How Law Affects Lending

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The paper investigates the effect of legal change on the lending behavior of banks in twelve transition economies. First, we find that banks increase the supply of credit subsequent to legal change. Second, changes in collateral law matter more for increases in bank lending than do changes in bankruptcy law. We attribute this finding to the different functions of collateral and bankruptcy law. While the former enhances the likelihood that individual creditors can realize their claims against a debtor, the latter ensures an orderly process for resolving multiple, and often conflicting, claims after a debtor has become insolvent. Finally, we find that foreign-owned banks respond more strongly to legal change than incumbents. (*JEL* F34, F37, G21, G28, G33, K39)

Previous studies (La Porta, Lopez-de-Silanes, Shleifer, and Vishny 1998, henceforth LLSV; Levine 1998, 1999; Djankov, McLiesh, and Shleifer 2007) have linked creditor rights with financial development by documenting positive correlations between creditor rights and the size of credit markets in cross-country regressions.[1] The major function attributed to law is that it empowers creditors to enforce their contracts. The suggested mechanism through which law affects financial development is by reducing the cost of external financing.[2]

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[1] Another important strand of this literature looks at the effect of legal codes on financial contracts (e.g., Acharya, John, and Sundaram 2006; Qian and Strahan 2007; Davydenko and Franks 2008).

[2] Liberti and Mian (2009) find that institutions that promote development decrease the cost of collateral.

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There is, however, scant attention paid to understanding the channel through which changes in legal institutions get transmitted to the economy. How do improvements of creditor rights get transmitted to the economy? Which laws matter more? Do laws affect all market participants in the same manner? A good and thorough understanding of these questions is essential if one has to incorporate creditor rights into broader discussions on policy. This article attempts to further the scholarship on law and finance by investigating these issues.

We exploit variation in legal institutions of twelve transition economies and employ a research design that is commonly referred to as the "quasi-natural experiment" approach. Using a differences-in-differences methodology (DID, henceforth), we find that law does in fact promote lending, i.e., overall level of formal creditor rights protection is positively associated with the lending volume.

A critical issue that is mostly ignored is what kind of creditor protection lenders are reasonably looking for. The existent empirical literature uses devices that protect creditors in bankruptcy, overlooking components that pertain to collateral laws. The LLSV index, the most widely used index in the Law and Finance literature, consists of four legal indicators: secured creditors first; management out; no automatic stay on assets; and creditor consent for reorganization. These indicators primarily protect creditors from competing claims by other creditors and not against a defaulting debtor. We therefore investigate which components of creditor rights are crucial for credit supply. Specifically, we differentiate between legal rules designed to protect individual creditors' claims outside bankruptcy (*Collateral*) and the collective enforcement regime bankruptcy establishes (*Bankruptcy*).

The key distinction between a collateral and bankruptcy regime is the following. The collateral regime specifies what type of assets can be pledged. For instance, it states whether land can be pledged as an asset and whether a valid security interest can be established in personal property without transferring possession over the asset to the creditor. Further, it stipulates whether a registration system for security interests in movable assets has been established. The distinct benefit of a credit registry is that it allows creditors' claims in secured assets to be easily verified against third parties. These parties may be either creditors wishing to secure the same asset at a later point in time, or buyers who acquire the asset from the debtor without knowing that the asset may have been secured already. The objective of the bankruptcy regime is to ensure that the liquidation process is carried out in a systematic and organized manner to avoid a wasteful run on the assets of the firm.

From a theoretical perspective, it is a priori not clear whether bankruptcy or collateral law is more important for the credit supply decisions of banks in emerging and transition economies. Several scholars have postulated that collective enforcement problems arising from coordination failures are a key impediment to financing, especially in emerging and transition economies, thus

underscoring the importance of bankruptcy design (see, for example, Gertner and Scharfstein 1991; Aghion, Hart, and Moore 1992; and Berkovitch and Israel 1999).

There is also a fairly large literature that documents the disciplining role of debt finance (Townsend 1979; Diamond 1984; Gale and Hellwig 1984; Bolton and Scharfstein 1990, 1996; Hart and Moore 1994; and several others), which comes from the liquidation threat that accompanies debt contracts. The threat of liquidation is governed by the collection rights that are accorded by the existing collateral law. Bankruptcy procedures respect these collection rights by privileging secured creditors over unsecured creditors. By implication, the relevance of bankruptcy law depends on the existence and scope of a country's collateral regime. Putting it differently, the existence of a collateral law is a precondition for the effectiveness of the bankruptcy regime. The relative importance of these laws (and their interactions) for lending, thus, remains an empirical question.

We find *Collateral* to be more important than *Bankruptcy*. This result is in contrast to previous articles, in which measures related to collective enforcement/reorganization (LLSV index) were used to proxy for creditor rights. Further, the effectiveness of a bankruptcy regime is conditional on the existing collateral regime, i.e., the existence of a strong collateral regime is critical for the efficacy of the bankruptcy regime.

Finally, our data suggest that entrants to the market, and in particular foreign banks, respond more strongly to legal change than incumbents by increasing their lending volume. The same is true when comparing greenfield banks with incumbents. The main intuition for this result comes from the notion that domestic banks have an informational advantage over foreign banks that may find it difficult to break into the existing relational networks (see, for example, Buch 2003). Specifically, they lack the information and cultural know-how to effectively compete with domestic players. The strengthening of formal creditor rights protection may reduce these cultural and informational barriers to market entry and therefore foreign players may benefit in particular. Moreover, if, as suggested in some of the literature (Claessens, Demirgüc-Kunt, and Huizinga 2001; Khanna and Palepu 2000; Brown and Maurer 2005; Mian 2006; and Giannetti and Ongena 2008, 2009), foreign banks are indeed more efficient lenders in emerging markets 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.[3]

To further corroborate our claims, we investigate the impact of legal change on different types of borrowers. We find that changes in creditor rights affect the composition of banks' financing. More specifically, improvements in collateral law result in an increase in individual and household lending, while lending to the government remains unaffected. Finally, legal improvements also affect

[3] Sengupta (2007) develops a formal model that captures the intuition of these findings.

firms' level of external debt and their capital structure. As a response to an improvement in collateral law, we detect that firms take on more debt and change their capital structure toward more debt financing. Moreover, these effects seem stronger for small firms.

There are several hurdles that hinder empirical research in this area. The first and foremost concern is related to the endogenous nature of legal institutions. The general problem is that legal variables are very sticky, as institutions hardly change. Most of the existing research, therefore, relies on cross-sectional studies that relate differences in legal institutions to various economic parameters. It may be clear, though, that countries that differ in their legal framework also differ in other dimensions, both observed and unobserved. Thus, comparing countries with good legal institutions to those with bad legal institutions may capture the effect of omitted variables or unobserved differences. Second, most of the prior research uses macro-level indicators, such as the size of credit markets as a share of GDP. The use of these aggregate outcome measures, even though extremely insightful, puts enormous constraints on the set of questions that can be explored.

We overcome these problems by focusing our study on twelve Central Eastern European (CEE) transition economies and assembling a unique matched database comprising bank-level information, ownership information, and time series information of legal changes for these countries. There are several advantages of using this set of countries as a laboratory: (i) these countries have undergone major legal reforms in the 1990s; (ii) these countries form a fairly homogeneous group; (iii) there is a considerable inter-temporal variation in the timing of these reforms; (iv) the reforms are motivated by pressures from outside governing bodies such as the European Union (EU),[4] European Bank for Reconstruction and Development (EBRD), and USAID; and (v) these are all bank-based economies; therefore, creditor rights should play an important role in these countries.[5]

There are several broad implications of our results. First, our article illustrates the causal nexus between law and lending. Elaborating further, strengthening creditor rights facilitates the credit supplied in the economy by increasing lenders' willingness to attract capital. Further, the results of our article suggest that foreign banks benefit more from changes in legal institutions when compared to domestic banks. This finding is consistent with the economic argument that legal institutions help reduce the information gap between borrowers and lenders. Thus, strengthening creditor rights also aids in attracting foreign capital to the country.

Second, an important empirical result of our article is that the ability to pledge assets seems to be an important determinant of credit supplied in the

[4] Most CEE countries were seeking EU membership, and there were strict guidelines that these countries had to adhere to.

[5] A drawback of using transition economies as a laboratory is that other events (e.g., institutional changes) could confound our empirical analysis. We address these concerns in Section 3.4.

economy. The collateral variable, however, has been vastly ignored in prior empirical work. This article suggests that it plays an important role, especially in emerging and transitional economies where information asymmetries tend to be of a greater concern compared to developed markets. Further, our study documents that the existence of a functioning collateral regime is essential for the effectiveness of the bankruptcy regime.

Finally, our results suggest that the effect of legal change is different across different types of borrowers. Collateral law favors individual consumers and smaller borrowers more compared to corporate lending. Thus law also aids in creating new markets.

1. Legal Reforms and Data

In this section, we provide detailed information on the legal reforms that constitute the event in our analysis, as well as information on the data set that we employed.

1.1 The event: Creditor rights reforms in Eastern Europe

Our sample consists of the ten new Eastern European EU member countries (Bulgaria, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovak Republic, Slovenia) together with Croatia and Ukraine. At the outset of legal reforms, these former socialist countries had their level of shareholder and creditor protection well below the world average (Pistor 2000). In an attempt to reform these laws, the EBRD established the secured transactions project, which culminated in the formation of the so-called model law (Dahan 2000). The model law served as a template from which the national legislation of transition economies was drafted.[6] According to the EBRD (2000):

> The model law is intended to form a basis from which national legislation for transition countries can be developed, [. . .], indicating through a detailed legal text how the principal components of a secured transactions law can be drafted.

The model law together with some elements of American Uniform Commercial Code (UCC) were used in a number of reform projects throughout the region to induce and shape reforms. The detailed information on the reforms, collected through several interviews with individual members involved in the reforms, is summarized in Table 1. With Estonia being an exception, all observed reforms were accompanied by foreign donors, as well as foreign contractors. These reforms of creditor rights constitute the event for our subsequent analysis.

[6] Besides the EBRD, other multilateral and bilateral development agencies such as the World Bank and USAID identified the need to adapt a legal framework for the former socialist countries.

Table 1
Foreign involvement in the law-making process of CEE economies

		Collateral law	Bankruptcy Law
Bulgaria	Change	1997	—
	Institutions	IRIS/Center for the Study of Democracy (CSD)/USAID/EBRD	EU Phare
	Notes	A joint CSD-IRIS Project coordinated with the Ministry of Justice of Bulgaria to draft Registered Pledges Law. USAID and EBRD provided technical assistance to the expert team at the time of reform.	Support to Bankruptcy Unit through the main contractor Deloitte.
Croatia	Change	—	1996
	Institutions	USAID/World Bank	USAID/World Bank/GTZ
	Notes	The system has only changed until recently (2006) where a collateral register is supposed to have started operations.	Modeled similar to German law facilitated by GTZ.
Czech Rep.	Change	—	—
	Institutions		USAID
	Notes	Reform efforts were entirely home grown led by the chamber of notaries.	Bankruptcy law is only now being revised.
Estonia	Change	1996	2000
	Institutions		
	Notes		
Hungary	Change	1996/1997	—
	Institutions	EBRD	
	Notes	EBRD's Model Law and Atilla Haramathy were leading player in Civil Code reform. The EBRD further provided technical assistance for the development of the register.	
Latvia	Change	1998	1996
	Institutions	ABA/USAID/EBRD	
	Notes	Initiative was started within the country but there was considerable support by ABA-CEELI, USAID and EBRD.	Regulator in place since early 2000's. New law being drafted.
Lithuania	Change	1997	—
	Institutions	NDR (Norwegian company)/ IRIS	
	Notes	The credit register was set up with the assistance of a Norwegian company, based on Norwegian law model.	

Poland	Change	1998	—
	Institutions	IRIS	USAID
	Notes	IRIS played an important substantive and catalytic role in developing the appropriate language for bills and moving laws to the top of the legislative calendar.	USAIS was active by providing funds to the contractor IRIS.
Romania	Change	1999/2000	1995/2002
	Institutions	World Bank/CEAL	USAID/ EU
	Notes	The World Bank launched a project which covered collateral law (contractor: CEAL and Heywood Fleisig).	Contractor: Caranna and KPMG Bearing Point.
Slovak Rep.	Change	2002	2000
	Institutions	EBRD	World Bank
	Notes	EBRD worked with the government from 1999 until 2003 when the reform started operating in 2002.	Various contractors financed by the World Bank.
Slovenia	Change	—	—
	Institutions		
	Notes	No external influence intended to modernize the system. Credit register was reformed in July 2004.	Law remains substantially unreformed since 1992.
Ukraine	Change	—	2000
	Institutions	World Bank/CEAL	USAID/ EC Tacis
	Notes	The World Bank (contractor: CEAL, Heywood Fleisig) provided support that resulted in a reform in 2004.	Contractor: IRIS/ Deloitte

Sources: CSD Bulgaria (2006); EBRD (2000): Ten years of secured transaction reform; EBRD (1996): Feasibility Study for a Computerised Registration System for Charges in Hungary; Simpson and Fairgrieve (1998): Registration of Charges in Hungary, in *Law in Transition*, p. 10; Andrius Smaliukas (2002): Reform of security over movable property in Lithuania; Mizaras and Nekrosius: Das neue Zivil- und Zivilprozessrecht in Litauen, in *Zeitschrift fuer Europäisches Privatrecht*; EBRD (2002): *Law in Transition*; American Bar Association—CEEL Institute (2007): The Latvian Judicial Training Center; Iris, University of Maryland (2006): Examples of Iris's Work; ABA-CEELI (2004): Open Society Justice Initiative; EBRD (2005): The Impact of the Legal Framework on the Secured Credit Market in Poland. Furthermore, expert interviews with Frederique Dahan (EBRD), Hugo Green (Deloitte), Allen Jay (EBRD), Mahesh Uttamchandani (World Bank), and Milo Stephanovish (Booz Allen) were conducted.

We begin by coding the statutory legal changes for our sample countries, distinguishing between the individual enforcement regime (*Collateral*) from the collective enforcement regime (*Bankruptcy*).[7] The distinction between *Collateral* and *Bankruptcy* is important for two reasons.

First, the two regimes perform different even though partly overlapping functions. *Collateral* determines the type and scope of security interests a creditor may obtain from a debtor, such as the ability to mortgage land or to secure personal assets without the creditor taking possession. From an individual creditor's perspective, *Collateral* offers two advantages. First, it facilitates enforcement against the debtor in the case of default (i.e., the debtor falls behind with payments, but is not technically insolvent) as the creditor can simply enforce against the collateralized asset without having to go through a full court trial. Second, should the debtor become insolvent and face liquidation, secured creditors tend to be privileged over unsecured creditors. In other words, *Collateral* offers protection against individual debtors in default, as well as against competing claims by creditors in the event of insolvency. *Bankruptcy* governs the enforcement procedure against an insolvent debtor with multiple creditors, each of whom is seeking to enforce her claim before others can. The major function of *Bankruptcy* is to provide an orderly procedure for resolving conflicting creditor claims and for determining the fate of the insolvent debtor (Baird 1993). Any bankruptcy regime needs to determine whether to facilitate a firm's reorganization by placing a temporary hold on the enforcement of any creditor claims; whether or not to leave the incumbent management in place; and whether to grant secured creditors priority over all other claimants (including tax claims, employee claims, and the claims of other unsecured creditors) (e.g., Bebchuk and Fried 1996). From the perspective of an individual creditor, bankruptcy is not an attractive proposition, even though having a good bankruptcy regime in place is superior to not having one. The reason is that bankruptcy delays enforcement of each creditor's claim until the fate of a firm has been decided. In the case of unsecured creditors, it may also result in a "haircut," i.e., a substantial reduction of the claim, as unsecured creditors typically receive only a pro rata share of the assets that remain after all secured creditor rights have been enforced.

Second, the two aspects of creditor rights, *Collateral* and *Bankruptcy*, address different types of debtors and by implication different segments of the lending market. *Bankruptcy* as depicted in this article addresses the bankruptcy of firms, not individuals, for whom the role of management during bankruptcy or

[7] We do not code provisions regarding "fraudulent conveyance" law, since this concept does not exist as such in civil law countries (i.e., the CEE countries in our sample). However, most bankruptcy codes in those countries have provisions stipulating that any transfer of assets within 6–12 months can be voided if and when the transfer was made with the knowledge of an impeding bankruptcy procedure, and the assets can then be transferred back into the pool. Pistor, Raiser, and Gelfer (2000) have coded those provisions, but could not find any statistically significant impact of these provisions on the economic outcomes. The difficulty with fraudulent conveyance as well as the statutory provisions in civil law countries is that it is exceedingly difficult to prove intent.

reorganization is not relevant.[8] *Collateral*, by contrast, serves creditors of firms and individuals. *Collateral* is critical for expanding consumer finance, which has been an important growth industry in recent years. The ability to secure assets as collateral without transferring possession is critical, for example, for financing car sales and similar consumer items. Similarly, the ability to mortgage land is a prerequisite for asset-based financing of home ownership. Individual entrepreneurs benefit in a similar fashion. But even incorporated firms may increase their access to credits by being able to offer different types of assets (personal property as well as real estate) as collateral.

Earlier data of the underlying legal indicators was drawn from Pistor, Raiser, and Gelfer (2000), while information on additional indicators for the period after 1998 was hand-collected from statutory law books of our sample countries. For *Collateral*, we first code the possibility to secure land by way of establishing a mortgage that would be recorded in local land or court registries.[9] 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 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 nonpossessory security interests (collateral) in movable assets. To capture this, we code two additional indicators. First, whether a country's law recognizes that a legally valid security interest can be established without transferring possession of 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 nonpossessory charge; the second checks for the verifiability of a charge. This is crucial, because an asset may be secured more than once. The registry of security interests allows creditors to establish their priority vis-à-vis other creditors. The cumulative index *Collateral* is the sum of the three subindicators.

For the collective creditor rights regime (*Bankruptcy*), we use the indicators included in the LLSV (1998) coding discussed above, namely, "secured creditors first," "management out," and "no automatic stay." In addition, we include indicators for the initiation of 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. We therefore require that creditor consent must be given at the initiation stage. Where this is not the case, we code that reorganization does not require creditor consent. Finally, many transition economies have introduced a so-called "creditor trigger." Creditor triggers lower the verification costs of bankruptcy and creditors suffer from information problems particularly

[8] For an account of how different personal bankruptcy regimes affect entrepreneurship, see Armour and Cumming (2008).

[9] Since all countries in question formally recognized by 1993 the possibility to secure land, there is no variation in this aspect in our sample. In contrast, the legal regime for securing movable assets has changed considerably over time.

in the context of transition economies. The sum of the two indicators is the main legal variable of this study, referred to as *Creditor Rights*. The coding of these indicators is reported in Table 2.

There is substantial anecdotal evidence that suggests that these legal reforms had significant effects on economic outcomes. Some expected benefits of these reforms that were mentioned in the popular press included lowering of interest rates derived from an improvement in lenders' willingness to supply capital (see Appendix A for a selection of business press articles related to our event). To further illustrate the impact of these reforms, we hand-collected data on the frequency of credit registry usage by banks brought about by collateral law. This information is obtained from the respective ministries of finance of our sample countries, as well as the EBRD, and is summarized in Table 3. Most countries show a clear increase in the usage of credit registry entries following passage of collateral laws. For example, in 2002 more than one hundred and seventy thousand pledges were registered only in Romania.

We also analyze the effect of these reforms on the composition of aggregate financing in a sample of transition economies. We find that strengthening of creditor rights resulted in an increase in lending to both individuals (households) as well as firms while lending to the government sector remains unaffected. Further, the impact of legal change on individual lending is larger in magnitude as compared to the impact on enterprise lending (see Table B1 in Appendix B).[10] One plausible economic rationale for this is that, with strong creditor rights, banks are more comfortable in lending to informationally opaque households that were rationed in the older regime.

1.2 Bank- and firm-level data

In order to gain insights about the behavior of banks in our sample countries, we construct an extensive database that contains detailed information on the accounting and ownership variables of these banks. The accounting information is obtained from the Bureau van Dyck Bankscope database, which covers banks controlling at least 85% of the banking assets in each nation. We use consolidated statements unless they are not reported by Bankscope, in which case we use unconsolidated statements. Furthermore, we only report commercial banks, since noncommercial banks operate under a different set of constraints. In particular, we exclude national banks, trade banks, agricultural banks, cooperative banks, development banks, automotive banks, and investment banks since these banks may have different objectives. We collect annual data of financial information for banks in our sample countries from 1995 throughout 2002. Overall, we have 1874 bank-year observations from 323 banks available and our sample runs from 1995 to 2002.

An important variable of this study is the time-series information on the ownership of banks, specifically whether a bank is foreign or domestically

[10] This finding is consistent with the anecdotal evidence that collateral reforms have been accompanied by credit expansions in consumer lending in several countries, including India (Vig 2007).

Table 2
Coding of legal indicators

Country	Year	Non-poss. charge	Register	Land	*Collateral*	Reorganization debtor initiated	No automatic stay	Secured assets first	Creditor trigger	Management out	*Bankruptcy*	*Creditor Rights*
Bulgaria	1994	0	0	1	**1**	0	0	1	0	1	**2**	**3**
	1997	1	1	1	**3**	0	0	1	0	1	**2**	**5**
Croatia	1994	0	0	1	**1**	0	0	0	0	0	**0**	**1**
	1996	0	0	1	**1**	0	0	1	0	1	**2**	**3**
Czech Rep.	1994	0	0	1	**1**	0	0	1	0	1	**2**	**3**
Estonia	1994	0	0	1	**1**	0	0	1	0	1	**2**	**3**
	1996	1	1	1	**3**	0	0	1	0	1	**2**	**5**
	2000	1	1	1	**3**	0	0	1	1	1	**3**	**6**
Hungary	1994	0	0	1	**1**	0	0	1	0	1	**2**	**3**
	1996	1	0	1	**2**	0	0	1	0	1	**2**	**4**
	1997	1	1	1	**3**	0	0	1	0	1	**2**	**5**
Latvia	1994	0	0	1	**1**	0	0	1	0	1	**2**	**3**
	1996	0	0	1	**1**	0	0	1	1	1	**3**	**4**
	1998	1	1	1	**3**	0	0	1	1	1	**3**	**6**
Lithuania	1994	0	0	1	**1**	0	0	1	0	1	**2**	**3**
	1997	1	1	1	**3**	0	0	1	0	1	**2**	**5**

(continued overleaf)

Table 2
(Continued)

Country	Year	Non-poss. charge	Register	Land	*Collateral*	Reorganization debtor initiated	No automatic stay	Secured assets first	Creditor trigger	Management out	*Bankruptcy*	*Creditor Rights*
Poland	1994	0	0	1	**1**	0	0	0	0	1	**1**	**2**
	1998	1	1	1	**3**	0	0	0	0	1	**1**	**4**
Romania	1994	0	0	1	**1**	0	0	0	0	0	**0**	**1**
	1995	0	0	1	**1**	0	0	1	0	1	**2**	**3**
	1999	1	0	1	**2**	0	0	1	0	1	**2**	**4**
	2000	1	1	1	**3**	0	0	1	0	1	**2**	**5**
	2002	1	1	1	**3**	0	0	1	1	1	**3**	**6**
Slovak Rep.	1994	0	0	1	**1**	0	0	1	0	1	**2**	**3**
	2000	0	0	1	**1**	0	0	1	1	1	**3**	**4**
	2002	1	0	1	**2**	0	0	1	1	1	**3**	**5**
Slovenia	1994	0	0	1	**1**	0	0	1	0	1	**2**	**3**
Ukraine	1994	1	0	1	**2**	0	0	1	0	1	**2**	**4**
	2000	1	0	1	**2**	0	0	1	1	1	**3**	**5**

This table reports the coding of three cumulative legal indices we use in the empirical analysis. *Collateral* is the sum of three components: (i) a legally valid security interest can be established without transferring possession of this asset to the lender (Non-poss. charge); (ii) a system is in place for the registration of such security interests (Register); (iii) the possibility to secure land by way of establishing a mortgage that would be recorded in local land or court registries (Land). *Bankruptcy* is the sum of five components: (i) restrictions such as creditor consent exist for going into reorganization as opposed to liquidation and creditor consent must be given at the initiation stage (Reorganization debtor initiated); (ii) secured creditors are not stayed in bankruptcy (No automatic stay); (iii) secured assets are satisfied first, when assets are distributed (Secured assets first); (iv) creditors can trigger bankruptcy (creditor trigger); (v) management does not stay during bankruptcy, but is replaced by a court- or creditor-appointed receiver (Management out). *Creditor Rights* is the sum of *Collateral* and *Bankruptcy*. For further details, see Section 1.1.

Table 3
Number of pledge entries after creation of credit registries

Year	1997	1998	1999	2000	2001	2002	2003	2004
Bulgaria	2,357	9,423	12,275	16,718	23,357	26,256	33,717	—
Hungary	38,126	35,087	33,451	35,819	38,020	43,739	41,357	41,548
Latvia		3,381	3,876	6,206	8,014	8,610	10,421	13,600
Poland		0	35,000	90,000	95,000	99,000	98,000	95,000
Romania				95	65,174	171,170	189,653	—
Slovak Rep.							10,553	7,464

This table reports the amount of pledges that were registered with the newly established credit registries in the respective countries at a given year. The underlying data were obtained from the EBRD and the respective Finance and/or Law Ministries from our sample countries.

Table 4
Definition of variables

Variable	Definition	Source
I. Bank variables/controls		
Loans	total customer loans in millions of U.S. dollar	Bankscope (2004)
Assets	total assets in millions of U.S. dollar	Bankscope (2004)
Solvency	ratio of equity capital divided by assets of each bank	Bankscope (2004)
Liquidity	ratio of liquid assets to total assets	Bankscope (2004)
Foreign	value of 1 if bank is foreign owned (0 otherwise)	hand-collected
Green	value of 1 if bank entered market by greenfield operation (0 otherwise)	hand-collected
II. Macro controls		
Lending rate	average lending rate prevailing in a country	World Bank (2004)
Deposit rate	average deposit rate prevailing in a country	World Bank (2004)
GDP	real GDP per capita growth	World Bank (2004)
Inflation	consumer price index	World Bank (2004)
Concentration	Herfindahl index of banks' market shares	Bankscope (2004)
Market share	bank's share of total banking assets in each market	Bankscope (2004)
LIBOR	London interbank offered rate	World Bank (2004)
Beakert/Harvey foreign entry	index that measures changes in the conditions of foreign banks	Bekaert and Harvey (2004)
Privatization	index that measures privatization progress	Campos and Horvath (2006)
External liberalization	index that measures current account and FDI liberalization	Campos and Horvath (2006)
Internal liberalization	index that measures progress regarding price and wage liberalization	Campos and Horvath (2006)
III. Legal indicators		
Creditor Rights	sum of Collateral and Bankruptcy	hand-collected
Collateral	see Table 2	hand-collected
Bankruptcy	see Table 2	hand-collected
Rule of Law	index developed to measure law enforcement capabilities	Kaufmann, Kraay, and Mastruzzi (2003)

owned. This information was hand-collected from central bank reports, annual reports of the banks, and the individual Web sites of each of these banks. A bank is defined as foreign owned if foreigners or foreign entities own 50% or more of its assets. In addition, a bank is considered foreign if it is a subsidiary of a domestic bank that is itself owned by foreigners. In addition, we hand-collected details about the merger and acquisition activities of all banks in our sample. The detailed information on the variables used is provided in Table 4.

Table 5 presents descriptive statistics of these indicators divided into ownership categories. These ownership categories encompass foreign and domestic

Table 5
Descriptive statistics

	Foreign			Domestic		
Variables	total	green	takeover	total	gov	private
Observations	814	487	327	1060	297	763
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

This table reports mean values of the most important balance sheet items for 1,874 bank-year observations of 323 different banks for the years 1995–2002. 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 takeover. Domestic banks are further split up into domestic private and government-owned banks. All values are in millions of U.S. dollars.

banks. Foreign banks are further divided into those that entered the market by taking over a domestic bank (takeover) and those that founded a new bank (greenfield). On average, foreign banks are slightly bigger in terms of assets and total loans. The foreign takeover banks are more than three times larger than the greenfield banks. Domestic banks are divided into government- and privately-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 ratios. Domestic private banks have the highest solvency ratio.

We also collect detailed financial information on firms from the Bureau van Dyck Amadeus database in order to examine the effect of legal changes on the nature of borrowing industries. The Amadeus database has extensive coverage of large, medium, and small enterprises (the mean asset size is 147 million Euro). Here we focus on the unconsolidated statements since consolidated statements are only available for the very large and listed firms. Further, we exclude firms that belong to the public utilities, as well as firms that do not report total assets and debt. Our sample comprises forty-nine thousand four hundred and ten firm-year observations of fifteen thousand seven hundred and seventy firms for our sample countries from 1995 to 2002. Finally, our macro indicators are gathered from the World Bank World Development Indicators.

2. Empirical Analysis

We apply a differences-in-differences approach. Using bank-level data, we test the following specification:

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

where i indexes banks,[11] j indexes countries, and t indexes years. The logarithm of loans is denoted by y_{it}. The year fixed effects and the bank fixed effects are given respectively by α_t and α_i. The set of control variables is referred to as X_{it}. Bank-specific control variables are the logarithm of assets, as well as the solvency and liquidity ratio. In order to control for the macroeconomic environment a bank operates in, we include the lending and deposit rate, GDP, inflation rate, measures for the size and concentration of the credit markets, as well as the market share of each bank. $CreditorRights_{jt-1}$ is our legal variable, as described in the previous section. Our variable of interest is δ. It captures the sensitivity of the dependent variable to the legal change. We use block bootstrapped robust clustered standard errors, as suggested by Bertrand, Duflo, and Mullainathan (2004).[12] Table 4 provides definitions and sources of all variables included in the subsequent regressions.

A similar research design has been used in several studies, particularly in labor economics, of which Card and Krueger (1994) and Bertrand and Mullainathan (2003) are some notable examples. The multiple pre-intervention and post-intervention time periods take care of many threats concerning validity. This methodology is best illustrated by the following example.[13] 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 in time. This specification is robust to the fact that some groups might not be treated at all, or that other groups were treated prior to 1995, which is our sample's beginning date.

For the DID approach to be meaningful, two aspects need to be accounted for. First, a similarity between comparison groups is desirable. Meyer (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, the change in creditor rights should be exogenous.

The first issue surrounding similar comparison groups has little effect on our analysis since our sample consists of CEE economies, which are similar along several critical dimensions. All countries in our sample share the legacy of socialism and introduced substantial economic reforms in the early 1990s. Furthermore, the pooling of data from different countries is helpful if each country has a different bias.

[11] This refers to an entity owning a separate commercial banking license.

[12] We cluster our standard errors by country.

[13] Here we assume that the legal variable is a 0–1 binary variable. However, this intuition extends when the legal variable (e.g., *Creditor Rights*) is an index. Basically, the DID strategy identifies out of differences.

The second issue, i.e., whether changes in creditor rights are exogenous or endogenous, is an important concern. However, legal change in these countries was largely induced by external pressures from multilateral and bilateral development agencies such as the EBRD, the World Bank, and USAID, as well as the quest to join the EU (Pistor 2000).[14] Special emphasis was placed on introducing creditor protection devices. In 1992, the EBRD established the secured transactions project, leading in 1994 to the production of the so-called model law on secured transaction, which was used in a number of reform projects throughout the region to induce and shape reform (Dahan 2000). In Poland, for example, the first proposal on the creation of a registered pledge regime was as early as 1990. Nevertheless, this draft was rejected by the Polish parliament, so that a final adaptation of this law lasted until 1996, becoming effective only on January 1998. This example illustrates both the exogenous nature as well as the randomness in adoption of these reforms, brought about by political process, that characterized the passage of these laws. We will come back to this issue again later but would like to stress at this point that endogeneity is less of a concern for us since we only look at bank-level outcomes while legal change is at the country level. An individual bank does not have the luxury to opt in or opt out of the market.[15]

3. Results

In this section, we present the results of our empirical analysis. In the first subsection, we report the effect of legal change on the credit supplied by banks. In the second subsection, we investigate whether law has separate effects on different players, in particular on incumbents versus new entrants. Next, we discuss the response of multinational banks to improvements in creditor rights and present further robustness tests. Finally, we show firm-level evidence.

3.1 Legal change and loan supply

We begin our analysis by estimating the following country-level regression: $log(loans)_{jt} = \alpha_j + \beta_t + \gamma \cdot X_{jt} + \delta \cdot CreditorRights_{jt-1} + \varepsilon_{jt}$, where j indexes for country and t for year. Country and year fixed effects are indicated by α_j and β_t, respectively. Thus, $log(loans)_{jt}$ are the logarithm of total loan supply in country j at year t. We include macroeconomic control variables, like GDP, the inflation rate, and the interest rate spread (difference between lending and deposit rate), that are summarized by X_{jt}. Legal indicators are defined as in Table 2. The coefficient of interest is δ. It can be seen from Table 6, columns 1 and 4, that the coefficient on the legal variable is positive and highly significant.

[14] We formalize the involvement of international institutions in the creditor rights reforms of our sample countries in Table 1. See Ajani (1995) for details about the supply of new legal models through international organizations in the CEE countries.

[15] This is different from many studies in corporate governance where, for example, the firms decide whether to adopt a poison pill or not.

Table 6
Country-level regressions

	(1)	(2)	(3)	(4)	(5)	(6)
const.	6.759 (0.337)***	7.486 (0.261)***	7.248 (0.433)***	6.981 (0.173)***	7.433 (0.145)***	7.277 (0.242)***
Creditor Rights	0.226 (0.047)***			0.206 (0.039)***		
Collateral		0.216 (0.065)***			0.235 (0.066)***	
Bankruptcy			0.142 (0.101)			0.106 (0.095)
trend	—	—	—	0.074 (0.024)***	0.092 (0.022)***	0.135 (0.025)***
year fixed effects	yes	yes	yes	no	no	no
country fixed effects	yes	yes	yes	yes	yes	yes
macro controls	yes	yes	yes	yes	yes	yes
Adjusted R^2	93.04%	92.56%	91.55%	90.56%	90.42%	79.21%
N	96	96	96	96	96	96

The table reports regression results of the form: $log(loans)_{jt} = \alpha_j + \beta_t + \gamma \cdot X_{jt} + \delta \cdot CreditorRights_{jt-1} + \varepsilon_{jt}$, where j indexes countries and t indexes years. Country and year fixed effects are indicated by α_j and β_t, respectively. Thus, $log(loans)_{jt}$ are the logarithm of total loan supply in country j at year t. We include macroeconomic control variables, like GDP, the inflation rate, and the interest rate spread (difference between lending and deposit rate) that are summarized by X_{jt}. Legal indicators are defined as in Table 2. Standard errors are reported in parentheses. The regressions were run for ninety-six country year observations of twelve different countries for the years 1995–2002. All standard errors are clustered by country of operation and are block bootstrapped. A dash means that the respective coefficient got absorbed by the fixed effects in the specification. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

We continue by running specification 1. As can be seen in column 1 of Table 7, the coefficient on the legal variable is also positive and highly significant. In column 2, we use bank-level controls used in previous research. The advantage of this approach is that it reduces the residual variance, thereby increasing the efficiency of the results. Including these variables does not change our results and in many cases strengthens them. However, because of the possibility of these variables endogenously affecting the dependent variable, we consistently present regressions with and without these controls. The economic impact of a legal change on bank lending is considerable. Even after controlling for bank and macro control variables, an improvement of our legal indicator by one implies an increase in loan supply by 13.66%.[16]

The above specification does not control for country-specific time-varying shocks. In order to fully account for such shocks, the inclusion of interacted year and country dummies ($\alpha_t * \alpha_j$) would be required. These dummies, however,

[16] According to Halvorsen and Palmquist (1980), the effect of dummy variables in semilogarithmic equations is $(exp(\delta) - 1)$, with δ being the coefficient of interest. Kennedy (1981) proposes a variance correction for this interpretation, which has a negligible impact here.

Table 7
Regression results for the legal indicators

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Sample	all	all	all	all	all	all	all	all	change in bank, if coll was good	change in bank, if coll was bad	change in coll, if bank was good	change in coll, if bank was bad
Creditor Rights	0.163 (0.031)***	0.128 (0.040)***	0.161 (0.031)***	0.124 (0.039)***								
Collateral							0.193 (0.044)***	0.166 (0.064)***			0.232 (0.030)***	0.133 (0.056)**
Bankruptcy							0.115 (0.143)	0.06 (0.148)	0.288 (0.056)***	0.049 (0.072)		
$Loans_{jt(-i)}$			0.039 (0.270)	0.066 (0.308)								
$Before^1$					−0.003 (0.109)	0.008 (0.110)						
$Before^0$					0.085 (0.041)**	0.084 (0.036)**						
$After^1$					0.157 (0.045)***	0.097 (0.027)***						
$After^2$					−0.062 (0.061)	−0.025 (0.053)						
bank/macro controls	no	yes	no	yes	no	yes	no	yes	no	no	no	no
Adjusted R^2	90.12%	92.60%	90.12%	92.62%	90.22%	92.65%	90.14%	92.65%	90.54%	89.34%	90.66%	90.28%
N	1874	1874	1874	1874	1874	1874	1874	1874	1874	1874	1874	1874

The table shows regression results from estimating specification $y_{it} = \alpha_t + \alpha_i + \gamma \cdot X_{it} + \delta \cdot CreditorRights_{jt-1} + \varepsilon_{it}$. In all regressions, the dependent variable is the logarithm of loans. Variables are defined as in Table 4 and legal indicators are defined as in Table 2. $Loans_{jt(-i)}$ is the mean value of loans of each country and each year excluding each respective bank i itself. In columns 7 and 8, leads and lags of the *Creditor Rights* indicator, denoted by $Before^1$, $Before^0$, $After^1$, and $After^2$, are included in the regression (see Section 3.1 for more details). The regressions were run for 1,874 bank-year observations of 323 different banks for the years 1995–2002. In columns 9–12, the sample is split up as follows: in columns 9 and 10 we divide the sample based on whether *Collateral* was above or below the mean ("good" or "bad") at the time the bankruptcy reform was done; in columns 11 and 12, we divide the sample based on whether *Bankruptcy* was above or below the mean ("good" or "bad") at the time the collateral reform was done. Standard errors are reported in parentheses and are block bootstrapped by clusters of their country of operation. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

would fully absorb the variation of our legal indicator. In order to address this issue, we follow the methodology of Bertrand and Mullainathan (2003). Instead of including a whole set of $\alpha_t * \alpha_j$ dummies, we include the mean value of the dependent variable of each country and each year excluding each respective bank i itself, denoted as $Loans_{jt(-i)}$. As presented in Table 7, columns 3 and 4, this leaves our results unchanged.

As mentioned earlier, the political process and the external pressures that led to the adoptions of these reforms should allay most concerns of endogeneity. To further address reverse causality issues, we study the dynamic effects of creditor rights change on banks' loan supply in greater detail. In Table 7, columns 5 and 6, we replace the *Creditor Rights* indicator with four variables: $Before^1$ takes the value of *Creditor Rights* one period before the actual legal change took place, $Before^0$ takes the value of *Creditor Rights* in the actual period, $After^1$ takes the value of *Creditor Rights* of the last year, and $After^2$ equals the value of *Creditor Rights* of two years ago. The variable $Before^1$ allows us to assess whether any loan supply effect can be found prior to the improvement in creditor rights. Finding such an "effect" of the legislation prior to its introduction could be symptomatic of some reverse causation. In fact, the estimated coefficient on $Before^1$ is economically and statistically insignificant.[17] Consequently, the legal changes in this sample have not been anticipated. This assuages any remaining concerns of biases driven by endogeneity.

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 assets to protect their loans. *Collateral* protects an individual creditor against default even before a debtor enters bankruptcy.[18] By contrast, *Bankruptcy* creates a collective enforcement regime once a debtor has become insolvent and specifies which creditors have priority over others.[19] In Table 7, columns 7 and 8, we run a horse race between *Bankruptcy* and *Collateral* by including both legal variables together in specification 1. Results show that improvements in collateral law seem to have a statistically significant effect on bank lending, while improvements in bankruptcy legislation do not. These results demonstrate the importance of laws relating to the pledgeability of assets as a driver of credit supply, thus underscoring the

[17] When *Collateral* is used as a legal variable, the results are similar. The coefficients of *Bankruptcy* remain insignificant independent of timing.

[18] We also attempted to distinguish between different components of the *Collateral* variable. However, it is difficult to distinguish between the effects of the establishment of a credit registry and that of the pledgeability of movable assets since both these reforms were generally implemented at the same time.

[19] We also distinguished between the different components of the *Bankruptcy* indicator, but not all subindicators vary for our sample countries. In specific, "management out" and "secured creditors first" are the same for all countries with the exception of Poland. We substituted the remaining subindicators ("creditor trigger," "no automatic stay," "debtor requires creditor consent") with the *Bankruptcy* variable in the previous specification. The coefficients of each of these indicators are individually always positive, but remain statistically insignificant.

importance of collateral law.[20] Our results show that it is collateral law that turns out to be stronger, at least for emerging/transition economies.[21]

It is quite natural to expect that the effectiveness of the bankruptcy regime is a function of the underlying collateral regime. To test this, we divide the sample based on the level of our *Collateral* variable at the time the bankruptcy reform was done, i.e., we classify whether *Collateral* was "good" or "bad" (meaning whether *Collateral* was above or below the mean), and see the effect of a change in the *Bankruptcy* variable on subsequent lending by banks. It can be seen from Table 7, column 9, that the effect of bankruptcy law on lending is indeed positive for those countries that had a good collateral regime at the time of the passage of the bankruptcy law. However, there is no effect on lending subsequent to a bankruptcy law change in countries that had a "bad" collateral regime (column 10). Thus, the presence of a good collateral regime seems to be the prerequisite for the effectiveness of the bankruptcy regime. Interestingly, the effect of a change in collateral regime on lending is positive and significant irrespective of the quality of the prevailing bankruptcy regimes (columns 11 and 12).[22]

3.2 Incumbents versus entrants

We further try to answer whether a formal legal change affects different types of lenders in different ways. One would expect that foreign players are more receptive to legal changes than domestic players since, as entrants to the domestic markets, they benefit from the creation of a level playing field. This is consistent with Buch (2003), who suggests that foreign players might be disadvantaged due to cultural constraints. Benefiting from formal legal protection may allow foreign banks to fully optimize their comparative lending advantage (Khanna and Palepu 2000).[23]

The specification for this test is the following:

$$y_{it} = \alpha_t + \alpha_i + \gamma \cdot X_{it} + \beta \cdot Foreign_{it} + \theta \cdot CreditorRights_{jt-1} + \delta \cdot Foreign_{it} \cdot CreditorRights_{jt-1} + \varepsilon_{it}, \quad (2)$$

where all variables and subscripts are defined as in specification 1. The dummy variable $Foreign_{it}$ takes the value of one if a bank is majority foreign owned and zero otherwise. Our variable of interest is δ, which measures the sensitivity to

[20] The creditor rights variable (LLSV index) used in most of the empirical literature is primarily a bankruptcy variable.

[21] We obtain the same results with country-level regressions. As can be seen in Table 6, columns 2 and 3 as well as 5 and 6, the coefficient of *Collateral* enters the positive and is highly significant, while the coefficient of *Bankruptcy* is statistically not significant.

[22] The magnitudes are slightly lower when the existing bankruptcy regime at the time of the collateral law change is "bad." We define a "good"/"bad" bankruptcy regime if *Bankruptcy* was above/below the mean.

[23] Qian and Strahan (2007) find that foreign banks are more likely to join a loan syndicate in countries with a higher quality of creditor rights protection.

Table 8
Regression results testing for incumbents versus new entrants

	(1)	(2)	(3)	(4)	(5)	(6)
Foreign	−0.605	−0.723	−0.544			
	(0.272)*	(0.245)***	(0.158)***			
Creditor Rights	0.136	—	—	0.149	—	—
	(0.035)***			(0.038)**		
Foreign*Creditor Rights	0.102	0.144	0.088			
	(0.040)**	(0.036)***	(0.036)**			
Green				—	—	—
Creditor Rights*Green				0.095	0.135	0.112
				(0.038)**	(0.091)	(0.060)*
bank/macro controls	no	no	yes	no	no	yes
country*year intercepts	no	yes	yes	no	yes	yes
bootstrap	yes	no	no	yes	no	no
Adjusted R^2	90.20%	91.46%	93.91%	90.06%	91.41%	93.89%
N	1874	1874	1874	1874	1874	1874

The table shows regression results from estimating specification $y_{it} = \alpha_t + \alpha_i + \gamma \cdot X_{it} + \beta \cdot Foreign_{it} + \theta \cdot CreditorRights_{jt-1} + \delta \cdot Foreign_{it} \cdot CreditorRights_{jt-1} + \varepsilon_{it}$. In all regressions, the dependent variable is the logarithm of loans. Variables are defined as in Tables 4 and 2. The dummy variable *Foreign* takes the value of one if a bank is foreign owned and zero otherwise. In columns 4 through 6 *Foreign* is replaced by the dummy variable *Green*, which takes the value of one if a bank was established by a greenfield operation and zero otherwise. Standard errors are reported in parentheses. The regressions were run for 1,874 bank-year observations of 323 different banks for the years 1995–2002. All standard errors are clustered by country of operation and block bootstrapped when indicated at the bottom of the table. A dash means that the respective coefficient got absorbed by the fixed effects in the specification. *, **, and *** indicates significance at the 10%, 5%, and 1% levels, respectively.

the interaction of the legal change and foreign ownership dummy. Our results, as presented in Table 8, columns 1–3, suggest that foreign banks indeed increase their lending volume in response to legal change more than domestic banks. This is illustrated by the positive interaction coefficient of our legal variable with the foreign ownership dummy (*Foreign*). Since bank ownership varies over the sample period, specification 2 also allows for the inclusion of interacted country and year dummies ($\alpha_j * \alpha_t$), eliminating all shocks specific to each country in a given year. Results are robust to this test (columns 2 and 3).

So far, we have treated foreign banks as 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 entrants over incumbents, we reclassify entrants and incumbents. We compare greenfield foreign-owned banks (*Green*) with all other banks (see Table 8, columns 4–6). The results are similar to that of foreign versus domestic banks but the significance is somewhat lower.

3.3 Multinational bank evidence

To further strengthen our claim, we exploit a unique feature of our data set. Our sample includes twenty-seven multinational banks that operated in at least two different countries at the same point in time. We exploit this feature to test how multinational banks' allocation of credit responds to legal change. An

Table 9
Multinational banks

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Creditor Rights	0.219	0.158			0.202	0.124		
	(0.077)***	(0.076)**			(0.082)**	(0.082)		
Collateral			0.245	0.196			0.224	0.128
			(0.104)**	(0.091)**			(0.103)**	(0.095)
Bankruptcy			0.146	0.055			0.138	0.113
			(0.099)	(0.164)			(0.143)	(0.181)
$\overline{Loans}_{jt(-s)}$	−0.206	0.115	−0.228	0.082	−0.087	0.261	−0.105	0.258
	(0.146)	(0.086)	(0.132)	(0.121)	(0.189)	(0.068)***	(0.186)	(0.085)
bank/macro controls	no	yes	no	yes	no	yes	no	yes
multinational * year fixed effects	no	no	no	no	yes	yes	yes	yes
multinational * country fixed effects	yes	yes	yes	yes	yes	yes	yes	yes
Adjusted R^2	71.78%	81.58%	71.80%	81.63%	77.75%	86.91%	77.77%	86.91%
N	534	534	534	534	534	534	534	534

The table shows regression results from estimating specification $y_{st} = \alpha_t + \alpha_k \cdot \alpha_j + \gamma \cdot X_{it} + \eta \cdot \overline{Loans}_{jt} + \delta \cdot CreditorRights_{jt-1} + \varepsilon_{st}$. In all regressions, the dependent variable is the logarithm of loans. Variables are defined as in Table 4 and legal indicators are defined as in Table 2. $\overline{Loans}_{jt}$ is the mean value of loan supply in each country and each year of all other bank besides the multinational bank itself. Standard errors are reported in parentheses and are block bootstrapped by clusters of their country of operation. The regressions were run for 534 subsidiary year observations of 27 multinational banks for the years 1995–2002. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

example illustrates the intuition behind the test. Let us say that a bank supplies a certain amount of loans via its 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. Comparing the differences in loan supplied at $t = 1$ and $t = 0$ between these subsidiaries allows us to measure the impact of the legislative change within the same banking institution.

The specification for this test is as follows:

$$y_{st} = \alpha_t + \alpha_k \cdot \alpha_j + \gamma \cdot X_{it} + \eta \cdot \overline{Loans}_{jt} + \delta \cdot CreditorRights_{jt-1} + \varepsilon_{st}, \tag{3}$$

where s indexes subsidiaries, k indexes multinational banks, j indexes countries, and t indexes year. The level of loans for each subsidiary at each point in time is denoted as y_{st}. In this specification, we include both year fixed effects and country of operation fixed effects interacted with multinational bank fixed effects ($\alpha_k \cdot \alpha_j$). It is important to note that this is similar to adding a subsidiary fixed effect except for the fact that several multinational banks in our sample have multiple subsidiaries in the same country. Our variable of interest is δ, which measures the sensitivity of credit supplied to the legal change. In order to control for investment opportunities, we benchmark the lending of multinational subsidiaries to credit supplied by the other banks in their respective markets, denoted as $\overline{Loans}_{jt}$.

As presented in Table 9, columns 1 and 2, *Creditor Rights* is significant. We also examine the components of *Creditor Rights* that are critical for multinational banks. In columns 3 and 4, we split the *Creditor Rights* indicator into its components. As before, we find a positive effect of *Collateral* on multinational banks' lending decision. The coefficient on the *Bankruptcy* variable is smaller in magnitude and is insignificant. The specification further allows us to control for bank-specific trends or specific market expansion strategies of the foreign banks, as it allows us to further include multinational bank fixed effects interacted with year fixed effects ($\alpha_k \cdot \alpha_t$). The inclusion of these controls leaves our results basically unaffected (columns 5–8) but the significance is somewhat lower.

3.4 Further tests

We now address some sample-related concerns.[24] The sample used is unbalanced, as it includes banks that have entered the market during the sample period and banks that ceased to exist, due to takeover or bankruptcy. In order to examine whether these issues are responsible for our findings, we reestimate our results excluding all banks that do not provide data over the entire sample period (1995–2002). This leaves us with a balanced panel of 946 bank-year

[24] The subsequent sample adjustments were also conducted for specification 2. The coefficient of the interaction term between the legal indicator and the foreign ownership dummy remained unaffected. Results are available from the authors upon request.

Table 10
Further tests for the legal indicators

Sample	(1) balance	(2) balance	(3) no M&A	(4) no M&A	(5) no crises bank restruct.	(6) no crises bank restruct.	(7) privatization out	(8) privatization out	(9) all	(10) all	(11) all	(12) all
Creditor Rights	0.147 (0.055)***		0.134 (0.043)***		0.136 (0.054)***		0.136 (0.054)***		0.114 (0.026)***		0.143 (0.026)***	
Collateral		0.204 (0.061)***		0.182 (0.056)***		0.115 (0.047)**		0.148 (0.050)**		0.154 (0.045)***		0.182 (0.040)***
Bankruptcy		0.036 (0.067)		0.042 (0.070)		0.132 (0.088)		0.021 (0.048)		0.044 (0.060)		0.071 (0.060)
Internal liberalization									−0.261 (0.165)	−0.288 (0.121)**		
External liberalization									0.191 (0.403)	0.324 (0.392)		
Privatization									0.413 (0.454)	0.344 (0.381)		
Bekaert/Harvey foreign entry											0.114 (0.151)	0.115 (0.140)
Adjusted R^2	91.47%	91.63%	92.30%	91.89%	94.19%	93.94%	94.19%	91.80%	92.62%	92.67%	92.64%	92.69%
N	946	946	1719	1719	1394	1394	1394	1394	1874	1874	1874	1874

A4 The table shows regression results from estimating specification $y_{it} = \alpha_t + \alpha_i + \gamma \cdot X_{it} + \delta \cdot CreditorRights_{jt-1} + \varepsilon_{it}$. In all regressions, the dependent variable is the logarithm of loans. Variables are defined as in Table 4 and legal indicators are defined in Table 2. In columns 1 and 2, we exclude observations from banks that do not report continuously financial statement information during our sample period from 1995 to 2002. In Columns 3 and 4, all banks that were involved in mergers and acquisitions of other banks, as well as banks that were acquired by other banks during our sample period, were excluded. In columns 5 and 6, all observations related to crisis and bank restructuring periods (as well as the year after each crisis/restructuring period) were excluded. In columns 7 and 8, all banks that gained a foreign owner during our sample period, both through privatization or takeovers, as well as banks that were domestically privatized, are excluded from the sample. In columns 9 and 10, control indicators that proxy for differences in external and internal liberalization as well as privatization for our sample countries, as derived by Campos and Horvath (2006), are included in the main specification. In columns 11 and 12, a measure for changes in the business climate of foreign banks that was constructed by Giannetti and Ongena (2009) is included in the regression. Standard errors are reported in parentheses and are block bootstrapped by clusters of their country of operation. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

observations. Results remain unchanged for the balanced sample as shown in Table 10, columns 1 and 2.

Another potential concern is the acquisition of banks during the sample period. When bank A acquires 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. This survivorship issue might create a bias toward finding a positive effect of a legal change on bank lending. To address this problem, we exclude all banks that were involved in the mergers and acquisitions of other banks (so we exclude both the bank taken over, as well as the acquiring bank).[25] As shown in Table 10, columns 3 and 4, the results are only slightly affected by this correction of survivorship bias.

A possible concern with our analysis is that the results could be caused by factors other than changes in the law. Thus, it is important to examine other events that took place during the sample period that might drive our results. In general, such events should be controlled for by the chosen methodology, unless they are correlated with our legal indicators. Several countries in our sample underwent a banking crisis or restructuring during transition from a command to a market economy. Bulgaria had a banking crisis from 1995 to 1997, experiencing a bank run in 1996.[26] But the banking sectors in Latvia (1995–1997), Slovakia (1996–2000), and Ukraine (1997–1998) also experienced considerable solvency problems. Croatia (1996), the Czech Republic (1995–1997), Lithuania (1995–1996), and Romania (1998–1999) had bank restructuring in the periods given in parentheses. To control for these events, we removed all observations related to these events (we also excluded the year after each crisis/restructuring period). Our results are robust to this sample adjustment (Table 10, columns 5 and 6).

A considerable fraction of banking assets were privatized during our sample period (Bonin, Hasan, and Wachtel 2005). A possible concern resulting from this observation is that the previously observed increases in bank lending were caused through efficiency gains from bank privatization instead of improvements in the legal system. Furthermore, a considerable fraction of government banks were privatized by being sold to foreign banks. An inflow of foreign capital as a consequence of foreign banking privatization might also explain increases in lending. In order to address these concerns, we reestimated our main specifications, excluding banks that were privatized during our sample period. In Table 10, columns 7 and 8, all banks that gained a foreign owner during our sample period, both through privatization or takeovers, as well as banks that were domestically privatized, are excluded from our sample. All prior stated results are robust to this sample adjustment. It is worth noting that

[25] Most bank takeovers and mergers during our sample period occurred in the Czech Republic and Poland. In most countries there were state-initiated merger waves of government banks before privatization in the beginning of the 1990s (before our sample period).

[26] See Caprio and Klingebiel (2003) for a summary of banking crises and bank failures in transition periods.

banking privatization had a considerable effect on total banking assets since banks being privatized were generally large in size. However, the number of banks being privatized during the sample period is relatively small in comparison to the overall sample size. Finally, we analyzed whether the dates of bank privatization are clustered around the dates of legal changes. We find that banking privatization seems to be a continuous process with mostly only one or two banks being privatized at each given year in each country.

Further, we aim at controlling for other reforms in the CEE transition economies, which potentially drive our results. We include the indicators derived by Campos and Horvath (2006) for external liberalization, internal liberalization, and privatization. As presented in columns 9 and 10 of Table 10, only the internal liberalization indicator enters our specification significantly. Overall, these control variables have only a marginal effect on our indicators. Another possible concern is that our findings are driven by foreign banking penetration due to the abolition of entrance barriers for banks. The countries in our sample started off as closed economies, but quickly liberalized entry to their domestic markets for foreign institutions. To control for this, we include a variable that aims at measuring changes in the conditions of foreign banks that was constructed by Giannetti and Ongena (2009) based on the Bekaert and Harvey (2004) database.[27] This variable identifies significant foreign bank-related events and codes the improvement/worsening of conditions for foreign banks in our sample countries. Our presented results are robust to these changes (see columns 11 and 12).

We further include measures of legal enforcement (i.e., the Rule of Law index provided by Kaufmann, Kraay, and Mastruzzi 2003) in order to account for possible differences in law enforcement in the sample countries. This *Rule of Law* index does not enter significantly in our regressions, while the coefficients of our other legal indicators remain unaffected. Most countries in our sample had only one change in *Collateral* and/or *Bankruptcy*. Therefore, we can also construct these two indicators as a one/zero dummy variable. Applying these alternative indicators as our legal variables supports previous findings. Improvements in collateral law have a positive significant effect on bank lending, while the coefficient of the bankruptcy dummy indicator is statistically insignificant.[28]

3.5 Structure of financing

To further strengthen our results, we investigate the effect of legal changes on the composition of financing. Using firm-level data from the Bureau van Dyck Amadeus database, we examine the effect of creditor rights change on firms' debt as well as on firms' capital structure by applying a DID

[27] We thank the referee for suggesting this control variable.

[28] The corresponding results are provided in a previous version of this article and are available from the authors upon request.

Table 11
The effect of legal change on debt

Dependent variable:	(1) log(debt)	(2) log(debt)	(3) log(debt)	(4) log(debt)	(5) log(debt)	(6) debt ratio	(7) debt ratio	(8) debt ratio	(9) debt ratio	(10) debt ratio
Creditor Rights	0.161		0.212			0.014		0.012		
	(0.067)**		(0.044)***			(0.006)**		(0.005)**		
Collateral		0.146		0.212			0.014		0.012	
		(0.054)**		(0.057)**			(0.006)**		(0.006)*	
Bankruptcy		0.270			0.227		0.014			0.015
		(0.254)			(0.218)		(0.022)			(0.021)
Creditor Rights*Size			−0.127					−0.002		
			(0.068)*					(0.003)		
Collateral*Size				−0.153					−0.002	
				(0.072)**					(0.003)	
Bankruptcy*Size					−0.018					−0.001
					(0.114)					(0.008)
Adjusted R^2	78.49%	78.50%	79.44%	80.24%	80.23%	67.96%	67.96%	67.36%	65.98%	67.24%
N	49410	49410	49410	49410	49410	49410	49410	49410	49410	49410

This table reports evidence regarding the effect of creditor rights change on firms' debt, as well as on firms' leverage. The table reports the coefficient δ from the following specification: $log(debt_{it}) = \alpha_i + \beta_t + \gamma X_{it} + \delta CreditorRights_{jt-1} + \varepsilon_{it}$, where i indexes for firm, j for country, and t for year. The dependent variable is the logarithm of debt in columns 1–5 and the debt structure (log of debt to assets ratio) in columns 6–10. Firm and year fixed effects are denoted by α_i and β_t, respectively. The specification includes size ($log(sales)$) and tangibility (*fixed assets/assets*), which are summarized by X_{it} as control variables. The dummy variable $Size$ takes the value of one if a firm belongs to the largest 25% of all firms before the respective legal change in each country (based on total assets) and zero if it belongs to the smallest 25% of firms. In all regressions including interaction terms, the variables included in the interaction term are also included in levels. The firm-level data is obtained from the Bureau van Dyck Amadeus database. We exclude firms that belong to the public utilities as well as firms that do not report total assets and debt from the analysis. The sample comprises 49,410 firm-year observations of 15,770 firms for the twelve sample countries from 1995 to 2002. Standard errors are reported in parentheses and are block bootstrapped by clusters of their country of operation. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

methodology as previously described.[29] The coefficients of interest are reported in Table 11. Improvements in *Creditor Rights* or the *Collateral* measure are clearly associated with higher firm debt (columns 1 and 2). We find that the effect of bankruptcy legislation is not significant. Furthermore, the capital structure of firms changes following legal improvement toward more leverage (columns 6 and 7).

It is quite plausible that certain types of borrowers may be differently affected by creditor rights change. Specifically, we expect small, information-opaque firms to benefit more from collateral reform as compared to large enterprises. Large enterprises that can provide audited financial statements are more likely to obtain external financing without offering collateral. Thus, improvements in collateral law should most importantly benefit small firms. To test for this presumption, we define a dummy variable that takes the value of one if a firm belongs to the largest 25% of all firms before the respective legal change in each country (based on total assets) and zero if it belongs to the smallest 25% of firms. Coefficients of this dummy indicator interacted with our legal indicator are also reported in Table 11, columns 3–5 and 8–10. The negative significant coefficient for the *Creditor Rights* and *Collateral* indicator suggests that small firms received more external debt following legal change as compared to large firms. Concerning the firms' financial structure, evidence points in the same direction but is not statistically significant at conventional levels. As mentioned in Section 1.1, we also investigate the composition of aggregate bank financing in the economy and find that the collateral laws tend to favor smaller borrowers (individuals) more than firms (Table B1, Appendix B).

4. Conclusion

This article attempts to improve our understanding of how law affects lending by focusing on legal changes in twelve transition economies. This allows us to deal with endogeneity concerns that have plagued previous research. Using bank-level data and a DID methodology, we find that formal legal change does indeed promote lending by banks.

We also show that a collateral regime is of greater importance for lenders than a bankruptcy regime. The collateral regime, however, has been vastly ignored in empirical work. This article suggests that it may play a very important role, especially for emerging and transition economies where information asymmetries tend to be a greater concern. We would like to stress here that our results do not imply that a bankruptcy regime is not important. Rather, what our results do indicate is that the efficacy of the bankruptcy regime is conditional on the existence of a strong collateral regime.

Further, we document that entrants, in particular foreign banks, benefit more from legal changes by expanding their lending volume to a greater extent

[29] See note on Table 11 for further details.

than incumbent domestic banks. Finally, our results suggest that the effect of legal change is different across different types of borrowers. Improvement in creditor rights favors individual consumers and smaller borrowers more compared to large corporations. This finding is consistent with the anecdotal evidence that collateral reforms have been accompanied by credit expansions in consumer lending in several countries, including India (Vig 2007). This article thus sheds new light on the causal nexus between banks, lending, and the law.

Appendix A: Reports on Legal Reform

Articles concerning the reform of bankruptcy law

- BCD News, June 27, 2001: *The barriers to implementing Ukraine's new bankruptcy law* (by Alexander Biryukov) " . . . the new law was adopted. Since then, the number of bankruptcy cases has grown dramatically."
- The Baltic Times, February 23, 2000: *Summed up* "Estonia on Jan. 27 adopted amendments to the bankruptcy law to guarantee equal treatment of creditors during bankruptcy proceedings."

Articles concerning the reform of collateral law

- East European Business Law, April 1, 1996: *Progress of EBRD's model law on secured transactions*. "The Bank is confident that the secured transactions project clearly has influenced the reform process in the transition countries. Another problem is that it is competing with other aid agencies with their own idea of what a secured transactions law should look like. Communication between agencies is not always good and sometimes non-existent. . . . It is unlikely to lead to uniformity in approach across the region."
- Budapest Business Journal, April 1, 1996: *Draft loan law could boost GNP by 2%*. "The law draft, which should reach the cabinet soon, will also make it easier for creditors to sell collateral in case of default. The results of these changes could mean more lending and lower rates, which will fuel the economy. . . . There is currently no system in Hungary for registering security interests in movable assets. Creditors either have to rely on debtors' honesty in claiming assets aren't pledged elsewhere, or seize the asset. But seizing factory or office equipment is often impractical, as it shuts down the debtor."
- Financial Times, June 14, 1994: *Business and law: Clearing the way for capital—A look at a model law to provide the basis for workable secured lending regimes in Eastern Europe* (by Robert Rice). "The absence of workable laws on secured transactions restricts the availability of finance. Lenders will most often only make funds available if payment is guaranteed by assets of the borrower. . . . Hungary and Poland have already drafted secured lending laws which draw heavily on the model. . . ."
- East European Banker: *A model way of doing business*. "The model law aims to make it easier for banks to grant long-term loans, according to John Simpson and Jan-Hendrik Rover, the two lawyers who headed the project. Banks in Central and Eastern Europe are notoriously reluctant to lend. . . . The model law on secured transactions hoped to help banks lend by eliminating some risk. 'The problem is simple: without security, banks don't want to lend and if they do, they are only prepared to make very short-term loans—and they take a hefty premium for the risk on their interest rates,' said Simpson."
- Financial Times, March 28, 1995 (by Christopher Bobinski): "Another factor in relatively low lending levels is the lack of adequate laws covering collateral. 'There won't be any significant lending in Poland, indeed no real expansion of the economy, until a workable collateral law is put on the statute books,' explains one banker. The caution in extending credit is quite justified as 'at the moment it is impossible to secure loans,' he adds."

Appendix B: Structure of Financing

Table B1
Lending ratios and legal change

Dependent variable:	(1) log(enter)	(2) log(indi)	(3) log(gov)	(4) log(enter)	(5) log(indi)	(6) log(gov)
Creditor Rights	0.096	0.139	−0.021			
	(0.053)*	(0.059)**	(0.101)			
Collateral				0.140	0.247	−0.050
				(0.063)**	(0.073)***	(0.119)
Bankruptcy				0.036	−0.081	0.039
				(0.010)	(0.100)	(0.160)
Adjusted R^2	98.61%	98.43%	94.33%	98.63%	98.61%	94.27%

This table reports changes in the composition of banks' loan portfolios on an aggregated country level. Aggregate loans that are granted to enterprises (*enter*), households/individuals (*indi*), and government (*gov*) were collected through the respective national central banks and finance ministries of our sample countries. The table reports the coefficient δ from the following specification: $(LendingCategory)_{j,t,k} = \alpha_{j,k} + \beta_{j,t} + \gamma X_{j,t,k} + \delta Legal_{j,t,k} + \varepsilon_{j,t,k}$. In this specification, the dependent variable is the logarithm of loans in each country j that is allocated to each of the different sectors k, namely, the enterprise, household, and government sectors in a given year t. Country and year fixed effects are indicated by α_j and β_t, respectively. Further, GDP, the inflation rate, and the interest rate spread (difference between lending and deposit rate) that are summarized by X_{it}, are included as control variables. Each equation is estimated by OLS. Standard errors are reported in parentheses and are clustered by country of operation. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

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