



Munich Personal RePEc Archive

## **Legal origin, creditor protection and bank lending around the world**

Cole, Rebel and Turk, Rima

DePaul University, Lebanese American University

30 May 2007

Online at <https://mpra.ub.uni-muenchen.de/29180/>  
MPRA Paper No. 29180, posted 11 Mar 2011 19:57 UTC

# Legal Origin, Creditor Protection and Bank Lending Around the World

Rebel A. Cole

Departments of Finance and Real Estate

DePaul University

Chicago, IL 60604

[rcole@depaul.edu](mailto:rcole@depaul.edu)

1-312-362-6887

Rima Turk-Ariss

Department of Economics & Finance

Lebanese American University

Beirut, Lebanon

[rima.turk@lau.edu.lb](mailto:rima.turk@lau.edu.lb)

## Abstract:

In this study, we test whether bankers make more loans when they enjoy superior creditor protection. We test these hypotheses using bank-level data from 35 developed countries and 113 developing countries over the period 2000-2006 and using a random-effects model that controls for bank heterogeneity. We find that bankers allocate a significantly larger portion of their assets to risky loans: (i) when they enjoy English common-law legal origin rather than French civil-law legal origin; (ii) when creditors' rights are weaker; (iii) when their banks are larger; and (iv) when the largest shareholder has a lower percentage ownership. We also find that bankers in developing countries, but not in developed countries, allocate a significantly larger portion of their assets to risky loans when legal enforcement of creditor rights is more efficient. Overall, these results provide strong support for the theory of legal origin but provide only mixed support for the "power" theories of credit.

**Keywords:** banking, bank loans, bank risk-taking, creditor protection, creditors' rights, emerging markets, investor protection, judicial enforcement, law and finance, legal origin, legal rights

**JEL Classifications:** G21, G34

We are grateful for helpful comments from Allen Berger, Robert DeYoung, Gerald Dwyer, Robert Eisenbeis, Mark Flannery, Iftekhar Hasan, Joel Houston, George Kaufman, Paul Kupiec, Fariborz Moshirian, Maria Nieto, Haluk Unal, Neeltje Van Horen, Larry Wall, and participants at the Conference on Financial Instability held in June 7 – 8, 2007 in Helsinki, Finland, especially our discussant Kose John, at a research seminar held at the FDIC August 6, 2008 in Washington, DC, and at the Annual Meeting of the Financial Management Association held on October 8 – 11, 2008 in Grapevine, TX, especially our discussant Robert Nash.

## **Legal Origin, Creditor Protection and Bank Lending Around the World**

### **1. Introduction**

During the past decade, financial researchers have established that legal origin and investor protection are important determinants of financial development. The “law-and-finance” literature, which grew out of the seminal works of La Porta, Lopez-de-Silanes, Shleifer and Vishny, hereafter “LLSV” (1997, 1998), has demonstrated that differences in the legal protection of investors explain much of the cross-country variation in financial-sector development and that legal origin explains much of the cross-country variation in legal protection of investors.<sup>1</sup> The “finance and growth” literature, which is most closely associated with King and Levine (1993), Levine and Zervos (1998) and Rajan and Zingales (1995, 1998), has established that financial sector development is positively related to economic growth. Together, these two literatures tie legal protection to economic development through financial sector development.

Most studies in these two areas have analyzed country-level data, usually focusing on how investor protection affects the amount of private-sector credit, which King and Levine (1993) and many other studies have linked to future economic growth. One question left unanswered by this literature is how individual lenders respond to differences in governance regimes. More specifically, do bankers take on more risk by making more loans when they enjoy stronger creditor protection? This question is especially important to emerging market economies, where bond markets are often non-existent and bank debt is the primary source of business and consumer credit.

---

<sup>1</sup> See LLSV (1997, 1998 and 2002); Levine (1999), Demirguc-Kunt and Maksimovic (1998); Djankov, La Porta, Lopez-de-Silanes and Shleifer (2003); Qian and Strahan (2006); Djankov, McLiesh and Shleifer (2007); John, Litov and Yeung (2008); Acharya, Amihud and Litov (2010); and Houston *et al.* (2010).

Our study is an empirical test of the “power” theory of credit, which posits that lenders will grant more credit when they can more easily force repayment by borrowers. This theory is generally attributed to Townsend (1979), Aghion and Bolton (1992), and Hart and Moore (1994, 1998). We test whether bankers make more loans when they are better protected by strong creditor rights and by efficient judicial enforcement. Djankov, McLiesh and Shleifer, hereafter DMS, (2007) analyze this issue at the country level, looking at the volume of private sector credit.

In this article, we extend “the law-and-finance” literature by using firm-level data from banks in 113 developing and 35 developed countries to analyze how individual lenders respond to country-level differences in legal origin and creditor protection. Following LLSV (1998) and DMS (2007), we distinguish between creditors’ rights and efficiency of enforcement. Our analysis rests on a panel data set of 2,677 commercial banks from 148 countries over the period 2000-2006.<sup>2</sup> We are especially interested in our results for developing countries for at least three reasons: first, there is wide variation in legal origin across these countries; second, banks are the primary source of credit in most of these countries; and third, banking in these parts of the world has received scant attention in the academic literature.

Using a random-effects model that controls for bank heterogeneity, we find that lenders allocate a significantly higher portion of their assets to loans: (i) when they enjoy English common-law legal origin rather than French civil-law legal origin; (ii) when creditors’ rights are weaker; (iii) when their banks are larger; and (iv) when the largest shareholder has a lower percentage ownership. We also find that bankers in developing countries, but not in developed countries, allocate a significantly larger portion of their assets to risky loans when legal

---

<sup>2</sup> We stop our analysis period at the year 2006 in order to avoid contamination from the effects of the financial crisis, which began in 2007.

enforcement of creditor rights is more efficient. Overall, these results provide strong support for the theory of legal origin but provide mixed support for the “power” theory of credit. Our finding that banks make fewer loans when creditors’ rights are stronger is supportive of a “dark side” to creditors’ rights, as proposed by Acharya, Amihud and Litov (2010), but contradicts the results reported by Houston *et al.* (2010), who find that stronger creditor rights are associated with greater bank risk-taking. Our opposing findings regarding the effects of creditors’ rights and the effects of judicial enforcement also highlight the importance of distinguishing between strong legal rights and efficient judicial enforcement of those rights, as pointed out by LLSV (1998).

Our primary contribution to the literature is new evidence from bank-level data of a bank-lending channel by which better legal protection, especially in developing countries, leads to more credit and, consequently, to better financial-sector development. With better judicial enforcement, bankers increase the portion of their asset portfolios allocated to loans. In aggregate, this should lead to higher levels of private sector credit, which the “finance and growth” literature has shown to be positively related to economic growth.

We also contribute to the growing literature on the relation between investor protection and corporate risk-taking (John, Litov and Yeung (2008); Laeven and Levine (2008); Acharya, Amihud and Litov (2010); and Houston *et al.* (2010)). Here, we provide new firm-level evidence that banking firms take on more risk when their interests are better protected by the judiciary.

The rest of the paper is organized as follows. Section 2 provides a brief review of the most relevant literature. In Section 3, we develop our hypotheses regarding creditor protection and bank lending. In Section 4, we discuss our data and methodology. Section 5 presents our results, followed, in Section 6, by a summary and conclusions.

## **2. A brief review of the relevant literature**

The “law and finance” literature essentially begins with LLSV (1997, 1998), who argue and provide empirical evidence at the country level that the most important determinant of capital markets development is the degree of legal protection provided to investors. Corporate finance flourishes in countries with legal systems that better protect investors’ rights and support contract enforcement. In addition, the authors find that a country’s “legal origin” is a fundamental determinant of investor protection. “Legal origin” refers to the legal family from which a country’s legal system evolved.

In their 1998 article, LLSV distinguish among two broad legal traditions: English common law and Roman civil law. Within the broad civil law tradition, they distinguish three families—French, German and Scandinavian. LLSV find that countries with English common law tradition enjoy the best investor protection while countries with French civil law tradition suffer the worst investor protection. They attribute these findings to differences in the legal protection from institutions left behind by the colonial powers. Also in this article, LLSV develop an index of creditor rights, which they show is higher in common law countries than in civil law countries.

In a 1999 follow-up article, LLSV expand the four families to five—with the addition of the Socialist civil law tradition, which enables them to better categorize eastern European countries that emerged following the breakup of the Soviet Union. They find that countries with Socialist civil law tradition suffer from poor legal protection similar to countries with French civil law tradition.

Beck, Demirguc-Kunt and Levine (2003) analyze a sample of 70 countries for evidence regarding how well legal origins can explain financial development. Among other findings, but

most relevant to this study, they find that credit from financial intermediaries to the private sector as a share of GDP is higher in countries of British legal origin.

Djankov, La Porta, Lopez-de-Silanes and Shleifer (2003) construct two indices of procedural formalism in the legal resolution of disputes—how many days it takes to collect a bounced check and how many days it takes to evict a tenant for nonpayment of rent. They find considerable variation in these measures and that procedural formalism is greater in civil-law countries than common law countries and in poor countries than in rich countries.

DMS (2007) extend previous work on legal protection of creditors to a panel analysis of 129 countries over 25 years. They find that the creditors' rights index developed by LLSV (1998) is associated with higher levels of private sector credit, but that this relationship does not hold in poorer countries. They also find that procedural formalism is associated with lower levels of private sector credit but, again, this relationship does not hold in poorer countries.

Qian and Strahan (2007) examine data on individual bank loans for evidence on how differences in legal systems affect the terms of bank loans. Like DMS (2007), they focus on the LLSV (1998) index of creditor rights rather than legal origin, and find that stronger creditor rights are associated with lower interest rates and longer maturities. However, they also report that loans in countries of English legal origin carry higher rates, and that higher rates are associated with greater financial development, which they attribute to higher loan demand for loans in more developed economies.

John, Litov and Yeung (2008) examine the relationship between investor protection and the choice of risk in corporate investment decisions. They argue that, when investors are better protected, the value of private benefits to insiders is lower, leading them to take on more risky positive net present value projects. Using data both from an international panel of 39 countries,

they find that a positive relationship between investor protection and both firm-level riskiness and firm growth rates. However, the authors also make the case for a negative relationship between investor protection and risk-taking. In an environment where creditors' rights are strong, there is less fear of expropriation by managers, thus reducing the likelihood of a dominant shareholder. The resulting reduction in ownership concentration may lead to greater managerial discretion in implementing conservative investment strategies to protect their own private benefits.

Laeven and Levine (2008) investigate how corporate governance influences bank risk-taking at a sample of 288 large, publicly traded banks in 48 countries. They use the Z-score, defined as the sum of return on assets and equity to assets divided by the standard deviation of return on assets, as an inverse measure of risk, but also analyze the volatility of accounting earnings and stock market returns. Their primary finding is that the bank risk-taking increases with the ownership of the bank's largest block holder. They also find that two pillars of banking supervision—capital requirements and official supervisory oversight of banks—do not appear to reduce bank risk-taking, calling into question much of the bank regulatory framework used by supervisors around the world.

Acharya, Amihud and Litov (2010) propose a “dark side” to strong creditors' rights, whereby these rights lead managers to reduce corporate risk-taking. Managers do so to avoid inefficient liquidation of assets and to preserve their private benefits of control. The authors provide empirical evidence supportive of their hypothesis in that firms in countries with strong creditors' rights engage in diversifying mergers and choose operating policies that reduce the standard deviation of return on assets. Further, the authors find that these results are strongest in countries where there is no automatic stay on debtor's assets in bankruptcy, and where



management does not stay in bankruptcy (two of the four component rights that comprise the LLSV creditors' rights index).

Houston *et al.* (2010) examine the relation between creditor rights as defined by the LLSV (1998) index and bank risk-taking as measured by the Z-score, which is also used by Laeven and Levine (2008). They find that banks in countries with stronger creditor rights take on more risk, and that countries with stronger creditors rights are more prone to financial crises, but also enjoy higher growth.

The literature on “finance and economic growth” examines how economic growth is related to financial development. There now exists a wide empirical strand of the literature establishing a positive relationship between financial sector development and economic growth, although the direction of causality remains an issue of debate.

Levine and Zervos (1998) document that stock-market liquidity and banking development are both positively and robustly correlated with future economic growth, capital accumulation and productivity growth.

Rajan and Zingales (1998) examine the channels through which financial development promotes growth. They find that industrial sectors more dependent upon external finance develop disproportionately faster in countries with more developed financial markets. Hence, banks promote economic growth by reducing the cost of external finance of firms.

Beck, Levine and Loayza (2000) find that financial development boosts economic growth primarily by improving resource allocation and accelerating total factor productivity growth.

This positive effect of financial development on growth is found to be robust to different econometric methods, from the cross-country regressions, cross-country instrumental variable

studies and time-series analyses to the dynamic panel GMM estimations. Levine (2004) provides an excellent review on the research in this area.

Demirguc-Kunt and Maksimovic (1998, 2002) and Levine (1999) tie these two strands of the literature together. Demirguc-Kunt and Maksimovic (1998) use firm level data to investigate how differences in legal systems affect use of external financing. They find that a greater portion of firms in countries with more efficient legal systems use external financing to fund growth.

Levine (1999) uses country-level data to examine how legal environment affects financial development and subsequent long-run economic growth. He finds that financial intermediaries are better developed in countries with better legal protection and that the portion of financial intermediary development explained by the legal environment is positively related to economic growth.

Demirguc-Kunt and Maksimovic (2002) use firm-level data from 40 countries to analyze how a country's legal and financial systems affect a firm's ability to access external finance to fund growth opportunities. They find that the access to external finance is primarily a function of the efficiency of a country's legal system.

### **3. Creditor Protection and Bank Lending: Hypotheses**

In this section, we separate creditor protection into two components—rights and enforcement—and we set forth our hypotheses regarding how creditor protection influences bank lending.

#### *3.1 Creditor Protection Variables*

Creditor protection encompasses both the legal rights of creditors and the ability of creditors to enforce those rights through the judiciary. Hence, we decompose creditor protection

into two measurable components: creditors' rights and judicial enforcement. We measure creditors' rights (*Creditors' Rights*) using the index developed by LLSV (1998), and we also consider its four components (*CRI* through *CR4*), which we enumerate below. We measure judicial enforcement using the index of legal formalism developed by DMS (2007), where *Legal Formalism* is a country-level estimate of the number of days necessary to collect an unpaid debt equal to 50% of the country's GDP per capita.

### *3.2 Hypotheses Regarding Legal Origin, Creditor Protection and Bank Lending*

Our primary hypotheses focus on how legal origin and creditor protection affect bank lending. Consistent with the "law-and-finance" literature and the "power" theory of credit, we hypothesize that the loan-to-asset ratio of a bank is a function of its country's legal tradition and how well that country's legal and judicial systems protect creditors. We expect credit from financial intermediaries as a share of assets to be higher in countries of English common law legal origin and lower in countries of French civil law legal origin. Also, better creditor protection in the form of stronger legal rights or more efficient judicial enforcement has the effect of reducing the expected loss rate on the bad-loan portfolio, which should lead to a higher loan-to-asset ratio.

We hypothesize that a bank adjusts its overall risk exposure to account for cross-country differences in creditor protection by changing the size of its total loan portfolio, which changes the size of the expected bad loan portfolio. In other words, when better creditor protection exists, the bank expects a lower loss rate on bad assets so it is willing to increase the amount it lends. Therefore, we expect that the loan-to-asset ratio is a positive function of the creditors' rights index and the dummy variable indicating English legal origin (or, alternatively, a negative function of dummy variables for French, German, Scandinavian and Socialist legal origin, as

English legal origin is our omitted category), but also a negative function of the legal formalism index.

Acharya, Amihud and Litov (2010) offer an alternative hypothesis, which they refer to as the “dark side” of creditors’ rights. They focus on the incentives of the borrower rather than those of the lender. When creditors have stronger rights, the management and controlling shareholder of a debtor firm have incentives to reduce operating risk so that they reduce the probability that they will lose their private benefits of control. If this hypothesis is true, then stronger creditors’ rights should lead firms to borrow less, so that the lenders’ loan-to-asset ratios would be inversely related to creditors’ rights.

### *3.3 Other Hypotheses*

We posit six secondary hypotheses that may impact the risk-taking behavior of banks. First, we expect that banks with less diversified controlling shareholders will take on less risk so that the ownership of the largest shareholder should be inversely related to bank risk. In contrast, dominant shareholders controlling a pyramid of firms may be able to instruct lower-layer units to take on more risk in a tunneling process (John, Litov and Yeung (2008)).

Second, in countries where the size of the government is large relative to the economy, the presence of government-related officials is likely to be widespread in different economic activities. We expect that banks in countries with larger government sectors will have higher ratios of loans to assets as bureaucrats direct policy loans to State-owned enterprises. Our measure of government size is the ratio of private credit to total domestic credit and we expect this ratio to be negatively related to the loan-to-asset ratio.

Third, large banks that have access to large pools of deposits and money market funding are able to make more loans as compared to their smaller competitors. In addition, large banks

are likely to be more diversified than small banks. For both reasons, we expect bank risk to increase with bank size so that the loan-to-asset ratio will be positively related to bank size, which we measure by the natural logarithm of bank assets.

Fourth, government-owned or controlled banks may play a key role in shaping the risk profile of domestic institutions. When the State is the controlling shareholder in a bank, credit is often directed toward select key industries without major regard to profitability (LLSV 2002). Consequently, we expect that State-controlled banks will have higher loan-to-asset ratios as the State has incentive to direct assets towards policy loans.

Fifth, foreign-controlled banks often operate to collect funds for the home office and to serve multinational customers who operate in a country. Consequently, we expect foreign-controlled banks to have lower loan-to-asset ratios.

Finally, banks that operate in countries with higher income per capita face stronger loan demand from borrowers. Therefore, we expected a positive relation between our measure of economic development (the natural logarithm of GDP per capita) and the loan-to-asset ratio.

## **4. Data and Methodology**

### *4.1 Data*

We retrieve bank-level financial data for the years 2000-2006 from the BankScope database provided by Fitch-IBCA (International Bank Credit Analysis Ltd). Our sample includes 12,889 bank-year observations on 2,677 banks located in 148 countries, including 5,488 bank-year observations on 1,147 banks in 35 developed countries and 7,411 bank-year observations on 1,530 banks in 113 developing countries.

We collect information on total assets and total loans from the banks' annual balance sheets. We use these financial data to create the ratio of total loans to total assets (*Loans to Assets*). We also create a measure of bank size as measured by  $\ln(\text{Assets})$ —the natural logarithm of total assets.

We also retrieve data on bank ownership from BankScope. We use this to construct ownership variables for the bank's controlling shareholder, including *Percentage Ownership*; a dummy variable *Largest Shareholder is Foreign*, which is equal to one if the bank's largest block holder owns at least ten percent of the bank's shares and is identified as residing in a country other than the one in which the bank is located; and a dummy variable *Largest Shareholder is the State*, which is equal to one if the bank's largest block holder is the government in which the bank is located and owns at least ten percent of the bank's shares.

We retrieve country-level "macro" data from the International Financial Statistics. These include GDP per capita, which we transform by taking its natural logarithm into ( $\ln(\text{GDP per Capita})$ ), and the ratio of private sector credit to total domestic credit. We include the latter two variables to control for the effects of economic development and policy loans, respectively, on bank lending.

Finally, we collect information on legal origin, creditors' rights, and legal formalism (efficiency of enforcement) from Professor Andrei Shleifer's Harvard web pages.<sup>3</sup> Legal origin is coded as a set of five dummy variables, one each for *English*, *French*, *Germanic*, *Scandinavian* and *Socialist* legal systems. In our sample of developing countries, we have no Germanic or Scandinavian countries.

---

<sup>3</sup> We are extremely grateful to Prof. Shleifer for sharing these data with us. At the time this manuscript was prepared, the dataset for the paper "Private Credit in 129 Countries" was available for download at: <http://www.economics.harvard.edu/faculty/shleifer/dataset>

*Creditors' Rights* is an index first proposed by LLSV (1998) that consists of four components. Each component gets a value of one if the creditors' right exists in a country and zero otherwise; the index is the sum of these four values. The four rights are: *CR1*, restrictions, such as creditors' consent, when a debtor files for reorganization; *CR2*, the ability of a secured creditor to seize pledged collateral after a court approves a debtor's petition for reorganization; *CR3*, the right of creditors to be paid first out of the proceeds from liquidation; and *CR4*, the right to replace management with an administrator during reorganization. Higher values imply stronger creditors' rights.

*Legal Formalism* is an estimate of the number of days necessary to collect an unpaid debt equal to 50% of the country's GDP per capita, which was first introduced and used by DMS (2007). As such, it can be viewed as an index of the inefficiency of legal enforcement because higher values are associated with less efficient judicial enforcement.<sup>4</sup>

We then merge these country-level data with our bank-level data. A description of the country-level governance and macroeconomic variables appears in Table 1.

#### 4.2 Methodology

With these data, we estimate a series of multivariate regression models to test the hypotheses laid out in the previous section. Specifically, we analyze different versions of the following regression model:

$$Y_{i,t} = \alpha X_j + \beta G_j + \delta O_i + \eta Z_{j,t} + \varepsilon_{i,t} \quad (1)$$

where:

$Y_{i,t}$  is our key variable of interest for bank  $i$  during time  $t$ . It measures the quantity of credit by the ratio of total loans to total assets (where higher values indicate more operating risk);

---

<sup>4</sup> For robustness, we also test other indicators of judicial enforcement from Djankov *et al.* (2003), e.g., the number of days to collect on a bounced check.

$X_j$  is a set of dummy variables describing the legal origin of country  $j$ ;

$G_j$  is a set of structural variables describing the country  $j$ , including governance indices that measure creditor protection;

$O_i$  denotes bank ownership variables, including the percentage of ownership of the controlling shareholder and whether the bank is State or foreign controlled,

$Z_{j,t}$  controls for the macroeconomic environment in terms of government size in the economy and the level of economic development; and

$\varepsilon_{i,t}$  is a random error term for bank  $i$  during year  $t$ .

Because we analyze panel data, we cannot rely upon ordinary-least-squares regression techniques, as our error terms would be serially correlated. Typically, one must choose between a fixed-effects model and a random-effects model when analyzing panel data such as ours; however, we are constrained to using a random-effects model because our primary variables of interest—our indicators for legal origin and creditors' rights—are invariant at both the bank and country levels. Therefore, we cannot estimate our models using the fixed-effects methodology since these governance variables would be collinear with the fixed-effects dummy variables. Consequently, we estimate all models using bank-level random effects.

We also cannot treat each bank as an independent observation because we are examining governance indicators measured only at the country level. Consequently, we calculate robust standard errors clustered at the country level.

## **5. Empirical Findings**

Our primary hypotheses are that: (1) banks in countries with English legal origin enjoy superior institutions that enable them to make more loans; (2) banks in countries with stronger



creditors' rights enjoy superior legal protection that enables them to make more loans; and (3) banks in countries with less legal formalism or, alternatively, more efficient judicial enforcement, enjoy superior legal protection that enables them to make more loans. The logic behind our hypotheses is that bankers are concerned about the total risk exposure of their loan portfolio. When banks enjoy better creditor protection, the lower expected losses on bad loans enables them to increase operating risk by making more loans per dollar of assets.

### *5.1 Univariate Descriptive Statistics*

Table 2 presents descriptive statistics for the full sample and Table 3 shows the same for the sample of banks in developed and developing countries along with tests of differences in means. Overall, the average loan-to-asset ratio is 0.497 and is significantly higher in developed countries than in developing countries (0.515 vs. 0.483). The average bank size in the entire sample is \$9.90 billion, and it is significantly larger in developed than in developing countries (\$17.90 billion vs. \$3.26 billion).

Among the governance variables, the average number of enforcement collection days (*Legal Formalism*) is 339, and is significantly shorter in developed than in developing countries (244 vs. 418). The average value of the creditors' rights index is 1.85 and is significantly higher in developed than in developing countries (1.90 vs. 1.81). In the developed sample, 49.9% of the banks are in countries of German legal origin, 29.2% in French legal origin, 14.3% in English legal origin, and 6.6% are in countries of Scandinavian legal origin. In the developing sample, 46.6%, 24.7%, 22.9%, and 7.7% of banks are in countries of French, English, Socialist, and Germanic legal origins, respectively.

Among the ownership variables, the average percentage ownership of the controlling shareholder is 62.21% and is significantly lower in developed than developing countries (65.9%

vs. 55.7%). The State is the controlling shareholder for 5.0% of the banks, and this percentage is significantly lower in developed than in developing countries (1.5% vs. 7.9%). The largest shareholder is foreign for 30.2% of the banks, and this percentage is significantly lower in developed than in developing countries (26.6% vs. 33.2%).

Among the macroeconomic control variables, average GDP per capita is \$15,449 and is significantly higher in developed than in developing countries (\$30,680 vs. \$2,822). The average ratio of private credit to total domestic credit is 0.892 and is significantly lower in developed than in developing countries (0.821 vs. 0.951).

### *5.2 Multivariate Regression Analysis: Loans to Assets*

The results of the multivariate analyses of equation (1) explaining the loan-to-asset ratio appear in Tables 4 – 6 for the full sample, developed countries, and developing countries, respectively. In each of these three tables, we present five specifications that we estimate using a bank random-effects model with robust standard errors clustered at the country level. We begin, in specification (1), with four dummy variables indicating legal origin (*French*, *Socialist*, *German* and *Scandinavian*, with *English* being the omitted category), our measure of *Legal Formalism* and our control variable ( $\ln(\text{GDP per capita})$ ) for differences in economic development; in specification (2), we add our index of *Creditors' Rights*; in specification (3), we replace the index of *Creditors' Rights* with its four components (*CR1 – CR4*); in specification (4), we add our four bank-specific variables for bank size ( $\ln(\text{Total Assets})$ ) and ownership structure (*Percentage Ownership of Largest Shareholder*, *Largest Shareholder is the State*, and *Largest Shareholder is Foreign*): and finally, in (5), we add our control variable for the size of the government in the credit market (*Private Credit*).

### 5.2.1 Full Sample of Developed and Developing Countries

In Table 4 are the results where the dependent variable is the ratio of total loans to total assets and we consider our full sample of banks in both developed and developing countries. We assess the effect of legal origin relative to the omitted category, which is *English* legal origin. Hence, the coefficients on *French*, *Socialist*, *German* and *Scandinavian* measure the difference in the loan-to-asset ratio of these groups from that of the excluded *English* group of banks.

In specification (1), none of the four legal-origin variables are statistically significant at the 0.05 level and only *French* is significant at the 0.10 level. The coefficient on *French* indicates that the loan to asset ratio is 4.94 percentage points lower at banks in countries of French legal origin than at banks in countries of English legal origin. Given the full sample's average loan-to-asset ratio of slightly less than 0.50, this represents a ten-percent decrease in the amount of credit that banks are injecting into economies of French legal origin. The coefficients for German and Scandinavian are negative but significant. Only the coefficient for Socialist is positive; it is marginally significant ( $p$ -value = 0.103). In general, these results support one of our primary hypotheses—that, in countries of English legal origin, better legal protection enables banks to take on more portfolio risk as compared to banks in countries of other legal origins and, particularly, in countries of French legal origin. The DMS (2007) measure of *Legal Formalism*—the natural logarithm of the number of days needed to recover a debt equal to half of a country's GDP per capita—is not statistically significant and the coefficient is smaller than its standard error. Our control variable for differences in the level of economic development—the natural logarithm of GDP per capita—is positive and highly significant ( $t$ -statistic = 5.22), indicating that banks in countries with higher GDP per capita have higher loan-to-asset ratios. This finding

supports our prediction that banks in better developed economies allocate a larger portion of their assets to risky loans because of higher loan demand than in lesser developed economies.

Moreover, this control variable remains positive and highly significant in all five specifications, underlining the importance of its inclusion in this analysis.

In specification (2), we add our index of *Creditors' Rights*. The coefficient is negative and statistically significant at the 0.10 level, indicating that, in countries with stronger creditor rights, banks have lower, rather than higher, ratios of loans to assets. This is consistent with the dark side of creditors' rights as laid out by Acharya, Amihud and Litov (2010). However, it is contrary to the findings of Houston *et al.* (2010), who find that stronger creditors' rights are associated with increased risk-taking. To the extent that the loan-to-asset ratio measures bank risk taking, our results suggest that stronger creditors' rights reduce, rather than increase, risk-taking. In the presence of the creditors' rights index, our indicator for banks in countries of French legal origin increases in absolute magnitude and becomes statistically significant at better than the 0.05 level.

In specification (3), we seek a better understanding of the relation between creditors' rights and bank lending by decomposing the index into its four component indicator variables. Here, we find that *CR2*, which indicates that "creditors can seize collateral after a debtor's filing for reorganization is approved by the courts," is negative and significant at the 0.05 level, whereas the remaining three components lack statistical significance at even the 0.10 level. This finding suggests that borrowers seek less credit when creditors enjoy this particular legal right. Again, our findings fit well with those of Acharya, Amihud and Litov (2010), who find that companies reduce operating risk in countries granting this right to creditors. However, our findings conflict with Houston *et al.* (2010), who report that banks take on more, rather than less, risk when they

receive this creditor right. Finally, in this specification, our indicator for banks in countries of French legal origin remains negative but is significant at only the 0.10 level ( $p$ -value = 0.75).

In specification (4), we add our four bank-specific variables measuring size and ownership structure. We find that bank size as measured by the log of total assets is positive and highly significant ( $t$ -statistic = 5.19). The percentage ownership of the largest shareholder is negative and significant at better than the 0.05 level. This finding is consistent with our hypothesis that less diversified owners will choose a less risky loan-to-asset ratio. However, it is inconsistent with Laeven and Levine (2008), who report that bank risk increases with the ownership of the largest shareholder. The indicator variables for banks with the State as a controlling blockholder and with a foreign entity as the controlling blockholder each are negative, consistent with our hypotheses, but lack statistical significance. With the addition of these variables, our results regarding legal origin change notably, with the indicator for banks in countries of Socialist legal origin almost tripling in size and becoming statistically significant at better than the 0.01 level. The indicator for banks in countries of French legal origin remains negative and significant at the 0.10 level ( $p$ -value = 0.058).

Finally, in specification (5), we add the ratio of private-sector credit to total domestic credit—our control variable for policy lending. This variable is negative but insignificant, and its addition does not qualitatively change the results shown in specification (4).

### *5.2.2 Developed Countries Only*

In Table 5 are the results where the dependent variable is the ratio of total loans to total assets and we only include in the analysis our sub-sample of banks in developed countries. We present the results for the same five specifications that we tested in Table 4 for the full sample.

In specification (1), none of our explanatory variables are statistically significant at even the 0.10 level. The coefficients on French and German legal origins are negative but smaller than their associated standard errors. The coefficient on legal formalism is very close to zero. These results suggest that creditor protection plays little role in the decisions of banks in developed countries to choose their loan-to-asset ratios. Also of note is the fact that our control variable for differences in levels of economic development is not significantly different from zero, and remains so in all five specifications. We speculate that this points to the lack of variability in economic development across developed countries when compared to the variability in GDP per capita across developing countries.

In specification (2), we add the index of creditors' rights. It, too, is statistically insignificant and the coefficient is smaller than its standard error.

In specification (3), we replace the creditors' rights index with its four component indicator variables. We now find that *CR3* (the right of creditors to be paid first out of the proceeds of a liquidating firm) is negative and significant at the 0.05 level whereas *CR4* (the right of creditors to have an administrator, rather than firm management, take responsibility for managing the firm during reorganization) is positive and significant at the 0.10 level. In addition, we now find that the coefficient of the indicator for French legal origin becomes much larger in magnitude and statistically significant at better than the 0.05 level.

In specification (4), we add our four bank-level variables for size and ownership structure. As in Table 5, we find that the loan-to-asset ratio is positively related to bank size and that the coefficient is highly significant ( $t$ -statistic = 3.88). We also find that the indicator for a foreign controlling blockholder is negative and significant at better than the 0.01 level and the coefficient indicates that the loan-to-asset ratio is lower by 4.45 percentage points when the controlling

block holder is foreign. Foreign banks do not generally serve a large retail base as compared to domestic banks, and their parent firms usually impose limits on their credit risk exposure to the local market. The coefficient on the percentage ownership of the largest shareholder is negative but not significant. The coefficient on the indicator for banks with the State as the controlling blockholder is essentially zero.

In specification (5), we add our control for government size and find that it is positive and significant at the 0.05 level, indicating that the loan-to-asset ratio is significantly higher when the ratio of private sector credit to total domestic credit is higher. This finding argues against our hypothesis that banks in countries where the government plays a more prominent role in the credit market will have higher loan-to-asset ratios as they allocate credit to politically connected firms.

### *5.2.3 Developing Countries Only*

In Table 6 are the results where the dependent variable is the loan-to-asset ratio and where we only include our sub-sample of banks in developing countries. Again, we present the results for the same five specifications tested in Table 4 for our full sample.

In specification (1), each of the three indicators of legal origin is negative, but only *French* is statistically significant at the 0.05 level. The coefficient on *French* indicates that the loan to asset ratio is 6.8 percentage points lower at banks in countries of French legal origin than at banks in countries of English legal origin. Given the average loan-to-asset ratio of slightly less than 0.50, this represents a thirteen percent decrease in the amount of credit that banks are injecting into economies of French legal origin compared to economies with a common law tradition. Also in specification (1), we find that the coefficient on our measure of *Legal Formalism* is negative and significant at better than the 0.05 level. This indicates that the loan-to-

asset ratio is lower when it takes longer for creditors to recover bad debts. These results regarding legal origin and legal formalism are robust to the inclusion of our additional control variables in specifications (2) – (5). In fact, the statistical significance of the legal formalism indicator increases in our most inclusive specification ( $t$ -statistic = 3.20,  $p$ -value = 0.0014). In conjunction with our findings in Table 5, these results suggest that the importance of legal origin and legal formalism for bank lending is more pronounced in developing than in developed countries. Our control for differences in the levels of economic development is positive and highly significant ( $t$ -statistic = 6.76) and remains so as we add explanatory variables in each of the remaining specifications.

In specification (2), we add our index of creditor rights. The coefficient of creditors' rights is negative and statistically significant at better than the 0.05 level. Again, this is consistent with the findings of Acharya, Amihud and Litov (2010) but contrary to the findings of Houston *et al.* (2010).

In specification (3), we replace the index of creditor's rights with its four components. We find that *CR2* (the right to seize collateral) is negative and significant at better than 0.01 ( $t$ -statistic = 3.05,  $p$ -value = 0.0023), consistent with our results for the full sample and with Acharya, Amihud and Litov (2010). This result is robust to inclusion of the additional explanatory variables in specifications (4) and (5). *CR1* also is negative and is significant at the 0.10 level; *CR4* is negative and *CR3* is positive but each lacks statistical significance.

In specification (4), we add our four bank-specific variables measuring size and ownership structure. As is the case for the full sample and for the developed-country sub-sample, bank size is positive and significant at better than the 0.01 level, indicating that larger banks have higher loan-to-asset ratios. We also find that the percentage ownership of the largest shareholder is



negative and significant at better than the 0.01 level, supportive of our hypothesis that large undiversified shareholders prefer lower-risk portfolios. The indicator for the State as the controlling blockholder is negative but only marginally significant ( $t$ -statistic = 1.57,  $p$ -value = 0.117); the indicator for a foreign controlling blockholder is positive but only a fraction of its standard error in magnitude.

In specification (5), we add our control for the size of government in the credit sector. The ratio of private sector credit to total domestic credit is negative and insignificant, but, in its presence, the coefficient of indicator for State as the controlling blockholder increases in magnitude and in statistical significance ( $p$ -value = 0.020); while *CRI* loses its statistical significance.

### 5.3 Robustness Tests

Not shown in the tables are results from a number of additional regressions that we run to test the robustness of our findings. We iteratively include a number of additional country-level governance and regulatory variables that have been examined by other researchers. Many of these variables are highly correlated so we cannot incorporate all of them in a single model. Instead, we add them one at a time to the specifications shown in our tables. Governance variables include the *Heritage Index of Economic Freedom* and several of its components (*Financial Freedom, Government Size, Property Rights* and *Freedom from Corruption*).<sup>5</sup> None of these are significant when added to our models and their inclusion does not qualitatively affect our results. We obtained additional governance variables from the World Bank's Worldwide Governance Indicators project, including the *Rule of Law, Political Stability and Absence of*

---

<sup>5</sup> Beach and Kane (2008) document how the 10 indices of economic freedom are calculated. At the time of this study, information on the index and its components was available at: <http://www.heritage.org/index>.

*Violence, Voice and Accountability* and *Control of Corruption*.<sup>6</sup> When we include these indices in our models, we find that the *Rule of Law* is highly correlated with our measure of legal formalism and its inclusion diminishes the significance of legal formalism by inflating its standard error. Inclusion of the other indices does not qualitatively affect our findings.

We include two indicators for the existence of a public or private credit registry developed by Djankov, McLiesh and Shleifer (2008).<sup>7</sup> Neither of these is significant when added to our models and their inclusion does not qualitatively affect our findings. This finding contradicts Houston *et al.* (2010, p. 36) who report that “the benefits of information sharing appear to be universally positive.” However, their measure of risk-taking is the Z-score, whereas ours is the ratio of loans to assets.

We consider three regulatory variables analyzed by Laeven and Levine (2008)—an indicator for whether or not a country provides deposit insurance,<sup>8</sup> an index of regulatory restrictions on capital, and an index of official supervisory powers (both developed by Barth *et al.* (2004)).<sup>9</sup> Again, none of these variables are statistically significant in our models and our main findings are maintained.

Following DMS (2007), we include total GDP to control for the possibility that credit markets only function when they are large enough to cover institutional fixed costs, and inflation

---

<sup>6</sup> At the time of this study, these indices were available from the World Bank’s website: <http://info.worldbank.org/governance/wgi/index.asp>

<sup>7</sup> Both of these indicator variables are included in the dataset for the paper “Private Credit in 129 Countries,” which, at the time of this study, was available for download at: <http://www.economics.harvard.edu/faculty/shleifer/dataset>.

<sup>8</sup> At the time of this study, this index was available from the World Bank’s website: <http://econ.worldbank.org/WBSITE/EXTERNAL/EXTDEC/EXTRESEARCH/0,,contentMDK:20699211~pagePK:64214825~piPK:64214943~theSitePK:469382,00.html>.

<sup>9</sup> At the time of this study, these variables were available from the World Bank’s website : <http://econ.worldbank.org/WBSITE/EXTERNAL/EXTDEC/EXTRESEARCH/0,,contentMDK:20345037~pagePK:64214825~piPK:64214943~theSitePK:469382,00.html>

to account for the possibility that high inflation might undermine bank lending.<sup>10</sup> Neither is significant and their inclusion does not qualitatively alter our results.

#### *5.4 Discussion*

From the results in Tables 4 – 6, we find similarities and differences in lending for banks located in developed and in developing countries. With respect to legal origin, banks of French legal origin have significantly lower loan-to-asset ratios than banks of English legal origin. This result holds for the full sample, for the developed-country sub-sample and for the developing-country sub-sample, but is more precisely measured at banks in developing countries. The magnitude is large—6.8 percentage points for developing countries and 11.9 percentage points for developed countries. Given the average loan-to-asset ratio of around 0.50, this translates into a 14 to 24 percent difference in the amount of credit at French legal-origin banks relative to English legal-origin banks.

With respect to the legal rights of creditors, we find that stronger creditor rights are associated with lower loan-to-asset ratios. When we measure creditors' rights using the LLSV index, this result is statistically significant for the full sample and for the developing-country sub-sample, but not for the developed-country sub-sample. When we decompose the LLSV index into its four components, we find that the results for the index are driven primarily by only one component and that this component is different in developed and in developing countries. In developed countries, it is the right to be paid first out of the proceeds of a liquidating firm that is driving down the loan-to-asset ratio whereas in developing countries, it is the right to seize collateral in reorganization that is reducing the loan-to-asset ratio. To the extent that the loan-to-asset ratio is a measure of bank risk-taking, our results are consistent with Acharya *et al.* (2009),

---

<sup>10</sup> Both of these variables are included in the dataset for the paper “Private Credit in 129 Countries.”

who posit that borrowers reduce risk when creditors are better protected, but are in striking contrast to those of Houston *et al.* (2010), who find that better creditor rights are associated with increased risk-taking. We think that this discrepancy is attributable to their measure of risk, which is largely a function of the standard deviation of returns calculated over 2000-2007. When measured over such a short period of time, we think that the standard deviation may be inversely related to ex-ante risk, reflecting variability in returns associated with financial crises that occurred during the measurement period rather than reflecting ex-ante risk. To the extent that crises only occur once every decade, banks in countries that have already suffered a crisis may actually be ex-ante less risky than banks in countries that did not experience a crisis during 2000-2007, but did in 2008-2009. It would be interesting to see which set of results are robust over the last half of this decade.

With respect to the efficiency of enforcement as proxied by Djankov's legal-formalism measure of the number of days needed to collect a debt equal to 50% of GDP per capita, we find no evidence that efficiency of enforcement is important in developed countries, but strong evidence that it is important in developing countries, where other governance institutions are much weaker than in developed countries. This finding suggests that efficiency of enforcement is an important substitute for those underdeveloped institutions in protecting creditors. With more efficient judicial enforcement, bankers in developing countries allocate a significantly larger portion of the asset portfolio to risky loans.

Beyond the importance of legal origin, the only other consistent result across developed and developing countries is that the loan-to-asset ratio is a positive function of bank size. Larger banks, which are more diversified than smaller banks, allocate a significantly higher portion of the asset portfolio to risky loans.

With respect to our two control variables, we find that it is most important to control for differences in levels of economic development in developing countries and when both developed and developing countries are analyzed together. This is not surprising, but we had expected our control variable—the log of GDP per capita—to be important even in the developed sub-sample. We also find that it is important to control for the role of the government in the credit market, which we proxy with the ratio of private-sector credit to total domestic credit. In developed countries, the smaller is the role of government, the more banks allocate their asset portfolio to risky loans. In developing countries, this variable is not significant, but its inclusion illuminates the role of the State as the controlling blockholder in reducing the loan-to-asset ratio of State-controlled banks.

## **6. Summary and Conclusions**

In this article, we extend the law-and-finance literature by using bank-level data from 35 developed and 113 developing countries to analyze how bank lending behavior responds to differences in legal origin and creditor protection. Using a random-effects model that controls for bank heterogeneity, we find that bankers allocate a significantly higher portion of their assets to loans: (i) when they enjoy English common law legal origin rather than French civil law legal origin; (ii) when creditors' rights are weaker; (iii) when their banks are larger; and (iv) when the largest shareholder has a lower percentage ownership. We also find that bankers in developing countries, but not in developed countries, allocate a significantly larger portion of their assets to risky loans when legal enforcement of creditor rights is more efficient. These results strongly support the theory of legal origin but provide only mixed support for the “power” theories of credit.

Our finding that banks make fewer loans when creditors' rights are stronger is supportive of a "dark side" to creditors' rights, as proposed by Acharya, Amihud and Litov (2010), but it contradicts the results reported by Houston *et al.* (2010), who find that stronger creditor rights are associated with greater bank risk-taking. Our opposing findings regarding the effects of creditors' rights and the effects of judicial enforcement also highlight the importance of distinguishing between strong legal rights and efficient judicial enforcement of those rights, as pointed out by LLSV (1998). We do not address how the financial crisis that began in 2007 affected bank lending; we leave that most interesting topic to future research.

In summary, our results provide new evidence on the importance of legal origin and creditor protection to the provision of bank credit, which has implications for financial sector development and economic growth. Researchers in the "finance and growth" literature have established that better financial sector development as measured by aggregate domestic private credit leads to higher levels of economic growth. We extend the literature by documenting one channel through which creditor protection leads to financial sector development. With better creditor protection, bankers increase the portion of their assets allocated to loans. In aggregate, this should lead to higher levels of private-sector credit, which the "finance and growth" literature has shown to be positively related to economic growth.

## References

- Acharya, Viral V., Yakov Amihud, and Lubomir Litov. (2010). Creditor rights and corporate risk-taking. *Journal of Financial Economics*, forthcoming.
- Aghion, Phillippe. and Patrick Bolton. (1992). An incomplete contracts approach to corporate bankruptcy. *Review of Economic Studies* 59: 473–494.
- Aghion, Phillippe, Oliver Hart, John Moore. (1992). The economics of bankruptcy reform. *Journal of Law, Economics and Organization* 8 (3): 523–546.
- Beach, Willam W. and Tim Kane. (2008). Methodology: Measuring the 10 economic freedoms. In 2008 Index of Economic Freedom, Heritage Foundation, Washington, DC.
- Beck, Thorsten, Asli Demirguc-Kunt, Ross Levine. (2003a). Law and finance: Why does legal origin matter? *Journal of Comparative Economics* 31: 653–675.
- Beck, Thorsten, Asli Demirguc-Kunt, Ross Levine (2003b). Law, endowments, and finance. *Journal of Financial Economics* 70: 137–181.
- Beck, Thorsten, Ross Levine, Norman Loayza. (2000). Finance and the source of growth. *Journal of Financial Economics* 58: 261-300.
- Claessens, Stijn, Asli Demirguc-Kunt and Harry Huizinga. (2001). How does foreign entry affect the domestic banking market? *Journal of Banking & Finance* 25: 891–911.
- Demirguc-Kunt, Asli and Vogislav Maksimovic. (1998). Law, finance, and firm growth. *The Journal of Finance* 53: 2107-2137.
- Demirguc-Kunt, Asli and Vogislav Maksimovic. (2002). Funding growth in bank-based and market-based financial systems: evidence from firm-level data. *Journal of Financial Economics* 65: 337-363.
- Djankov, Simeon, Rafael La Porta, Florencio Lopez-de-Silanes and Andrei Shleifer. (2003). Courts. *Quarterly Journal of Economics*: 453-517.
- Djankov, Simeon, Caralee McLiesh and Andrei Shleifer. (2007). Private credit in 129 countries. *Journal of Financial Economics* 84: 299-329 .
- Glaeser, Edward Ludwig, Simon Johnson and Andrei Shleifer. (2001). Coase versus the Coasians. *The Quarterly Journal of Economics* 116 (3): 853-899.
- Hart, Oliver and John Moore. (1994). A theory of debt based on the inalienability of human capital. *Quarterly Journal of Economics* 109: 841–879.
- Hart, Oliver and John Moore. (1998). Default and renegotiation: a dynamic model of debt. *Quarterly Journal of Economics* 113: 1–42.

- Houston, Joel, Chen Lin, Ping Lin and Yue Ma. (2010). Creditor rights, information sharing and bank risk-taking. *Journal of Financial Economics*, forthcoming.
- Iannotta, Giuliano, Giacomo Nocera and Andrea Sironi. (2007). Ownership structure, risk and performance in the European banking industry. *Journal of Banking and Finance* 31: 2127-2149.
- John, Kose, Lubomir Litov and Bernard Yeung. (2008). Corporate governance and risk-taking. *The Journal of Finance* 63 (4): 1679-1728.
- Kaufmann, Daniel, Aart Kraay and Massimo Mastruzzi. (2007). Governance Matters VI: Governance indicators for 1996–2006. World Bank Policy Research Working Paper 4280.
- King, Robert and Ross Levine. (1993). Finance and growth: Schumpeter might be right. *Quarterly Journal of Economics* 108: 717-738.
- La Porta, Rafael, Florencio Lopez-de-Silanes, Andrei Shleifer and Robert W. Vishny. (1997). Legal determinants of external finance. *The Journal of Finance* 52 (3): 1131-1150.
- La Porta, Rafael, Florencio Lopez-de-Silanes, Andrei Shleifer and Robert W. Vishny. (1998). Law and finance. *The Journal of Political Economy* 106 (6): 1113-1155.
- La Porta, Rafael, Florencio Lopez-de-Silanes, Andrei Shleifer and Robert W. Vishny. (1999). The quality of government. *Journal of Law, Economics and Organization* 15 (1): 222-279.
- La Porta, Rafael, Florencio Lopez-de-Silanes, Andrei Shleifer and Robert W. Vishny (2002). Investor protection and corporate valuation. *The Journal of Finance* 57 (3): 1147-1170.
- Levine, Ross. (1999). Law, finance, and economic growth. *Journal of Financial Intermediation* 8: 36-67.
- Levine, Ross. (2004). Finance and growth: theory, evidence, and mechanisms. NBER Working paper No. 10776.
- Levine, Ross, and Sara Zervos. (1998). Stock markets, banks and economic growth. *American Economic Review* 88: 537-558.
- Qian, Jun, and Philip Strahan. (2007). How laws and institutions shape financial contracts: The case of bank loans. *The Journal of Finance* 62 (6): 2803-2834.
- Rajan, Raghuram and Luigi Zingales. (1995). Financial systems, industrial structure and growth. *Oxford Review of Economic Policy* 17 (4): 467-482
- Rajan, Raghuram and Luigi Zingales (1998). Financial dependence and growth. *American Economic Review* 88: 559-586.



Townsend, Robert M. (1979). Optimal contracts and competitive markets with costly state verification. *Journal of Economic Theory* 21 (2): 265-293.

**Table 1:**  
**Definitions of Country and Firm Level Governance and Macroeconomic Variables**

Variable Name	Description
Legal Origin	Identifies the legal origin of the company law or commercial code of each country (English, French, Socialist, German, Scandinavian). Source: Djankov <i>et al.</i> (2003, 2007).
Legal Formalism	An estimate of the number of days necessary to collect an unpaid debt equal to 50% of the country's GDP per capita. Higher values indicate greater procedural formalism and greater inefficiency in judicial enforcement. Source: Djankov <i>et al.</i> (2007)
Creditors' Rights Component 1	Restrictions, such as creditors' consent, when a debtor files for reorganization. This component gets a weight of one if a country's legal system grants that creditors' right and zero otherwise. Source: LLSV (1998)
Creditors' Rights Component 2	Right of creditors to seize collateral after a debtor's filing for reorganization is approved by the court. This component gets a weight of one if a country's legal system grants that creditors' right and zero otherwise. Source: LLSV (1998)
Creditors' Rights Component 3	Right of creditors to be paid first out of the proceeds of a liquidating firm. This component gets a weight of one if a country's legal system grants that creditors' right and zero otherwise. Source: LLSV (1998)
Creditors' Rights Component 4	An administrator, rather than management, takes responsibility for running a firm during reorganization. This component gets a weight of one if a country's legal system grants that creditors' right and zero otherwise. Source: LLSV (1998)
Creditors' Rights Index	Index of components 1 through 4, where each component gets a weight of one if a country's legal system grants that creditors' right and zero otherwise. Ranges from zero to four, with higher values indicating stronger creditors' rights. Source: LLSV (1998)
Largest Shareholder	Percentage of ownership of the largest shareholder. Source: Authors' calculation from BankScope.
State Shareholder	Largest shareholder is a state or public authority. Source: Authors' calculation from BankScope.
Foreign Shareholder	Largest shareholder is foreign. Source: Authors' calculation from BankScope.
Private Credit/ Domestic Credit	The ratio of the claims on private credit to domestic credit. This is the fraction of domestic credit which finances the private sector. Source: International Financial Statistics.
Per Capita GDP	Logarithm of per capita GDP. Source: <i>International Financial Statistics</i>

**Table 2:**  
**Descriptive Statistics- All Countries**

Based upon an unbalanced panel of 2,677 banks in 148 countries over the years 2000-2006, or a total of 12,084 observations. Loans to Assets is the ratio of total loans to total assets; Total Assets are measured in USD thousands. Each of these two variables is measured at the bank level in each year. English, French, Socialist, German and Scandinavian are dummy variables indicating English, French, Socialist, German or Scandinavian legal origin as first defined by LLSV 1998. Legal Formalism is the number of days needed to enforce a contract; higher values indicate less efficient judicial enforcement. Creditors' Rights is an index defined by LLSV (1998) where higher values indicate stronger rights; its components are labeled CR1 through CR4. Largest Shareholder is the ownership share of the largest shareholder. Largest Shareholder is State/ Public Authority and Largest Shareholder is Foreign are two dummy variables set to 1 if the largest shareholder is a public authority or foreign, respectively. Private Credit is the ratio of claims on private credit to domestic credit, and GDPPC is the per capita Gross Domestic Product expressed in USD. Table 1 provides more details on each variable.

Variable	Median	Mean	Std Error of the Mean
Loans to Assets	0.5162	0.4858	0.0020
Total Assets	601,529	9,068,604	467,478
English Legal Origin	0	0.203	0.0035
French Legal Origin	0	0.335	0.0042
Socialist Legal Origin	0	0.137	0.0030
German Legal Origin	0	0.297	0.0040
Scandinavian Legal Origin	0	0.029	0.0015
Legal Formalism	330.00	344.37	2.2881
CR- Creditors Rights	2	1.8656	0.0092
CR1- Restrictions on filing for reorganization	0	0.3129	0.0041
CR2- Right to seize collateral	0	0.3448	0.0042
CR3- Right to be paid first	1	0.6550	0.0042
CR4- Right to run a firm during reorganization	1	0.5529	0.0044
Largest Shareholder	0.7	0.6221	0.0032
Largest Shareholder is State/ Public Authority	0	0.0501	0.0019
Largest Shareholder is Foreign	0	0.3528	0.0041
Private Credit	0.8364	0.9034	0.0164
GDPPC	6,879	15,977	145

**Table 3:**  
**Descriptive Statistics- Developed Vs. Developing Countries**

Based upon an unbalanced panel of 1,147 banks in 35 developed countries and 1,530 banks in 113 developing countries over the years 2000-2006. Loans to Assets is the ratio of total loans to total assets; Total Assets are measured in USD thousands. Each of these two variables is measured at the bank level in each year. English, French, Socialist, German and Scandinavian are dummy variables indicating English, French, Socialist, German or Scandinavian legal origin as first defined by LLSV 1998. Legal Formalism is the number of days needed to enforce a contract; higher values indicate less efficient judicial enforcement. Creditors' Rights is an index defined by LLSV (1998) where higher values indicate stronger rights; its components are labeled CR1 through CR4. Largest Shareholder is the ownership share of the largest shareholder. Largest Shareholder is State/ Public Authority and Largest Shareholder is Foreign are two dummy variables set to 1 if the largest shareholder is a public authority or foreign, respectively. Private Credit is the ratio of claims on private credit to domestic credit, and GDPPC is the per capita Gross Domestic Product expressed in USD. Table 1 provides more details on each variable.

Variable	Developed Countries (5,477 obs.)			Developing Countries (6,607 obs.)			Tests of difference in means  p-values
	Median	Mean	Std Error of the Mean	Median	Mean	Std Error of the Mean	
Loans to Assets	0.544	0.4881	0.0035	0.502	0.484	0.002	0.1520
Total Assets	1,411,900	16,700,000	1,004,216	320,772	2,997,375	233,426	0.0000
English Legal Origin	0	0.154	0.005	0	0.238	0.005	0.0000
French Legal Origin	0	0.358	0.006	0	0.378	0.006	0.0000
Socialist Legal Origin	0	0.000	0.000	0	0.237	0.005	0.0000
German Legal Origin	0	0.419	0.007	0	0.147	0.004	0.0000
Scandinavian Legal Origin	0	0.069	0.003	0	0.000	0.000	0.0000
Legal Formalism	170.00	243.710	4.158	380.00	418.910	2.150	0.0000
CR- Creditors Rights	2	1.899	0.015	2	1.841	0.011	0.0008
CR1- Restrictions on filing for reorganization	0	0.175	0.005	0	0.415	0.006	0.0000
CR2- Right to seize collateral	0	0.398	0.007	0	0.305	0.005	0.0000
CR3- Right to be paid first	1	0.763	0.006	1	0.575	0.006	0.0000
CR4- Right to run a firm during reorganization	1	0.563	0.007	1	0.545	0.006	0.0195
Largest Shareholder	0.92	0.675	0.005	0.553	0.580	0.004	0.0000
Largest Shareholder is State/ Public Authority	0	0.015	0.002	0	0.078	0.003	0.0000
Largest Shareholder is Foreign	0	0.332	0.006	0	0.369	0.006	0.0000
Private Credit to Total Credit	0.850	0.841	0.002	0.790	0.958	0.031	0.0002
GDPPC	30,340	32,130	168	2,334	3,134	33	0.0000

**Table 4:****Random-Effects Regression to Explain the Ratio Total Loans to Total Assets- All Countries**

Based upon an unbalanced panel of 2,677 banks in 148 countries over the years 2000-2006, or a total of 12,084 observations. English, French, Socialist, German, and Scandinavian are dummy variables indicating the country's legal origin as first defined by LLSV (1998). English is the omitted category. Legal Formalism is the natural logarithm of the number of days needed to recover a debt equal to half of the country's GDP per capita, as defined by Djankov *et al.* (2007). Creditors' Rights is an index of four creditors' rights as first defined by LLSV (1998). Ln(GDP per capita) is the natural logarithm of the country's per capita Gross Domestic Product in each year. Ln (Total Assets) is the natural logarithm of total assets. Largest Shareholder is the ownership share of the largest shareholder. Largest Shareholder is State/ Public Authority and Largest Shareholder is Foreign are two dummy variables set to 1 if the largest shareholder is a public authority or foreign, respectively. Private Credit is the ratio of claims on private credit to domestic credit, and GDPPC is the per capita Gross Domestic Product. Table 1 provides more details on each variable. Robust standard errors are clustered by country. \*\*\*, \*\*, and \* indicate statistical significance at the 0.01, 0.05 and 0.10 levels, respectively.

	Model 1	Model 2	Model 3	Model 4	Model 5
French Legal Origin	-0.0494 (0.0291)*	-0.0728 (0.0334)**	-0.0645 (0.0361)*	-0.0587 (0.0309)*	-0.0603 (0.0343)*
Socialist Legal Origin	0.0457 (0.0280)	0.0392 (0.0281)	0.0235 (0.0280)	0.0663 (0.0232)***	0.0629 (0.0255)**
German Legal Origin	-0.0523 (0.0392)	-0.0528 (0.0395)	-0.0603 (0.0392)	-0.0365 (0.0295)	-0.038 (0.0325)
Scandinavian Legal Origin	-0.012 (0.0449)	-0.0068 (0.0405)	-0.0067 (0.0435)	0.0217 (0.0416)	0.0216 (0.0431)
Legal Formalism	0.0102 (0.0163)	0.0158 (0.0159)	0.0169 (0.0154)	0.0202 (0.0130)	0.0167 (0.0141)
CR- Creditors Rights		-0.0232 (0.0141)*			
CR1- Restrictions on filing for reorganization			-0.0326 (0.0239)	-0.0408 (0.0205)**	-0.0388 (0.0228)*
CR2- Right to seize collateral			-0.0638 (0.0262)**	-0.0446 (0.0252)*	-0.0416 (0.0261)
CR3- Right to be paid first			-0.0067 (0.0276)	-0.0179 (0.0238)	-0.0181 (0.0271)
CR4- Right to run a firm during reorganization			0.0183 (0.0257)	0.0126 (0.0202)	0.0114 (0.0198)
ln (Total Assets)				0.0223 (0.0043)***	0.0221 (0.0045)***
Largest Shareholder				-0.0425 (0.0177)**	-0.0436 (0.0193)**
Largest Shareholder is State/ Public Authority				-0.0217 (0.0205)	-0.0319 (0.0212)
Largest Shareholder is Foreign				-0.0132 (0.0111)	-0.0178 (0.0110)
Private Credit to Total Credit					-0.0001 (0.0003)
ln (GDP per capita)	0.0444 (0.0085)***	0.0451 (0.0085)***	0.045 (0.0086)***	0.0273 (0.0090)***	0.0237 (0.0095)**
Constant	0.0748 (0.1366)	0.0907 (0.1346)	0.0699 (0.1364)	-0.0702 (0.1187)	-0.014 (0.1233)
Number of Observations	12,874	12,874	12,874	12,874	12,067
Number of Banks	2,499	2,499	2,499	2,499	2,351

**Table 5:****Random-Effects Regression to Explain the Ratio Total Loans to Total Assets- Developed Countries**

Based upon an unbalanced panel of 1,147 banks in 35 countries over the years 2000-2006, or a total of 6,140 observations. English, French, Socialist, German, and Scandinavian are dummy variables indicating the country's legal origin as first defined by LLSV (1998). English is the omitted category. Legal Formalism is the natural logarithm of the number of days needed to recover a debt equal to half of the country's GDP per capita, as defined by Djankov *et al.* (2007). Creditors' Rights is an index of four creditors' rights as first defined by LLSV (1998). Ln(GDP per capita) is the natural logarithm of the country's per capita Gross Domestic Product in each year. Ln (Total Assets) is the natural logarithm of total assets. Largest Shareholder is the ownership share of the largest shareholder. Largest Shareholder is State/ Public Authority and Largest Shareholder is Foreign are two dummy variables set to 1 if the largest shareholder is a public authority or foreign, respectively. Private Credit is the ratio of claims on private credit to domestic credit, and GDPPC is the per capita Gross Domestic Product. Table 1 provides more details on each variable. Robust standard errors are clustered by country. \*\*\*, \*\*, and \* indicate statistical significance at the 0.01, 0.05 and 0.10 levels, respectively.

	Model 1	Model 2	Model 3	Model 4	Model 5
French Legal Origin	-0.0139 (0.0527)	-0.0283 (0.0521)	-0.1473 (0.0720)**	-0.1169 (0.0627)*	-0.1195 (0.0630)*
Socialist Legal Origin					
German Legal Origin	-0.0031 (0.0593)	-0.0048 (0.0567)	-0.0176 (0.0523)	-0.0013 (0.0463)	0.0023 (0.0483)
Scandinavian Legal Origin	0.0633 (0.0596)	0.0644 (0.0565)	0.0521 (0.0597)	0.0794 (0.0580)	0.071 (0.0589)
Legal Formalism	0.0000 (0.0149)	0.0037 (0.0166)	-0.0027 (0.0186)	0.0168 (0.0144)	0.0143 (0.0154)
CR- Creditors Rights		-0.0116 (0.0187)			
CR1- Restrictions on filing for reorganization			-0.0368 (0.0480)	-0.0498 (0.0390)	-0.0495 (0.0412)
CR2- Right to seize collateral			-0.0498 (0.0323)	-0.0063 (0.0213)	-0.0181 (0.0245)
CR3- Right to be paid first			-0.1424 (0.0613)**	-0.1211 (0.0478)**	-0.1212 (0.0462)***
CR4- Right to run a firm during reorganization			0.0640 (0.0340)*	0.0025 (0.0250)	0.0094 (0.0272)
Ln (Total Assets)				0.0283 (0.0073)***	0.0282 (0.0074)***
Largest Shareholder				-0.0065 (0.0274)	-0.0082 (0.0280)
Largest Shareholder is State/ Public Authority				0.0064 (0.0701)	0.0007 (0.0716)
Largest Shareholder is Foreign				-0.0445 (0.0159)***	-0.0465 (0.0157)***
Private Credit to Total Credit					0.0658 (0.0304)**
Ln (GDP per capita)	0.0134 (0.0175)	0.013 (0.0176)	0.0132 (0.0176)	-0.0133 (0.0180)	-0.0151 (0.0178)
Constant	0.3753 (0.2183)*	0.3886 (0.2203)*	0.5369 (0.2299)**	0.3088 (0.2132)	0.2892 (0.2108)
Number of Observations	5,488	5,488	5,488	5,488	5,477
Number of Banks	1,027	1,027	1,027	1,027	1,026

**Table 6:****Random-Effects Regression to Explain the Ratio Total Loans to Total Assets- Developing Countries**

Based upon an unbalanced panel of 1,530 banks in 113 countries over the years 2000-2006, or a total of 7,705 observations. English, French, Socialist, German, and Scandinavian are dummy variables indicating the country's legal origin as first defined by LLSV (1998). English is the omitted category. Legal Formalism is the natural logarithm of the number of days needed to recover a debt equal to half of the country's GDP per capita, as defined by Djankov *et al.* (2007). Creditors' Rights is an index of four creditors' rights as first defined by LLSV (1998). Ln(GDP per capita) is the natural logarithm of the country's per capita Gross Domestic Product in each year. Ln (Total Assets) is the natural logarithm of total assets. Largest Shareholder is the ownership share of the largest shareholder. Largest Shareholder is State/ Public Authority and Largest Shareholder is Foreign are two dummy variables set to 1 if the largest shareholder is a public authority or foreign, respectively. Private Credit is the ratio of claims on private credit to domestic credit, and GDPPC is the per capita Gross Domestic Product. Table 1 provides more details on each variable. Robust standard errors are clustered by country. \*\*\*, \*\*, and \* indicate statistical significance at the 0.01, 0.05 and 0.10 levels, respectively.

	Model 1	Model 2	Model 3	Model 4	Model 5
French Legal Origin	-0.068 (0.0339)**	-0.098 (0.0360)***	-0.0875 (0.0336)***	-0.0738 (0.0315)**	-0.068 (0.0337)**
Socialist Legal Origin	-0.0212 (0.0342)	-0.0291 (0.0347)	-0.0396 (0.0320)	-0.0072 (0.0303)	-0.0144 (0.0341)
German Legal Origin	-0.0638 (0.0404)	-0.0645 (0.0380)*	-0.0863 (0.0404)**	-0.0691 (0.0336)**	-0.0433 (0.0295)
Legal Formalism	-0.0537 (0.0272)**	-0.0506 (0.0232)**	-0.0536 (0.0214)**	-0.0486 (0.0203)**	-0.0643 (0.0201)***
CR- Creditors Rights		-0.0338 (0.0149)**			
CR1- Restrictions on filing for reorganization			-0.0466 (0.0272)*	-0.0522 (0.0260)**	-0.0407 (0.0270)
CR2- Right to seize collateral			-0.0933 (0.0306)***	-0.0808 (0.0295)***	-0.0783 (0.0294)***
CR3- Right to be paid first			0.0171 (0.0275)	0.0115 (0.0257)	0.0155 (0.0283)
CR4- Right to run a firm during reorganization			-0.0032 (0.0268)	0.0113 (0.0252)	0.0151 (0.0267)
Ln (Total Assets)				0.0139 (0.0052)***	0.0127 (0.0055)**
Largest Shareholder				-0.0481 (0.0162)***	-0.0461 (0.0176)***
Largest Shareholder is State/ Public Authority				-0.0298 (0.0190)	-0.043 (0.0185)**
Largest Shareholder is Foreign				0.0045 (0.0133)	0.0024 (0.0143)
Private Credit to Total Credit					-0.0001 (0.0003)
Ln (GDP per capita)	0.0608 (0.0090)***	0.0622 (0.0088)***	0.0652 (0.0082)***	0.0524 (0.0086)***	0.0488 (0.0096)***
Constant	0.3805 (0.1791)**	0.4279 (0.1585)***	0.4033 (0.1457)***	0.2992 (0.1504)**	0.4247 (0.1481)***
Number of Observations	7,386	7,386	7,386	7,386	6,590
Number of Banks	1,472	1,472	1,472	1,472	1,325