The Legal Environment, Banks, and Long-Run Economic Growth

Ross Levine*
Department of Economics
University of Virginia

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Abstract: This paper examines the relationship between the legal system and banking development and traces this connection through to long-run rates of per capita GDP growth, capital stock growth, and productivity growth. The data indicate that countries where the legal system (1) emphasizes creditor rights and (2) rigorously enforces contracts have better developed banks than countries where laws do not give a high priority to creditors and where enforcement is lax. Furthermore, the exogenous component of banking development -- the component defined by the legal environment -- is positively and robustly associated with per capita growth, physical capital accumulation, and productivity growth.

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I. Introduction

This paper addresses two questions. First, do cross-country differences in the legal rights of creditors, the efficiency of contract enforcement, and the origin of the legal system explain cross-country differences in the level of banking development? Second, do better-developed banks cause faster economic development; i.e., is the component of banking development defined by the legal environment positively associated with long-run rates of economic growth, capital accumulation, and productivity growth?

Examining the relationship between the legal system and banking development is valuable irrespective of issues associated with long-run growth. First, banks may influence the level of income per capita and the magnitude of cyclical fluctuations [Bernanke and Gertler 1989, 1990]. Second, many economists stress that understanding the evolution of legal and financial systems is essential for understanding economic development [North 1981; Engerman and Sokoloff 1996]. Consequently, quantitative information on the relationship between the legal environment and banks will improve our understanding of business cycles and the process of economic development.

Furthermore, examining the causal links between banks and economic growth has both conceptual and policy implications. On the conceptual front, a long literature debates the importance of banks in economic development. Starting as early as Bagehot (1873), economists have argued that better banks -- banks that are better at identifying credit-worthy firms, mobilizing savings, pooling risks, and facilitating transactions -- accelerate economic growth. Others, however, question the importance of the financial system in the development process or disagree with the causal interpretation as discussed in Levine (1997a). Robinson (1952), for example, argues that economic development creates demands for financial services and the

financial system responds to provide these services. Evidence on whether banks cause growth will help reconcile these conflicting views. There are also potential policy implications associated with clarifying the causal relationship between banks and growth. For example, if evidence suggests that greater banking development induces faster economic growth and we can identify the legal determinants of banking development, then this supports granting a higher priority to those reforms that improve the functioning of the banking sector. Alternatively, if the component of banking development associated with legal factors is unrelated to economic development, this lowers the priority given to these legal factors in any reform package.

By studying the connection between the legal environment and banking development and then tracing this link through to long-run economic development, this paper fills two gaps in the literature. First, consider research on the relationship between the legal system and financial development. Through arduous data collection and careful analysis, LaPorta, Lopez-de-Silanes, Shleifer, and Vishny (1996, 1997; henceforth LLSV) have substantially advanced research into the legal determinants of financial development. LLSV (1996) collect and summarize information on the legal systems of 49 countries. LLSV (1997) then use these data to show that legal systems that rigorously protect creditors and enforce contracts encourage better functioning debt and equity markets than legal systems that are more lax in safeguarding creditors and enforcing contracts. This paper complements LLSV (1997) by examining the relationship between legal systems and banking sector development.

Second, this paper contributes to research on the causal relationship between banking development and long-run economic growth. Although King and Levine (1993a) show that the level of financial development in 1960 is a good predictor of growth over the next thirty years, Rajan and Zingales (1997, p. 2) note that "… financial development may simply be a leading

indicator rather than a causal factor." A major impediment to circumventing this critique has been the absence of valid instrumental variables for extracting the exogenous component of banking development. Given the recent work by LLSV (1996), however, this paper examines whether the exogenous component of banking development – the component defined by the legal system – is positively associated with economic development in a cross-section of countries over the 1976-1993 period. LLSV (1996) note that (a) the 49 countries in their sample can be divided into countries with predominantly English, French, German, and Scandinavian legal origins and (b) countries typically obtained their legal systems through occupation or colonization. Consequently, I view legal origin as an exogenous "endowment" in studying banking development and growth over the 1976-1993 period. LLSV (1996) go on to show that cross-country differences in legal origin account for a significant amount of cross-country variation in the legal codes defining creditor rights and the efficiency of the legal system in enforcing those codes. In turn, this paper uses cross-country differences in legal origin, creditor rights, and the efficiency of contract enforcement to identify the exogenous component of banking development. Besides examining the determinants of banking development and tracing this relationship through to per capita GDP growth, this paper also examines the relationship between the exogenous component of banking development and both capital stock accumulation and productivity growth.

The paper finds that cross-country differences in the legal rights of creditors and the efficiency with which legal systems enforce those rights explain over half of the cross-country variation in banking sector development. Empirically, I define banking development as credit allocated by commercial and other deposit-taking banks to the private sector divided by GDP. The data show that countries with legal systems that give a high priority to banks receiving the

full present value of their claims against firms have better developed banks than countries where the legal codes do not emphasize the rights of creditors. Furthermore, enforcing legal codes is as important as the legal codes themselves. The data indicate that countries that effectively enforce compliance with laws tend to have better developed banks than countries where enforcement is lax. Finally, the data also indicate that countries with a German legal system tend to have better developed banks, even after controlling for the level of economic development. Thus, the legal system materially influences banking development.

Next, the paper finds that the component of banking development defined by the legal environment is positively associated with long-run rates of economic growth, capital accumulation, and productivity growth. The paper uses the LLSV (1996) legal indicators as instrumental variables to extract the exogenous component of banking development. The Generalized Method of Moments (GMM) results are robust to changes in the instrumental variables and to changes in the conditioning information set. More specifically, using either (a) the LLSV (1996) measures of creditor rights and contract enforcement or (b) the LLSV (1996) measures of legal origin produces the same conclusions. Also, tests of the overidentifying restrictions indicate that the data do not reject the hypothesis that the instrumental variables are uncorrelated with the error term, which strengthens the confidence one has in the instruments. Furthermore, after controlling for a very wide array of indicators designed to measure economic, political, and cultural characteristics, the data still indicate a statistically significant and economically large relationship between the exogenous component of banking development and the rate of economic growth.

This paper must be viewed as complementing a number of recent efforts aimed at reconciling whether financial development is simply a good predictor of economic growth.

Taking a microeconomic approach, Rajan and Zingales (1997) show that, in countries with well-developed financial systems, industries that are naturally heavy users of external financing grow relatively faster than other industries. Alternatively, in countries with poorly developed financial systems, industries that are naturally heavy users of external financing grow more slowly than other industries. Furthermore, Demirguc-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. Furthermore, this paper is consistent with Levine (1997b), where I examine the interactions among the legal environment, financial intermediaries, and growth. In contrast to the current paper that focuses on banks, Levine (1997b) uses measures of financial intermediation from King and Levine (1993a,b) that include the activities of non-bank financial intermediaries. Finally, this paper also 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.

The remainder of the paper is organized as follows. Section II discusses the data and presents evidence on the legal determinants of banking development. Section III investigates whether the component of the banking system defined by the legal environment is linked with per capita GDP growth, per capita capital stock growth, and productivity improvements. Section IV summarizes the results and discusses policy implications.

II. The Legal Determinants of Banking Development

This section examines whether differences in the legal rights of creditors, the efficiency with which legal systems enforce those rights, and legal origin explain differences in banking development. First, the section describes the legal variables used to characterize national legal systems. Second, the section empirically defines the measure of banking development. Finally, I present evidence regarding the legal determinants of banking development.

A. Legal determinants

1. *creditor rights*

The ability of banks to persuade firms to pay their loans differs across national legal systems. Legal systems differ in terms of the rights of banks to repossess collateral or liquidate firms in the case of default. Legal systems differ in terms of the rights of banks to remove managers in corporate reorganizations. Finally, legal systems different 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 the firm upon filing a reorganization petition. AUTOSTAY equals 0 if this restriction does not appear in the legal code. The restriction would prevent bankers 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 banks providing secured credit.

MANAGES equal one if the firm continues to manage its property pending the resolution of the reorganization process, 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 courts or the creditors. If management stays

pending resolution, this reduces pressure on management to pay bank loans. Thus, MANAGES should be negatively correlated with the activities of banks.

SECURED1 equals one if secured creditors are ranked first in the distribution of the proceeds that result from the disposition of the assets of a bankrupt firm. SECURED1 equals zero if non-secured creditors, such as the government or workers get paid before secured creditors. In cases where SECURED1 equals zero, this certainly reduces the attractiveness of lending secured credit. SECURED1 should be positively correlated with activities of banks engaged in secured transactions, holding everything else constant.

CREDITOR is a conglomerate index of these three individual creditor rights indicators that is designed to be positively associated with creditor rights. Specifically, CREDITOR = SECURED1 - AUTOSTAY - MANAGES, and takes on values between 1 (best) and -2 (worst). One would expect countries with higher values of CREDITOR to have better-developed banks, all else equal.

The individual country values for AUTOSTAY, MANAGES, SECURED1, and CREDITOR are provided in Table 2. Summary statistics on CREDITOR are given in Table 1. 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. These are measures of the laws on the books, however, and do not incorporate information regarding enforcement.

2. enforcement

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 (1996).

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.

Again, the individual country values for RULELAW, CONRISK, AND ENFORCE are provided in Table 2. Summary statistics on ENFORCE are given in Table 1. 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 enforce, 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. origin

LLSV (1996), collect and summarize information on the legal systems of 49 countries. Based on the work of comparative legal scholars, LLSV (1996) place these 49 countries into four legal families, either English, French, German, or Scandinavian. The English legal system is common law, where the laws were primarily formed by judges trying to resolve particular cases. In contrast, French, German, and Scandinavian legal systems are based on the civil law tradition, where the laws were generally formed by legal scholars. Civil law is a more direct descendent of Roman Law than common law.

As described in 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 Roman law and adapted the law to the problems of their own day. The initial Justinian texts plus the work of the Glossators and Commentators became known as *the jus commune*, the common law, of Europe. Eventually, individual countries decided to formalize their own legal codes. The Scandinavian countries did this in the 17^{th} and 18^{th} centuries. These countries have remained relatively unaffected from the far reaching influences of the German and especially the French Civil Codes.

The French Civil Code of 1804 is concise, meant to be assessable to the general population, and relies heavily on the *jus commune*. Napoleon saw the permanence of the Code as more important than the fleeting nature of his military conquests. He made it a priority to secure its adoption 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 Guiana, 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 appeared almost a century later. Following the unification of Germany under Bismarck in 1871, it took over 20 years to complete the Code *(Burgerliches Gesetzbuch*) in 1896. In terms of consistency, technical precision, and detail, the German Civil Code was unprecedented. 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.

Since the English, French, and German systems were spread primarily through conquest and imperialism, this paper takes national legal origin as an exogenous "endowment" in examining the relationship between the legal system and banking development over the period 1976-1993.

Furthermore, LLSV (1996) trace differences in legal origin through to differences in the legal rules covering secured creditors and the quality of contract enforcement in 49 countries. They show that laws and enforcement quality vary systematically with legal origin. More specifically, LLSV (1996) show that common law countries -- countries based on the English tradition -- 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. LLSV (1996) also examine

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. Table 2 summarizes some of these findings.

B. Banking development

A large literature examines the ties between banks and economic activity. Ideally, researchers would construct cross-country measures of how well banks identify profitable activities, exert corporate governance, mobilize resources, manage risk and facilitate transactions. In practice, however, economists have been unable to accurately measure these financial services for a broad cross-section of countries. Consequently, researchers traditionally use measures of the overall size of the banking sector to proxy for "financial depth." Financial depth, however, does not measure where the financial system allocates capital. To minimize this problem, I use a measure of banking development, BANK, constructed by Levine and Zervos (1998).

BANK equals the value of loans made by commercial banks and other deposit-taking banks to the private sector divided by GDP. BANK improves upon traditional financial depth measures of banking development by isolating credit issued by banks to the private sector, as opposed to credit issued to governments or public enterprises. As Table 1 and Table 2 illustrate, there is a wide variation in the value of BANK. The values presented in Tables 1 and 2 are average values of BANK over the 1976-1993 period. The maximum value is 2.7 (Switzerland), the minimum is 0.1 (Peru, Zimbabwe), and the standard deviation is 0.5.

C. Evidence on the legal determinants of bank development

The data suggest a strong, positive relationship between banking development and both the rights of creditors and the efficiency of contract enforcement. Table 3 presents the results of regressing BANK on different combinations of the legal indicators. I compute the value of BANK as the average over the 1976-1993 period. Thus, there is one observation per country. In regression (1), the regressors are CREDITOR and ENFORCE. Each legal indicator enters positively and significantly at the five percent level. Regressions (2), (3), and (4) also include the logarithm of per capita GDP (INITIAL OUTPUT) to control for the overall level of economic development. When INITIAL OUTPUT is included along with either CREDITOR (equation 2) or ENFORCE (equation 3), the legal variables enter significantly at the one percent level. When INITIAL OUTPUT, CREDITOR, and ENFORCE are simultaneously included (equation 4), the P-value on CREDITOR rises to about 0.1 while the results on ENFORCE do not change.

Moreover, the empirical relationship between the legal system indicators and banking development are economically meaningful. For example, a one standard deviation increase in CREDITOR (1.1) would increase BANK by 0.1 (using the smallest value of the estimated coefficients), which is about 12 percent of the mean value of BANK. More impressively, a one standard deviation increase in ENFORCE (2.2) would increase BANK by 0.35, which is over 40 percent of the mean value of BANK. Thus, the legal rights of creditors and the ability to enforce those rights are strongly tied to the ratio of bank credit to the private sector as a share of GDP. As shown by the regression R^2's, the creditor rights and enforcement indicators account for over half of the cross-country variation in banking sector development.

The data also suggest that legal origin has a profound impact on bank development. The regressors in regression (5) of Table 3 are dummy variables for German, English and French legal origin as defined by LLSV (1996) and shown in Table 2. Regression (6) also includes

INITIAL OUTPUT. The major message that emerges from regressions (5) and (6) is that countries with a German legal origin have better developed banks. While countries with a French legal tradition tend to have less well-developed banks than other countries on average (regression (5)), this result does not hold when controlling for the overall level of economic development (regression (6)). In contrast, the dummy variable for a German legal tradition enters with a positive and significant coefficient even after controlling for INITIAL OUTPUT.

In sum, the legal system matters for banking development. Differences in banking development can be traced back to the legal origin of the country. Even after controlling for the level of economic development, countries with a German legal system tend to have better developed banks. Moreover, the data identify particular aspects of the legal system that are important for banking sector development. Countries where the legal system gives a high priority to banks getting the full present value of their loans to firms have better developed banks. Furthermore, countries where the legal system effectively enforces contracts tend to have better developed banks than countries that less efficiently contract enforcement.

III. Banks and Growth

This section examines whether the exogenous component of banking development – the component associated with national legal characteristics – is related to rates of per capita GDP growth, capital stock growth, and productivity growth. Specifically, this section uses the legal determinants of banking development examined in Section II as instrumental variables. The data suggest that the component of banking development defined by the legal environment is positively and robustly associated with long-run rates of economic development.

A. Methodology

In the tradition of recent cross-country empirical studies of economic growth, this paper uses data averaged over long periods, such that there is one observation per country. The basic regression takes the form:

$$(1) \qquad G(i) = \alpha(i) + \beta(i)\text{BANK} + \gamma(i)\boldsymbol{X} + \varepsilon(i),$$

where the dependent variable, $G(i)$, is either real per capita GDP growth, per capita capital stock growth, or productivity growth [index i distinguishes among these dependent variables], BANK equals credit to the private sector divided by GDP, and $\boldsymbol{X}$ represents a matrix of conditioning information that controls for other factors associated with economic growth (e.g., income per capita, education, political stability, ethnic diversity, civil rights, bureaucratic efficiency, and indicators of trade, fiscal, and monetary policy). Given data availability, the data cover the period 1976-1993.

In contrast to traditional cross-country investigations, however, this paper seeks to examine whether cross-country variations in the exogenous component of banking sector development explain cross-country variations in the rate of economic development. Thus, I use the legal determinants of banking development as instrumental variables for BANK. Specifically, I select a vector of instrumental variables Z for the equations specified by equation (1). Assuming that $E[\varepsilon]=0$ and that $E[\varepsilon\varepsilon']=\Omega$, where Ω is unrestricted, implies a set of orthogonality conditions, $E[Z'\varepsilon]=0$. This produces a nonlinear instrumental variable estimator of the coefficients in equation (1). After computing these GMM estimates, I use a standard Lagrange-Multiplier test of the overidentifying restrictions to see whether the instrumental

variables are associated with growth beyond their ability to explain cross-country variation in banking sector development.

B. The Growth Indicators

As indicated by equation (1), this paper examines three dependent variables: per capita GDP Growth (OUTPUT GROWTH), per capita capital stock growth (CAPITAL STOCK GROWTH), and productivity growth (PRODUCTIVITY GROWTH). Specifically, define PRODUCTIVITY GROWTH as follows:

PRODUCTIVITY GROWTH = OUTPUT GROWTH - κ*(CAPITAL STOCK GROWTH).

To obtain empirical estimates, I (a) obtain OUTPUT GROWTH from national accounts data, (b) use CAPITAL STOCK GROWTH from King and Levine (1994), (c) select a standard value for κ (κ =0.3), and then compute PRODUCTIVITY GROWTH.

C. Conditioning Information, $\boldsymbol{X}$

This paper examines whether the exogenous component of banking development has a robust, independent relationship with the growth indicators. To enhance confidence in the analysis, it is important to control for "other factors." That is, I want to reduce the chances that regression (1) omits an important explanatory variable [Levine and Renelt 1992]. Given that the maximum sample size is only 43 countries, there are limits on the number of variables that can be included in $\boldsymbol{X}$ in any one regression. Consequently, the analysis includes three different conditioning information sets in all of its analyses.

Conditioning information set 1 included a constant, the logarithm of initial per capita GDP and initial secondary school enrollment. The initial income variable is used to capture the convergence effect highlighted by Barro and Sala-i-Martin (1995). As in many cross-country analyses, initial secondary school enrollment is used to control for investment in human capital accumulation. I sometimes refer to conditioning information set 1 as the "simple" conditioning information set.

Conditioning information set 2 includes conditioning information set 1 plus the ratio of government consumption to GDP, the inflation rate, and the black market exchange rate premium. All of these variables are averaged over the 1976-1993 period. 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]. Thus, conditioning information set 2 is designed to control for policy distortions in studying the relationship between banking development and economic development. I sometimes refer to conditioning information set 2 as the "policy" conditioning information set.

Conditioning information set 3 includes conditioning information set 1 plus the number of revolutions and coups [Banks 1994], the number of assassinations per thousand inhabitants [Banks 1994], an index of political rights [Barro and Lee 1995], an index of civil liberties [Gastil 1990], an index of bureaucratic red tape [Mauro 1995], and the degree of ethnic diversity [Easterly and Levine 1997]. This group of conditioning information is designed to control for bad policies, bad bureaucracies, bad institutions, and bad politics, as emphasized in Knack and Keefer (1995). I sometimes refer to conditioning information set 3 as the "political" conditioning information set.

D. GMM Results with CREDITOR and ENFORCE as Instruments

Table 4 summarizes the instrumental variable results from nine regressions. The dependent variable is either OUTPUT GROWTH, CAPITAL STOCK GROWTH, or PRODUCTIVITY GROWTH. For each of these three dependent variables, Table 4 presents the regressions results for the three conditioning information sets, i.e., the simple, policy, and political conditioning information sets. In the Table 4 results, the instrumental variables are CREDITOR and ENFORCE, which measure the degree to which legal codes emphasize the rights of creditor and the efficiency of the legal system in enforcing laws and contracts respectively. Furthermore, I treat the $\boldsymbol{X}$ matrix as exogenous because I am focusing on examining whether the exogenous component of banking development as defined by the legal environment is associated with economic development. For conciseness, I present only the statistics on the BANK coefficients as well as the tests of the overidentifying restrictions.

The results indicate a very strong connection between the exogenous component of banking development and the growth indicators. BANK enters all nine of the regressions positively and significantly at the one percent level. The component of BANK defined by creditor rights and the efficiency of contract enforcement is closely tied to long-run rates of per capita GDP growth, capital stock growth, and productivity growth. Furthermore, the data do not reject the orthogonality conditions at the ten percent level in any of the nine regressions. Thus, the results are consistent with the statement that the creditor rights indicator and the contract enforcement indicator influence the growth indicators only through their impact on banking development. Also, the results are economically meaningful. As noted earlier (Table 3), a one standard deviation increase in both CREDITOR and ENFORCE would increase BANK by 0.45

(which is about one-half of the mean value of BANK). According to Table 4, a rise in the exogenous component of BANK by 0.45 would increase the rate of per capita GDP growth by almost two percent per year (0.45*0.043) over the sample period. (This example uses the political conditioning information set results, which have the smallest BANK coefficients.) Accumulating over the 18 years of the sample, the results suggest that real per capita GDP would have been about 40% higher in 1993 given this 0.45 increase in the exogenous component of banking sector development. The estimates imply an economically large relationship between banking sector development and economic performance. Legal reforms that enhance creditor rights and contract enforcement may substantially accelerate long-run rates of per capita GDP growth, capital accumulation, and productivity growth.

E. GMM Results with Legal Origin Dummies as Instruments

Table 5 presents additional results regarding the relationship between the three growth indicators and the exogenous component of banking sector development using an alternative instrument set. Specifically, the instrumental variables are dummy variables for legal origin, either English, French, or German. Some view these instruments as better than CREDITOR and ENFORCE because legal origin is less prone to endogeneity problems than measures of the legal rights of creditors and the efficiency of the judicial system. On the negative side, dummy variables for legal origin give less guidance regarding the particular characteristics of the legal system that are important for banking sector development. For this section's purposes, the relevant point is that the two sets of instruments give similar results.

Table 5 summarizes the results from nine regressions, where the dependent variable is either OUTPUT GROWTH, CAPITAL STOCK GROWTH, or PRODUCTIVITY GROWTH.

For each of these three dependent variables, Table 5 presents the regression results for the simple, policy, and political conditioning information sets. In all of the OUTPUT GROWTH regressions, BANK enters positively and significantly at the five percent level. Also, BANK enters positively and significantly in two out of the three CAPITAL STOCK GROWTH regressions and in two out of the three PRODUCTIVITY GROWTH regressions. With political conditioning information set, BANK enters the CAPITAL STOCK GROWTH regression with a P-value of 0.052. With the policy conditioning information set, BANK enters the PRODUCTIVITY GROWTH regression with a P-value of 0.18. With these two exceptions noted, the data indicate a strong, positive relationship between the growth indicators and the exogenous component of banking development. While the legal origin instruments tend to produce smaller coefficients than the CREDITOR and ENFORCE instruments, the coefficients still indicate an economically large relationship between banking sector development and long-run growth. Using the same example as above, a rise in the exogenous component of BANK by 0.45 would increase the rate of per capita GDP growth by 0.9 of one percent per year (0.45*0.019) over the sample period. Accumulating over the 18 years of the sample, the results suggest that real per capita would have been about 18% higher in 1993 with a 0.45 increase in the exogenous component of banking sector development.

The hardy links between banking development and long-run rates of per capita GDP growth, capital stock growth, and productivity growth pass some additional diagnostic tests. The data do not reject the orthogonality conditions at the five percent level in the nine regressions. At the ten percent level, the PRODUCTIVITY GROWTH regressions with the policy and political conditioning information sets reject the null hypothesis that the instrumental variables are uncorrelated with the error term. In these regressions and at this higher P-value, the data suggest

that legal origin may not be specific enough; that is, legal origin may be associated with growth beyond its link to banking sector development. In general, however, the results are consistent with the statement that the legal environment affects the rate of economic development by influencing banking sector development.

F. Cautionary Note

It is important to be clear about what these results do not show. The paper does not show that economic growth does not influence the banking system. The results do not contradict theories by Patrick (1966), Greenwood and Jovanovic (1990), and Greenwood and Smith (1997), which suggest that causality runs in both directions; banking development influences economic growth, and economic growth influences banking sector development. This paper provides evidence for the hypothesis that the exogenous component of banking development promotes economic growth. Furthermore, this paper examines neither the determinants nor the effects of various financial regulations. Thus, I do not consider the determinants or effects of deposit insurance [Calomiris (1989); Demirguc-Kunt and Detragiache (1997); Kane (1985,1989)], restrictions on banking activities [Kroszner and Rajan (1994); Calomiris (1995)], or a wide array of supervisory and regulatory issues that may affect bank stability and performance [Barth, Nolle, and Rice (1996), BIS (1997), Calomiris and Gorton (1991), Kroszner and Strahan (1996)]. Rather, this paper makes a more limited point: the legal environment influences the banking sector and this component of banking sector development is strongly linked with long-run rates of economic growth.

IV. Summary and Conclusions

This paper first examined the connection between the legal environment and banking development and then studied the link between that part of banking sector development associated with the legal environment and rates of economic growth, capital accumulation, and productivity improvements. The data indicate a close relationship between the legal system and banking development. Countries where legal codes emphasize the rights of creditors have better developed banks, as measured by bank credit to the private sector divided by GDP, than countries where laws do not give a high priority to creditors in the case of corporate bankruptcy or reorganization. Furthermore, enforcement matters. Countries with legal systems that rigorously enforce laws and contracts have better developed banks than countries where enforcement is more lax. Moreover, these differences can be traced back to the legal origin of the country. As noted by LLSV (1996), English common law countries have laws that emphasize the rights of creditors to a greater degree than the French, German, and Scandinavian countries. On average, French civil law countries protect creditors the least. In terms of law enforcement, countries with a French legal heritage have, on average, the lowest quality of law enforcement, while countries with German and Scandinavian legal traditions tend to be the best at enforcing laws and contracts.

The paper also finds that the exogenous component of banking development – the component defined by the legal environment – is positively associated with economic growth. This finding was robust to changes in the conditioning information set and to alterations in the instrumental variables. The policy implications are clear. Although changing legal codes and improving the efficiency with which legal systems enforce laws and contracts is difficult, the economic returns to improving the legal environment appear very large. For many countries,

these reforms could begin at the level of regulation and implementation . For example, it may be prohibitively difficult -- or undesirable -- to change a country's law that imposes an automatic stay on the assets of a firm upon filing a reorganization petition. Nevertheless, corporate reorganization procedures could be improved to reduce delays and uncertainty, so that bankers feel greater confidence about receiving the full present value of their loans. Thus, this paper's results emphasize the prominent role that legal reforms – defined broadly – can have in stimulating economic development by improving the functioning of the banking system

Table 1: Summary Statistics: Annual Averages 1976-1993

Variable	Mean	Median	Maximum	Minimum	Standard Deviation
OUTPUT GROWTH	0.023	0.018	0.097	-0.014	0.022
CAPITAL STOCK GROWTH	0.028	0.024	0.095	-0.019	0.025
PRODUCTIVITY GROWTH	0.017	0.014	0.079	-0.019	0.017
BANK	0.844	0.760	2.678	0.122	0.536
CREDITOR	-0.310	0.000	1	-2	1.070
ENFORCE	7.451	8.310	9.990	3.545	2.154

Observartions: 42

Notes:
OUTPUT GROWTH = per capita GDP growth. CAPITAL STOCK GROWTH = per capita capital growth
PRODUCTIVITY GROWTH = OUTPUT GROWTH - (0.3)*CAPITAL STOCK GROWTH.
BANK = deposit money bank credit to the private sector divided by GDP.
CREDITOR = index of secured creditor rights. ENFORCE = index of law and contract enforcement.

Table 2: Legal variables and banking development

Country	CREDITOR	ENFORCE	BANK
Australia	-1	9.36	0.77
Canada	-1	9.48	0.83
Hong Kong	1	8.52	1.19
India	1	5.14	0.46
Israel	1	6.18	0.96
Malyasia	1	7.11	1.00
New Zealand	0	9.65	0.58
Nigeria	1	3.55	0.23
Pakistan	1	3.95	0.45
Singapore	1	8.72	1.50
South Africa	0	5.85	0.62
Thailand	1	6.91	0.75
United Kingdom	1	9.10	1.22
United States	-1	9.50	0.77
Zimbabwe	1	4.36	0.14
Avg-English	**0.47**	**7.16**	**0.77**
Argentina	-1	5.13	0.29
Belgium	0	9.74	0.53
Brazil	-2	6.31	0.23
Chile	-1	6.91	0.75
Colombia	-2	4.55	0.25
Egypt	1	5.11	0.44
France	-2	9.09	1.51
Greece	-1	6.40	0.50
Indonesia	1	5.04	0.48
Italy	-1	8.75	0.69
Mexico	-2	5.95	0.24
Netherlands	-1	9.68	1.31
Peru	-2	3.59	0.12
Philippines	-2	3.77	0.45
Portugal	-1	8.63	0.96
Spain	0	8.10	1.31
Turkey	-1	5.57	0.35
Avg-French	**-1.00**	**6.61**	**0.61**
Austria	0	9.80	1.36
Germany	0	9.50	1.64
Japan	0	9.34	1.96
Korea	1	6.97	0.82
Switzerland	-1	9.99	2.68
Taiwan	0	8.84	1.38
Avg-German	**0.00**	**9.07**	**1.64**
Denmark	0	9.66	0.69
Finland	-1	9.58	1.22
Norway	-1	9.86	0.93
Sweden	-1	9.79	0.87
Avg-Scandinavian	**-0.75**	**9.72**	**0.93**

Notes: Countries are divided into those with English, French, German, and Scandinanvian legal origins. CREDITOR is an index of the legal rights of secured creditors, with values between -2 and 1, and where larger values indicate greater creditor rights. ENFORCE is an index of the efficiency of the legal system in enforcing contracts, with values potentially between 0 and 10, and where larger values indicate greater contract enforcement efficiency.
BANK equals bank credit to the private sector divided by GDP.

Table 3: Banking Development and Legal Systems, 1976-1993

	1	2	3	4	5	6
Constant	-0.32 [0.028]	-2.23 [0.001]	0.52 [0.248]	-0.15 [0.807]	0.93 [0.000]	-1.45 [0.014]
INITIAL OUTPUT		0.37 [0.001]	-0.13 [0.083]	0.03 [0.766]		0.26 [0.000]
CREDITOR	0.09 [0.020]	0.17 [0.001]		0.09 [0.103]		
ENFORCE	0.16 [0.000]		0.19 [0.000]	0.16 [0.000]		
GERMAN					0.51 [0.017]	0.66 [0.001]
ENGLISH					-0.19 [0.199]	0.08 [0.639]
FRENCH					-0.30 [0.038]	-0.06 [0.714]
R-square	0.56	0.43	0.51	0.56	0.30	0.50

Notes:
INITIAL OUTPUT = Initial logarithm of real per capita GDP.
CREDITOR = index of secured creditor rights. ENFORCE = index of law and contract enforcement.
GERMAN, ENGLISH, FRENCH = Dummy variables for corresponding legal origin.
The null hypothesis that the regressors explain none of the cross-country variation in banking development is rejeted at the 0.001 level in all of the regressions.
[Heteroskedasticity-consistent P-values in square brackets]

Table 4: Banks, Growth, and the Sources of Growth

Independent Variable	Conditioning Information	Dependent Variable: OUTPUT GROWTH	Dependent Variable: CAPITAL STOCK GROWTH	Dependent Variable: PRODUCTIVITY GROWTH
BANK	1	0.056	0.058	0.046
		(0.011)	(0.012)	(0.009)
		[0.001]	[0.001]	[0.001]
		{0.01}	{0.40}	{0.01}
BANK	2	0.056	0.061	0.042
		(0.017)	(0.018)	(0.014)
		[0.003]	[0.002]	[0.004]
		{0.21}	{0.06}	{0.05}
BANK	3	0.043	0.035	0.038
		(0.009)	(0.010)	(0.008)
		[0.001]	[0.001]	[0.001]
		{0.38}	{2.13}	{0.21}

(Heteroskedasticity-consistent standard errors in parentheses)
[P-values in square brackets]
{LM-test of overidentifying restrictions in braces}

Critical values for LM-Test (1 d.f.): 10% 2.71; 5%=3.84

Conditioning information 1: Other regressors include a constant, logarithm of initial per capita GDP, and initial secondary school enrollment rate. Observations=40.

Condition information 2: Other regressors include Conditioning information 1, plus the ratio of government consumption spending to GDP, inflation rate, and the black market exchange rate premium. Observations=40.

Condition information 3: Other regressors include Conditioning information 1, plus the number of revolutions and coups, the number of assassinations per thousand inhabitants, index of political rights, index of civil liberties, index of bureaucratic red tape and degree of ethnic diversity. Observations=38.,

Instruments: conditioning information set plus CREDITOR AND ENFORCE, which are indexes of secured creditors legal rights and the efficiency of law enforcement.

Table 5: Banks, Growth, and the Sources of Growth: Alternative Instruments

Independent Variable	Conditioning Information	Dependent Variable: OUTPUT GROWTH	Dependent Variable: CAPITAL STOCK GROWTH	Dependent Variable: PRODUCTIVITY GROWTH
BANK	1	0.052 (0.020) [0.013] {0.56}	0.037 (0.015) [0.020] {0.37}	0.046 (0.017) [0.010] {2.12}
BANK	2	0.043 (0.018) [0.019] {0.80}	0.034 (0.015) [0.032] {0.19}	0.017 (0.012) [0.175] {5.46}
BANK	3	0.019 (0.009) [0.033] {3.32}	0.020 (0.010) [0.052] {0.03}	0.016 (0.007) [0.027] {5.57}

(Heteroskedasticity-consistent standard errors in parentheses)
[P-values in brackets]
{LM-test of overidentifying restrictions in braces}

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

Conditioning information 1: Other regressors include a constant, logarithm of initial per capita GDP, and initial secondary school enrollment rate. Observations= 43.

Condition information 2: Other regressors include Conditioning information 1, plus the ratio of government consumption spending to GDP, inflation rate, and the black market exchange rate premium. Observations= 43.

Condition information 3: Other regressors include Conditioning information 1, plus the number of revolutions and coups, the number of assassinations per thousand inhabitants, index of political rights, index of civil liberties, index of bureaucratic red tape, and degree of ethnic diversity. Observations= 41.

Instruments: conditioning information set plus dummy variables for legal origin.

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