How Law Affects Lending*

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ABSTRACT

The paper explores how legal change affects lending behavior in twelve transition economies of Central and Eastern Europe. In contrast to previous studies, we use bank level data rather than aggregate data, which allow us to control for country level heterogeneity and to analyze the effect of legal change on different types of lenders. Using differences-in-differences methodology to analyze the within country variation of changes in creditor rights protection, we find that lending volume increases subsequent to legal change. Further, we find that Collateral law matters more for development of financial markets as compared to Bankruptcy law. We also find that new entrants respond more strongly to legal change than do incumbents. In particular, foreign owned banks extend their lending volume substantially more than do domestic banks, be they private or state owned. The same holds when we use foreign green field banks as proxies for new entrants. These results are robust after controlling for a wide variety of possibilities.

JEL Codes: F34, F37, G21, G28, G33, K39.

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I. Introduction

The present paper addresses three major questions that are at the core of how law might influence credit market development: Does law promote lending? If so, what law? Do all creditors benefit from legal change in the same way or does legal change play into the strengths of some as opposed to other lenders?

Growing empirical evidence suggests that law is an important determinant of credit market development, at least in the long run (La Porta et al., 19987,1998; Levine, 1998,1999; Djankov et al., 2005).[1] The major function attributed to law is that it empowers creditors to enforce their contracts. Effective legal institutions reduce the risk of lending and therefore result in greater lending volume in an economy as a share of GDP. Implicit in this view of how law affects economic outcome is that all actors in the economy benefit from better law.

There are several drawbacks of studies in the law and finance tradition pioneered by La Porta et al. (1998). First, most of the research done in this area uses macro level indicators, such as the size of credit markets as a share of GDP. These aggregated outcome measures make it impossible to disentangle the impact of legal change on different market participants. Second, there are major endogeneity concerns regarding legal changes. What is ideally required is an exogenous variation in the legal variable of interest. Even though there is

[1]However, for transition economies these results have not been confirmed. In a study that closely follows the methodology developed by LLSV (1997), Pistor, Raiser and Gelfer (2000) find no statistically significant relation between the overall level of creditor rights protection and the size of credit markets. However, they do find that improvements of creditor rights over time appear to have a positive impact on the growth of credit markets - although the findings are only marginally statistically significant.

wide agreement among scholars[2] that legal institutions cause economics growth, the issue of causality is quite tricky and far from settled. Most of the existing research relies on cross-sectional studies that relate differences in legal institutions to various economic parameters. Clearly, countries that differ in their legal framework also differ in other observed as well as unobserved dimensions. Thus comparing countries with good legal institutions to those with bad legal institutions may capture the effect of omitted variables or unobserved differences. This can create huge biases in the results.[3] Third, legal variables in general are very sticky. Institutions do not change that often. Thus finding a within country variation in a legal variable is difficult.

We attempt to deal with the above mentioned concerns by focusing our research on 12 transition economies. These economies have undergone major legal reforms at different points in time. Using a differences-in-differences methodology and combining data sets on bank lending behavior, bank ownership structures, and legal change we exploit within country variation. These data allow us to explore the causal relation between law and lending behavior. Further, we use the data sets to disentangle the impact of law on different types of lenders. To our knowledge, this is the first study to explore the causal relation between creditor rights protection law and behavioral change at the microlevel.

[2]Rajan and Zingales(2003) and Levine (1999)

[3]The study by Pistor et al (2000) is a notable exception in that it utilizes time series variation for statistical inference.

We find that law does in fact promote lending. The overall level of formal creditor rights protection is positively associated with the lending volume, and so is legal change with increases in lending volume over time. Differentiating between legal rules designed to protect individual creditors' claims outside bankruptcy (Collateral) and the collective enforcement regime bankruptcy establishes (Bankruptcy), we find Collateral to be more important than Bankruptcy. Finally, our data suggest that new entrants to the market, and in particular foreign banks, respond more strongly to legal change than do incumbents by increasing their lending volume. The same is true when comparing green-field banks with incumbents. An important implication of this finding is that financial development in these countries takes place by increasing the number of banks as well as the lending volume per bank.

II. Law and Debt Finance

The article "law and finance" by La Porta et al. (1998) has elevated law to an important explanatory variable for financial market development. The findings of their paper are based on the observation that legal rules covering the protection of corporate shareholders and creditors differ widely among countries. These differences in the legal system can be used as determinants of the structure and size of capital markets. However, this analysis captures

only the static relationship between creditor protection and financial development, not the dynamic interaction between these variables.[4]

Moreover, the literature ignores the transmission channel through which changes in law propagate to the firms. This would have been inconsequential if the markets were perfect.[5] However, it is widely accepted that markets are far from perfect and therefore some type of friction is generally used in modeling real world scenarios. In the case of creditor rights, changes in legislation are passed on to the real economy via financial intermediaries (i.e. banks). Therefore, there appears to be a direct relationship between the behavior of banks and creditor legislation[6]

Several empirical studies investigate the role of banking and lending in transition economies. Bonin et al. (2004, 2005) focus on the determinants of banking performance and efficiency in transition economies. Demirguc-Kunt and Huizingac (1999) allow legal and institutional cross-country differences to have an impact on banking performance in developed as well as transition countries. They regress indicators for contract enforcement, efficiency of the legal system and lack of corruption on banks' net interest margins and returns on assets. They find a significant negative relationship between their measures on the one hand, and realized interest margins and profitability on the other. However, these legal indices are based on surveys and use perception data rather than objective indicators. There-

[4]See Beck and Levine (2004) for a current literature overview.

[5]In the Arrow-Debreu general equilibrium framework, there is no role for banks.

[6]A recent set of papers document the impact of differences in creditor rights on financial contracts. Qian and Strahan (2005), Davedenko and Franks (2005) and Acharya et al.(2005) are some notable examles.

fore, they may proxy for the quality of the institutional environment, but say little about institutions directly responsible for enforcing creditor rights.

The goal of this paper is to establish how law and legal change affects banks' willingness to lend. Moreover, we are interested in exploring the relative importance of different aspects of creditor rights protection. By contrast, previous literatures focus either exclusively on secured lending, or lump together legal legal protections for creditors insider and outside bankruptcy, assuming that contracting takes place in the shadow of the law irrespective of its specific features.

An important insight of the literature on secured lending is that in perfect markets with risk neutral lenders collateral does not play a significant role.[7] However, it is widely accepted that markets are far from perfect and instead are characterized by incomplete and asymmetric information. Bester (1985) and Besanko and Thakor (1987) argue that in real markets collateral serves as a signaling tool which helps lenders sort firms into their respective risk classes. The equilibrium in these models is characterized by collateral being offered by the low risk firms which in turn get paid a lower interest rate whereas the high risk firms choose not to use collateral and are therefore charged a higher interest rate.

In contrast to the secured lending literature, the theoretical bankruptcy literature focuses on the problem of resolving multiple creditor claims in the context of bankruptcy, link-

[7] As mentioned in Schwartz (1981), the argument that collateral lowers the cost of borrowing is incorrect in perfect markets setting.

ing the effectiveness of the contractual commitment device to the number of creditors (see Bolton and Scharfstein, 1996; see also Berglof, Roland, and Von Thadden, 2000). Cross-country empirical studies also tend to focus on creditor rights in bankruptcy. Claessens and Klapper (2005), for example, conduct a survey on the number of bankruptcies worldwide including the transition economies. When using the La Porta et al. (1998) creditor rights indices they find no relation between the level of creditor rigths protection in general and the number of bankruptcies. However, when dissecting the cumulative creditor rights index into its various sub-compoments, they do find a significant relationship with some variables. Specifically, the existence of laws for restrictive reorganization seems to be negatively related, whereas laws that do not allow an automatic stay on assets are positively related with the number of observed bankruptcies.

Finally, there is a substantial literature on bankruptcy in transition economies (see Berglof and Roland (1997, 1998) Dewatripont and Roland (1999)). According to the models developed in these papers, an important characteristic of transition economies is the soft budget constraint, implying that borrowers are aware that lenders cannot enforce the lending contract once they fail to repay their debt. This moral hazard problem reduces banks' willingness to lend. In theory, legal protection of creditor rights may help harden the soft budget constraint and thereby induce an expansion of the supply side of lending. However, several empirical studies on creditor rights protection in transition economies have shown that the positive effect of the law may depend on the nature of the change and the context in

which it is effectuated. Thus, Bonin and Schaffer (2002) review the bankruptcy legislation in Hungary. They argue that the reliance on an automatic trigger for initiation bankruptcy complicates the position of the banking sector. A recent study by Lambert-Mogiliansky et al. (2003) analyzes the behavior of courts as an explaining factor for the number of bankruptcies. They survey how the treatment of firms in bankruptcy depends on the regional location of the courts in Russia.

In sum, several literatures address the relation between law and finance either theoretically or empirically. There is a general consensus that law matters for finance. However, the literature is relatively silent on the mechanisms through which law affects outcomes. This paper builds on these literatures and contributes to our understanding of the dynamic interaction between law and finance by exploring how different features of the law affect the willingness of different types of banks to lend over time.

III. Analytical Framework

If lenders had perfect information about their borrowers and effective substitutes to formal law at their disposal to prevent and/or punish strategic default Law and legal change should have no impact on lending behavior. Thus, in a market where players know and can effectively monitor each other and punish default by denying defaulting borrowers future access to credit, law should not be of great importance for banks' willingness to lend. By the

same token legal change should have little effect on changes in the lending volume. Even in the absence of such ideal conditions, law may not be the primary ordering mechanism for lending relations. An extensive literature has analyzed substitutes for formal legal creditor protection. They include multilateral governance devices, such as networks of middlemen (Greif, Milgrom, and Weingast 1994; Casella and Rauch 1998), or company groups that internalize credit markets (Kali 1999). Alternatively a lender can require the transfer of a collateral, which functions as a screening device to mitigate adverse selection problems (Beste, 1985; Kronman 1985). Finally, lenders can charge interest rates that reflect their full risks, thus increasing the overall costs of borrowing and effectively denying many market participants access to credit markets (Stiglitz and Weiss 1981). Higher interest rates can also lead to moral hazard problems, resulting in suboptimal efforts exerted by borrowing firms to repay their loans.

All of these essentially non-legal strategies entail costs and may reduce creditors' willingness to lend. Mulilateral governance devices typically work well for networks or relations linked not only by commercial, but also by ethnic and/or religious ties, thus subjecting defectors to multiple punishments (Landa 1981). While this reduces the costs of monitoring for those participating in the network relation, outsiders are denied access to credit or face substantially higher costs. Similarly, the internalization of credit markets benefits members of a company group, but crowds out others and may change the quality of borrowers in

the market as most players will seek membership to a group leaving the least viable firms outside (Kali 1999).

The major contribution of this paper is to analyze more precisely how law affects lending. We begin the analysis by investigating the impact of changes in creditor rights on banks' lending. We next explore the possibility that some aspects of creditor rights are more important than others by making use of the various subindices created in previous studies on legal change in transition economies (Pistor, 2000). Finally, we relax the assumption commonly made in empirical studies that law and legal change affects all lenders in a similar fashion. We explore variations among different groups of lenders by classifying them by ownership (foreign, domestic private and state), and by status as new entrants or incumbents.

A. Formal Law and Banks' Lending Behavior

Formal law may affect banks' willingness to lend by making legal protection generally available without regards to group or network membership. The threat of effective contract enforcement in a court of law will deter the borrower from defecting and should therefore lower the cost of lending. More generally, good institutions solve the borrower's commitment problem and reduce both adverse selection and moral hazard problems.

Our first Hypothesis therefore is:

Hypothesis 1: The introduction and/or strengthening of formal legal creditor rights is positively associated with increases in banks' lending volume.

B. Collateral vs. Bankruptcy Regimes

In addition to providing effective contract enforcement mechanisms, the law may facilitate the collateralization of assets, thus reducing agency costs associated with imperfect or asymmetric information. There is little need for formal legal protection when the borrower transfers possession over the secured asset to the lender as the lender now has physical control over the asset and can satisfy his claims against the debtor at will. This, however, is costly for the borrower who loses an asset that could be put to economic usage, and for the lender who may not have any use for it, but has to store and maintain it. A more cost effective result can be obtained by creating registration systems and making the creation of a legally enforceable security conditional on valid registration rather than transfer of possession.

Such systems are common for security interests (mortgages) in real estate where land registries have long performed the relevant function in many countries and across legal systems, but are of more recent origin for personal property, or "movable assets". In the United States registries for personal properties were introduced with Art. 9 of the Uniform Commercial Code. The transition economies initially followed the continental European tradition, requiring the transfer of possession for the valid creation of a security interest in movable assets. In order to boost credit market development in these countries, the Euro-

pean Bank for Reconstruction and Development (EBRD) developed a model law on security interests for transition economies in 1994. Many countries in our sample implemented at least parts of this model law over time and this paper offers the first systematic analysis of how the implementation of the model law in various countries has affected banks' lending behavior.

The current law and finance literature relies primarily on creditor rights protection in bankruptcy for assessing the quality of a country's creditor rights regime and ignores details of the collateral regime. Bankruptcy is a major event debtor and creditor alike. At this stage the critical issue for the creditor is not so much whether she can recover from the borrower, as recovery rates tend to be low or zero in most cases. Instead, the primary interest shifts to whether a particular creditor's claim will trump other creditors' claims. Bankruptcy is a collective enforcement regime designed to ensure an orderly distribution of the remaining assets, and on occasion to facilitate the refinancing of distressed firms. From an individual creditor's perspective bankruptcy is always the second best to individual enforcement (Baird 1991). The calculus changes only when a run on the assets is imminent, at which point securing a fraction of a claim becomes superior to loosing out completely to fellow creditors. This does not mean that creditors are indifferent to the design of a bankruptcy regime. In fact, the treatment of individual creditor rights claims, in particular of secured claims, in bankruptcy is likely to determine the extent to which lenders are willing to make use of security interests in the first place.

Not surprisingly, in the coding of creditor rights by La Porta et al (1997, 1998) two of the four indicators are devoted to the role of secured creditors in bankruptcy. One is ”secured creditors first”, which means that secured creditors have priority over all other creditors - including employees, tax authorities and unsecured creditors - when assets of a liquidated debtor are distributed. The other is ”no automatic stay on assets”. An automatic stay means that as long as the stay is in effect, secured creditors cannot take out the asset they secured, but have to wait until creditors have decided to deny reorganization of the firm and to move into liquidation. Obviously, an automatic stay weakens the enforcement powers of a secured creditor. The rational is that without imposing a stay on assets, there will be little prospect for reorganizing a firm. This analysis also suggests an important relation between individual creditor rights protection and the design of the collective resolution system called bankruptcy. Legal rules in bankruptcy, such as ”secured creditors first” or ”automatic stay on asset” assume the existence of individual creditor protections and are useless without them (Pistor 2000).

More generally, we propose that not all creditor rights protection devices are of equal importance to lenders. From a lender’s perspective, her ability to enforce claims against her borrower individually and independently of other creditors is likely to be greater importance than the details of a bankruptcy regime, since at this time the prospect of recovering anything tends to be low in any case. Moreover, a well designed bankruptcy regime is critically dependent on the existence of a collateral regime that protects individual creditors’ interests.

Hypothesis 2: A collateral regime is of greater relevance to lenders than a bankruptcy regime.

C. Winners and Losers of Legal Change

So far our analysis has focused on the first two questions we posed: Does law affect lending behavior? And if so, what law? We now turn to the third question, namely whether all lenders benefit from legal change in the same way. If all lenders started from the same baseline they all should benefit equally from legal change that reduces the cost of lending. Yet, not all lenders necessarily start from the same position. Incumbent lenders with a well established relation based network of borrowers may be less dependent on formal legal protection than new entrants that lack similar networks of relations.

In the transition economies in our sample many new entrants were foreign banks. Buch (2003) suggests that foreign banks entering a new market are disadvantaged vis-à-vis incumbents as they may find it difficult to break into existing relational networks. Moreover they lack the information and cultural know how to effectively compete with domestic players. The strengthening of formal creditor rights protection may benefit foreign players by reducing the cultural and informational barriers to entry. Moreover, if, as suggested in some of the literature (Khanna and Palepu 2000) foreign banks are indeed more efficient lenders than domestic banks, strengthening creditor rights should help foreign banks take full advantage

of their greater expertise, as legal protections may offer a substitute for cultural and local knowledge. Our third hypothesis therefore is:

Hypothesis 3: Improvements in creditor rights are associated with higher lending volume of new entrants (foreign banks) as compared to incumbents (domestic banks)

IV. Data

Our study analyzes changes in legal regimes and lending markets in the context of Central and Eastern European transition economies. These countries were chosen for three reasons. Firstly, in all countries under consideration bank based financing is of crucial importance for financial market development, as equity based financing plays only a marginal role (Berglöf and Bolton 2002). Second, virtually all countries have experienced major revisions of their creditor rights regimes, including collateral and bankruptcy regimes, since the inception of economic reforms in the early 1990s and throughout the period we investigate. Third, the composition of the banking market has changed considerably in these countries, allowing us to investigate the impact of legal change on different types of lenders.

A. Bank Data

In order to gain detailed information about the behavior of banks in transition economies we created an extensive database on bank specific balance sheet items. The Bureau van

Dyck Bankscope database, which covers banks controlling at least 85 percent of the banking assets in each nation, served as the main source of information. We decided to eliminate all unconsolidated statements whenever both consolidated and unconsolidated statements were reported by Bankscope. Furthermore, we only report commercial banks, since the behavior of non-commercial banks might not reflect profit-maximizing banking behavior. In particular, we exclude national banks, trade banks, agricultural banks, cooperative banks, development banks, automotive banks, and investment banks. We collect data for 12 Eastern European transition countries (Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovak Republic, Slovenia, Ukraine) from 1994 throughout 2002. Table *III* [8] gives the frequency distributions of our sample by country and year.

A central issue of this study is the ownership of banks, specifically whether a bank is foreign or domestically owned. Bankscope offers incomplete shareholder information for 2002. A classification into foreign and domestically owned banks based on shareholder information of the year 2002 is likely to be misleading, since a considerable number of banks was privatized during the sample period. Many banks were domestically owned at the outset of the sample period and sold to foreign investors or banks in the late nineties. Therefore, time series information on banking ownership is indispensable. This time series information was gathered by consulting central banks reports, annual reports of the banks and the bank's internet presence. A bank is defined as being foreign owned if foreigners or

[8]Note that there is a considerable increase in the number of banks in the initial years in our sample, but levels out from the late nineties onwards.

foreign entities own 50 percent or more of its assets. A bank is also considered foreign if it is a subsidiary of a domestic bank that is itself owned by foreigners.[9] As can be seen in figure 1, which presents the number of domestic, foreign, government and domestic private banks over time, there has been considerable change in banking ownership during the sample period. The number of foreign banks drastically increased as a result of foreign acquisitions (during privatization or subsequently) and the establishment of foreign greenfield banks.[10] The steady rise of foreign banking participation can be further illustrated by presenting the average market shares of foreign banks over time (as can be seen in figure 2). At the outset of the sample, foreign banks only controlled 18 percent of the market, but more than 70 percent in 2002.

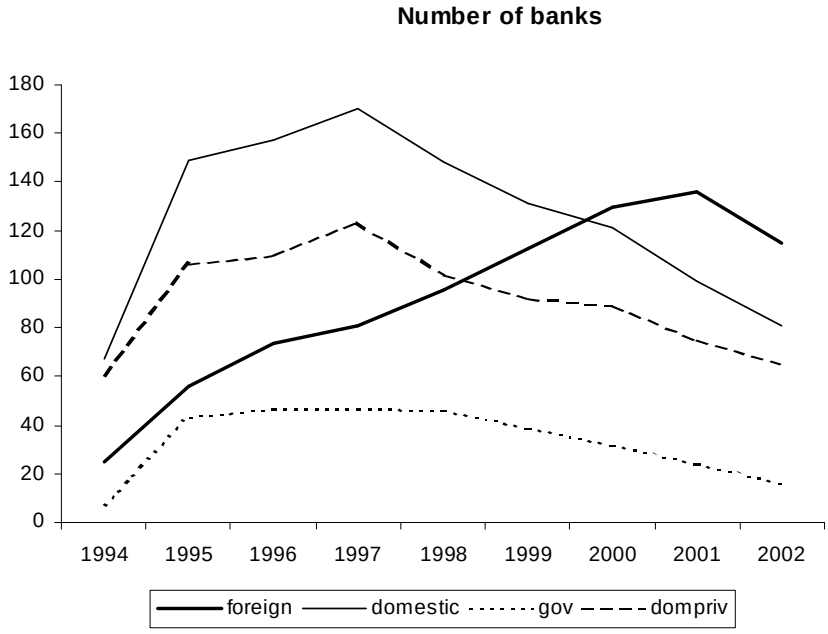

Figure 1. Number of banks classified by ownership

[9] In the relevant literature this aspect is generally left aside when defining foreign banking ownership.

[10] This outcome underlines the importance of hand-collecting ownership information for the sample and not to rely on the information provided by Bankscope at one point in time only.

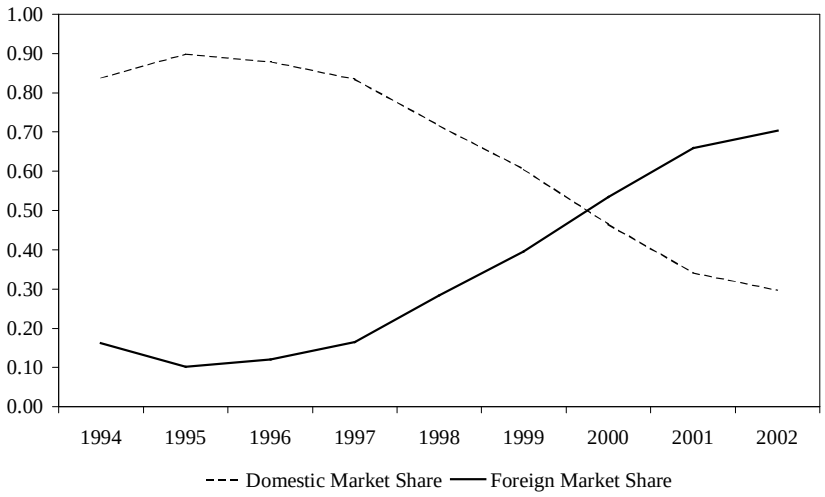

Figure 2. Market shares of banks classified by ownership

Based on this database we also analyze bank-specific information. Loans are defined as total customer loans. The solvency of a bank is defined as the ratio of total equity and total assets. A bank's liquidity is determined by the ratio of liquid to total assets, where liquid assets are the sum of trading and equity securities, cash, dues from central bank and treasury bills. Descriptive statistics for the bank specific indicators are presented in table *I*. In table *II* these indicators are further divided into ownership categories. These ownership categories encompass foreign and domestic banks, while foreign banks are further divided into those that enter the market by taking a over a domestic bank (take-over) and those that founded a new bank (greenfield). On average, foreign banks are slightly bigger in terms of assets and average total loans. The foreign take-over banks are more than three times larger than the greenfield banks. Domestic banks are split up into government and private owned banks. Domestic government owned banks are clearly bigger than domestic private banks.

These differences are less pronounced in the equity to asset, loan to asset, profit to asset and liquidity ratio. Domestic private banks have the highest solvency ratio.

B. Legal Data

To capture formal legal change, we code statutory legal change for the twelve countries in our sample for the period from 1992 through 2003. Earlier data were drawn from (Pistor, Raiser, and Gelfer 2000). Information on additional indicators and the period after 1998 was hand collected from statutory law in the twelve countries. We distinguish between the individual creditor rights regime (Collateral) from the collective creditor rights regime (Bankruptcy). For Collateral we focus on the introduction of non-possessory security interests over movable assets. All countries in question formally recognized by 1994 the possibility to secure land by way of establishing a mortgage that would be recorded in local land or court registries. Anecdotal evidence suggests that there was substantial variance within countries over time and across countries in the development of a real estate market and the enforcement of rights related to real estate (Harding 1996). Systematic comparative data on the development of a mortgage market in the countries in our sample, however, is not available.

We therefore code the development of a collateral regime for personal property (movable assets). Exclusive reliance on real property for securing loans may crowd out companies with limited real estate, in particular small and medium size firms. Introducing an

effective collateral regime for security interests in movable assets (personal property) expands the scope of assets a creditor may secure in return for a loan. The critical issue is not whether or not a country allows that movable assets may be secured - all countries did this early on in the transition process. Instead it is, whether they recognize non-possessory security interests (collateral) in movable assets. To capture this, we code two indicators. First, whether a country's law recognizes that a legally valid security interest can be established without transferring possession over this asset to the lender. And second, whether a country has a system in place for the registration of such security interests. The first of the two variables notes the existence of a non-possessory charge, the second checks for the verifiability of such charges. This is crucial, because an asset may be secured more than once. Registering security interests allows creditors to establish their priority vis-à-vis each other. The cumulative index Collateral is the sum of the two sub-indicators.

For the collective creditor rights regime (Bankruptcy) we use the two indicators included in the LLSV coding (1998) discussed above, namely "Secured Creditors First" and "No Stay on Assets". In addition, we include indicators for the initiation reorganization procedures and for creditor initiated triggers. LLSV also code reorganization asking whether there can be reorganization without creditors' consent. By contrast, we deem the timing of creditor consent crucial. If the debtor cannot on her own trigger a reorganization procedure without creditor consent, this is different from whether a debtor may initiate insolvency proceedings, but the choice between a reorganization or liquidation procedure is made af-

ter proceedings have been initiated. Clearly, the first variant is more debtor friendly than the second, because in the latter case the debtor faces substantial uncertainty as to whether reorganization will be seriously considered at all. We therefore require that creditor consent must be given at the initiation stage. Only where this is not the case do we code that reorganization does not require creditor consent. Finally, many transition economies have experimented with a so-called ”automatic trigger”. The most widely discussed case has been the debtor-trigger Hungary introduced in 1992 (Bonin and Schaffer 2002). The law required each debtor who was unable to pay his debts after they became due for 90 days to file for reorganization. The trigger was, however, soon removed, because it caused an excessive number of debtor filed bankruptcies. However, Hungary as well as many other countries also introduced creditor-triggers allowing creditors to file for bankruptcy when the debtor had failed to pay his dues of a minimum amount for 90 days (or other time frame depending on the legal system) after they had become due. Creditor triggers lower the verification costs of bankruptcy. Creditors suffer from information problems particularly in the context of transition economies. Allowing them to file for bankruptcy when events they can easily verify occur, addresses this problem. Table *IV* below summarized the definitions of indicators and lists the cumulative indices we have created. The sum of the two indicators is Creditor Rights.

Finally, our macro indicators are taken from the World Bank - World Development Indicators (GDP overall and per capita) and the IMF - International Financial Statistics 2004 (lending and deposit rates).

V. Empirical Analysis

The methodology we use is commonly referred to as the differences-in-differences approach. Using bank-level data we test the following specification.

$$y_{it} = \alpha_t + \alpha_i + \gamma \cdot X_{it} + \delta \cdot CreditorRights_{jt} + \varepsilon_{it} \quad (1)$$

where i indexes firms, j indexes countries and t indexes year. y_{it} is the level of loans. The year fixed effects and the bank fixed effects are given respectively by α_t and α_i. X_{it} refers to the control variables. $CreditorRights_{jt}$ is our legal variable defined as described in the previous section. Our variable of interest in the regressions is δ which measures the sensitivity to the legal change. The specification stated above does not control for bank*year specific shocks. However, we do use several control variables to address those concerns.

Several studies have used such a research design, particularly in labor economics, of which Card and Krueger (1994) and Bertrand and Mullainathan (2004) are some notable examples. The multiple pre-intervention and post-intervention time periods take care of

many threats concerning validity. This methodology [11] is best illustrated by the following example. Suppose we have two countries, A and B, undergoing legal changes at times t= 1 and t=2 respectively. Consider t=0 to be the starting period in our sample. From t=1 to t = 2 country B initially serves as a control group for legal change and after that serves as a treated group for subsequent years. Therefore most countries belong to both treated and control groups at different points of time. This specification is robust to the fact that some groups might not be treated at all, or other groups that were treated prior to 1994, which is our sample's beginning date. However, this approach is not able to capture any changes contemporaneous with changes in legal framework. Omitted interactions might also be a valid concern.

For the differences-in-differences approach to be meaningful, two aspects need to be accounted for. First, a similarity between comparison groups is desirable. Meyers (1995) has emphasized the importance of group similarity in research while suggesting that "for a given degree of similarity within the treatment group, however, greater differences across comparison groups are desirable if they are likely to lead to different biases." Second, and more importantly for our analysis, is that the change in creditor rights is exogenous.

The first issue surrounding similar comparison groups has little effect on our analysis since our sample consists of Eastern European Economies, which are similar along several critical dimensions. All countries in our sample share the legacy of socialism and introduced

[11] Here we assume that the Legal variable is a 0-1 binary variable. However, this intuition extends when *Legal* variable is an index. Basically, the DD strategy identifies out of differences.

substantial economic reforms in the early 1990s. Moreover, all countries share a proximity to Western Europe and most were slated for membership in the EU, which served as an important anchor for economic and legal reforms. Furthermore, the pooling of data from different countries is helpful if each country has a different bias.

The second aspect regarding endogeneity is an important concern. However, our analysis is at the bank level as opposed to the country level, which eliminates most concerns. Moreover, legal change in these countries was largely induced by external pressures, including policy advice by multilateral (World Bank, EBRD) or bilateral (USAID) lending organizations, and the quest of joining the European Union (Pistor et al., 2000). Most of the countries in our sample have been slated to join the European Union and were required to implement extensive legal reforms to comply with the body of EU legislation, the so called Acquis Communautaire.

Finally, we use block bootstrapped robust clustered[12] standard errors keeping the Bertrand and Mullainathan(2004) critique in mind.

VI. Results

In this section we report the results of our empirical analysis. In the first subsection we explore the influence of legislation on the loan supply of banks while in the second subsection

[12]We cluster our standard errors by country.

we analyze what law affects banks' lending behavior. In the third subsection we test whether law has separate effects on different players, in particular on incumbents vs. new entrants. The section finishes by presenting robustness tests.

A. Loan Supply

We begin by running specification 1. Table *V* reports the relevance of the Creditor Rights variable. As can be seen, the coefficients on the legal variables are positive and highly significant. This result is robust to the inclusion of bank and year fixed effects used to control for any unobserved bank level heterogeneity and year specific shocks. (columns (1) and (1*)). In column (1**) we use bank level controls that have been shown to be important in previous research; results remain unchanged. The advantage of doing this is that it reduces the residual variance, thereby increasing the efficiency of the results. Including these variable does not change our results and in many cases strengthens them. However, because of the possibility of these variables endogenously affecting the dependent variableto we exclude these variables in subsequent regressions . Further, we use block bootstrapped robust clustered[13] standard errors.

In order to test for the robustness of the previous results, we can make use of a special characteristic of our underlying data set. The sample includes more than 50 multinational banks that operate in at least two different countries at the same point of time. This allows

[13]Clustering is done at the country level

us to test if banks allocate more credit to countries that had an improvement in their legal system compared to other countries they operate in. This constitutes a test for the effect of law on banking behavior by focusing on within bank variation in the data. An example illustrates the intuition behind this test. A bank supplies a certain amount of loans via different subsidiaries in country A and country B at $t = 0$. Further country A has a legal change between $t = 0$ and $t = 1$, while country B has none. By comparing the difference in loan supply at $t = 1$ and $t = 0$ between both subsidiaries allows to measure the impact of the legislative change within the same banking institution. The specification for this test is as follows:

$$y_{it} = \alpha_t + \alpha_k + \alpha_j + \gamma \cdot X_{it} + \delta \cdot CreditorRights_{jt} + \varepsilon_{it} \tag{2}$$

where i indexes subsidiaries, k indexes banks, j indexes countries and t indexes year. y_{it} is the level of loans for each subsidiary at each point in time. We control for bank fixed effects, country of operation fixed effects and year fixed effects. $Creditor\ Rights_{jt}$ is the legal variable defined above. Our variable of interest in the regressions is δ which measures the sensitivity to the legal change. As presented in table *VI*, *Creditor Rights* is highly significant in the presented specification. Specification 2 is also robust to the inclusion of country and year fixed effects.

A possible concern with this analysis is that our results may be driven by factors other than changes in the law. When Bank A acquires another Bank B, we see an increase in lending by Bank A. However, we do not document a similar decrease for Bank B as it

simply disappears from our sample. We may therefore observe an increase in lending by Bank A without an overall increase in credit supplied to the economy leading to incorrect identification. A related concern is that increases in average lending by banks that have been taken over by foreign banks could be as much a function of ownership change as of changes in the legal regime for creditor rights. To address these concerns, we restrict our sample to domestic incumbent banks only - eliminating foreign banks as well as domestic banks that have experienced an ownership change. We still find that legal change is positively associated with increases in lending behavior and the results are significant at the 99% level (Table *XI*). This clearly implies that change in lending behavior can be attributed directly to changes in the creditor rights' regime and not changes in bank ownership.

B. Collateral vs Bankruptcy

We now disaggregate the general measure for creditor rights protection into its two components, Collateral and Bankruptcy. Collateral measures whether creditors can use security interests in movable assets (personal property) to protect their loans. It consists of two subvariables: (1) the legal recognition of non-possessory security interests in movable assets; and (2) the existence of a registry to verify such interests. Collateral protects an individual creditor against default before a debtor enters bankruptcy. By contrast, Bankruptcy creates a collective enforcement regime once a debtor has become insolvent and specifies which creditors have priority over others. As can be seen from Table *V*, columns 2 and 3,

both “Collateral” and “Bankruptcy” variables turn out to be significant in univariate regressions. However, only the “Collateral” variable survives in the de-trended data (See Table *V*, columns 3* and 3*). Further, when we do a horse race between the two variables (Columns 2** and 3**), the “Bankruptcy” variable does not seem to be relevant in the regressions. Once again, we use block bootstrapped robust clustered standard errors where the clustering is at the country level.

We conclude from this that creditors’ ability to protect and enforce their individual claims against a defaulting debtor by using a collateral regime is of greater importance for banks’ lending behavior than bankruptcy’s collective enforcement regime.

C. Incumbents versus new entrants

The third question we try to answer in this paper is whether formal legal change affects different types of lenders in different ways. One would expect that foreign players are more receptive than domestic players to legal change since as new entrants to the domestic markets they benefit from the creation of a level playing field. This is consistent with the claim by Buch (2003), who suggests that foreign players might be disadvantaged due to cultural constraints. Taking advantage of formal legal protection may allow foreign banks to fully optimize their comparative lending advantage (Khanna and Palepu 2002).

The specification for this test is the following:

$$y_{it} = \alpha_t + \alpha_i + \gamma \cdot X_{it} + \beta \cdot OWN_{it} + \theta \cdot Legal_{jt} + \delta \cdot OWN_{it} \cdot CreditorRights_{jt} + \varepsilon_{it} \qquad (3)$$

where all variables and subscripts are defined as in specification 1. OWN_{it} is a dummy variable that takes the value of 1 if a bank is majority foreign owned and 0 otherwise. Our variable of interest in the regressions is δ, which measures the sensitivity to the interaction of the legal change and foreign ownership dummy. Our results as presented in table *VII* suggest that foreign banks indeed increase their lending volume in response to legal change more than do domestic banks. This is illustrated by the positive interaction coefficient of our legal variable with the foreign ownership dummy (*Foreign*).

So far we have treated foreign banks as new entrants and domestic banks as incumbents. In fact, many banks that became foreign owned banks were domestic private or state owned banks prior to the ownership change. To further investigate our proposition that law benefits primarily new entrants over incumbents, we reclassify new entrants and incumbents. We compare greenfield foreign owned banks with all other banks (see table *VIII*, columns (1) and (2)). The results point in the same direction as the test of foreign vs. domestic banks, even though the significance is lower. We believe that this is caused by the somewhat smaller sample, which includes only foreign owned banks. When our legal variable is replaced with "Collateral"', the interaction coefficient turns out to be significant at the 90 percent hurdle

(see column (5)*). Even though this coefficient is not strongly statistically significant the sign is in the correct direction and consistent with our other results.

VII. Conclusion

This paper has analyzed how law affects lending, i.e. through which channels law impacts economic outcomes. We find that formal legal change does indeed promote lending by banks and that a collateral regime is of greater importance for lenders than a bankruptcy regime. We also find that new entrants, in particular foreign banks, benefit more from legal change by expanding their lending volume more than do incument domestic banks.

The results of this study offer important insights into the dynamics of change in the supply side of loans by foreign vs. domestic lenders, incumbents vs. greenfield banks in response to changes in the law affecting various aspects of creditor rights protection. We find that changes lending volume in response to legal change is a function of an increase in the number of banks in an economy as well as increased lending volume per bank - with new entrants (foreign banks) tending to increase lending volume more than incumbents (domestic banks). Identifying these channels has been possible by moving the level of analysis from the macro to the micro level, by using time series data, and by differentiate between the nature of legal change on the one hand, and the identity of bank lenders on the

other. Moreover, employing DD analysis has allowed us to make stronger inferences about the causal nexus between banks, lending and the law.

As important as these findings are, our study can only be a first stepping stone in exploring more fully the causal nexus between legal change and lending behavior by different types of lenders. For example, while we can show that certain legal variable matter more than others and that some lenders respond more than others, we have not fully identified the channels through which law affects lending behavior. Thus, increases in lending behavior by foreign banks could be the result of more foreign banks entering the market by taking over domestic banks or establishing new ones; of foreign banks using formal creditor rights protection devices, such as collateral regimes, at a greater rate than domestic incumbents; or of foreign banks being more effective in contracting ”in the shadow of the law”. A clearer understanding of the indirect vs. direct effects of the law on lending behavior would further illuminate the causal nexus between lending and the law and be of great value for policy makers interested in how to achieve increases in loan supply.

Finally, our study has focused almost exclusively on the supply side of credits. We address demand side factors by controlling for changes in the overall economic environment. However, our data do not allow us to identify the borrowers to whom banks extend their loans. Thus, we cannot explude the possibility that the banks in our sample lend more to the same borrowers subsequent to legal change, rather than expanding the borrower base. Several recent studies have documented that small and medium size enterprises in transition

economies continue to suffer from lack of access to external sources of finance, including credit finance (Klapper et al (2005)). Others suggest that the entry of foreign banks has done little to improve the plight of these firms, and may in fact have worsened their access to credit finance (Brown and Maurer (2005)). These studies look exclusively at the demand side of loans. In order to obtain a fuller picture on how changes in the composition of the lending market affect firms' access to finance, it would be important to put together the supply and demand sides of the lending market and to analyze how law affects changes not only in lending volume, but also in the banks' customer base. We hope to take up some of these challenges in future research.

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Table I
Descriptive Statistics

Notes: This table reports mean values and standard deviations of the most important balance sheet items of the banks included in the sample. The sample is split up between foreign and domestic owned banks. All values are in millions of US dollars.

Variables	Mean	Standard Dev.
Loans	451.29	1039.12
Assets	981.81	2326.37
Equity	87.01	188.70
Equity/Assets	0.15	0.14
Loan/Assets	0.46	0.19
Profit/Assets	0.01	0.06
Solvency	0.15	0.14
Liquidity	0.23	0.22
Market share	0.05	0.10

Table II
Descriptive Statistics

Notes: This table reports mean values of the most important balance sheet items of the banks included in the sample. The sample is split up between foreign and domestic owned banks. Foreign banks are further classified into banks that have entered the market by a greenfield operation and those that have entered the market by taking over a domestic bank. Domestic banks are further split up into domestic private and domestic government owned banks. All values are in millions of US dollars.

Variables	Foreign			Domestic		
	total	green	take-over	total	gov	dom-priv
Obs.	828	500	328	1119	300	819
Loans	493.08	232.60	875.87	420.41	848.89	263.98
Assets	1070.14	498.16	1906.97	916.45	1913.63	551.19
Equity	95.97	43.04	173.50	80.37	148.74	55.33
Equity/Assets	0.12	0.12	0.12	0.16	0.13	0.17
Loan/Assets	0.47	0.47	0.49	0.46	0.46	0.45
Profit/Assets	0.01	0.01	0.01	0.01	0.01	0.01
Solvency	0.12	0.12	0.12	0.16	0.13	0.17
Liquidity	0.23	0.23	0.23	0.23	0.17	0.25
Market share	0.04	0.02	0.07	0.06	0.09	0.05

Table III: **Data Description**

Notes: This table reports the number of banks observations for each year and country. In the second part of the table banks are classified according to their ownership. A bank is defined as being foreign owned if more than 50 percent of its assets are owned by foreigners or foreign institutions.

	Total	Bulgaria	Croatia	Czech Republic	Estonia	Hungary	Latvia	Lithuania	Poland	Romania	Slovakia	Slovenia	Ukraine
Number of Banks	323	25	47	37	11	31	25	12	54	11	21	21	28
Number of Observations	1947	144	291	211	56	209	161	78	326	53	124	143	151
Observations by Year													
1994	73	4	10	13	6	4	6	3	16	1	2	4	4
1995	203	12	31	24	9	23	18	9	36	1	13	18	9
1996	229	14	34	26	9	25	20	10	42	2	18	20	9
1997	254	16	41	26	9	27	22	10	43	4	18	19	19
1998	241	19	36	23	4	24	20	10	41	9	17	18	20
1999	243	18	35	25	4	27	20	9	41	10	13	18	23
2000	253	22	36	26	5	28	19	9	41	9	15	18	25
2001	236	20	36	25	5	26	18	9	36	9	14	15	23
2002	215	19	32	23	5	25	18	9	30	8	14	13	19
Ownership: Percent of observations with majority ownership:													
Foreign	42.5	41.0	25.1	65.9	28.6	77.5	20.5	42.3	48.8	49.1	57.3	16.1	22.5
Domestic	57.5	59.0	74.9	34.1	71.4	22.5	79.5	57.7	51.2	50.9	42.7	83.9	77.5

Table IV
Overview of legal indicators

Definition	Collateral	Bankruptcy	Creditor Rights
Law recognizes non-possessory security interest	x		x
Law establishes registration system for non-possessory security interests	x		x
Secured Creditors First		x	x
No Automatic Stay on Assets		x	x
Debtor Requires Creditor Consent for Filing for Reorganization		x	x
Creditor Trigger		x	x

Table V: Regression results for the legal variable

Notes: Regression results from estimating specification 1. In all regressions the dependent variable is the logarithm of loans. Variables are defined as in table *IV*. Standard errors are reported in parentheses. The bottom line of the table states the adjusted R-squared of each estimation. Standard errors are block bootstrapped by clusters of their country of operation. * Significantly different from 0 at the 10-percent level. **Significantly different from 0 at the 5-percent level. ***Significantly different from 0 at the 1-percent level.

	(1)	(2)	(3)	(1)*	(2)*	(3)*	(1)**	(2)**	(3)**
Creditor Rights	0.559 (0.105)***			0.212 (0.104)***			0.231 (0.106)***		
Collateral		0.688 (0.141)***			0.287 (0.153)**			0.346 (0.083)***	
Bankruptcy			0.518 (0.163)***			0.070 (0.168)			0.035 (0.166)
bank/macro controls	no	no	no	no	no	no	yes	yes	yes
bank fixed effects	yes	yes	yes	yes	yes	yes	yes	yes	yes
year fixed effects	no	no	no	yes	yes	yes	yes	yes	yes
clustered st. errors	yes	yes	yes	yes	yes	yes	yes	yes	yes
R-squared	87.44%	86.92%	85.41%	89.77%	89.80%	89.55%	91.79%	91.89%	91.53%

Table VI
Regression results for the legal variable

Notes: Regression results from estimating specification 2. In all regressions the dependent variable is the logarithm of loans. Standard errors are reported in parentheses. The bottom line of the table states the adjusted R-squared of each estimation. * Significantly different from 0 at the 10-percent level. **Significantly different from 0 at the 5-percent level. ***Significantly different from 0 at the 1-percent level.

	(1)	(2)
Creditor Rights	0.330	0.330
	(0.141)**	(0.130)**
bank fixed effects	yes	yes
year fixed effects	yes	yes
country fixed effects	yes	yes
cluster	no	yes
R-squared	50.70%	50.70%

Table VII
Regression results for the legal variable

Notes: Regression results from estimating specification 3. In all regressions the dependent variable is the logarithm of loans. Variables are defined as in table *IV*. Standard errors are reported in parentheses. The bottom line of the table states the adjusted R-squared of each estimation.Standard errors are block bootstrapped by clusters of their country of operation. * Significantly different from 0 at the 10-percent level. **Significantly different from 0 at the 5-percent level. ***Significantly different from 0 at the 1-percent level.

	(1)	(2)	(3)
Foreign	-0.575	-1.017	-0.677
	(0.320)*	(0.382)**	(0.448)
Creditor Rights	0.163	0.106	0.055
	(0.101)*	(0.030)***	(0.043)
Creditor Rights*Foreign	0.156	0.323	0.216
	(0.085)*	(0.089)***	(0.122)*
bank/macro controls	no	no	yes
bank fixed effects	yes	yes	yes
year fixed effects	yes	yes	yes
country*year fixed intercepts	no	yes	yes
clustered st. errors	yes	yes	yes
R-squared	89.82%	91.57%	92.80%

Table VIII
Regression results comparing green field banks with others

Notes: Regression results from estimating specification 3. In all regressions the dependent variable is the logarithm of loans. Standard errors are reported in parentheses. The bottom line of the table states the adjusted R-squared of each estimation. * Significantly different from 0 at the 10-percent level. **Significantly different from 0 at the 5-percent level. ***Significantly different from 0 at the 1-percent level.

	(1)	(2)
Green	-	-
Creditor Rights	0.460 (0.092)***	0.460 (0.104)***
Creditor Rights*Green	0.260 (0.159)	0.260 (0.145)*
bank fixed effects	yes	yes
cluster	yes	yes
bootstrap st errors	no	yes
R-squared	87.21%	87.21%

Table IX
Overview of banking crises and liberalization dates in CEE countries

Notes: Classification of banking crises according to Caprio and Klingbiel (2003). Classification of banking sector liberalization according to the EBRD banking sector reform index. Dates stated in the table give the year when this indicator reached a value of 2 or higher.

Country	Banking Crises	Liberalization of banking market
Bulgaria	1995-1997	1995
Croatia	1996	1992
Czech Republic	1993-1997	1992
Estonia	1992-1995	1993
Hungary	1991-1995	1993
Latvia	1995-1997	1993
Lithuania	1995-1996	1993
Poland	1991-1995	1992
Romania	1998-1999	1994
Slovakia	1996-2000	1993
Slovenia	1992-1994	1993
Ukraine	1997-1998	1995

Table X
Overview of banking crises in CEE countries

Country	Crises Years	Scope of crises
Bulgaria	1995-1997	In 1995 an estimated 75 percent of banking system loans were substandard. The banking system experienced a run in early 1996. The government then stopped providing bailouts, prompting the closure of 19 banks accounting for one-third of sector assets. Surviving banks were recapitalized by 1997.
Croatia	1996	Five banks accounting for about half of banking system loans were deemed insolvent and taken over by the Bank Rehabilitation Agency.
Czech Republic	1993-1997	Several banks have closed since 1993. In 1994-95, 38 percent of banking system loans were nonperforming.
Estonia	1992-1995	Insolvent banks accounted for 41 percent of financial system assets. Five banks‘ licenses were revoked, and two major banks were merged and nationalized Two other large banks were merged and converted to a loan recovery agency. In 1994, the Social Bank, which controlled 10 percent of financial assets, failed.
Hungary	1991-1995	In the second half of 1993 eight banks - accounting for 25 percent of financial system assets - were deemed insolvent.
Latvia	1995-1997	Between 1994 and 1999, 35 banks saw their license revoked, were closed, or ceased operations.
Lithuania	1995-1996	In 1995, of 25 banks, 12 small banks were liquidated, 3 private banks (accounting for 29 percent of banking system deposits) failed, and 3 state-owned banks were deemed insolvent.
Poland	1991-1995	In 1991 seven of nine treasury-owned commercial banks - accounting for 90 percent of credit - the Bank for Food Economy, and the cooperative banking sector experienced solvency problems.
Romania	1998-1999	In 1998 nonperforming loans reached 25 - 30 percent in the six main state-owned banks.
Slovakia	1996-2000	In 1997 unrecoverable loans were estimated at 1001 billion crowns, or about 31 percent of loans bad 15 percent of GDP.
Slovenia	1992-1994	Three banks - accounting for two-thirds of banking system assets - were restructured.
Ukraine	1997-1998	By 1997, 32 of 195 banks were being liquidated, while 25 others were undergoing financial rehabilitation. Bad loans accounted for 5065 percent of assets even in some leading banks. In 1998 banks were further hit by the governments decision to restructure government debt.

Table XI
Robustness Test: Excluding both new entrants as well as banks that were taken over

Notes: Regression results from estimating specification 1. In all regressions the dependent variable is the logarithm of loans. Standard errors are reported in parentheses. The bottom line of the table states the adjusted R-squared of each estimation. * Significantly different from 0 at the 10-percent level. **Significantly different from 0 at the 5-percent level. ***Significantly different from 0 at the 1-percent level.

	1	2
Creditor Rights	0.367	0.231
	(0.1549)***	(0.09715)***
Country fixed effects	Yes	No
Year fixed effects	Yes	Yes
Bank fixed effects	No	Yes

Table XII
Rule of Law

Notes: Regression results from estimating specification 1+ $Rule of Law as an additional dependant variable$. In all regressions the dependent variable is the logarithm of loans. Standard errors are reported in parentheses. The bottom line of the table states the adjusted R-squared of each estimation. * Significantly different from 0 at the 10-percent level. **Significantly different from 0 at the 5-percent level. ***Significantly different from 0 at the 1-percent level.

Rule	0.0441	0.0088	0.00756	0.0058	0.0017
	(0.0078)***	(0.0127)	(0.008)	(0.01425)	(0.0126)
Creditor Rights				0.3523	0.2236
				(0.1539)	0.1082
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes
Country Fixed Effects	No	Yes	No	Yes	No
Bank Fixed Effects	No	No	Yes	No	Yes