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Law, Finance, and Economic Growth

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This paper examines how the legal environment affects financial development, and then asks how this in turn is linked to long-run economic growth. Financial intermediaries are better developed in countries with legal and regulatory systems that (1) give a high priority to creditors receiving the full present value of their claims on corporations, (2) enforce contracts effectively, and (3) promote comprehensive and accurate financial reporting by corporations. The data also indicate that the exogenous component of financial intermediary development—the component defined by the legal and regulatory environment—is positively associated with economic growth. *Journal of Economic Literature* Classification Numbers: G21, K12, O16 © 1999 Academic Press

Countries grow at startlingly different rates. Since 1960, real per capita Gross Domestic Product (GDP) has grown at 4.2% per annum in Thailand and at 1.8% in the United States and is essentially the same today as it was in 1960 in Senegal. Given the potential impact on human welfare, economists have suggested a variety of explanations for these growth differences, ranging from macroeconomic stability, to openness to international trade, to institutional development, and ethnic diversity. Some policymakers and economists have also argued that cross-country differences in financial sector development play a key role in determining cross-country differences in long-run economic growth rates.[1] These views are far from unanimous, however. Joan Robinson (1952) claimed that finance does not exert a causal impact on growth; rather, the financial sector responds to developments in the nonfinancial sector.

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[1] For recent formulations of the conditions under which financial intermediaries accelerate economic growth, see, for example, Bencivenga and Smith (1991), Greenwood and Jovanovic (1990), Greenwood and Smith (1997), and King and Levine (1993b).

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Although King and Levine (1993b) and Levine and Zervos (1998) show that measures of financial development are good predictors of economic growth, these results do not settle the issue of causality.[2] As argued by Rajan and Zingales (1998), financial markets may anticipate economic growth and develop in anticipation of greater economic activity. Thus, financial development may simply be a leading indicator, rather than an underlying cause. Furthermore, even if financial systems do exert a causal impact on economic growth, insufficient cross-country empirical work exists on the underlying determinants of financial development. Thus, if better developed financial systems accelerate economic growth and therefore induce higher standards of living, financial economists need to identify policy, regulatory, and legal levers that policymakers can manipulate to improve the functioning of financial systems.

Given the debate about whether finance causes growth and the lack of information regarding the sources of financial development, I choose to address this issue by posing two related questions: (1) How does the legal and regulatory environment affect financial intermediary development? (2) Is there then a causal link between financial intermediary development and economic growth? Specifically, Part I of this paper searches a new cross-country data set to identify some legal and regulatory determinants of financial intermediary development. Laporta *et al*. (1998, henceforth LLSV 1998) assemble data on the legal treatment of creditors, the efficiency of the legal system in enforcing contracts, and accounting standards. Since contractual arrangements form the basis of financial activities, legal systems that protect creditors and enforce contracts are likely to encourage greater financial intermediary development than legal and regulatory systems that impede creditors from gaining access to their claims or that ineffectively enforce contracts. Similarly, since information about corporations is critical for exercising corporate control and identifying creditworthy firms, accounting standards that simplify the interpretability and comparability of corporate financial statements may ease financial activities. Moreover, LLSV (1998) (a) note that the 49 countries in their sample can be divided into those with predominantly English, French, German, or Scandinavian legal origins, and (b) show that differences in the legal treatment of creditors, legal system efficieny, and the comprehensiveness and quality of information disclosed in corporate annual reports are systematically linked to the country's legal origin. Since most countries obtained their legal systems through occupation and colonization and since these systems vary little over time, the legal variables are treated—after a variety of diagnostic and sensitivity checks—as exogenous in this paper's analyses.

Part I finds that the legal and regulatory environment influences financial intermediary development. To measure financial development, this paper uses the

[2] Also, using annual data, Wachtel and Rousseau (1995) and Neusser and Kugler (1998) find that financial development causes economic performance. These time-series studies, however, remain subject to the problems that financial development may be a leading indicator but not a cause of growth, and they do not identify the determinants of financial development.

King and Levine (1993b, henceforth KL 1993b) indicators of financial intermediary development. These indicators quantify the size of financial intermediaries, the relative importance of commercial banks versus the central bank in allocating credit, and the degree to which intermediaries allocate credit to the private sector versus the government or public enterprises. The data show that financial intermediaries develop more in countries with legal systems that assign a higher priority to creditors extracting the full present value of their claims against corporations in the case of corporate bankruptcy or reorganization. Similarly, countries with legal systems that more effectively enforce contracts have better developed financial intermediaries than countries where contract enforcement is more lax. Furthermore, information disclosure matters. While less robust than the creditor rights and legal efficiency variables, the data also illustrate a strong positive link between financial intermediary development and the degree to which corporations publish comprehensive and comparable information. Moreover, the results are confirmed even when legal origin dummy variables (English, French, German, Scandinavian) are used as instrumental variables to extract the exogenous component of the creditor rights, contract enforcement, and accounting standards variables.

Part II of this paper examines the issue of causality. Specifically, I extend the work of KL (1993b) by using various combinations of the legal and regulatory determinants of financial development as instrumental variables for financial development. Generalized Method of Moments (GMM) procedures reveal that the exogenous component of financial intermediary development—the component defined by national legal and regulatory characteristics—positively influences economic growth. These results are robust to variations in the instrument variables, modifications in the conditioning information set, alterations in the sample period, and changes in the measure of financial intermediary development. Tests of the overidentifying restrictions indicate that the data do not reject the hypothesis that the instrumental variables are uncorrelated with the error term, implying that simultaneity bias is not dominating the strong, positive connection between financial intermediary development and long-run growth. Furthermore, this link is economically large. The estimated coefficients suggest, for example, that moving a country from the lowest quartile of countries in terms of legal protection of creditor rights to the next quartile translates into a 20% rise in financial development (evaluated at the sample mean). This rise in turn accelerates long-run growth by almost one percentage point per year (which is about 60% of the standard deviation of cross-country growth rates over the 1980s).

This paper complements recent alternative methods for addressing the issue of causality. Using industry-level data, Rajan and Zingales (1998) show that industries that rely comparatively heavily on external funding grow comparatively faster (than industries that do not rely heavily on external capital) in countries with well-developed financial systems. Similarly, Demirgüç-Kunt and Maksimovic (1998) show that firms with access to better developed financial systems grow faster than they could have grown without this access. Furthermore, Jayaratne and Strahan (1996) show that when individual states of the United States relaxed intrastate

banking restrictions, bank lending quality improved and economic growth accelerated. This paper also complements the Laporta *et al*. (1997, henceforth LLSV 1997) study of the legal determinants of equity and bond market development. Whereas LLSV (1997) use general measures of equity an debt market development, this paper focuses on financial intermediaries and excludes both measures of equity and bond markets, which may have very different determinants from those underlying intermediary development.

The paper is organized as follows. Section I establishes an empirical connection between cross-country differences in banking development and cross-country differences in the legal and regulatory environment. Section II then traces the impact of differences in the legal and regulatory environment on banking development through to economic growth. The data indicate that the exogenous component of financial intermediary development—the component defined by the legal and regulatory system—is positively associated with economic growth. Section III assesses the robustness of the results, and Section IV concludes.

I. THE LEGAL AND REGULATORY DETERMINANTS OF FINANCIAL DEVELOPMENT

To examine the relationship between financial intermediary development and measures of national legal and regulatory conditions, one needs (1) measures of financial intermediary development and (2) measures of the legal and regulatory characteristics for a cross-section of countries. This section first describes the data. Then, it presents evidence regarding the links between each measure of financial intermediary development and various indicators of (1) the legal and regulatory treatment of creditors, (2) the enforcement of contracts, and (3) the accuracy and comprehensiveness with which information about firms is disclosed to outsiders. The section also argues that the legal and regulatory characteristics exert a causal influence on financial intermediary development.

A. Financial Intermediary Development

Ideally, one would like to construct measures of the particular functions provided by the financial system. That is, one would like to have comparative measures of the ability of the financial system to research firms and identify profitable ventures, exert corporate control, manage risk, mobilize savings, and ease transactions. Accurately measuring the provision of these services in any single country would be extraordinarily difficult; doing it for a broad cross-section of countries would be virtually impossible. Instead, I follow KL (1993b) and use four indicators of financial intermediary development. These indicators measure the size of financial intermediaries, the relative importance of commercial banks versus the central bank in allocating credit, and the degree to which intermediaries allocate credit to the private sector versus the government or public enterprises. While there are

positive features and shortcomings associated with each measure (as discussed by KL 1993b), all four are used. Since the results are broadly similar across the four financial intermediary indicators, this enhances the confidence one holds in the conclusions. These data are available for 77 countries over the 1960–1989 period.[3]

The first measure, LLY, measures the size of financial intermediaries and equals liquid liabilities of the financial system (currency plus demand and interest-bearing liabilities of banks and nonbank financial intermediaries) divided by GDP. There are problems with this commonly used measure of financial development. It may not accurately measure the effectiveness of the financial system in intermediating resources. Also, LLY includes deposits by one intermediary in another, which may involve "double counting." Under the assumption that the size of the financial system is positively correlated with the provision and quality of financial services, many researchers use this measure of financial depth (McKinnon 1973). Thus, we include LLY in our analysis.

The second measure of financial development, BANK, measures the degree to which commercial banks versus the central bank allocate credit. BANK equals the ratio of bank credit divided by bank credit plus central bank domestic assets. The intuition underlying this measure is that banks are more likely to identify profitable firms, exercise corporate control, pool risk, mobilize savings, and facilitate transactions than central banks. There are two notable weaknesses of this measure, however. Banks are not the only financial intermediaries providing valuable financial functions and banks may simply lend to the government or public enterprises.

The third and fourth measures partially address concerns about the allocation of credit. The third measure, PRIVATE, equals the ratio of credit allocated to the private sector to total domestic credit (excluding credit to banks). The fourth measure, PRIVY, equals credit to the private sector divided by GDP. Directed credit initiatives and government subsidy programs may importantly influence the fraction of credit allocated to the private sector. The assumption underlying these measures is that financial systems that allocate more credit to the private sector are more engaged in researching firms, exerting corporate control, providing risk management services, mobilizing savings, and facilitating transactions than financial systems that simply funnel credit to the government or state owned enterprises.

B. The Legal System and Financial Intermediary Development

1. Legal tradition. Glendon *et al*. (1982) and Berman (1983) describe how Roman law was compiled under the direction of Byzantine Emperor Justinian in the sixth century. Over subsequent centuries, the law was interpreted and adapted to confront problems as they arose throughout Europe. Eventually, individual countries formalized individual legal codes. The Scandinavian countries developed their

[3] KL (1993a,b) provide data sources and summary statistics of the financial intermediary indicators.

Civil Codes in the 17th and 18th centuries. These countries have remained relatively unaffected by the far-reaching influences of the English, German, and French legal traditions. The English legal tradition is not a civil law heritage, where laws are heavily shaped by legal scholars. Instead, in the English—common law—legal tradition, laws are heavily influenced by judges trying to resolve particular cases.

The French Civil Code was written in 1804 under the direction of Napoleon, who saw the permanence of the Code as more important than the fleeting nature of his military conquests. He had the Code adopted in all conquered territories, including Italy, Poland, the low countries, and the Habsburg Empire. Through conquest and colonization, France extended her legal influence to parts of the Near East, northern and sub-Saharan Africa, Indochina, Oceania, French Guiana, and the French Caribbean islands during the colonial era. Furthermore, since the French Civil Code exerted a major influence on the Portuguese and Spanish legal systems, this helped spread the French legal tradition to Central and South America.

Following the unification of Germany under Bismarck in 1871, the German Civil Code was completed in 1896. The German Code exerted a great influence on Austria and Switzerland, as well as China, Czechoslovakia, Greece, Hungary, Italy, and Yugoslavia. Also, the German Civil Code heavily influenced the Japanese Civil Code, which helped spread the German legal tradition to Korea.

This paper takes national legal origin as an exogenous "endowment" since legal systems were spread primarily through conquest and imperialism. Based on the work of comparative legal scholars, LLSV (1998) place 49 countries into four legal families, either English, French, German, or Scandinavian. Table I lists countries by legal origin. Table I also provides information on financial intermediary development and measures of the legal and accounting environment that are described below. It is worth noting here that LLSV (1998) show that laws and enforcement quality vary systematically with legal origin. More specifically, LLSV (1998) 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 (1998) 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.

2. Creditor rights. Outside creditors can influence firms to satisfy their debt obligations in a variety of ways. For instance, a creditor may have the right to repossess collateral or liquidate the firm in the case of default. Some legal and regulatory systems make repossession easier than other systems. Similarly, creditors may enjoy rights regarding the reorganization of a company since the reorganization may affect the probability of repayment. Again, legal systems differ in the rights assigned to creditors in terms of corporate reorganizations. Thus, legal and regulatory systems that facilitate the repossession of collateral and that

TABLE I
The Legal Environment and Financial Development

Country	LLY	BANK	PRIVATE	PRIVY	AUTOSTAY	MANAGES	SECURED1	CONRISK	ACCOUNT
Australia	0.65	0.94	0.72	0.35	1	1	1	8.71	75.00
Canada	0.64	0.94	0.88	0.45	1	1	1	8.96	74.00
Hong Kong					0	0	1	8.82	69.00
India	0.40	0.67	0.52	0.24	0	0	1	6.11	57.00
Ireland	0.49	0.94	0.61	0.26	1	1	1	8.96	
Israel	0.67	0.84	0.41	0.47	0	0	1	7.54	64.00
Kenya	0.38	0.75	0.58	0.19	0	0	1	5.66	
Malyasia	0.94	0.96	0.75	0.52	0	0	1	7.43	76.00
New Zealand	0.50	0.82	0.68	0.23	0	0	0	9.29	70.00
Nigeria	0.27	0.59	0.41	0.15	0	0	1	4.36	59.00
Pakistan	0.40	0.63	0.47	0.26	0	0	1	4.87	
Singapore	0.96			0.80	0	0	1	8.86	78.00
South Africa	0.51	0.93	0.84	0.32	1	0	1	7.27	70.00
Thailand	0.54	0.81	0.65	0.40	0	0	1	7.57	64.00
United Kingdom	0.59			0.44	0	0	1	9.63	78.00
United States	0.64	0.90	0.88	0.66	1	1	1	9.00	71.00
Zimbabwe	0.39	0.87	0.67	0.16	0	0	1	5.04	#na
Avg—English	**0.56**	**0.83**	**0.65**	**0.37**	**0.29**	**0.24**	**0.94**	**7.53**	**69.62**
Argentina	0.11	0.66	0.50	0.13	1	1	1	4.91	45.00
Belgium	0.56	0.97	0.46	0.27	0	1	1	9.48	61.00
Brazil	0.10	0.31	0.29	0.07	1	1	0	6.30	54.00
Chile	0.18	0.31	0.35	0.28	1	1	1	6.80	52.00
Colombia	0.14	0.67	0.32	0.07	1	1	0	7.02	50.00
Ecuador	0.19			0.19	0	0	1	5.18	
Egypt	0.84	0.43	0.29	0.26	0	0	1	6.05	24.00
Spain	0.69	0.86	0.66	0.62	0	1	1	8.40	64.00
France	0.71	0.90	0.91	0.77	1	1	0	9.19	69.00
Greece	0.73	0.66	0.47	0.35	1	0	0	6.62	55.00

Indonesia	0.20	0.60	0.48	0.16	0	0	1	6.09	
Italy	0.75			0.33	1	1	1	9.17	62.00
Mexico	0.25	0.63	0.36	0.10	1	1	0	6.55	60.00
Netherlands	0.82	0.97	0.83	0.68	1	1	1	9.35	64.00
Peru	0.16	0.67	0.38	0.06	1	1	0	4.68	38.00
Philippines	0.26	0.70	0.56	0.22	1	1	0	4.80	65.00
Portugal	1.04	0.77	0.46	0.46	1	1	1	8.57	36.00
Turkey	0.24	0.53	0.38	0.17	1	1	1	5.95	51.00
Uruguay	0.38	0.60	0.58	0.38	1	0	1	7.29	31.00
Venezuela	0.54	0.84	0.77	0.26	#na	#na	1	6.30	40.00
Avg—French	**0.44**	**0.67**	**0.50**	**0.29**	**0.74**	**0.74**	**0.65**	**6.94**	**51.17**
Austria	0.79	0.95	0.70	0.68	0	1	1	9.60	54.00
Switzerland	1.32	0.98	0.94	1.35	1	1	1	9.98	68.00
Germany	0.63	0.94	0.73	0.82	0	1	1	9.77	62.00
Japan	1.56	0.95	0.81	0.95	1	0	1	9.69	65.00
Korea	0.37	0.79	0.74	0.44	0	0	1	8.59	62.00
Taiwan					0	1	1	9.16	65.00
Avg—German	**0.94**	**0.92**	**0.78**	**0.85**	**0.33**	**0.67**	**1**	**9.47**	**62.67**
Denmark	0.51			0.48	0	1	1	9.31	62.00
Finland	0.44	0.93	0.94	0.55	1	1	1	9.15	77.00
Norway	0.55	0.90	0.62	0.46	1	1	1	9.71	74.00
Sweden	0.33	0.89	0.58	0.40	1	1	1	9.58	83.00
Avg—Scandinavian	**0.46**	**0.90**	**0.71**	**0.47**	**0.75**	**1**	**1**	**9.44**	**74.00**

Note. LLY = Ratio of liquid liabilities to GDP. BANK = Ratio of deposit money bank credit to deposit money bank plus central bank credit. PRIVATE = Ratio of claims on nonfinancial private sector to total credit. PRIVY = Ratio of Claims on financial private sector to GDP. AUTOSTAY = 1, if reorganization imposes a stay on firm assets; and equals 0 otherwise. MANAGES = 1, if management stays in control pending resolution of reorganization process; and equals 0 otherwise. SECURED = 1, if secured creditors are ranked first in asset distribution of bankrupt firm; equals 0 otherwise. CONRISK assessment of the risk that government will modify a contract (scale 1–10, 10 = least risk). ACCOUNT = index of the comprehensiveness of corporate annual reports (scale 0–90; 90 equals most comprehensive).

grant creditors a clear say in reorganization decisions are, all else equal, likely to encourage the development of financial intermediaries engaged in issuing credit supported by these laws. In terms of the specific financial intermediary indicators, legal systems that assign strong rights to creditor are—all else equal—more likely to support the growth of financial intermediaries (LLY), commercial banks relative to the central bank (BANK), and financial intermediaries that allocate more credit to private firms as opposed to the government or public enterprises (PRIVATE, PRIVY) than legal systems that impede the repossession of collateral or limit the role of creditors in reorganizations.

The paper considers three creditor rights indicators. The first two focus on the rights of creditors in reorganizations. The third indicator measures the seniority of creditors in the case of a defaulting firm. LLSV (1998) construct the data from bankruptcy and reorganization laws for 49 countries.

AUTOSTAY equals one if a country's bankruptcy and reorganization 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 prevents secured creditors from gaining possession of collateral or liquidating a firm to meet obligations. Thus, all else equal, AUTOSTAY should be negatively correlated with the activities of intermediaries engaged in providing secured credit.

MANAGES equals 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 meet secured creditor obligations. Thus, MANAGES should be negatively correlated with the activities of financial intermediaries engaged in secured transactions.

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 nonsecured 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 financial intermediaries engaged in secured transactions, holding everything else constant.[4]

Tables II–IV present results regarding the empirical connection between each of the three creditor rights variables and the four measures of financial intermediary

[4] LLSV (1998) also examine REORG, which equals one if a country's bankruptcy and reorganization laws impose restrictions, such as creditors' consent, on filing for reorganization, and zero otherwise. This type of restriction may boost creditor rights by increasing the likelihood and shortening delays in creditors getting paid. If the legal system does not impose this restriction, then managers can reorganize corporations and thereby avoid or delay paying secured creditors. While I also examined REORG, it was insignificantly related to all of the financial intermediary development indicators.

TABLE II
Financial Intermediaries and AUTOSTAY: 1980s

	Dependent variable			
	LLY	BANK	PRIVATE	PRIVY
C	−1.05	−0.46	−0.47	−1.36
	(0.007)	(0.037)	(0.096)	(0.000)
Logarithm of income per capita	0.19	0.16	0.13	0.21
	(0.000)	(0.000)	(0.001)	(0.000)
AUTOSTAY	−0.12	−0.13	−0.06	−0.11
	(0.151)	(0.009)	(0.362)	(0.088)
R^2	0.22	0.42	0.28	0.38
Observations	44	39	39	44

Note. AUTOSTAY = 1 if the reorganization procedure imposes a stay on firm assets, which prevents secured creditors from gaining immediate possession of their security. AUTOSTAY = 0 otherwise. (Heteroskedasticity-consistent P-values in parentheses.) LLY = Ratio of liquid liabilities to GDP. BANK = Deposit money bank credit divided by deposit money bank plus central bank credit. PRIVATE = Ratio of claims on the nonfinancial private sector to total domestic credit. PRIVY = Ratio of claims on the nonfinancial private sector to GDP.

development, while Table I lists these creditor rights indicators by country and aggregates them by legal origin. Consistent with LLSV (1998) findings, Table I shows that English-origin countries have legal codes that emphasize the rights of creditors to a greater degree than countries with French, German, or Scandinavian legal traditions. Also consistent with LLSV (1998), French legal heritage countries

TABLE III
Financial Intermediaries and MANAGES: 1980s

	Dependent variable			
	LLY	BANK	PRIVATE	PRIVY
C	−1.41	−0.44	−0.63	−1.46
	(0.004)	(0.089)	(0.041)	(0.000)
Logarithm of income per capita	0.25	0.15	0.15	0.23
	(0.000)	(0.000)	(0.000)	(0.000)
MANAGES	−0.26	−0.09	−0.12	−0.13
	(0.026)	(0.151)	(0.091)	(0.091)
R^2	0.32	0.36	0.33	0.39
Observations	44	39	39	44

Note. MANAGES = 1 if management stays in control of property pending the resolution of the reorganization process. MANAGES = 0 otherwise. (Heteroskedasticity-consistent P-values in parentheses.) LLY = Ratio of liquid liabilities to GDP. BANK = Deposit money bank credit divided by deposit money bank plus central bank credit. PRIVATE = Ratio of claims on the nonfinancial private sector to total domestic credit. PRIVY = Ratio of claims on the nonfinancial private sector to GDP.

TABLE IV
Financial Intermediaries and SECURED1: 1980s

	Dependent variable			
	LLY	BANK	PRIVATE	PRIVY
C	−1.03	−0.35	−0.50	−1.32
	(0.007)	(0.080)	(0.041)	(0.000)
Logarithm of income per capita	0.16	0.12	0.12	0.18
	(0.000)	(0.000)	(0.000)	(0.000)
SECURED1	0.22	0.13	0.14	0.19
	(0.014)	(0.031)	(0.051)	(0.014)
R^2	0.27	0.40	0.35	0.41
Observations	45	40	40	45

Note. SECURED1 = 1 if secured creditors are ranked first in the distribution of the assets of a bankrupt firm. SECURED1 = 0 otherwise. (Heteroskedasticity-consistent P-values in parentheses.) LLY = Ratio of liquid liabilities to GDP. BANK = Deposit money bank credit divided by deposit money bank plus central bank credit. PRIVATE = Ratio of claims on the nonfinancial private sector to total domestic credit. PRIVY = Ratio of claims on the nonfinancial private sector to GDP.

are notably weak in terms of the legal codes regarding creditor rights. Tables II–IV present regressions of the measures of financial intermediary development on the creditor rights variables while controlling for the level of per capita income. I do this because LLSV (1998) show that the level of income per capita is frequently correlated with creditor rights indicators even after controlling for legal origin.

As expected, countries that prevent secured creditors from gaining possession of their security by imposing an automatic stay on firm assets in the case of reorganization (AUTOSTAY = 1) tend to have commercial banks that allocate a relatively low amount of credit relative to central banks (BANKS) and commercial banks that extend a relatively low amount of credit to private firms as a fraction of GDP (PRIVY). AUTOSTAY enters negatively in all four regressions and is significant at the 0.01 level in the BANK regression and at the 0.09 level in the PRIVY regression.

Similarly, countries where managers stay in control of the firm pending the resolution of the reorganization process (MANAGES = 1) tend to have less well developed financial intermediaries than countries where officials appointed by creditor or the courts assume responsibility for the operation of the business during reorganization. As shown in Table III, MANAGES enters all of the regressions negatively and is statistically significant at the 0.05 level in the LLY equation and at the 0.10 level in the PRIVATE and PRIVY regressions.

The findings are strongest for SECURED1. Countries where nonsecured creditors, such as the government or labor, are given priority in the distribution of the proceeds that result from the disposition of the assets of a bankrupt firm (SECURED1 = 0) tend to have less well developed financial intermediary sectors than countries where secured creditors are ranked first (SECURED1 = 1). As

shown in Table IV, SECURED1 enters the LLY, BANK, and PRIVY equations positively and significantly at the 0.05 level and enters the PRIVATE equation positively with a *P*-value of 0.05.

I also consider the issue of causality. These OLS regressions show that measures of creditor rights are strongly related with financial intermediary development. These regressions, however, assume that the creditor rights indicators are exogenous. Consequently, I redo all the regressions in Tables II–IV using national legal origins (English, French, German, Scandinavian) as instrumental variables. Thus, ENGLISH equals one if the country has an English legal tradition and zero otherwise. Similarly, FRENCH, GERMAN, and SCANDINAVIAN take on appropriate values of one and zero for each country. The results of these instrumental variable regressions are reported in Tables V–VII. As shown, the instrumental variable results suggest an even stronger relationship between measures of creditor rights and financial development than the simple OLS regressions reported in Tables II–IV. Thus, endogeneity bias does not appear to dominate the strong links between creditor rights and financial development.

3. Contract enforcement and financial intermediary development. The laws and regulations governing secured creditors will affect secured creditors only to the extent that the laws and regulations are enforced. Indeed, comparatively lax creditor rights laws in conjunction with efficient property rights enforcement may promote financial intermediary activities more effectively than strong creditor rights laws with lax enforcement. Consequently, I use a measure of the efficiency of the legal system in enforcing contracts.

TABLE V
Financial Intermediaries and AUTOSTAY: Instrumental Variables

	Dependent variable			
	LLY	BANK	PRIVATE	PRIVY
C	−1.62	−0.88	−1.07	−1.88
	(0.033)	(0.035)	(0.034)	(0.003)
Logarithm of income per capita	0.29	0.22	0.23	0.30
	(0.009)	(0.000)	(0.002)	(0.001)
AUTOSTAY	−0.52	−0.38	−0.42	−0.48
	(0.072)	(0.009)	(0.027)	(0.036)
Observations	44	39	39	44

Note. AUTOSTAY = 1 if the reorganization procedure imposes a stay on firm assets, which prevents secured creditors from gaining immediate possession of their security. AUTOSTAY = 0 otherwise. (Heteroskedasticity-consistent *P*-values in parentheses.) Estimated using two-stage least squares. Instruments: Dummy variables for English, French, and German legal origin. Scandinavian legal origin is the omitted category. LLY = Ratio of liquid liabilities to GDP. BANK = Deposit money bank credit divided by deposit money bank plus central bank credit. PRIVATE = Ratio of claims on the nonfinancial private sector to total domestic credit. PRIVY = Ratio of claims on the nonfinancial private sector to GDP.

TABLE VI
Financial Intermediaries and MANAGES: Instrumental Variables

	Dependent variable			
	LLY	BANK	PRIVATE	PRIVY
C	−1.78	−1.16	−1.31	−1.82
	(0.008)	(0.030)	(0.021)	(0.002)
Logarithm of income per capita	0.30	0.26	0.26	0.28
	(0.001)	(0.000)	(0.002)	(0.000)
MANAGES	−0.44	−0.42	−0.43	−0.30
	(0.020)	(0.017)	(0.017)	(0.045)
Observations	44	39	39	44

Note. MANAGES = 1 if management stays in control of property pending the resolution of the reorganization process. MANAGES = 0 otherwise. (Heteroskedasticity-consistent *P*-values in parentheses.) Estimated using two-stage least squares. Instruments: Dummy variables for English, French, and German legal origin. Scandinavian legal origin is the omitted category. LLY = Ratio of liquid liabilities to GDP. BANK = Deposit money bank credit divided by deposit money bank plus central bank credit. PRIVATE = Ratio of claims on the nonfinancial private sector to total domestic credit. PRIVY = Ratio of claims on the nonfinancial private sector to GDP.

CONRISK is an assessment of the risk that a government will—and 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

TABLE VII
Financial Intermediaries and SECURED 1: Instrumental Variables

	Dependent variable			
	LLY	BANK	PRIVATE	PRIVY
C	−1.21	−0.63	−0.77	−1.59
	(0.020)	(0.069)	(0.029)	(0.001)
Logarithm of income per capita	0.16	0.12	0.12	0.18
	(0.000)	(0.000)	(0.002)	(0.000)
SECURED 1	0.47	0.48	0.48	0.56
	(0.111)	(0.015)	(0.021)	(0.034)
Observations	45	40	40	45

Note. SECURED1 = 1 if secured creditors are ranked first in the distribution of the assets of a bankrupt firm. SECURED1 = 0 otherwise. (Heteroskedasticity-consistent *P*-values in parentheses.) Estimated using two-stage least squares. Instruments: Dummy variables for English, French, and German legal origin. Scandinavian legal origin is the omitted category. LLY = Ratio of liquid liabilities to GDP. BANK = Deposit money bank credit divided by deposit money bank plus central bank credit. PRIVATE = Ratio of claims on the nonfinancial private sector to total domestic credit. PRIVY = Ratio of claims on the nonfinancial private sector to GDP.

TABLE VIII
Financial Intermediaries and CONRISK: 1980s

	Dependent variable			
	LLY	BANK	PRIVATE	PRIVY
C	0.00	0.14	−0.02	−0.47
	(0.993)	(0.482)	(0.933)	(0.025)
Logarithm of income per capita	−0.02	0.02	0.03	0.06
	(0.756)	(0.461)	(0.435)	(0.028)
CONRISK	0.10	0.06	0.05	0.08
	(0.024)	(0.001)	(0.022)	(0.002)
R^2	0.25	0.44	0.33	0.42
Observations	47	42	42	47

Note. CONRISK = assessment of the risk that the government will modify a contract. Scale from 1 to 10; 10 equals least amount of risk. (Heteroskedasticity-consistent *P*-values in parentheses.) LLY = Ratio of liquid liabilities to GDP. BANK = Deposit money bank credit divided by deposit money bank plus central bank credit. PRIVATE = Ratio of claims on the nonfinancial private sector to total domestic credit. PRIVY = Ratio of claims on the nonfinancial private sector to GDP.

financial obligation. This measure was constructed by ICRG and is an average over the period 1982–1995. Legal systems that effectively enforce contracts—including contracts with the government—will support financial intermediary activities. Table I lists, by country and by legal origin, values of CONRISK. The data indicate that countries with a German or Scandinavian legal tradition have particularly strong contract enforcement.[5]

Table VIII presents results regarding the empirical connection between legal system efficiency and the four measures of financial intermediary development. CONRISK is positively associated with all of the financial intermediary development indicators at the 0.05 significance level after controlling for the level of real per capita GDP. The results suggest that legal systems that enforce contracts—including government contracts—efficiently promote financial intermediary development.[6] Again, I consider the issue of causality by re-running the regressions

[5] I also experimented with an additional measure of the efficiency of the legal system in enforcing contracts. 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. As in the case of CONRISK, I found a positive relationship between RULELAW and financial intermediary development.

[6] I also examined an interaction term, CREDITOR ∗ CONRISK, where CREDITOR was set equal to either AUTOSTAY, MANAGES, or SECURED1, to examine whether creditor rights are less important in the presence of an effective contract enforcement system and whether contract enforcement exerts a different impact on financial development depending on the legal treatment of creditors. This interaction term always enters insignificantly.

TABLE IX
Financial Intermediaries and CONRISK: Instrumental Variables

	Dependent variable			
	LLY	BANK	PRIVATE	PRIVY
C	0.33	0.50	0.49	0.36
	(0.562)	(0.102)	(0.194)	(0.489)
Logarithm of income per capita	−0.10	−0.07	−0.09	−0.17
	(0.496)	(0.299)	(0.239)	(0.160)
CONRISK	0.14	0.11	0.12	0.19
	(0.143)	(0.003)	(0.008)	(0.010)
Observations	47	42	42	47

Note. CONRISK = assessment of the risk that the government will modify a contract. Scale from 1 to 10; 10 equals least amount of risk. (Heteroskedasticity-consistent *P*-values in parentheses.) Estimated using two-stage least squares. Instruments: Dummy variables for English, French, and German legal origin. Scandinavian legal origin is the omitted category. LLY = Ratio of liquid liabilities to GDP. BANK = Deposit money bank credit divided by deposit money bank plus central bank credit. PRIVATE = Ratio of claims on the nonfinancial private sector to total domestic credit. PRIVY = Ratio of claims on the nonfinancial private sector to GDP.

presented in Table VIII using instrumental variables. The instruments are dummy variables for legal tradition (English, German, French, and Scandinavian). Table IX presents these results. Except in the case of LLY, the instrumental variable results confirm the finding that the efficiency of contract enforcement positively impacts financial intermediary development.

4. Accounting standards and financial intermediary development. Information about corporations is critical for exerting corporate governance and identifying the best investments. These activities will be facilitated by accounting standards that simplify the interpretability of information and its comparability across corporations. Furthermore, many types of financial contracting use accounting measures to trigger particular actions. Contracts of these types can only be enforced and will only be used if accounting measures are reasonably unambiguous. Accounting standards differ across countries and governments impose an assortment of regulations regarding information disclosure and accounting standards. 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. Given the importance of information in financial contracting, I expect ACCOUNT to be positively correlated with financial

TABLE X
Financial Intermediaries and ACCOUNT: 1980s

	Dependent variable			
	LLY	BANK	PRIVATE	PRIVY
C	−0.92	−0.47	−0.62	−1.27
	(0.088)	(0.032)	(0.025)	(0.006)
Logarithm of income per capita	0.17	0.11	0.10	0.17
	(0.007)	(0.001)	(0.007)	(0.003)
ACCOUNT	−0.0006	0.0057	0.0059	0.0034
	(0.961)	(0.000)	(0.006)	(0.129)
R^2	0.15	0.52	0.44	0.32
Observations	39	35	35	39

Note. ACCOUNT = index of the comprehensiveness of annual reports. Scale 0–90; 90 equals the most comprehensive annual reports. (Heteroskedasticity-consistent P-values in parentheses.) LLY = Ratio of liquid liabilities to GDP. BANK = Deposit money bank credit divided by deposit money bank plus central bank credit. PRIVATE = Ratio of claims on the nonfinancial private sector to total domestic credit. PRIVY = Ratio of claims on the nonfinancial private sector to GDP.

intermediary development.[7] In particular, one might expect that commercial banks will benefit more than central banks from reliable and comparable corporate financial statements in terms of allocating credit, and accurate information on corporations is likely to be more important for the funding of private firms than for public firms. Data on ACCOUNT are provided in Table I. As shown, countries with an English or Scandinavian legal tradition have particularly strong reporting standards for corporate financial statements.

Table X indicates that while ACCOUNT is not significantly correlated with LLY and PRIVY, ACCOUNT is positively and significantly related to BANK and PRIVATE at the 1% level. Countries with better standards of corporate financial reporting tend to have financial systems where the central bank plays a smaller role in allocating credit relative to commercial banks and where more credit flows to the private sector relative to the public sector. These results are confirmed when using the legal origin dummy variables as instruments. Table XI shows that the exogenous component of ACCOUNT—the component associated

[7] 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., an 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. See the review by Levine (1997) and especially 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. To test this potential nonlinearity, I included various combinations of quadratic expressions for ACCOUNT and CONRISK. The quadratic terms never enter significantly.

TABLE XI
Financial Intermediaries and ACCOUNT: Instrumental Variables

	Dependent variable			
	LLY	BANK	PRIVATE	PRIVY
C	−0.88	−0.44	−0.59	−1.27
	(0.118)	(0.024)	(0.022)	(0.008)
Logarithm of income per capita	0.15	0.09	0.09	0.17
	(0.036)	(0.005)	(0.035)	(0.014)
ACCOUNT	0.003	0.008	0.008	0.004
	(0.546)	(0.005)	(0.028)	(0.290)
Observations	39	35	35	39

Note. ACCOUNT = index of the comprehensiveness of annual reports. Scale 0–90; 90 equals the most comprehensive annual reports. (Heteroskedasticity-consistent *P*-values in parentheses.) Estimated using two-stage least squares. Instruments: Dummy variables for English, French, and German legal origin. Scandinavian legal origin is the omitted category. LLY = Ratio of liquid liabilities to GDP. BANK = Deposit money bank credit divided by deposit money bank plus central bank credit. PRIVATE = Ratio of claims on the nonfinancial private sector to total domestic credit. PRIVY = Ratio of claims on the nonfinancial private sector to GDP.

with national legal origin—is positively associated with financial intermediary development.

5. Discussion. The results are consistent with the view that the legal and regulatory environment materially affect financial intermediary development. More specifically, countries with legal and regulatory systems that assign a high priority to creditors receiving the full value of their claims tend to have better developed financial intermediaries. In contrast, countries where the legal environment does not protect potential outsider creditors against the interests of insiders tend to have less developed financial systems. The data also indicate—albeit less robustly—that comprehensive and comparable information on corporations boost financial intermediary development. Furthermore, the three different legal/regulatory indicators—creditor rights, contract enforcement, and accounting information on corporations—provide different information. As summarized in Table XII, although ACCOUNT is highly correlated with CONRISK, the creditor rights indicators (AUTOSTAY, MANAGES, and SECURED1) do not have very high correlation coefficients with CONRISK or ACCOUNT.

Not only is the relationship between financial development and the legal/regulatory environment statistically significant, it is economically large. For example, a one-standard-deviation improvement in CONRISK (1.8) increases financial depth by 0.18, which is 32% of the mean value of LLY. Thus, countries that enforce contracts effectively have better developed financial intermediaries than countries where the government frequently modifies the terms of preexisting contracts.

TABLE XII
Correlations: Legal and Regulatory Indicators

	MANAGES	SECURED1	CONRISK	ACCOUNT
AUTOSTAY	0.48	−0.30	−0.13	−0.09
	(0.00)	(0.03)	(0.62)	(0.56)
MANAGES		−0.13	0.15	0.00
		(0.26)	(0.03)	(0.99)
SECURED1			0.36	0.15
			(0.12)	(0.44)
CONRISK				0.54
				(0.00)

Note. *P*-values are in parentheses. See Tables I–VII for variable definitions. AUTOSTAY = 1 if reorganization imposes a stay on firm assets, and equals 0 otherwise. MANAGES = 1 if management stays in control pending resolution of reorganization process, and = 0 otherwise. SECURED = 1 if secured creditors are ranked first in asset distribution of bankrupt firm, and = 0 otherwise. CONRISK assessment of the risk that government will modify a contract (scale 1–10, 10 = least risk). ACCOUNT = index of the comprehensiveness of corporate annual reports (scale 0–90; 90 equals most comprehensive).

II. CAUSALITY: FINANCIAL INTERMEDIARY DEVELOPMENT AND ECONOMIC GROWTH

This part of the paper uses the legal and regulatory determinants of financial development examined in Part I as instrumental variables for financial development. Thus, the paper examines whether the exogenous component of financial development is positively associated with economic growth. To do this, I extend King and Levine's (1993b) cross-country study to an instrumental variable framework. After briefly describing the methodology, this section summarizes the instrumental variable results.

A. Brief Description of King and Levine Methodology

KL (1993b) assess the strength of the empirical relationship between growth and each of the four indicators of the level of financial intermediary development discussed above. They primarily use data averaged over the 1960–1989 period. Let $F(i)$ represent the value of the ith indicator of financial development (LLY, BANK, PRIVY, PRIVATE) averaged over the period 1960–1989, let G represent real per capita GDP averaged over the period 1960–1989, and let $\mathbf{X}$ represent a matrix of conditioning information to control for other factors associated with economic growth (e.g., income per capita, education, political stability, and indicators of trade, fiscal, and monetary policy). They then run the following four separate regressions on a cross-section of countries:

$$G = \alpha + \beta F(i) + \gamma \mathbf{X} + \varepsilon. \tag{1}$$

There is a strong positive relationship between each of the four financial development indicators, $F(i)$, and growth. Not only are *all* the financial development coefficients statistically significant, but the sizes of the coefficients imply an economically important relationship. Ignoring causality for the moment, their estimated coefficient of 0.024 on LLY implies that a country that increased LLY from the mean of the lowest LLY quartile of countries (0.16) to the mean of the highest LLY quartile of countries (0.70) would have increased its per capita growth rate by almost 1.3% points per year. This is large. The difference between the slowest growing 25% of countries and the fastest growing quartile of countries is about five percent per annum over this 30-year period. Thus, the rise in LLY alone eliminates 25% of this growth difference.

B. Extension to an Instrumental Variable Framework

Given this basic framework, the paper uses the legal and regulatory determinants of financial development examined in the previous section as instrumental variables for financial development, $F(i)$. That is, a vector of instrumental variables $Z(i)$ is selected for each regression equation specified by Eq. (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 an instrumental variable estimator of the coefficients in Eq. (1). After computing these GMM estimates, I use a 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 financial intermediary development. For completeness, all of the equations were also estimated using two-stage least squares. This alternative estimator does not change either the statistical inferences or the coefficient sizes from those reported below.

For instrumental variables, I use the creditor rights indicators (AUTOSTAY, MANAGES, SECURED1) and CONRISK as instrumental variables for all of the financial intermediary development indicators. Furthermore, ACCOUNT is included as an instrument for the BANK, PRIVATE, and PRIVY regressions. I exclude ACCOUNT from the LLY regressions because (i) it is noticeably uncorrelated with LLY (Tables X and XI) and (ii) inclusion of ACCOUNT lowers the number of country observations markedly. Note, however, that including ACCOUNT as an instrument in the LLY regressions does not alter the conclusions discussed below.[8]

I also consider an assortment of conditioning information, **X**. 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) or that I select a particular set of explanatory

[8] Also, if I use RULELAW instead of CONRISK to measure cross-country differences in legal system efficiency in enforcing contracts, the results reported below are unchanged.

variables that produces attractive results. Given that the maximum sample size is only 45 countries (with the legal/regulatory variables), there are limits on the number of variables that can be included in **X** in any one regression. Consequently, the analysis includes two different conditioning information sets in all of its analyses.

The simple conditioning information set includes a constant, the logarithm of initial per capita GDP, initial secondary school enrollment, and the degree of ethnic diversity, which equals the probability that two randomly selected individuals in a country belong to different ethnolinguistic groups. 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 include the ethnic diversity index because Easterly and Levine (1997) show that countries with ethnically diverse populations tend to select public policies that slow growth. The ethnic diversity measure was computed in the early 1960s and varies extraordinarily little through time.

The full conditioning information set includes the simple conditioning information set plus the ratio of government consumption to GDP, the inflation rate, and the ratio of exports plus imports to GDP. All of these variables are averaged over the estimation period. The trade ratio is frequently used as an overall index of trade distortions (King and Levine 1993a,b). The inflation rate and size of the government serve as indicators of macroeconomic stability (Easterly and Rebelo 1993; Fischer 1993). Thus, the full conditioning information set is designed to control for policy distortions in studying the relationship between financial intermediary development and economic growth. I treat the **X** matrix as exogenous because I am focusing on examining the question of whether the exogenous component of financial intermediary development as defined by the legal and regulatory environment is positively associated with economic growth.[9]

C. Instrumental Variable Results over the 1980s

Since the legal and regulatory variables are measured over the 1980s, I first conduct the analysis using data over the period 1980–1989. As shown in Table XIII, the results are very strong. In seven of eight regressions, financial intermediary development enters the growth regression significantly at the 0.05 level and it enters the eighth regression significantly at the 0.11 level. A test of the orthogonality restrictions suggests that the instrumental variables are appropriate. The data do not reject the null hypothesis of the overidentifying restrictions even at the 0.25 significance level. Thus, the data are consistent with the view that improvements in creditor rights, contract enforcement, and the information content of corporate

[9] As a sensitivity check, I used the initial values (the predetermined values instead of the average values over the period) of the **X** matrix variables. This did not alter the results.

TABLE XIII
Finance and Growth, Instrumental Variables: 1980s (Dependent Variable: Real per Capita GDP Growth, 1980–1989)

Explanatory variable	Coefficient	Standard error	*t*-statistic	*P*-value	Number of observations	*J*-statistic	LM-test OIR
Regression #1: simple conditioning information set							
LLY	0.087	0.027	3.286	0.002	41	0.06	2.30
BANK	0.147	0.030	4.888	0.000	31	0.04	1.35
PRIVATE	0.137	0.018	7.565	0.000	31	0.07	2.30
PRIVY	0.134	0.026	5.195	0.000	35	0.11	3.75
Regression #2: full conditioning information set							
LLY	0.074	0.045	1.652	0.108	40	0.09	3.60
BANK	0.175	0.034	5.170	0.000	31	0.04	1.27
PRIVATE	0.138	0.023	6.044	0.000	31	0.06	1.75
PRIVY	0.085	0.032	2.703	0.012	34	0.12	4.13

Note. Critical values for LM-Test *O*ver *I*dentifying *R*estrictions (4 d.f.): 25% = 5.39; 10% = 7.78; 5% = 9.49. Simple conditioning information set: logarithm of initial income per capita and schooling, plus measure of ethnic diversity. Full conditioning information set: simple set, plus govenment size, inflation, and the ratio of exports plus imports to GDP. LLY = Ratio of liquid liabilities to GDP. BANK = Deposit money bank credit divided by deposit money bank plus central bank credit. PRIVATE = Ratio of claims on the nonfinancial private sector to total domestic credit. PRIVY = Ratio of claims on the nonfinancial private sector to GDP. Instruments: AUTOSTAY (= 1, if reorganization procedure imposes a stay on firms assets); MANAGES (= 1, if management stays in control pending resolution of reorganization process); SECURED1 (= 1, if secured creditors are ranked first in asset distribution); CONRISK (= assessment of the risk that government will modify a contract); ACCOUNT (= index of the comprehensiveness of coporate reports). ACCOUNT is excluded from LLY regressions.

financial statements induce improvements in the functioning of financial intermediaries that accelerate economic growth. The strong positive relationship between measures of financial intermediary development and growth does not appear to be due to simultaneity bias.[10]

Furthermore, this relationship is economically large.Rough estimates of the influence of an exogenous improvement in financial development on economic growth can be obtained from the above tables.[11] Consider, for example, a country that changes its laws such that now secured creditors are ranked first in the

[10] Note that when these regressions are run using a two-stage least-squares framework, the *F* statistic in the first stage always rejects the null hypothesis at the 0.01 significance level that none of the cross-sectional variation in financial intermediary development is explained by the exogenous variables.

[11] These approximations are not completely correct for two reasons. First, the growth equations are estimated using GMM. However, I use the approximate first-stage linear results to conduct the conceptual experiments. This is immaterial because the two-stage least-squares results are virtually identical to the GMM estimates. Second, I use results from Tables I–VII to conduct the conceptual experiments. However, the "real" first-stage regressions include all of the **X** variables. This is also immaterial, because the size of the relevant coefficient in the conceptual experiments is not altered much by the inclusion of the other instruments.

distribution of the assets of a bankrupt firm. The estimated coefficient from Table IV suggests that this would increase financial depth, LLY, by a value of 0.22. From Table XIII, we see that this would in turn accelerate economic growth by almost two percentage points per year. This is large considering that the standard deviation of cross-country growth rates is 1.8%. Also, consider an improvement in contract enforcement. From Table VIII and as discussed above, a one-standard-deviation improvement in contract enforcement (CONRISK) causes LLY to rise by 0.18. From Table XIII, we see that this would in turn accelerate economic growth by about 1.6 percentage points per year. Thus, a one-standard-deviation improvement in CONRISK induces a 0.8-standard-deviation acceleration in economic growth. These conceptual experiments must be viewed cautiously, however. The analysis does not examine one piece of machinery through time; therefore, it is inappropriate to view the coefficients as exploitable elasticities. Given this caveat, however, the magnitudes of the coefficients imply an economically large relationship between financial development and economic growth. Legal and regulatory features that hinder financial development may materially affect long-run growth rates.

D. Instrumental Variable Results over the 1960–1989 Period

Next, consider the same analysis over the 1960–1989 period, as summarized in Table XIV. Thus, real per capita GDP growth and the financial indicators are averaged over the period 1960–1989. I do this for two reasons. First, this paper is evaluating theories concerning long-run economic growth that abstract from business cycles fluctuations. Thus, it is important to use data encompassing as long a period as possible. Even though the legal variables are measured over the 1980s, this should not cause severe problems since the legal and regulatory indicators do not vary much through time (LLSV 1997, 1998). Second, conducting the analysis over a long horizon serves as a robustness check to ensure that the results are not peculiar to the 1980s.

The results over the 1960–1989 period confirm the earlier findings. The data indicate a strong link between the exogenous component of financial development and economic growth. The coefficient on financial intermediary development is significant at the 5% level in all eight regressions; however, the data reject the orthogonality conditions in the PRIVY regressions at the 25% significance level. For the other regressions, the data do not reject the null hypothesis that the instrumental variables are uncorrelated with the error term at the 25% level.

E. Alternative Instrumental Variable Results (Origin)

One may continue to be skeptical about the exogeneity of the instrumental variables. It is worth emphasizing, however, that the creditor rights variables are not general indices of the efficiency of the legal system. They measure the specific legal rights of secured creditors. As shown above, these creditor rights variables strongly

TABLE XIV
Finance and Growth, Instrumental Variables: 1960–1989 (Dependent Variable: Real per Capita GDP Growth, 1960–1989)

Explanatory variable	Coefficient	Standard error	*t*-statistic	*P*-value	Number of observations	*J*-statistic	LM-test OIR
Regression #1: simple conditioning information set							
LLY	0.068	0.016	4.273	0.000	42	0.04	1.50
BANK	0.103	0.018	5.626	0.000	33	0.17	5.69
PRIVATE	0.104	0.016	6.641	0.000	32	0.05	1.65
PRIVY	0.080	0.022	3.695	0.001	37	0.19	7.17
Regression #2: full conditioning information set							
LLY	0.037	0.017	2.221	0.033	41	0.09	3.74
BANK	0.069	0.018	3.916	0.001	33	0.13	4.33
PRIVATE	0.093	0.023	4.020	0.001	32	0.04	1.21
PRIVY	0.043	0.017	2.542	0.017	36	0.19	6.78

Note. Critical values for LM-Test *O*ver *I*dentifying *R*estrictions (4 d.f.): 25% = 5.39; 10% =7.78; 5% = 9.49. Simple conditioning information set: logarithm of initial income per capita and schooling, plus measure of ethnic diversity. Full conditioning information set: simple set, plus government size, inflation, and the ratio of exports plus imports to GDP. LLY = Ratio of liquid liabilities to GDP. BANK = Deposit money bank credit divided by deposit money bank plus central bank credit. PRIVATE = Ratio of claims on the nonfinancial private sector to total domestic credit. PRIVY = Ratio of claims on the nonfinancial private sector to GDP. Instruments: AUTOSTAY (= 1, if reorganization procedure imposes a stay on firms assets); MANAGES (= 1, if management stays in control pending resolution of reorganization process); SECURED1 (= 1, if secured creditors are ranked first in asset distribution); CONRISK (= assessment of the risk that government will modify a contract); ACCOUNT (= index of the comprehensiveness of corporate reports). ACCOUNT is excluded from LLY regressions.

influence financial intermediary development. But, other legal code variables, such as laws governing minority shareholder rights, do not strongly influence financial intermediary development. Thus, the instrumental variables measure particular characteristics of the legal system that influence financial intermediary development. Nevertheless, the exogeneity of the general indices of contract enforcement or accounting standards may be subject to greater doubt since they are subjective evaluations.

Thus, I evaluate the sensitivity of the results to alterations in the instrument set. Specifically, I use only the legal origin dummy variables as instruments. The results are reported in Table XV. All of the financial intermediary development indicators, except for the pure size measure (LLY), are significantly correlated with long-run growth even after controlling for many other factors associated with long-run growth. The exogenous component of financial intermediary development is positively and robustly linked with long-run growth. Put differently, simultaneity bias does not appear to be the reason for the strong, positive link between finance and growth. Moreover, when the financial indicators enter the growth regressions significantly, they do not reject the test of overidentifying restrictions at the 25% level.

TABLE XV
Finance and Growth, Instrumental Variables (Origin): 1960–1989 (Dependent Variable: Real per Capita GDP Growth, 1960–1989)

Explanatory variable	Coefficient	Standard error	*t*-statistic	*P*-value	Number of observations	*J*-statistic	LM-test OIR
Regression #1: simple conditioning information set							
LLY	0.003	0.013	0.241	0.811	45	0.11	4.74
BANK	0.084	0.029	2.925	0.006	41	0.02	0.64
PRIVATE	0.084	0.020	4.279	0.000	39	0.01	0.32
PRIVY	0.031	0.015	2.109	0.041	45	0.03	1.52
Regression #2: full conditioning information set							
LLY	0.004	0.010	0.385	0.702	44	0.09	3.80
BANK	0.083	0.032	2.572	0.015	40	0.01	0.39
PRIVATE	0.082	0.024	3.359	0.002	39	0.01	0.39
PRIVY	0.030	0.014	2.199	0.034	44	0.02	0.68

Note. Critical values for LM-Test *O*ver *I*dentifying *R*estrictions (2 d.f.): 25% = 2.77; 10% = 4.61; 5% = 5.99. Simple conditioning information set: logarithm of initial income per capita and schooling, plus measure of ethnic diversity. Full conditioning information set: simple set, plus government size, inflation, and the ratio of exports plus imports to GDP. LLY = Ratio of liquid liabilities to GDP. BANK = Deposit money bank credit divided by deposit money bank plus central bank credit. PRIVATE = Ratio of claims on the nonfinancial private sector to total domestic credit. PRIVY = Ratio of claims on the nonfinancial private sector to GDP. Instruments: Dummy variables for English, French, and German legal origin. Scandinavian legal origin is the omitted category.

III. SENSITIVITY ANALYSES AND DISCUSSION

A. Sensitivity Results

One risk with pure cross-country analyses concerns country-fixed effects.[12] That is, the regression may omit an important explanatory variable that is really driving the results and that is highly correlated with the financial intermediary development indicators. Thus, besides the **X** variables discussed above, I experimented with a wide array of additional explanatory variables that other researchers have identified as importantly related to long-run growth. Specifically, I included the following eight variables to test the robustness of the results to changes in the conditioning information set. First, the black market exchange rate premium is a general index of price, trade, and exchange rate distortions (Dollar 1992). Second, the number of assassinations per capita is one general index of political instability (Banks 1994). Third, the number of revolutions and coups is another commonly used indicator of political instability and is frequently found to be negatively associated with economic growth (Banks 1994). Fourth, Barro (1997) constructs a general index of political rights. Fifth, the degree of civil liberties is one frequently used measure of political freedom (Gastil 1990). Sixth, the degree to which the regulatory environment

[12] Levine *et al.* (1998) and Beck *et al.* (1999) use dynamic-panel procedures that control for endogeneity and that virtually eliminate the potential inconsistency arising from country-specific effects.

obstructs commerce is a general indicator of bureaucratic efficiency (Mauro 1995). Finally, I consider a measure of corruption, which many argue influences economic development (Mauro 1995; Shleifer and Vishny 1993). Each of these variables is used to examine the robustness of this paper's results by controlling for bad government, bad institutions, bad policies, and political instability.[13] Including these additional explanatory variables does not alter this paper's finding that the exogenous component of financial intermediary development—that part of financial development defined by each country's legal and regulatory environment—is strongly positively correlated with economic growth.

B. Perspectives and Interpretation

In many respects, my results can be viewed as a merger of KL (1993b) with LLSV (1998). I combine King and Levine's (1993b) data on financial intermediary development with the LLSV (1998) data on legal and regulatory indicators. I then (1) examine the legal and regulatory determinants of financial intermediary development and (2) test whether the exogenous component of financial intermediary development as defined by the legal and regulatory environment is positively associated with economic growth. The paper can also be viewed as an extension of LLSV (1997) along two dimensions. First, LLSV (1997) examine the legal determinants of equity and bond markets. I examine the legal determinants of financial intermediaries. Second, I then trace the affect of differences in the legal environment on the financial system through to differences in long-run economic growth rates.

My results are consistent with the arguments made by Bagehot (1873) and Hicks (1969): exogenous improvements in financial intermediary development cause an acceleration in long-run growth rates. The results are also consistent with arguments made by Patrick (1966), Greenwood and Jovanovic (1990), and Greenwood and Smith (1997): the direction of causality runs in *both* directions. Namely, the results do not show that growth does not cause finance. Rather, they show that the strong positive association between financial intermediary development and long-run economic growth is not due only to simultaneity bias.

IV. CONCLUSIONS

This paper focuses on identifying a connection between the legal and regulatory environment and financial development, and then tracing this link through to long-run economic growth. First, I show that the legal and regulatory environment matters for financial development. Specifically, my findings are consistent with Shleifer and Vishny's (1997) argument that cross-country differences in legal systems affect the relationship between entrepreneurs and creditors. Countries with

[13] See Knack and Keefer (1995) for a comprehensive and careful examination of the relationship between economic growth and array of institutional and political indicators.

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 much weaker support to creditors. Moreover, contract enforcement matters as much as the formal legal and regulatory codes. Countries that impose compliance with laws efficiently and enforce contracts—including government contracts—effectively tend to have much 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.

Second, the paper uses the legal and regulatory indicators of creditor rights, contract enforcement, and information disclosure as instrumental variables for financial development. The data indicate that the exogenous component of financial intermediary development—the component defined by the legal and regulatory environment—is positively associated with economic growth. The results are consistent with the view that legal and regulatory changes that boost financial intermediary development will induce a rapid acceleration in long-run economic growth.

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