law was compiled under the direction of Byzantine Emperor Justinian in the sixth century. Over subsequent centuries, the *Glossators* and *Commentators* interpreted, adapted, and amended the Law [Berman 1997]. In the 17th and 18th centuries the Scandinavian countries

formalized their own legal codes. The Scandinavian legal systems have remained relatively unaffected from the far reaching influences of the German and especially the French Civil Codes.

Napoleon directed the writing of the French Civil Code in 1804. He made it a priority to secure the adoption of the Code in France and all conquered territories, including Italy, Poland, the low countries, and the Habsburg Empire. Also, France extended her legal influence to parts of the Near East, Northern and Sub-Saharan Africa, Indochina, Oceania, French Guyana, and the French Caribbean islands during the colonial era. Furthermore, The French Civil Code was a major influence on the Portuguese and Spanish legal systems, which helped spread the French legal tradition to Central and South America.

The German Civil Code *(Bürgerliches Gesetzbuch)* was completed almost a century later in 1896. The German Code exerted a big influence on Austria and Switzerland, as well as China (and hence Taiwan), 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. Unlike these Civil Law countries, the English legal system is common law, where the laws were primarily formed by judges trying to resolve particular cases.

This paper takes national legal origin as an exogenous "endowment" since the English, French, and German systems were spread primarily through conquest and imperialism. It is critical to recognize, however, that exogeneity is not a sufficient condition for economically meaningful instrumental variables. It must also be the case that there are good reasons for believing that legal origin is closely connected to factors that directly affect the behavior of financial intermediaries. Here, we rely on LLSV (1998). They trace differences in legal origin through to differences in the legal rules covering secured creditors, the efficiency of contract enforcement, and the quality of accounting standards. Thus, legal origin is connected to legal and regulatory characteristics defining financial intermediary activities. We

discuss the relationship between legal origin and the legal and regulatory environment in more detail below. Here, note that legal origin has a profound impact on financial intermediary development.

Table 2 presents regressions of the financial intermediary development indicators on the dummy variables for English, French and German legal origin, relative to Scandinavian origin (which is captured in the constant). We extend the LLSV (1998) data set from 44 countries (with financial intermediary data) to 71. Some of the regressions also control for the level of real per capita GDP. The major message is that countries with a German legal origin have better developed financial intermediaries. While countries with a French legal tradition tend to have less well-developed institutions than other countries on average, this result does not hold when controlling for the overall level of economic development . In contrast, the dummy variable for a German legal tradition enters with a positive and significant coefficient even after controlling for the level of real per capita GDP. Also, as indicated by the P-values of the F-test that the explanatory variables do not explain the dependent variable, the legal origin variables explain a significant fraction of the cross-country variation of the financial intermediary development indicators.

C. Legal origin and growth in a pure cross-section of countries

1. Cross-sectional estimator

The pure cross-sectional analysis uses data averaged over 1960-95, such that there is one observation per country. The basic regression takes the form:

$$GROWTH_i = \alpha + \beta FINANCE_i + \gamma' [CONDITIONING\ SET]_i + \varepsilon_i,$$

where the dependent variable, GROWTH, equals real per capita GDP growth, FINANCE equals either LIQUID LIABILITIES, COMMERCIAL-CENTRAL BANK, or PRIVATE CREDIT, and

CONDITIONING SET represents a vector of conditioning information that controls for other factors associated with economic growth.[7]

To examine whether cross-country variations in the exogenous component of financial intermediary development explain cross-country variations in the rate of economic growth, the legal origin indicators are used as instrumental variables for FINANCE. Econometrically, given the vector of instrumental variables, Z, and assuming that $E[\varepsilon]=0$ and that $E[\varepsilon\varepsilon']=\Omega$, where Ω is unrestricted, this implies a set of orthogonality conditions, $E[Z'\varepsilon]=0$. This produces an instrumental variable estimator of the coefficients in the cross-country growth equation. After computing these GMM estimates, the standard Lagrange-Multiplier test of the overidentifying restrictions assesses whether the instrumental variables are associated with growth beyond their ability to explain cross-country variation in banking sector development.

2. Conditioning information set

To examine the sensitivity of the results, we experiment with different conditioning information sets . We seek to reduce the chances that the cross-country growth regression either omits an important variable or includes a select group of regressors that yields a favored result. We report the results with three conditioning information sets. The *simple conditioning information set* includes the constant, the logarithm of initial per capita GDP and initial level of educational attainment. The initial income variable is used to capture the convergence effect and school attainment is used to control for the level of human capital. The *policy conditioning information set* includes the simple conditioning information set plus measures of government size, inflation, the black market exchange rate premium, and openness

[7] Due to the potential nonlinear relationship between economic growth and the assortment of economic indicators, we use natural logarithms of the regressors.

to international trade.[8] The *full conditioning information set* includes the policy conditioning information set plus measures of political stability (the number of revolutions and coups and the number of assassinations per thousand inhabitants (Banks 1994)) and ethnic diversity (Easterly and Levine 1997). Thus, for each of the three financial intermediary development indicators, we present regression results for the (i) simple, (ii) policy, and (iii) full conditioning information sets.

3. Regression results

The results indicate a very strong connection between the exogenous component of financial intermediary development and long-run economic growth. Table 3 summarizes the purely cross-sectional instrumental variable results for nine regressions, where the instrumental variables are the legal origin variables. For brevity, we report only the coefficients on the financial development indicators. Each of the three financial intermediary development indicators (PRIVATE CREDIT, COMMERCIAL-CENTRAL BANK, LIQUID LIABILITIES) is significantly correlated with economic growth at the five percent significance level in the simple, policy, and full conditioning information set regressions. The exogenous component of financial intermediary development is closely tied to long-run rates of per capita GDP growth. Furthermore, the data do not reject the orthogonality conditions at the ten percent level in any of the nine regressions. The inability to reject the orthogonality conditions plus the result that the instruments are highly correlated with financial intermediary development (Table 2) suggest that the instruments are appropriate. These results indicate that the strong link between financial development and growth is not due to simultaneity bias.

Besides suggesting that greater financial intermediary development causes faster economic growth, the results indicate an economically large relationship. For example, India's value of

[8] The black market exchange rate premium is frequently used as an overall index of trade, exchange rate, and price distortions [Easterly 1994; Levine and Zervos 1993]. The inflation rate and size of the government serve as indicators of macroeconomic stability [Easterly and Rebelo 1993; Fischer 1993].

PRIVATE CREDIT over the 1960-95 period was 19.5 percent of GDP, while the mean value for developing countries was 25 percent of GDP. The results suggest that an exogenous improvement in PRIVATE CREDIT in India that had pushed it to the sample mean for developing countries would have accelerated real per capita GDP growth by about 0.6 percentage point per year.[9] Similarly, if Argentina had moved from its value of PRIVATE CREDIT (16) to the developing country sample mean, it would have grown more than one percentage point faster per year. This is large considering that growth only averaged about 1.8 percent per year over this period.

D. Sensitivity Analyses

We have conducted a number of sensitivity analyses to gauge the robustness of these findings. For instance, the two-stage least squares estimator gives similar results to the GMM estimator reported above. We have also restricted the sample to those countries for which LLSV (1998) collect legal data. This did not alter the results. Furthermore, as control variables, we used measures of the efficiency of the bureaucracy and the level of bureaucratic red tape [Knack and Keefer 1995; Mauro 1995], as well as measures of terms of trade changes and population growth. These did not alter our findings. We controlled for the level of stock market development (Levine and Zervos 1998) without changing the conclusion that financial intermediary development exerts a positive impact on long-run growth. We also experimented with two additional measures of financial intermediary development. One measure equals deposit money bank credit to the private sector divided by GDP. This is smaller than PRIVATE CREDIT, which also includes other financial intermediaries. The second additional measure equals the ratio of deposit money bank domestic assets to GDP (and so does not distinguish between credits issued to the private sector and those issued to the public sector). These two additional measures also suggest that better financial intermediaries induce faster economic growth. Finally, we assess the sensitivity of

[9] To get this, recall that the regressors are in logs and note that the ln(25) - ln(19.5) = 0.25. Then, use the smallest

our findings to outliers, but we do not find any particular influential observations materially affecting the coefficient on financial intermediation or its significance.

III. Finance and Growth: Causality Using Panel Procedures

After describing the underlying econometrics, this section presents results on causality using dynamic panel estimators. Here, we use panel estimation procedures. The panel consists of data for 74 countries over the period 1961-1995. We average data over non-overlapping, five-year periods, so that data permitting there are seven observations per country (1961-65; 1966-70; 1971-75; etc.). Thus, when we use the subscript "t" to designate a time-period, it represents one of these five-year averages.

A. GMM Estimators for Dynamic Panel Models

We use Generalized-Method-of-Moments dynamic panel estimators that control for unobserved country-specific effects, the endogeneity of explanatory variables, time-specific effects, and the use of lagged dependent variables.[10] Consider the following regression equation,

$$y_{i,t} - y_{i,t-1} = (a - 1)y_{i,t-1} + b' X_{i,t} + h_i + e_{i,t} \qquad (1)$$

where *y* represents the logarithm of real per capita GDP, *X* represents the set of explanatory variables (other than lagged per capita GDP), h is an unobserved country-specific effect, ε is the error term, and the subscripts *i* and *t* represent country and time period, respectively.[11] The dependent variable in

---

parameter on PRIVATE CREDIT from Table 3, which equals 2.5, so that 2.5*(0.25) = 0.63.

[10] The Generalized Method of Moments (GMM) estimator was proposed by Chamberlain (1984), Holtz-Eakin, Newey and Rosen (1988), Arellano and Bond (1991), and Arellano and Bover (1995), and has been applied to cross-country studies by, among others, Caselli, Esquivel and Lefort (1996), Easterly, Loayza and Montiel (1997), and Fajnzylber, Lederman, and Loayza (1998). For a concise presentation of the GMM estimator addressed to a general audience, see the appendix of Easterly, Loayza, and Montiel (1997) and chapter 8 of Baltagi (1995).

[11] We also include time dummies to account for time-specific effects.

equation (1) is the period's average growth rate. We can rewrite equation (1) as a lagged-dependent variable equation as follows,

$$y_{i,t} = a\, y_{i,t-1} + b'\, X_{i,t} + h_i + e_{i,t} \qquad (2)$$

The usual method of dealing with the country-specific effect in the context of panel data has been to first-difference the regression equation (Anderson and Hsiao 1981). In this way the specific-effect is directly eliminated from the estimation process. First-differencing equation (2), we obtain

$$y_{i,t} - y_{i,t-1} = a\left(y_{i,t-1} - y_{i,t-2}\right) + b'\left(X_{i,t} - X_{i,t-1}\right) + \left(e_{i,t} - e_{i,t-1}\right) \qquad (3)$$

The use of instruments is again required to deal with two issues: first, the likely endogeneity of the explanatory variables, *X*; and, second, the new error term, $e_{i,t} - e_{i,t-1}$ is correlated with the differenced lagged dependent variable, $y_{i,t-1} - y_{i,t-2}$. This second issue arises by construction when we difference equation (2).

We would like to relax the assumption that all the explanatory variables are strictly exogenous (that is, that they are uncorrelated with the error term at all leads and lags). Relaxing this assumption allows for the possibility of simultaneity and reverse causality, which are very likely present in growth regressions. We adopt the assumption of weak exogeneity of the explanatory variables, in the sense that they are assumed to be uncorrelated with future realizations of the error term. This weaker assumption

means that current explanatory variables may be affected by past and current growth rates but not by future ones. In practice we assume that all variables are weakly exogenous.[12]

Under the assumptions that (a) the error term, e, is not serially correlated, and (b) the explanatory variables, *X*, are weakly exogenous, the following moment conditions apply to the lagged dependent variable and the set of explanatory variables:

$$E\left[y_{i,t-s} \cdot \left(e_{i,t} - e_{i,t-1}\right)\right] = 0 \quad for\ s \geq 2; t = 3, \ldots, T \tag{4}$$

$$E\left[X_{i,t-s} \cdot \left(e_{i,t} - e_{i,t-1}\right)\right] = 0 \quad for\ s \geq 2; t = 3, \ldots, T \tag{5}$$

We use a consistent GMM estimator based on these moment conditions. We refer to this estimator as the *difference* estimator.

There are, however, conceptual and statistical shortcomings with this estimator. Conceptually, we would like to study not only the time-series relationship between financial development and per capita GDP growth but also their cross-country relationship, which is eliminated in the case of the simple *difference* estimator. Statistically, Alonso-Borrego and Arellano (1996) and Blundell and Bond (1997) show that when the lagged dependent and the explanatory variables are persistent over time, lagged levels of these variables are weak instruments for the regression equation in differences. The instruments' weakness has repercussions on both the asymptotic and small-sample performance of the difference estimator. As the variables' persistence increases, the asymptotic variance of the coefficients obtained with the *difference* estimator rises (that is, the asymptotic precision of this estimator deteriorates). Furthermore, Monte Carlo experiments show that the weakness of the instruments

[12] Population growth rate and the growth rate of the terms of trade are assumed exogenous, but these variables are only

produces biased coefficients in small samples. This bias is exacerbated with the variables' over time persistence, the importance of the specific-effect, and the smallness of the time-series dimension. An additional problem with the simple *difference* estimator relates to measurement error: Differencing may exacerbate the bias due to errors in variables by decreasing the signal-to-noise ratio (see Griliches and Hausman, 1986).

To confront these conceptual and statistical concerns, we use alternative estimators. Blundell and Bond (1997) suggest the use of Arellano and Bover's (1995) *system* estimator that -- based on asymptotic and small-sample properties -- reduces the potential biases and imprecision associated with the usual difference estimator. Arellano and Bover (1995) present an estimator that combines, in a *system*, the regression in differences with the regression in levels. The instruments for the regression in differences are the same as above (i.e., the lagged *levels* of the corresponding variable), so that, the moment conditions in equations (4) and (5) apply to this first part of the system. The instruments for the regression in levels are the lagged *differences* of the corresponding variables. These are appropriate instruments under the following additional assumption: although there may be correlation between the levels of the right-hand side variables and the country-specific effect in equation (2), there is no correlation between the *differences* of these variables and the country-specific effect. This assumption results from the following stationarity property,

$$\begin{aligned} &E\left[y_{i,t+p} \cdot h_i\right] = E\left[y_{i,t+q} \cdot h_i\right] \\ &\textit{and} \quad E\left[X_{i,t+p} \cdot h_i\right] = E\left[X_{i,t+q} \cdot h_i\right] \quad \textit{for all } p \textit{ and } q \end{aligned} \tag{6}$$

---

included in the regressions when we conduct sensitivity analyses.

Therefore, the additional moment conditions for the second part of the system (the regression in levels) are given by the following equations:[13]

$$E\left[\left(y_{i,t-s} - y_{i,t-s-1}\right)\cdot\left(h_i + e_{i,t}\right)\right] = 0 \quad for\ s = 1 \tag{7}$$

$$E\left[\left(X_{i,t-s} - X_{i,t-s-1}\right)\cdot\left(h_i + e_{i,t}\right)\right] = 0 \quad for\ s = 1 \tag{8}$$

Thus, we use the moment conditions presented in equations (4), (5), (7), and (8) and employ a Generalized Method of Moments (GMM) procedure to generate consistent and efficient estimates of the parameters of interest (Arellano and Bond, 1991; and Arellano and Bover, 1995).[14]

The consistency of the GMM estimator depends on whether lagged values of per capita GDP and the other explanatory variables are valid instruments in the growth regression. To address this issue we consider three specification tests suggested by Arellano and Bond (1991), Arellano and Bover (1995), and Blundell and Bond (1997). The first is a Sargan test of over-identifying restrictions, which tests the overall validity of the instruments by analyzing the sample analog of the moment conditions used in the estimation process. The second test examines the hypothesis that the error term $e_{i,t}$ is not serially correlated. In the both the difference regression and the system difference-level regression we test whether the differenced error term is second-order serially correlated (by construction, it is likely

[13] Given that lagged levels are used as instruments in the differences specification, only the most recent difference is used as instrument in the levels specification. Using other lagged differences would result in redundant moment conditions. (see Arellano and Bover 1995)

[14] We are grateful to Stephen Bond for providing us with a program to apply his and Arellano's estimator to an unbalanced panel data set.

that this differenced error term be first-order serially correlated even if the original error term is not). The third test is the difference Sargan statistic, which tests the additional set of restrictions of the system estimator. This "difference" Sargan statistic is asymptotically distributed as Chi-square under the null hypothesis of validity of the additional instruments.[15] Failure to reject the null hypotheses of these tests gives support to the model.

B. Results

The dynamic panel estimates suggest that financial intermediary development exerts a large, positive causal impact on economic growth. Table 4 presents the results using the *difference* and *system* estimators described above. We also present the results when the panel estimation is performed purely in *levels* for comparative purposes. In Table 4, only the results on the financial indicators are given. Table 5 gives the full results from *system* dynamic-panel estimation. The analysis was conducted with two conditioning information sets. The first uses the simple conditioning information set, which includes initial income and educational attainment. The second uses the policy conditioning information set, and includes initial income, educational attainment, government size, openness to trade, inflation, and the black market exchange rate premium.[16] Table 5 also presents (1) the Sargan test, where the null hypothesis is that the instrumental variables are uncorrelated with the residuals and (2) the serial correlation test, where the null hypothesis is that the errors in the differenced equation exhibit no second-order serial correlation.

The three financial intermediary development indicators (LIQUID LIABILITIES, COMMERCIAL-CENTRAL BANK, and PRIVATE CREDIT) are significant at the 0.05 significance

[15] The degrees of freedom of the "difference" Sargan test is given by the number of additional restrictions in the system estimator (which is given by the difference between the number of degrees of freedom of the system estimator and that of the difference estimator).

level in the *levels*, *difference*, and *system* dynamic panel growth regressions, with one exception. The coefficient on LIQUID LIABILITIES is insignificant in the *difference* dynamic panel growth regression with the policy conditioning information set. While this may indicate a somewhat less robust link when using a purely "size" measure of financial intermediary development, LIQUID LIABILITIES enters the levels and system dynamic panel growth regressions significantly in all specifications. Put differently, after controlling for country-specific effects, endogeneity, and potential problems associated with lagged dependent variables and weak instruments, the data suggest a strong, positive, link between financial intermediary development and economic growth. Furthermore, there is no evidence of second order serial correlation and the regressions pass the Sargan specification test. In the system dynamic panel estimates, we do not reject the difference Sargan test; that is, we do not reject the assumption that the country-specific effect is uncorrelated with the differences of the regressors. It is also worth noting that many of the other regressors also enter significantly with the expected signs (Table 5).

The regression estimates are also economically large. As shown the coefficients that emerge from the dynamic panel estimation are very close to those that we obtain from the purely cross-section, instrumental-variable estimation. For example, PRIVATE CREDIT has a coefficient of 2.5 in the cross-section results (the simple conditioning information set regression in Table 3), while PRIVATE CREDIT has a coefficient of 2.24 in the system dynamic-panel results reported in Table 4.[17] As noted earlier, these coefficients suggest that exogenous changes in financial intermediary development imply large changes in economic growth.

---

[16] We do not use the full conditioning information set with data on political and institutional variables in the panel estimates. These variables frequently have very limited, if any, time-dimension.

[17] There is some divergence in coefficient estimates between the *system* dynamic panel estimates, Table 4, and the cross-sectional IV regressions, Table 3, when the conditioning information set is expanded to include the policy conditioning information set. The cross-section regression produces a coefficient estimate of 3.2 on PRIVATE CREDIT, while the panel yields a coefficient of 1.4. Besides exploiting the time-series dimension of the data, the dynamic-panel also recognizes the endogeneity of the other regressors, which may help account for the different coefficient estimates.

C. Sensitivity Analyses and Discussion

The dynamic panel results are also robust to a variety of sensitivity analyses. For instance, when we use alternative measures of financial intermediary development (deposit money bank credit to the private sector divided by GDP; and the ratio of total deposit money bank domestic assets to GDP), we still find a strong, causal relationship between finance and growth. Furthermore, if we control for terms of trade changes and population growth, we obtain virtually identical results to those reported in Tables 4 and 5.[18] Finally, when we include the legal origin variables as instruments in the dynamic panel estimates, we still find that financial intermediary development exerts a large, causal impact on economic growth.

---

[18] Note, that in the *system* dynamic panel regressions with the policy conditioning information set, the number of instrumental variables is larger than the number of cross-sectional observations (i.e., countries). This "over-fitting" of the data can bias the t-statistics upwards. This arises when the variance-covariance matrix is constructed from the first-stage residuals in order to allow for non-spherical distributions of the error term – and thereby get more efficient estimates in the second stage. (However, this "over-fitting" problem does not plague (a) the simple conditioning information set regressions, or (b) the *level* or *difference* estimators because there are many more countries than instruments in these specifications.) More generally, the two-step GMM estimator sometimes converges to its asymptotic distribution only slowly. Thus, we also considered the first-stage results, which assume homoskedasticity and independence of the error terms. These first-stage results also indicate that financial intermediary development exerts a causal impact on economic growth.

IV. Searching for Determinants of Financial Intermediary Development

The last two sections presented evidence consistent with the view that financial intermediation exerts a positive, economically large impact on long-run economic growth. This section undertakes a limited -- more speculative -- search of potential legal and accounting determinants of financial intermediary development.[19] This exploratory search shows that newly available information on particular features of national legal systems and accounting standards are closely associated with cross-country differences in financial intermediary development. After describing the empirical measures of the legal and accounting environment, we study the connection between the legal environment and financial intermediary development and then trace this link through to long-run growth.

A. The legal and accounting environment

This paper uses three indicators to characterize differences in national legal and regulatory systems: the legal rights of creditors, the soundness of contract enforcement, and the level of corporate accounting standards.[20]

1. Creditor rights

The ability of financial intermediaries to persuade firms to pay their loans differs across national legal systems. Legal systems differ in terms of the rights of financial institutions to repossess collateral or liquidate firms in the case of default. Legal systems vary in terms of the rights of creditors to remove

[19] Also, note that evidence on the determinants of financial intermediary development is informative regardless of causality. Financial intermediaries may affect business-cycles [Bernanke and Gertler 1989,1990; Williamson 1987] and North (1981) notes that understanding the evolution of key institutions, such as financial institutions, is critical for understanding the complex process of economic development.

[20] The legal data are available for 44 countries in our sample. In section II, we did not use these as instrumental variables because legal codes, enforcement quality, and accounting standards may be influenced by economic development. Thus, we feel comfortable arguing – and specification tests did not reject this argument – that legal origin is an exogenous endowment. We feel a bit less comfortable arguing that economic growth does not affect accounting standards. Nonetheless, we employ these legal data as instruments below to show that particular features of the legal environment are strongly linked with both financial sector performance and long-run growth.

managers in corporate reorganizations. Finally, legal systems differ in terms of the priority given to secured creditors relative to other claimants in corporate bankruptcy.

More specifically, this paper uses four measures of the legal rights of banks.

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. Thus, all else equal, AUTOSTAY should be negatively correlated with the activities of credit issuing intermediaries.

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, management is replaced by a team selected by the creditors. If management stays pending resolution, this reduces pressure on management to pay creditors. Thus, MANAGES should be negatively correlated with the activities of credit issuing intermediaries. Here it is important to highlight a substantive weakness with AUTOSTAY and MANAGES. They do not measure the efficiency of the legal and regulatory system in coping with bankruptcy. For instance, two countries could have very similar legal codes, such that management stays in place pending the resolution of a bankruptcy hearing and there is an automatic stay on the assets of a firm until the reorganization petition is processed by the bankruptcy courts. However, the two countries legal and regulatory systems may process bankruptcy and reorganization very differently. One country's system may take a long-time and be subject to great uncertainty. The other may be very rapid, efficient, and transparent. Thus, a major difference across countries may be the quality of the bankruptcy system, not the laws themselves. Currently, there do not exist cross-country measures of the speed, transparency, and fairness of bankruptcy systems.

The third measure of the legal rights of credits is SECURED1, which 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. SECURED1 should be positively correlated with activities of intermediaries engaged in secured transactions, holding everything else constant.

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).[21] One would expect countries with higher values of CREDITOR to have stronger creditor rights and better-developed financial intermediaries, all else equal.

Table 6 gives summary statistics on CREDITOR. As shown there is substantial cross-country variation in CREDITOR, where the maximum value is 1, the minimum value is -2, and the standard deviation is about 1. 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 is an indicator of legal codes, however, it does not incorporate information regarding enforcement.

2. Enforcement

[21] We could have redefined AUTOSTAY and MANAGES such that values of one indicated stronger (instead of weaker) creditor rights. This would have produced values of CREDITOR between 0 and 3 and would not have altered the results. We did not do this for consistency: the variables in this paper are defined the same as the variables in LLSV (1997,1998).

The laws governing secured creditors will affect secured creditors only to the extent that the laws are enforced. Consequently, measures of the efficiency of the legal system in enforcing contracts are included from LLSV (1998).

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. Given the contractual nature of banking, higher values of the RULELAW are likely to positively influence banking development.

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 either repudiation, postponement, or reducing the government's financial obligation. This measure was constructed by ICRG and is an average over the period 1982-1995. Legal systems that effectively enforce contracts will tend to support banking activities.

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.

Summary statistics on ENFORCE are given in Table 6. As shown, there is substantial cross-country variation in ENFORCE, where the maximum value is 9.99, the minimum value is 3.55, and the standard deviation is 2.2. The countries with very high values of enforcement, values of ENFORCE greater that 9, are Australia, Austria, Belgium, Canada, Denmark, Finland, France, German, 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.

3. Accounting standards

Information about corporations is critical for exerting corporate governance and identifying the best investments. Accounting standards that simplify the interpretability and comparability of information across corporations will simplify financial contracting. Furthermore, financial contracts that use accounting measures to trigger particular actions can only be enforced if accounting measures are sufficiently clear. Accounting standards differ across countries and governments impose an assortment of regulations regarding information disclosure. Since accurate information about corporations may improve financial contracting and intermediation, the paper examines a measure of the quality of information disclosed through corporate accounts from LLSV (1998).

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. We expect ACCOUNT to be positively correlated with financial intermediary development.[22] As shown in Table 6, ACCOUNT exhibits substantial cross-country variation. The maximum value is 83, Sweden, while the minimum

[22] This is not necessarily true and raises the need for a general conceptual qualification. An economy with perfect information, perfect contract enforcement and perfect legal codes (i.e., and economy with essentially zero transaction and information costs) would have little reason for financial intermediaries. Put differently, market frictions motivate the emergence of financial intermediaries, e.g., Boyd and Prescott (1986). Conceptually, this implies that at very high levels of legal system development and information dissemination, a marginal increase in legal efficiency or information quality may cause a *reduction* in the role and importance of financial intermediaries. However, quadratic expressions for ACCOUNT and CONRISK never entered significantly.

value in our sample is Egypt (24). The United States has a value of 71, which is well above the mean value of 61.

B. Determinants of Financial Intermediary Development and Growth

This section examines the links between the legal environment and financial intermediary development and traces this link through to long-run growth. First, note that the legal origin variables help explain cross country differences in creditor rights, enforcement quality, and accounting standards. As shown by LLSV (1998), English legal tradition countries have laws that emphasize the rights of creditors to a greater degree than the French, German, and Scandinavian countries. French civil law countries protect creditors the least, with German and Scandinavian civil law countries falling in the middle. In terms of enforcement quality, countries with a French legal heritage have the lowest quality of law enforcement, while countries with German and Scandinavian legal traditions tend to be the best at enforcing contracts. Finally, LLSV (1998) show that countries with an English legal tradition tend to have much better accounting standards than French or German civil law countries.

Table 7 shows that cross-country differences in creditor rights, enforcement quality, and accounting standards help explain cross-country differences in financial intermediary development, even after controlling for the level of income per capita. Jointly, the variables CREDITOR, ENFORCE, and ACCOUNT explain a significant amount of the cross-country variation in the three financial intermediary indicators (PRIVATE CREDIT, LIQUID LIABILITIES, and COMMERCIAL-CENTRAL BANK). Each of the legal/accounting indicators, however, is not significantly correlated with all of the intermediary measures. For instance LIQUID LIABILITIES is most closely associated with ENFORCE and CREDITOR. In turn, COMMERCIAL-CENTRAL BANK and PRIVATE CREDIT are very strongly linked with ENFORCE and ACCOUNT. The basic message that emerges from Table 7 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, Table 8 shows that creditor rights, enforcement quality, and accounting standards influence financial intermediary development, and that this component of financial intermediary development positively affects economic growth. Specifically, Table 8 uses CREDITOR, ENFORCE, and ACCOUNT as instrumental variables within the context of the pure cross-country growth regression framework described in Section II above. As shown, the data indicate that the component of financial intermediary development defined by particular characteristics of the legal and accounting environment is positively associated with economic growth. This strong link is robust to changes in the conditioning information set. While there are good reasons to believe that contract enforcement and accounting standards may be influenced by economic growth, these instruments pass the LM specification test. Thus, particular characteristics of the legal and regulatory regime seem to influence economic growth by affecting quality of financial intermediation.

B. Discussion of Causes

While still speculative, these findings (in conjunction with those in LLSV 1998) 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. Put differently, when countries are endowed with a certain legal heritage, one might view them as being endowed with a probability distribution regarding the laws, regulations, and enforcement mechanisms associated with financial activities. Thus, for example, the data suggest that countries with a French Civil Code have a lower probability of selecting laws that give a higher priority to secured credits, selecting accounting standards that produce high-quality corporate financial statements, and rigorously

enforce contracts than countries with English, German, and Scandinavian legal systems. The resultant laws, regulations, and enforcement mechanisms then affect the ability of the financial system to research firms, exert corporate control, mobilize savings, and provide risk management and transactions services. 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.

V. Conclusions

This paper first examined the issue of causality: Does greater financial intermediary development cause faster economic growth? We use two econometric approaches. We use a pure cross-sectional, instrumental variable estimator with one observation per country. The data are averaged over the period 1960-1995. We also create a panel-data set, where we average the data over each (non-overlapping) five-year period. Thus, data permitting, there are seven observations per country over the 1960-95 period. With this panel data set, we use a *difference* dynamic panel estimator developed by Arellano and Bond (1991) and Holtz-Eakin, Newey, and Rosen (1988) and a *system* dynamic panel estimator developed and studied by Arellano and Bover (1995) and Blundell and Bond (1997) that mitigates some of the biases frequently found when using the *difference* dynamic panel estimator. Both cross-section and panel-data results tell the same story: financial intermediary development exerts a statistically significant and economically large impact on economic growth.

Next, we investigate whether cross-country differences in the legal rights of creditor, the efficiency of contract enforcement, and accounting system standards help explain cross country

differences in the level of financial intermediary development. The results are clear: 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 paper's findings are consistent with the view that legal and accounting reforms that strengthen creditor rights, contract enforcement, and accounting practices can boost financial intermediary development and thereby accelerate economic growth. Due to data limitations, however, we do not conduct a comprehensive evaluation of the regulatory determinants of financial intermediary development [e.g., see Calomiris 1989; Kane 1985,1989; Barth, Nolle, and Rice 1996; BIS 1997; Calomiris and Gorton 1991; Kroszner and Rajan 1994; and Kroszner and Strahan 1996]. Future work would substantially broaden and deepen our understanding of the determinants of financial intermediary development by obtaining additional measures of the legal, supervisory, and regulatory factors that determine the level of financial intermediary development.

REFERENCES

Adams, John (1819) quoted from Hammond (1991, p. 36).

Alonso-Borrego, C. and Arellano, Manuel. "Symmetrically Normalised Instrumental Variable Estimation Using Panel Data," CEMFI Working Paper No. 9612, September 1996.

Arellano, Manuel and Bond, Stephen. "Some Tests of Specification for Panel Data: Monte Carlo Evidence and an Application to Employment Equations," Review of Economic Studies 1991, 58, pp. 277-297.

Arellano, Manuel, and Bover, Olympia. "Another look at the Instrumental-Variable Estimation of Error-Components Models," Journal of Econometrics 1995, 68, pp. 29-52.

Bagehot, Walter. Lombard Street. Homewood, IL: Richard D. Irwin, 1873 (1962 Edition).

Banks, Arthur S. "Cross-National Time Series Data Archive," Binghampton, NY: Center for Social Analysis, State University of New York at Binghampton, 1994.

Barro, Robert J and Lee, Jong-Wha: "International Measures of Schooling Years and Schooling Quality", AER Papers and Proceedings 1996, 86, pp. 218-223.

Barth, James R.; Nolle, Daniel E.; and Rice, Tara N. "Commercial Banking Structure, Regulation, and Performance: An International Comparison," Economic and Policy Analysis Working Paper, Office of the Comptroller of the Currency, United States. September 1996.

Bencivenga, Valerie R., and Smith, Bruce D. "Financial Intermediation and Endogenous Growth," Review of Economics Studies, April 1991, 58(2), pp. 195-209.

Berman, Harold J. Law and Revolution: The Formation of the Western Legal Tradition. Cambridge, MA: Harvard University Press, 1997.

Bernanke, Ben and Gertler, Mark. "Agency Costs, Net Worth, and Business Fluctuations," American Economic Review, March 1989, 79(1), pp. 14-38.

Bernanke, Ben and Gertler, Mark. "Financial Fragility and Economic Performance," Quarterly Journal of Economics, February 1990, 105(1), pp. 87-114.

BIS. "Core Principles for Effective Banking Supervision," No. 30. *Basle Committee on Bank Supervision*, 1997.

Blundell, Richard and Bond, Stephen. "Initial Conditions and Moment Restrictions in Dynamic Panel Data Models," University College London Discussion Paper 97-07, 1997.

Bond, Stephen; Hoeffler, Anke; and Temple, Jonathan. "Panel Data Estimators and Cross-Country Growth Regressions: A Cautionary Tale," Hertford College, Oxford mimeo, 1997.

Boyd, John H. and Prescott, Edward C. "Financial Intermediary Coalitions," Journal of Economic Theory, April 1986, 38(2), pp. 211-232.

Calomiris, Charles W. "Deposit Insurance: Lessons from the Record," Economic Perspectives, Federal Reserve Bank of Chicago, May/June 1989.

Calomiris, Charles W. "The Costs of Rejecting Universal Banking: American Finance in the German Mirror, 1870-1914," in Coordination and Information: Historical Perspectives on the Organization of Enterprise. Eds.: Naomi R. Lamoreaux and Daniel M.G. Raff, Chicago: National Bureau of Economic Research, University of Chicago, 1995, pp. 257-321.

Calomiris, Charles W. and Gorton, Gary. "The Origins of Banking Panics: Models, Facts, and Bank Regulation," in Financial Markets and Financial Crises, Ed.: R. Glenn Hubbard, Chicago: University of Chicago Press, 1991, pp. 109-174.

Caselli, Francesco; Esquivel, Gerardo; and LeFort, Fernando. "Reopening the Convergence Debate: A New Look at Cross-Country Growth Empirics," Journal of Economic Growth, September 1996, 1, pp. 363-389.

Chamberlain, G. "Panel Data", in: Handbook of Econometrics Vol.2 , Eds.: Z. Griliches and M.D. Intriligator, Elsevier, Amsterdam, 1984, pp. 1247-1313.

Demirgüç-Kunt, Asli and Maksimovic, Vojislav. "Financial Constraints, Uses of Funds, and Firm Growth: An International Comparison," World Bank mimeo, 1996.

Demirgüç -Kunt, Asli and Detragiache, Enrica. "The Determinants of Banking Crises: Evidence from Developed and Developing Countries. World Bank Policy Research Group Working Paper, No. 1828, 1997.

Diamond, Douglas W. "Financial Intermediation and Delegated Monitoring," Review of Economic Studies, July 1984, 51(3), pp. 393-414.

Easterly, William, and Rebelo, Sergio. "Fiscal Policy and Economic Growth: an Empirical Investigation," Journal of Monetary Economics December 1993, 32(3), pp. 417-57.

Easterly, William and Levine, Ross. "Africa's Growth Tragedy: Policies and Ethnic Divisions," Quarterly Journal of Economics, November 1997, 107, pp. 1203-50.

Easterly, William; Loayza, Norman; and Montiel, Peter. "Has Latin America's Post Reform Growth Been Disappointing?" Journal of International Economics, November 1997, 43(3/4), pp. 287-312.

Engerman, Stanley L. and Sokoloff, Kenneth L. "Factor Endowments, Institutions, and Differential Paths of Growth Among New World Economies: A View from Economic Historians of the

United States," in How Latin America Fell Behind, Ed.: Stephen Haber, Stanford, CA: Stanford University Press, 1996, pp. 260-304.

Faijnzylber, Pablo; Lederman, Daniel; and Loayza, Norman "What Causes Violent Crime," mimeo, March 1998, The World Bank.

Fischer, Stanley "The Role of Macroeconomic Factors in Growth," Journal of Monetary Economics, December 1993, 32(3), pp. 485-511.

Gastil, R.D. "The Comparison Survey of Freedom: Experiences and Suggestions," Studies in Comparative International Development, 1990, 25, pp.25-50.

Gertler, Mark. "Financial Structure and Aggregate Economic Activity: An Overview," Journal of Money, Credit, and Banking, August 1988, 20(3, Pt. 2), pp. 559-88.

Glendon, Mary Ann; Gordon, Michael; and Osakwe, Christopher. Comparative Legal Tradition in a Nutshell. St. Paul: West Publishing Co., 1982.

Goldsmith, Raymond W. Financial Structure and Development. New Haven, CT: Yale University Press, 1969.

Greenwood, Jeremy and Jovanovic, Boyan. "Financial Development, Growth, and the Distribution of Income," Journal of Political Economy, October 1990, 98(5, Pt.1), pp. 1076-1107.

Greenwood, Jeremy and Smith, Bruce. "Financial Markets in Development, and the Development of Financial Markets," Journal of Economic Dynamics and Control, January 1997, 21(1), pp. 145-186.

Hamilton, Alexander (1781), quoted from Hammond (1991, p. 36)

Hammond, Bray. Banks and Politics in America: From the Revolution to the Civil War. Princeton, NJ: Princeton University Press, 1991.

Hansson, Pontus and Jonung, Lars "Finance and Growth: The Case of Sweden 1834-1991," mimeo, Sweden: Stockholm School of Economics.

Hicks, John. A Theory of Economic History. Oxford: Clarendon Press, 1969.

Holtz-Eakin, D.; Newey, W, and Rosen, H. "Estimating Vector Autoregressions with Panel Data, " Econometrica, 1990, 56(6), pp. 1371-1395.

Jayaratne, Jith and Strahan, Philip E. "The Finance-Growth Nexus: Evidence from Bank Branch Deregulation," Quarterly Journal of Economics, August 1996, 111(3), pp. 639-670.

Kane, Edward J. "How Incentive-Incompatible Deposit-Insurance Funds Fail," National Bureau of Economic Research Working Paper, No. 2836, 1989.

Kane, Edward J. The Gathering Crisis in Federal Deposit Insurance, Cambridge: MIT Press, 1985.

King, Robert G. and Levine, Ross. "Finance and Growth: Schumpeter Might Be Right," Quarterly Journal of Economics, August 1993a, 108(3), pp. 717-38.

King, Robert G. and Levine, Ross. "Finance, Entrepreneurship, and Growth: Theory and Evidence," Journal of Monetary Economics, December 1993b, 32(3), pp. 513-42.

Knack, Stephen and Philip Keefer, "Institutions and Economic Performance: Cross-Country Tests Using Alternative Institutional Measures," Economic and Politics, 1995, 7, pp. 207-27.

Kroszner, Randall S. and Rajan, Raghuram G. "Is the Glass-Steagall Act Justified? A Study of the US Experience with Universal Banking Before 1933, American Economic Review, September 1994, 84(4), pp. 810-832.

Kroszner, Randall S. and Strahan, Philip E. "Regulatory Incentives and the Thrift Crisis: Dividends, Mutual-to-Stock Conversions, and Financial Distress," Journal of Finance, September 1996, 51(3), pp. 1285-1320.

Laporta, Rafael; Lopez-de-Silanes, Florencio; Shleifer, Andrei; and Vishny, Robert W. "Law and Finance," Journal of Political Economy, *forthcoming* 1998.

Laporta, Rafael; Lopez-de-Silanes, Florencio; Shleifer, Andrei; and Vishny, Robert W. "Legal Determinants of External Finance," Journal of Finance, July 1997, 52(3), pp. 1131-1150.

Levine, Ross. "Financial Development and Economic Growth: Views and Agenda," Journal of Economic Literature, June 1997, 35(2), pp. 688-726.

Levine, Ross. "The Legal Environment, Banks, and Long-Run Economic Growth," Journal of Money, Credit, and Banking, August 1998, *forthcoming*.

Levine, Ross and Renelt, David. "A Sensitivity Analysis of Cross-Country Growth Regressions," American Economic Review, September 1992, 82(4), pp. 942-63.

Levine, Ross and Zervos, Sara. "Stock Markets, Banks, and Economic Growth," American Economic Review, June 1998, *forthcoming*.

Loayza, Norman; Lopez, Humberto; Schmidt-Hebbel, Klaus and Serven, Luis "World Saving Database", mimeo 1997, The World Bank.

Mauro, Paolo. "Corruption and Economic Growth," Quarterly Journal of Economics, August 1995, 110(3), pp. 681-712.

McKinnon, Ronald I. Money and Capital in Economic Development. Washington, D.C.: Brookings

Institution, 1973.

Merton, Robert C. “Financial Innovation and Economic Performance,” Journal of Applied Corporate Finance, Winter 1992, 4(4), pp. 12-22.

Neusser, Klaus and Kugler, Maurice. "Manufacturing Growth and Financial Development: Evidence from OECD Countries," Review of Economics and Statistics, *forthcoming* 1998.

North, Douglas C. Structure and Change in Economic History, New York: Norton, 1981.

Patrick, Hugh. "Financial Development and Economic Growth in Underdeveloped Countries," Economic Development Cultural Change, January 1966, 14(2), pp. 174-89.

Rajan, Raghuram G. and Zingales, Luigi. "Financial Dependence and Growth," American Economic Review, June 1998.

Reynolds, Thomas H. and Flores, Arturo A. Foreign Law Current Sources of Codes and Legislation in Jurisdictions of the World, Fred B. Rothman & Co. (Littleton Colorado), (AALL Publication Series No. 33). 1996.

Robinson, Joan. "The Generalization of the General Theory," in The Rate of Interest and Other Essays, London: MacMillan, 1952.

Rousseau, Peter L. and Wachtel, Paul. “Financial Intermediation and Economic Performance: Historical Evidence from Five Industrial Countries,” Journal of Money, Credit, and Banking, *forthcoming*, 1998.

Schumpeter, Joseph A. The Theory of Economic Development, 1912, translated by Redvers Opie. Cambridge, MA: Harvard University Press, 1934.

Shleifer, Andrei and Vishny, Robert W. "A Survey of Corporate Governance," Journal of Finance, June 1997, 52(2), pp. 737-84.

Shleifer, Andrei and Vishny, Robert W. “Corruption,” Quarterly Journal of Economics, 109, 1993, pp. 599-617.

Williamson, Stephen D. “Financial Intermediation, Business Failures, and Real Business Cycles,” Journal of Political Economy, December 1987, 95(6), pp. 135-45.

Data Appendix

A. Countries in the Sample

*-Not in the 71 country pure cross-sectional data set.
-Not in the 74 country panel data set.**

Algeria*
Argentina
Australia
Austria
Bangladesh**
Barbados**
Belgium
Bolivia
Brazil
Cameroon*
Canada
Central African Republic*
Chile
Colombia
Costa Rica
Cyprus
Denmark
Dominican Republic
Ecuador
Egypt*
El Salvador
Fiji**
Finland
France
Gambia*
Germany
Ghana
Great Britain
Greece
Guatemala
Guyana**
Haiti
Honduras
Iceland**
India
Indonesia*
Iran*
Ireland
Israel
Italy
Jamaica
Japan
Kenya
Korea
Lesotho*
Liberia**
Malawi*
Malaysia
Malta**
Mauritius
Mexico
Nepal**
Netherlands
New Zealand
Nicaragua*
Niger
Norway
Pakistan
Panama
Papua New Guinea
Paraguay
Peru
Philippines
Portugal
Rwanda*
Senegal
Sierra Leone
South Africa
Spain
Sri Lanka
Sudan*
Sweden
Switzerland
Syria
Taiwan**
Thailand
Togo
Trinidad and Tobago
United States of America
Uruguay
Venezuela
Zaire
Zimbabwe

B. Data Sources

1. Log level and growth rate of per capita GDP, from Loayza et al. (1997).
2. Government size is government expenditures as share of GDP, from Loayza et al. (1997).
3. Openness to trade is the sum of exports and imports as share of GDP, from Loayza et al. (1997).

4. Inflation rates are calculated using CPI data from the International Financial Statistics (IFS), line 64.

5. The average years of secondary schooling in the total population (15 years and over) come from Barro and Lee (1996):

6. Data on the black market premium are from World's Currency Yearbook; and Adrian Wood, Global trends in real exchange rates: 1960-84, WB Discussion paper no. 35. 1988.

7. Data on Liquid Liabilities are calculated using IFS numbers, using the following method:

$$\{(0.5)*[F(t)/P\_e(t) + F(t-1)/P\_e(t-1)]\}/[GDP(t)/P\_a(t)]$$

where F is liquid liabilities (line 55l), GDP is line 99b, P_e is end-of period CPI (line 64) and P_a is the average annual CPI.

8. Data on Commercial versus Central Bank are calculated using IFS numbers, using the following method:

$$DBA(t) / (DBA(t) + CBA(t))$$

where DBA is assets of deposit money banks (lines 22a-d) and CBA is central bank assets (lines 12 a-d).

9. Data on Private Credit are calculated using IFS numbers, using the following method:

$$\{(0.5)*[F(t)/P\_e(t) + F(t-1)/P\_e(t-1)]\}/[GDP(t)/P\_a(t)]$$

where F is credit by deposit money banks and other financial institutions to the private sector (lines 22d + 42d), GDP is line 99b, P_e is end-of period CPI (line 64) and P_a is the average CPI for the year.

Table 1: Summary Statistics: 1960-1995

	Financial Intermediary Development		
	Liquid Liabilities	Commercial-Central Bank	Private Credit
Mean	43.44	78.16	38.29
Median	37.48	83.89	27.01
Maximum	143.43	98.99	141.30
Minimum	9.73	23.72	4.08
Std. Dev.	25.61	18.26	28.71
Observations	71	71	71

LIQUID LIABILITIES = liquid liabilities of the financial system (currency plus demand and interest-bearing liabilities of banks and nonbank financial intermediaries) divided by GDP, times 100.

COMMERCIAL-CENTRAL BANK = assets of deposit money banks divided by assets of deposit money banks plus central bank assets, times 100.

PRIVATE CREDIT = credit by deposit money banks and other financial institutions to the private sector divided by GDP, times 100.

Table 2: Legal Origin and Financial Intermediary Development

	Financial Intermediary Development					
	Liquid Liabilities		Commercial-Central Bank		Private Credit	
C	3.829	0.958	4.506	3.063	4.027	-0.674
	(0.000)	*(0.081)*	*(0.000)*	*(0.000)*	*(0.000)*	*(0.386)*
ENGLISH	-0.134	0.249	-0.170	0.022	-0.717	-0.090
	(0.325)	*(0.038)*	*(0.002)*	*(0.716)*	*(0.002)*	*(0.646)*
FRENCH	-0.434	-0.052	-0.270	-0.078	-0.894	-0.268
	(0.001)	*(0.703)*	*(0.000)*	*(0.152)*	*(0.000)*	*(0.190)*
GERMAN	0.477	0.683	0.048	0.152	0.401	0.738
	(0.016)	*(0.000)*	*(0.100)*	*(0.010)*	*(0.076)*	*(0.002)*
INCOME		0.330		0.166		0.541
		(0.000)		*(0.000)*		*(0.000)*
Obs.	71	71	71	71	71	71
Prob(F-test)	*0.001*	*0.000*	*0.040*	*0.000*	*0.000*	*0.000*
R-square	0.23	0.44	0.12	0.30	0.26	0.55

LIQUID LIABILITIES = liquid liabilities of the financial system (currency plus demand
and interest-bearing liabilities of banks and nonbank financial intermediaries) divided by GDP, times 100.
COMMERCIAL-CENTRAL BANK = assets of deposit money banks divided by assets of deposit money banks plus central bank assets, times 100.
PRIVATE CREDIT = credit by deposit money banks and other financial institutions to the private sector divided by GDP, times 100.
Values for the financial intermediary development indicators are averages over the 1960-95 period.
ENGLISH = English legal origin
FRENCH = Napoleonic legal origin
GERMAN = German legal origin
Scandinavian legal origin is the omitted category.
INCOME = Logarithm of real per capita GDP in 1960.

Table 3: Financial Intermediation and Growth: Cross-Section Regressions, 1960-95

Dependent variable: Real Per Capita GDP Growth, 1960-95
Instrumental variables: Legal Origin Dummy variables

Regression Set #1: *simple conditioning information set*

Explanatory Variable	coefficient	standard error	t-statistic	P-value	Number of Observations	J-Statistic	LM-test OIR
PRIVATE CREDIT	2.515	0.814	3.090	0.003	71	0.00189	0.13
COMMERCIAL-CENTRAL BANK	10.861	3.086	3.520	0.001	71	0.01626	1.15
LIQUID LIABILITIES	1.723	0.844	2.041	0.045	71	0.03491	2.48

Regression Set #2: *policy conditioning information set*

Explanatory Variable	coefficient	standard error	t-statistic	P-value	Number of Observations	J-Statistic	LM-test OIR
PRIVATE CREDIT	3.222	1.245	2.589	0.012	63	0.00799	0.50
COMMERCIAL-CENTRAL BANK	9.641	4.039	2.387	0.021	63	0.0373	2.35
LIQUID LIABILITIES	2.173	0.908	2.394	0.020	63	0.03799	2.39

Regression Set #3: *full conditioning information set*

Explanatory Variable	coefficient	standard error	t-statistic	P-value	Number of Observations	J-Statistic	LM-test OIR
PRIVATE CREDIT	3.356	1.150	2.918	0.005	63	0.02239	1.41
COMMERCIAL-CENTRAL BANK	11.289	3.258	3.465	0.001	63	0.00325	0.20
LIQUID LIABILITIES	2.788	0.903	3.089	0.003	63	0.03901	2.46

Critical values for LM-Test Over Identifying Restrictions (2 d.f.): 10% 4.61; 5%=5.99

Simple conditioning information set: logarithm of initial income per capita and schooling
Policy conditioning information set: simple set, plus government size, inflation, black market premium, and openness to trade.
Full conditioning information set: policy set, plus indicators of revolutions and coups, political assassinations, and ethnic diversity.
LIQUID LIABILITIES = liquid liabilities of the financial system (currency plus demand
and interest-bearing liabilities of banks and nonbank financial intermediaries) divided by GDP, times 100.
COMMERCIAL-CENTRAL BANK = assets of deposit money banks divided by assets of deposit money banks plus central bank assets, times 100.
PRIVATE CREDIT = credit by deposit money banks and other financial institutions to the private sector divided by GDP, times 100.

Table 4: Financial Intermediation and Growth: Dynamic Panel Regressions, Summary

Estimator	conditioning information set	LIQUID LIABILITIES	COMMERCIAL - CENTRAL BANK	PRIVATE CREDIT	observations
System estimator	simple	2.26	6.257	2.237	359
		(0.001)	*(0.001)*	*(0.001)*	
		[0.463]	[0.329]	[0.283]	
	policy	2.713	2.807	1.448	359
		(0.001)	*(0.001)*	*(0.001)*	
		[0.416]	[0.567]	[0.417]	
First Differences	simple	1.368	2.18	1.601	285
		(0.036)	*(0.011)*	*(0.001)*	
		[0.424]	[0.141]	[0.197]	
	policy	0.365	1.008	0.599	285
		(0.467)	*(0.001)*	*(0.001)*	
		[0.279]	[0.358]	[0.342]	
Levels	simple	1.802	6.094	2.151	359
		(0.015)	*(0.001)*	*(0.001)*	
		[0.248]	[0.210]	[0.259]	
	policy	2.919	3.234	2.063	359
		(0.001)	*(0.001)*	*(0.001)*	
		[0.344]	[0.139]	[0.349]	

Numbers in parentheses are p-values for the coefficient and numbers in brackets are p-values for the Sargan-test

simple conditioning information set: logarithm of initial income per capita, average years of secondary schooling
policy conditioning information set: simple set plus government size, openness to trade,
inflation, black market premium

LIQUID LIABILITIES: liquid liabilities of the financial system (currency plus demand and
interest-bearing liabilities of banks and nonbank financial intermediaries) divided by GDP
COMMERCIAL - CENTRAL BANK: assets of deposit money banks divided by
assets of deposit money banks plus central bank assets
PRIVATE CREDIT: credit by deposit money banks and other financial institutions to
the private sector divided by GDP

Table 5: Financial Intermediation and Growth:
Dynamic Panel Regressions, System Estimator

Regressors	(1)	(2)	(3)
Constant	0.251	-7.648	2.637
	(0.797)	*(0.001)*	*(0.003)*
Logarithm of initial income per capita	-0.799	-0.303	-0.305
	(0.001)	*(0.001)*	*(0.006)*
Government size[1]	-0.999	-0.664	-1.614
	(0.002)	*(0.014)*	*(0.001)*
Openness to trade[1]	0.388	0.667	0.634
	(0.091)	*(0.001)*	*(0.001)*
Inflation[2]	1.179	-1.518	-0.41
	(0.002)	*(0.001)*	*(0.147)*
Average years of secondary schooling	0.786	0.559	0.297
	(0.001)	*(0.001)*	*(0.001)*
Black market premium[2]	-1.982	-1.096	-1.072
	(0.001)	*(0.001)*	*(0.001)*
Liquid Liabilities[1]	2.713		
	(0.001)		
Comm. vs. Central Bank[1]		2.807	
		(0.001)	
Private Credit[1]			1.448
			(0.001)
dummy 71-75	-0.984	-0.741	-0.923
	(0.001)	*(0.001)*	*(0.001)*
dummy 76-80	*-1.142*	-0.805	-1.106
	(0.001)	*(0.001)*	*(0.001)*
dummy 81-85	-3.379	-2.738	-3.107
	(0.001)	*(0.001)*	*(0.001)*
dummy 86-90	-2.555	-1.904	-2.273
	(0.001)	*(0.001)*	*(0.001)*
dummy 91-95	-3.513	-2.744	*-3.054*
	(0.001)	*(0.001)*	*(0.001)*
Sargan test[3]	0.416	0.567	0.417
Serial correlation test[4]	0.607	0.957	0.797
	p-values in parentheses		

[1] In the regression, this variable is included as log(variable)

[2] In the regression, this variable is included as log(1 + variable)

[3] The null hypothesis is that the instruments used are not correlated with the residuals.

[4] The null hypothesis is that the errors in the first-difference regression exhibit no second-order serial correlation.

Table 6: Summary Statistics on the Legal and Accounting Environment

	Legal and Accounting Environment		
	CREDITOR	ENFORCE	ACCOUNT
Mean	-0.3	7.5	61.2
Median	0	8.2	64.0
Maximum	1	10.0	83.0
Minimum	-2	3.6	24.0
Std. Dev.	1.1	2.0	13.5
Observations	44	44	40

CREDITOR = index of secured creditor rights.
ENFORCE = index of law and contract enforcement.
ACCOUNT = index of the comprehensiveness and quality of company reports

Values for the legal environment indicators are averages over the 1982-95 period.
Values of accounting quality are assessments of company reports in 1990.

Table 7: Legal Environment and Financial Intermediary Development

	Financial Intermediary Development					
	Liquid Liabilities		Commercial-Central Bank		Private Credit	
C	3.497	2.450	4.112	3.943	2.694	1.557
	(0.000)	*(0.000)*	*(0.000)*	*(0.000)*	*(0.002)*	*(0.000)*
CREDITOR	0.060	0.101	-0.008	-0.001	-0.034	0.011
	(0.328)	*(0.034)*	*(0.759)*	*(0.947)*	*(0.591)*	*(0.852)*
ENFORCE	0.217	0.167	0.041	0.033	0.236	0.181
	(0.000)	*(0.000)*	*(0.022)*	*(0.014)*	*(0.000)*	*(0.000)*
ACCOUNT	0.003	0.003	0.004	0.004	0.014	0.014
	(0.536)	*(0.658)*	*(0.108)*	*(0.136)*	*(0.009)*	*(0.021)*
INCOME	-0.181		-0.029		-0.197	
	(0.096)		*(0.454)*		*(0.103)*	
Obs.	35	35	35	35	35	35
Prob(F-test)	*(0.000)*	*(0.000)*	*(0.005)*	*(0.002)*	*(0.000)*	*(0.000)*
R-square	0.625729	0.593971	0.381852	0.373959	0.634022	0.609374

LIQUID LIABILITIES = liquid liabilities of the financial system (currency plus demand and interest-bearing liabilities of banks and nonbank financial intermediaries) divided by GDP, times 100.
COMMERCIAL-CENTRAL BANK = assets of deposit money banks divided by assets of deposit money banks plus central bank assets, times 100.
PRIVATE CREDIT = credit by deposit money banks and other financial institutions to the private sector divided by GDP, times 100.
CREDITOR = index of secured creditor rights.
ENFORCE = index of law and contract enforcement.
ACCOUNT = index of the comprehensiveness and quality of company reports

Table 8: Financial Intermediation and Growth: Cross-Section Regressions, 1960-95

Dependent variable: Real Per Capita GDP Growth, 1960-95
Instrumental variables: Legal Environment variables (CREDITOR, ENFORCE, & ACCOUNT)

Regression #1: *simple conditioning information set*

Explanatory Variable	coefficient	standard error	t-statistic	P-value	Number of Observations	J-Statistic	LM-test OIR
PRIVATE CREDIT	2.097	0.298	7.032	0.000	35	0.080003	2.80
COMMERCIAL-CENTRAL BANK	12.734	4.686	2.718	0.011	35	0.073241	2.56
LIQUID LIABILITIES	2.935	0.499	5.887	0.000	35	0.040316	1.41

Regression #2: *full conditioning information set*

Explanatory Variable	coefficient	standard error	t-statistic	P-value	Number of Observations	J-Statistic	LM-test OIR
PRIVATE CREDIT	3.325	0.852	3.903	0.001	35	0.030649	2.33
COMMERCIAL-CENTRAL BANK	8.400	5.008	1.677	0.107	35	0.078816	3.31
LIQUID LIABILITIES	2.734	0.802	3.410	0.002	35	0.099216	2.73

Critical values for LM-Test Over Identifying Restrictions (2 d.f.): 10% 4.61; 5%=5.99

Simple conditioning information set: logarithm of initial income per capita and schooling

Full conditioning information set: simple set, plus government size, inflation, black market premium, and openness to trade, and indicators of revolutions and coups, political assassinations, and ethnic diversity.

LIQUID LIABILITIES = liquid liabilities of the financial system (currency plus demand and interest-bearing liabilities of banks and nonbank financial intermediaries) divided by GDP, times 100.

COMMERCIAL-CENTRAL BANK = assets of deposit money banks divided by assets of deposit money banks plus central bank assets, times 100.

PRIVATE CREDIT = credit by deposit money banks and other financial institutions to the private sector divided by GDP, times 100.

CREDITOR = index of secured creditor rights.

ENFORCE = index of law and contract enforcement.

ACCOUNT = index of the comprehensiveness and quality of company reports