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Institutions and Bank Behavior: Legal Environment, Legal Perception, and the Composition of Bank Lending

This paper explores how the legal environment affects bank behavior in 20 transition economies. Based on a newly constructed data set we find that banks' loan portfolio composition depends on the legal environment. If banks operate in a well-functioning legal environment they lend relatively more to SMEs and provide more mortgages. On the other hand, banks lend more to large enterprises and to the government if the legal system is unsound. As a transmission channel we identify the banks' willingness to accept collateral which depends on the bankers' perceptions of the prevailing laws regarding collateral.

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THE LINK BETWEEN the legal system and credit market development has been the subject of considerable interest. In their original papers, La Porta et al. (1997, 1998) and more recently Djankov, McLiesh, and Shleifer (2007) show that the size of credit markets depends on the legal origin as well as the prevailing creditor rights in a country. Similarly, on a micro level, Haselmann, Pistor, and Vig (2010) find that banks expand their credit supply once legal rights improve. These papers, however, say little about how the legal environment affects the composition of capital market activity. For example, how do differences in the legal system influence

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a banker's lending decision? Do creditors simply lend more to the same customers if they operate in a better institutional setting, or do they lend to new types of customers?

In this paper, we use data from a recent survey of bankers in the transition countries to address these questions. The survey provides information on both the composition of the bank loan portfolios and the bankers' perceptions of the quality of the legal system in which they operate. Prior work has been unable to relate the composition of bank portfolios to the legal environment because the standard data sources such as financial statements and aggregate data commonly used in cross country credit market studies do not include data on the composition of bank portfolios. Our data come from a 2005 European Bank for Reconstruction and Development (EBRD) survey, the Banking Environment and Performance Survey (BEPS) which conducted more than 200 face-to-face interviews with bank managers in 20 transition economies.¹

Collateral is an important trigger for creditors' willingness to lend to information opaque entities. Thus, we begin with an investigation of bankers' willingness to accept collateral. We find that it depends on the characteristics of the national legal system, as well as the banker's perceptions of the legal environment.

We next examine the relationship between the legal environment and the composition of bank loan portfolios. We find that better legal systems are associated with relatively less lending to low asymmetric information customers such as large and government-owned enterprises. Similarly, when bankers have positive perceptions of the legal environment, there tends to be relatively more lending to information opaque borrowers such as SMEs and mortgage borrowers. Consequently, a better legal environment does not only foster a bigger credit market as established in aggregate cross country studies (the "law and finance" literature cited earlier) but also shifts the composition of lending toward private sector capital formation.

A feature of this paper is that we compare perceptions of the quality of legal institutions from our survey of bankers with direct measures of the characteristics of national legal systems. We find that even after controlling for country heterogeneity, bankers' perceptions influence their lending decisions.

The paper is structured as follows. Section 1 motivates the link between the legal environment (specifically, creditor rights) and the portfolio decisions of banks and develops the hypotheses tested. In Section 2, the banking survey and descriptive statistics are presented. The empirical analysis is provided in Section 3 and Section 4 concludes.

1. MOTIVATION AND HYPOTHESES

Our paper builds on two strands of literature and fills a gap between them. First, we have already cited the law and finance literature that established the link between

1. The transition economies provide an ideal laboratory for examining the effects of the legal environment on bankers' lending decisions because progress toward a market economy has resulted in wide variation in the performance and functions of banks in the countries in our data. This is especially true for creditor rights as pointed out by Pistor (2000).

the quality of the legal environment and aggregate capital market development. The main conclusion from that literature is that better legal systems and institutions are associated with larger financial markets. Second, the corporate finance literature has demonstrated the link between the institutional environment and the capital structure of firms (e.g., Booth et al. 2001). There are, of course, similarities between the influence of the legal environment on firms and on banks. For example Demirgüç-Kunt and Maksimovic (1998, 1999) find that a higher proportion of firms use long-term external financing in countries with better legal systems.² However, there has heretofore been little work on how the behavior of the banks themselves is affected by differences in the legal environment.

Our study of bank behavior begins with an examination of the use of collateral in lending. Its importance was established by Bester (1985), Besanko and Thakor (1987), and Boot and Thakor (1994) who show that collateral can be an instrument to overcome the asymmetric information problem between lender and borrower. In their framework, collateral serves as a signaling device that informs the lender about the true riskiness of the borrower. The incomplete contracting literature (e.g., Hart and Moore 1994, 1998) views collateral differently. It suggests that the use of collateral is a mechanism through which lenders control borrowers and use their bargaining power to force repayment. The institutional environment (e.g., collateral laws) is a determinant of creditors' ability to force repayment.

Thus, there are two competing interpretations of the role of laws concerning collateral. In the first instance, lenders will be reluctant to accept collateral as a way of solving asymmetric information problems unless the legal environment clearly defines creditor rights. A good legal environment is needed to give a creditor access to the collateral in the event of default. Qian and Strahan (2007) illustrate this empirically by showing that in countries with better creditor rights, more loans are secured. On the other hand, if creditor rights are protected but the legal system is creditor unfriendly, lenders might demand more collateral. In this instance, a good legal environment might be associated with less use of collateral. Along these lines, Davydenko and Franks (2008) find that in countries with creditor-unfriendly laws banks' recovery rates are lower. If lenders anticipate this, they adjust their contract terms by requiring more collateral. In our sample of transition countries, it is possible that institutional uncertainties can make it difficult for a bank to collect its collateral in case of default. Thus, we anticipate that better legal structures will be associated with more use of collateral.

Our first hypothesis is that there is a positive link between the reliability of the laws on securing collateral and a bank's willingness to accept collateral in lending. The BEPS survey data provide information on the acceptance of assets as collateral by the banks that we use to test this relationship directly. We will use a probit model to estimate the probability of whether a bank accepts collateral or not.

2. In a related study, Fan, Titman, and Twite (2008) argue that firms operating within legal systems that provide better protection for financial claimants tend to have more long-term debt as a proportion of total debt. Giannetti (2003) shows that firms operating in countries that favor creditor rights are associated with higher leverage and greater availability of long-term debt.

Next, we note that the degree of asymmetric information between lender and borrower varies considerably with different types of borrowers. In the case of government lending the asymmetric information problem is negligible, since the government can always print money to avoid default. At the other extreme is lending to new firms or small firms without a credit history that makes it difficult for a bank to assess credit risk. Therefore, the ability to take collateral is especially important for contracts with such borrowers. Thus, the higher the degree of asymmetric information between lender and borrower, the more important is the ability to rely on collateral (see Liberti and Mian 2010). The willingness to collateralize loans, however, depends on the quality and enforceability of the legal system. Thus, a legal environment that reliably enables the lender to take collateral should have, all else held constant, more loans to information opaque borrowers.

Our survey data enable us to distinguish the proportion of each bank's lending to five sectors: SMEs, large enterprises, mortgages, consumer lending, and government.³ We will estimate a system of equations that relate bank portfolio allocations to the legal environment and expect the following:

- *Enterprise lending:* Banks find it considerably more difficult to gather information about the credit worthiness of a small enterprise compared to large enterprises for which audited financial statements are likely to be available. Thus, asymmetric information problems loom large in SME lending and thus we expect that a better legal environment will be associated with relatively more SME lending and less lending to large enterprises.⁴
- *Household lending:* Mortgage lending is virtually defined by the existence of collateral that can be taken to secure the loan. However, the law has to also provide the means of acquiring properties when a mortgage is in default which is often a complicated issue for occupied residential properties. However, in places where the law defines the collateral relationship and there is confidence that it can be applied, mortgage lending should flourish. Consumer finance usually involves either credit card debt or the purchase of movable assets. Credit card debt is generally not collateralized and therefore should be independent of differences in the legal system. Movable assets on the other hand might be used as collateral. However, the costs of liquidating such collateral can be substantial and banks are likely to use other means of reducing the risks of consumer finance.
- *Government lending:* As noted earlier, information asymmetries are unlikely to play an important role for government lending, since state guarantees are generally the most secure claims in an economy. When the legal environment makes interactions with private sector borrowers problematic, banks may prefer to lend to the government and other state entities.

3. Bank Scope does not provide information on lending by type. To verify the accuracy of the data we compared the lending ratios for the sample banks to aggregate lending by type in 11 countries where central bank data on lending were available. In most instances, the data for the sample banks and the country aggregates were broadly similar.

4. Berger and Udell (1995) point out that collateral is very important in lending to SMEs.

In summary, the expected effect of the overall quality of the legal environment on lending shares can be given by

	SMEs	Large enterprises	Mortgages	Consumer lending	Government
Quality of law	+	–	+	?	–

Measurement of the quality of the legal environment is not a simple matter. The empirical law and finance literature uses the characteristics of national legal structure. Such measures might be problematic for at least two reasons. First, there might be wide differences in the ways formal laws and legal structures are applied in practice. Second, decision making by lenders will depend on their perception of the legal structure. This perception is likely to differ for different types of lenders.⁵ We are able to address this issue by introducing bankers' perceptions from the BEPS survey as measures of the quality of the legal environment.

2. DATA AND DESCRIPTIVE STATISTICS

2.1 BEPS Survey Loan Data

The BEPS sample design was a random sample of 423 banks from 20 countries. Banks in smaller countries and also in Russia (26% of the sample frame) were oversampled. More than half the banks (63% when Russia is excluded) agreed to participate and data were collected from face-to-face interviews with 219 high-ranking bank managers.⁶ Each bank was linked to the Bank Scope data after a careful examination to properly identify the company and the appropriate level of consolidation.⁷ When the Bank Scope data for the 423 banks in the EBRD sample frame are compared to the data for the 219 banks that responded to the survey, there is no indication of systematic response bias.⁸ The actual sample sizes in the empirical analysis is often smaller because Bank Scope does not cover a handful of banks that

5. Haselmann, Pistor, and Vig (2010) find that foreign banks rely more on the law compared to domestic banks since they have less soft information available to base their lending decision on. Thus, their perception is likely to differ.

6. The countries with the lowest response rates were, in addition to Russia, the Ukraine and also Hungary and the Czech Republic. Successful bankers in the advanced transition countries might have been less inclined to set aside the time for an EBRD interview than others. In the tense environment in Russia and the Ukraine bankers might have had other reasons to avoid responding.

7. The Bank Scope data set was prepared by Dr. Anita Taci of the EBRD.

8. In most countries the average asset level and the return on assets are about the same for responding and nonresponding banks. The correlation of the country average ROAs from the full sample frame and from the survey respondents is 0.97 and the rank correlation is 0.76.

responded to the survey and, more importantly, responses for some questions are missing for many banks.⁹

The BEPS survey asked the bank manager to provide an allocation of customer loans among different types.¹⁰ As noted earlier, we distinguish among the following borrowers: small and medium enterprises (less than 250 employees), large enterprises, mortgages, consumer finance, lending to government and state-owned enterprises, and other lending. The survey also provides information on bank ownership. We used majority ownership as the basis for classifying banks as government or foreign owned. The privatization of banks in the transition countries was largely completed by 2005 so only 9% of the banks in the survey were government owned.¹¹ Even banks that reverted to government ownership during banking crises in the late 1990s (e.g., in Romania and Croatia) had been privatized when the survey was conducted. Sixty-one percent of the respondent banks are foreign, including both greenfield banks and banks acquired by mergers and acquisitions.

Table 1 shows summary statistics for the lending ratios for all respondent banks and then divides the banks by ownership, region, and size.¹² Perhaps the most striking observation from Table 1 is that foreign banks do relatively less lending to SMEs than either government or domestic private banks. Buch (2003) argues that foreign banks generally have to overcome cultural barriers and therefore it is more difficult for them to process soft information in their lending decisions. Giannetti and Ongena (2009) claim that foreign banks in a sample of transition countries lack the local information that is particularly important for lending in countries where asymmetric information problems are severe.

Since the number of respondents from many countries is too small to make a comparison of averages by countries informative, we show the means for three country groups: the eight transition countries that are now members of the European Union (EU), the countries of the former Soviet Union (FSU) with the exception of the Baltic countries that are already part of the EU, and the countries of South Eastern Europe (SEE).¹³ Mortgage lending is primarily found in the EU countries where the legal infrastructure for such loans is in place. Banks in the FSU do more enterprise lending, perhaps because many of them are corporate affiliates or house banks although banks in the FSU do more lending to both large and small enterprises.

9. Eighteen respondent banks were excluded because Bank Scope data were missing or inadequate: four in Moldova, three in Macedonia, three in Belarus, two in Slovakia, two in Serbia, and one in each of Bosnia, Bulgaria, Poland, and Ukraine.

10. The questionnaire is available from the authors upon request.

11. The state-owned banks including two for which there is no Bank Scope information were concentrated in a few countries, three each in Belarus, Bosnia, and Serbia; two in the Czech Republic; and one in each of seven other countries.

12. Row totals do not add to 100 because other lending is omitted and because of nonresponses for some categories.

13. The countries are: EU: Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Slovakia, Slovenia; FSU: Belarus, Kazakhstan, Moldova, Russia, Ukraine; SEE: Albania, Bosnia, Bulgaria, Croatia, Macedonia, Romania, Serbia.

TABLE 1
DESCRIPTIVE STATISTICS OF LENDING RATIOS

		Enterprise lending		Household lending		Government lending
		SME	Large enter.	Mortgage	Consumer	
I. Total						
	Mean	40.51	19.32	8.80	16.17	5.61
	St. dev.	27.72	21.93	15.55	19.17	11.89
	Obs	128	128	172	168	194
II. Ownership						
GOVERNMENT						
	Mean	40.00	7.49	1.91	13.76	15.28
	St. dev.	31.99	9.72	2.98	11.58	22.59
	Obs	11	11	15	14	16
DOMESTIC						
	Mean	48.24	23.55	6.10	13.43	3.28
	St. dev.	25.75	25.51	12.38	15.17	6.89
	Obs	48	48	67	67	77
FOREIGN						
	Mean	35.22	18.26	11.96	18.66	5.85
	St. dev.	27.49	19.95	18.06	22.45	11.87
	Obs	69	69	90	87	101
III. Region						
EU						
	Mean	32.47	13.24	16.12	16.06	7.35
	St. dev.	28.50	19.49	23.54	24.34	13.49
	Obs	35	35	59	56	64
SEE						
	Mean	41.81	15.64	6.87	19.29	5.25
	St. dev.	26.75	16.27	5.91	17.53	12.37
	Obs	55	55	65	65	71
FSU						
	Mean	46.04	30.24	2.43	11.98	4.14
	St. dev.	27.42	27.16	5.88	12.94	9.08
	Obs	38	38	48	47	59
IV. Size (assets in \$ million)						
< 200						
	Mean	52.43	11.89	7.52	16.15	4.39
	St. dev.	26.69	15.80	18.40	19.58	12.27
	Obs	41	41	53	53	57
200–1,000						
	Mean	39.65	20.18	7.06	17.63	4.41
	St. dev.	28.29	22.30	10.18	22.29	10.96
	Obs	54	54	67	67	78
>1,000						
	Mean	27.60	28.02	11.60	15.16	7.52
	St. dev.	21.67	25.56	13.30	13.58	11.81
	Obs	30	30	46	43	54

Finally, we group the banks into three size groups with roughly about a third of the banks in each group: assets less than \$200 million, between \$200 million and \$1 billion, and in excess of \$1 billion. Smaller banks do more SME lending, while larger banks prefer to lend to large enterprises. Large banks do less corporate lending overall, in part because they are more active in household lending.

2.2 Collateral Acceptance

The BEPS survey provides information about bankers' willingness to accept collateral. We use the survey responses to construct a measure of each bank's willingness to accept assets as collateral. The acceptances of collateral variable has a value of one if the bank frequently or always accepts collateral and a value of zero if sometimes

or never. The construction of the variable *Collateral Acceptance* from the BEPS responses is described in Appendix B.

2.3 Legal Indicators

Two types of legal indicators are used here to measure the quality of the legal environment. First, we use the bank managers' own assessment of the legal environment as reported in the BEPS survey. Second, we follow the law and finance literature and use national indicators to directly measure the quality of the legal environment. These variables are constructed from data in 2004 EBRD Legal Transition Programme (LTP).¹⁴

The BEPS survey asked bank managers about their perceptions of law enforcement and the quality of laws. In each instance, the bank manager was given several relevant criteria and asked to provide a response on a six-point scale. In order to synthesize the diffuse responses we follow Hoshi (2006) and aggregate the responses to construct indicators of positive views about law enforcement and collateral laws. The construction of *BEPS Collateral Perception* is shown in Appendix C.

A similar procedure was used to measure the bankers' confidence in the ability of the legal system to resolve disputes. BEPS respondents were asked to express the extent of their agreement with five statements indicating for example whether the system is fair and impartial, affordable, able to enforce decisions, etc. Details regarding the construction of *BEPS Law Perception* are shown in Appendix D.

The *LTP Direct Indicator* measures how well a lender's claim can be enforced. It is based on three EBRD indices that score each country on the basis of:¹⁵

- (i) the amount that can be expected to be recovered from a debtor,
- (ii) the time needed to realize recovery, and
- (iii) the simplicity of the legal process to be followed.

2.4 Further Controls

In our empirical analysis, we test a variety of country control variables to account for country heterogeneity. Data on the CPI inflation rate, GDP per capita, GDP per capita growth, the interest rate spread, and the ratio of private credit to GDP are taken from the World Bank Development Indicators. We also test the *Credit information index* from the World Bank "Doing Business" survey that measures rules affecting the scope, access, and quality of credit information in each country.¹⁶

Information on contract enforcement has been identified by Djankov et al. (2003) and collected by the World Bank "Doing Business" survey. The first is *Time* that records the number of calendar days from the time the plaintiff files a lawsuit until

14. See EBRD Legal Survey (2004) for further details.

15. Each index runs from 0 to 10 and *LTP Direct Indicator* is the sum of scores.

16. Earlier studies (Pagano and Jappelli 1993, Jappelli and Pagano 2002) emphasize the importance of information provision mechanisms as a determinant of credit supply.

payment is made. The second variable, *Cost*, is the cost of enforcing a contract (including court costs and average attorney fees) as a percentage of the claim. Finally, we use the measure *Efficiency* of debt enforcement in each of our sample countries from Djankov et al. (2008). It is a constructed measure of the efficiency of debt enforcement based on local practitioner's evaluations of a hypothetical case of a debt default and insolvency.

2.5 Summary Statistics

Definitions and summary statistics for all variables are shown Appendix A. The correlations of *LTP Direct Indicator* with the *BEPS Law Perception* and *BEPS Collateral Perception* are 0.11 and 0.28, respectively, suggesting that the direct and perception measures contain different information. One reason for this is that bankers in countries with objectively poor quality of law (according to LTP) often report a good perception of their legal environment. In addition, there is considerable variation among the responses of bankers from a given country, particularly in countries with relatively poor scores from the LTP survey. Since we are interested in explaining the banks specific behavior, the bankers' perceptions of the environment may be as important as directly measured country-to-country differences that are correlated with macro control variables.

3. EMPIRICAL RESULTS

3.1 Acceptance of Collateral

Our first hypothesis suggests that collateral is only effective as a tool to overcome asymmetric information in the borrower–lender relationship, if the legal environment is sufficiently good. That is, banks will only accept collateral, if they have a good perception of the law that protects collateral for the lender. The banker's choice to accept a certain type of collateral is examined with a probit model where the dependent variable has a value of one if the *i*th bank in the *j*th country accepts fixed assets as collateral:

$$\Pr(\text{Collateral Acceptance})_{ij} = \beta_0 + \beta_1 \cdot \log(\text{Assets}_{ij}) + \beta_2 \cdot \text{Country Controls}_j + \beta_3 \cdot \text{Legal Indicators}_{ij} + \varepsilon_{ij}. \quad (1)$$

We control for the bank size and country macroeconomic characteristics in equation (1) and are particularly interested in the coefficient β_3 , which measures the effect of the legal indicators on the willingness to accept collateral. Since the direct legal indicator only varies by country, country fixed effects that would absorb the variation in the legal variables cannot be included. Instead, we include each country's GDP per capita and inflation rate to control for country heterogeneity.

Results are found in Table 2 with alternative specifications for the quality of the legal environment. For each probit model, we show the coefficients, standard errors,

TABLE 2
PROBIT REGRESSION RESULTS

	(1)	(2)	(3)
Constant	-1.785 (0.735)**	-1.926 (0.762)***	-1.109 (0.833)
log(Assets)	0.142 (0.052)***	0.056 (0.052)***	0.143 (0.056)***
GDP pc	-0.121 (0.055)**	-0.048 (0.068)**	-0.055 (0.069)**
Inflation	-0.062 (0.021)***	-0.025 (0.020)***	-0.066 (0.020)***
<i>BEPS Collateral Perception</i>	0.069 (0.022)***	0.027 (0.023)***	0.025 (0.015)*
<i>LTP Direct Indicator</i>		0.015 (0.018)	0.024 (0.015)*
Pseudo R^2	9.85%	10.19%	7.55%

NOTES: Coefficients of probit estimates of (1). *Collateral Acceptance* is a binary variable that takes the value of 1 if a bank has a high acceptance assets as collateral and 0 otherwise. Standard errors are reported in parentheses below each coefficient. Estimated are based on 171 observations. ***, **, and * indicate significance at the 1%, 5%, and 10% level, respectively. The marginal effects are shown to the right of each corresponding coefficient.

and in the column to the right, the marginal impact of the variables on the probability of accepting collateral.¹⁷

The first specification includes the BEPS measure of the bankers' perceptions of the collateral law. In the second specification, we add the direct measure of law and the third specification includes the direct measure alone. Overall, there is some indication that larger banks are more willing to use collateral. Column (1) indicates that better perception of collateral laws is associated with a greater willingness to accept collateral. The coefficient is significant at the 1% level. In column (2), we add the *LTP Direct Indicator* to the estimation. The coefficient of the perception indicator remains statistically significant. These estimates suffer from endogeneity bias since bankers' behavior is the dependent variable and the same bankers' perceptions of the environment appear as explanatory variables. For this reason, we also use the exogenous legal measure, *LTP Direct Indicator*, without the perception variable in column (3). It also provides support for our hypothesis, the coefficient is positive, and significant at the 10% level.

The marginal effects, shown to the right of the probit coefficients, are a better measure of the impact of the independent variables on the probability of the willingness to accept collateral. To interpret the impact of the legal variables, consider a one standard deviation increase in the legal measures. From equation (1), this implies an 11 percentage point increase in the probability of collateral acceptance. Similarly, using equation (3), the impact of a one standard deviation increase in the direct measure of law enforcement is a 7 percentage point increase.

For a bank of average size, in a country with average macro characteristics and bankers with average perceptions of the quality of collateral law, the probability of

17. The results shown here are for the acceptance of immovable assets as collateral but the results for movable assets are similar.

collateral acceptance is 53.5%. A doubling of the bank's size will increase this probability by 11 percentage points. This comparison shows that the banker's perceptions of collateral laws is generally as important as the bank size.

3.2 *Lending and the Banking Environment*

The discussion in Section 1 turned next to the effect of the legal environment on a banker's decision to lend to certain types of borrowers. To test these relationships, we include the legal indicators in a system of equations for the composition of the banks' loan portfolio. The dependent variables are the percentages of total lending that sum to one. We also control for bank size and country-specific characteristics. The system is given by

$$\begin{aligned} (\text{Lending ratios})_{ijk} = & \beta_{0k} + \beta_{1k} \log(\text{Assets}_{ij}) + \beta_{2k} \text{Country Controls}_j \\ & + \beta_{3k} \text{Legal Indicators}_{ij} + \varepsilon_{ijk}, \end{aligned} \quad (2)$$

where i indexes banks, j countries, and k the lending categories.¹⁸ As before, we include each country's GDP per capita and inflation rate to control for country heterogeneity.

The aim of this system is to examine the allocation of the lending portfolio among SME, large enterprise lending, mortgages, consumer finance, government lending, and other loans. Since all categories add to 100% of total lending, other lending is explained by the other categories and is therefore left out of the estimation. Since our main interest is the impact of legal indicators on the portfolio allocations and since the survey measures of perceptions may be endogenous, we present instrumental variable estimates to account for possible endogeneity of the perception variables.

The endogeneity problem emerges because bankers that lend more to information opaque borrowers might claim that they have more trust in the legal system in order to justify their lending decision. Thus, there might be an upward bias in the coefficients on the legal measures derived from BEPS. Instruments should determine bankers' perception of the law but should not otherwise affect bankers' lending portfolio decision. We believe that bank ownership constitutes such an instrument. More specifically, government bankers' perception of the law is likely to differ from the perception of law of other bankers. Similar differences can also be expected for the perceptions of domestic and foreign bankers. While domestic bankers are likely to be more cross-linked and connected with national regulators, foreign bankers will be generally less dependent on personal relationships. Thus, the legal environment does not affect all market participants in the same way. For example, Bhattacharya, Galpin, and Haslem (2007) show for the United States that the announcement of a lawsuit affects domestic and foreign firms differently, since domestic firms tend to have a home court advantage. In a related paper, Haselmann, Pistor, and Vig (2010)

18. By construction, the lending ratios are bound between zero and one. Histograms of the loan ratios indicate that the underlying distributions are, however, symmetric.

TABLE 3
VALIDITY OF INSTRUMENT

Dependent var.	(1) <i>BEPS law perception</i>	(2) <i>BEPS collateral acceptance</i>
Constant	21.658 (0.729)***	18.655 (0.682)***
FOR	-1.658 (0.729)**	-0.753 (0.549)
GOV	-1.625 (0.936)*	-1.460 (1.379)
Adj. R^2	15.52%	21.70%

NOTES: OLS regression estimates of legal indicators on bank ownership and country dummies. Standard errors are reported in parentheses. The regressions were run for 219 banks for the year 2004. The bottom line of the table states the adjusted R^2 of each estimation. ***, **, and * indicate significance at the 1%, 5%, and 10% level, respectively.

TABLE 4
INSTRUMENTAL VARIABLE ESTIMATES FOR LOAN PORTFOLIO DECISION

	Enterprise		Household		Government
	SME	Large ent.	Consumer	Mortgage	
Constant	160.572 (31.843)***	-62.291 (25.023)**	35.688 (19.854)*	-21.430 (16.151)	24.643 (12.932)*
log(Assets)	-6.835 (2.092)***	4.854 (1.644)***	0.260 (1.273)	-0.347 (1.030)	0.910 (0.760)
GDP pc	-0.001 (0.001)	0.000 (0.001)	0.000 (0.001)	0.001 (0.001)	0.001 (0.001)
Inflation	-0.447 (0.469)	1.485 (0.369)***	-0.437 (0.299)	-0.229 (0.242)	-0.353 (0.186)*
Private Sector	0.129 (0.305)	0.119 (0.240)	-0.061 (0.154)	0.083 (0.125)	-0.216 (0.098)**
<i>BEPS Collateral Perception</i>	-2.063 (1.454)	-0.067 (1.142)	-1.036 (0.934)	1.932 (0.764)**	-1.034 (0.628)
Adj. R^2	15.67%	25.38%	2.18%	2.27%	4.79%

NOTES: Instrumental variable estimates for system (2). Bank ownership and country dummies are used as instruments. Standard errors are reported in parentheses. The regressions were run for 219 banks for the year 2004. The bottom line of the table states the adjusted R^2 of each estimation. ***, **, and * indicate significance at the 1%, 5%, and 10% level, respectively.

show that the response of foreign bankers to changes in the legal environment are greater than those of domestic bankers. These findings suggest that the ownership type of the bank will influence bankers' perception of the law. We test our choice of bank ownership as an instrument with regressions of the BEPS perception variables on bank ownership and country fixed effects. These regressions, presented in Table 3, show that bank ownership is a significant determinant of bankers' law perception and that the signs of the coefficients show the expected direction. Since ownership is a determinant of perceptions it is a valid instrument.

Instrumental variable estimates of (2) are shown in Tables 4–6. Each table includes a different specification of the legal variables. To begin, Table 4 includes the bankers' perceptions of the collateral laws, *BEPS Collateral Perceptions*. Our aim here is to show that the perception of the quality of the collateral laws not only affects

TABLE 5
INSTRUMENTAL VARIABLE ESTIMATES FOR LOAN PORTFOLIO DECISION

	Enterprise		Household		Government
	SME	Large ent.	Consumer	Mortgage	
Constant	71.853 (36.703)*	-14.752 (26.675)	47.177 (25.693)*	-17.338 (19.228)	27.866 (16.620)*
log(Assets)	-5.146 (0.265)**	3.480 (1.528)**	0.957 (1.562)	-0.404 (1.185)	1.257 (0.878)
GDP pc	-0.002 (0.001)	0.001 (0.001)	0.000 (0.001)	0.000 (0.001)	0.001 (0.001)
Inflation	-0.540 (0.486)	1.519 (0.353)**	-0.320 (0.336)	-0.326 (0.258)	-0.298 (0.210)
Private Sector	-0.079 (0.265)	0.027 (0.193)	-0.143 (0.168)	0.253 (0.128)**	-0.322 (0.106)***
<i>BEPS Law Perception</i>	3.276 (1.378)**	-1.730 (1.001)*	-1.919 (1.201)	1.016 (0.879)	-1.032 (0.732)
Adj. R^2	17.58%	28.73%	2.25%	3.52%	5.54%

***, **, and * indicate significance at the 1%, 5%, and 10% level, respectively.

TABLE 6
INSTRUMENTAL VARIABLE ESTIMATES FOR LOAN PORTFOLIO DECISION

	Enterprise		Household		Government
	SME	Large ent.	Consumer	Mortgage	
Constant	71.757 (36.951)*	-14.831 (26.812)	42.539 (24.784)*	-10.656 (18.425)	25.211 (16.125)
log(Assets)	-5.148 (2.117)**	3.478 (1.536)**	1.001 (1.500)	-0.397 (1.125)	1.187 (0.849)
GDP pc	-0.002 (0.002)	0.001 (0.001)	0.001 (0.001)	0.000 (0.001)	0.001 (0.001)*
Inflation	-0.540 (0.489)	1.519 (0.355)**	-0.241 (0.325)	-0.396 (0.246)	-0.268 (0.203)
Private Sector	-0.043 (0.285)	0.056 (0.207)	-0.051 (0.168)	0.158 (0.127)	-0.272 (0.106)**
<i>BEPS Law Perception</i>	3.303 (1.389)**	-1.707 (1.008)*	-1.526 (1.170)	0.476 (0.859)	-0.732 (0.727)
<i>LTP Direct Indicator</i>	-0.178 (0.502)	-0.147 (0.364)	-0.609 (0.301)**	0.597 (0.228)*	-0.329 (0.189)*
Adj. R^2	17.55%	28.93%	2.38%	13.88%	5.89%

***, **, and * indicate significance at the 1%, 5%, and 10% level, respectively.

the willingness to accept collateral (as already shown) but also affects the lending behavior of banks. In Table 5, we show how the overall perception of the quality of law, *BEPS Law Perception*, influences the allocation of the loan portfolio and in Table 6 we allow for the influence of overall perceptions and the objective measure of the quality of law, *LTP Direct Indicator*.

The size of the bank influences the allocation of loans between large and small enterprises. Larger banks devote a significantly greater proportion of their lending to large enterprises rather than SMEs. Larger banks seem to do relatively more government lending and less mortgage lending although these differences are not

significant. The national macroeconomic characteristics do not have very marked influences on lending patterns. The exception is that higher inflation leads to more lending to large enterprises perhaps because they have the pricing power that provides inflation protection. The size of the private sector is inversely related to the proportion of lending going to the government. To a certain extent, these relationships might be more descriptive than causal because there are more large enterprises in high inflation countries and the size of the private sector determines the size of the government sector.

Our principal interest is the effect of the legal system and perceptions of the legal environment on the allocation of lending among the sectors. Table 4 shows that when bankers have a better perception of collateral laws, there is relatively more mortgage lending. This is not surprising because a mortgage lending program is not likely to develop in the absence of well-defined law regarding collateral. Table 5 provides a further demonstration of the importance of the legal structure. When the bankers have a better overall perception of the quality of the law, a significantly higher proportion of loans goes to SMEs and significantly less to large enterprises. This result provides a connection between the quality of law and economic development through the SME sector. The quality of law is important for SMEs because it provides an environment where there is more bank lending.

In Table 6, we include both the BEPS variable for the banker's perception of the quality of law and the LTP direct measure of the quality of law enforcement. The bankers' perceptions have the same significant effects shown in Table 5, indicating a shift in lending from large enterprises to SMEs. Better enforcement of the law as indicated by the objective scoring by the LTP variable also has significant influences on the allocation of lending among sectors. A better legal environment is associated with more mortgage lending, less consumer lending, and less lending to government.

Importantly, the measures of the quality of law are constructed in very different ways. The BEPS survey questions bankers regarding their opinions concerning the legal environment in which they operate. The direct LTP data are based on national descriptive information collected by EBRD's experts. When both variables are placed in the system of regressions, the direction of influence is the same in every instance. The same story is told by these very different measures of the quality of the legal environment.

We use the results in Table 6 to indicate how portfolio allocations change when there is a one standard deviation improvement in both the perceptions (BEPS) and direct (LTP) measures of the quality of the legal environment. Summing the impacts of a one standard deviation increase in each legal measure provides the following (we include the implied effect on the residual category, other lending):

SME	Large ent.	Consumer	Mortgage	Government	Other lending
+13.9	-8.8	-11.0	+6.1	-5.6	+5.4

TABLE 7

INSTRUMENTAL VARIABLE ESTIMATES FOR LOAN PORTFOLIO DECISION WITH ADDITIONAL COUNTRY-SPECIFIC CONTROLS

	Enterprise		Household		Government
	SME	Large ent.	Consumer	Mortgage	
Constant	86.133 (90.716)	-60.910 (70.689)	47.810 (51.097)	1.973 (42.520)	7.165 (30.702)
log(Assets)	-4.629 (2.448)*	3.698 (1.908)*	-0.004 (1.812)	0.916 (1.518)	0.684 (1.009)
GDP pc	0.013 (0.005)**	0.005 (0.004)	-0.005 (0.003)	0.003 (0.003)	-0.002 (0.002)
Inflation	-2.152 (2.400)	2.465 (1.870)	-0.147 (1.329)	-0.953 (1.100)	0.296 (0.813)
Private Sector	0.199 (0.462)	0.431 (0.360)	-0.285 (0.296)	-0.037 (0.245)	-0.194 (0.187)
Cost	0.925 (1.446)	0.654 (1.127)	-1.601 (0.933)*	1.795 (0.793)**	-0.722 (0.633)
Time	-0.080 (0.032)**	-0.010 (0.025)	0.029 (0.017)*	-0.035 (0.015)**	0.020 (0.011)*
Efficiency	0.027 (0.374)	-0.078 (0.292)	0.147 (0.249)	0.297 (0.205)	0.007 (0.157)
EU	-19.946 (15.813)	-8.359 (12.322)	-0.077 (9.429)	10.592 (7.761)	-4.054 (5.980)
SEE	36.324 (15.896)**	16.335 (12.386)	-5.882 (10.659)	-5.570 (8.922)	-2.676 (6.613)
Credit information index	0.524 (3.888)	2.542 (3.030)	-1.348 (2.791)	-1.911 (2.277)	1.459 (1.768)
Domestic credit	-1.626 (0.857)*	-0.081 (0.668)	0.155 (0.385)	-0.095 (0.319)	0.191 (0.236)
<i>BEPS Law Perception</i>	3.489 (1.892)*	-2.475 (1.474)*	0.350 (1.655)	-1.306 (1.426)	-0.090 (1.028)
Adj. R^2	27.41%	34.41%	12.67%	13.87%	15.12%

***, **, and * indicate significance at the 1%, 5%, and 10% level, respectively.

Better legal institutions are associated with relatively more SME, mortgage, and other lending, and less large enterprise, consumer, and government lending.

3.3 Robustness Tests and Further Evidence

In this section, we provide some additional estimates to demonstrate the robustness of the results just discussed. Notably, we are concerned with the possibility that our legal indicators capture cross-country heterogeneity rather than differences in the legal environment. The basic specification in Tables 4–6 included three country controls: GDP per capita and inflation and the size of the private sector. In Table 7, we show estimates with additional controls. The additional explanatory variables are: *Time* (the number of calendar days from the time the plaintiff files a lawsuit until payment is made), *Cost* (the cost of enforcing a contract as a percentage of the claim), *Efficiency* (the efficiency of debt enforcement), *Domestic credit* (ratio of private credit to GDP), *Credit information index* (the country risk rating), as well as dummy variables for regions. The system in Table 7 also includes *BEPS Law*

Perception. Most importantly, including this broad range of country controls in our system has hardly any effect on the size or significance of our legal indicator. These results strongly suggest that the perception indicator included in our system does not simply account for country heterogeneity but for the prevailing influence of differences in the perception of the legal environment banks operate in.

The BEPS perceptions measures have a distinct advantage over the direct indicator. While the LTP measures only vary by country, the BEPS measures vary at the bank level. A common problem in the earlier law and finance literature is that legal structures are always measured at the national level. Since countries that differ in their legal systems are likely to also differ in other dimensions that are difficult to account for, it is difficult to distinguish the influences of the legal system from other national characteristics. However, we can use the BEPS measure and at the same time completely control for cross-country heterogeneity by including country fixed effects. In an additional robustness test, we include the BEPS measures of perceptions of the legal environment and also add country fixed effects to the equations. The legal coefficients are virtually unchanged when compared to the specifications without country effects.¹⁹ Thus, the significant impact of law perception on the lending decision of banks is caused by bank and not country variation. This suggests that it is not only the actual legal system existing in a country but also the individual banker's perception of these laws that matters for the lending decision of banks.

Finally, our BEPS and LTP legal measures are constructed as the sum of coded responses to survey questions. The scaling of these ordinal measures might not have any meaning when treated as a continuous variable a regression context. An alternative approach is to use the legal measures to construct dummy variables that categorize objective and perceptions measures into high and low groups. We estimated our systems of equations with dummy variables to denote the groups rather than the continuously varying measured constructed from the surveys. In all cases, the results are qualitatively the same as those shown.²⁰

4. CONCLUSION

The legal environment does not only influence credit market development but also has an important impact on the customers banks lend to. The better the legal system, the more willing a bank is to accept different types of assets as collateral and the more willing a bank is to lend to information opaque borrowers. On the contrary, the worse the legal environment, the more a bank lends to customers that can either provide guarantees (government lending) or easily provide information about their projects (large enterprise lending). Thus, a better legal environment fosters private capital formation.

19. Regression results are available from the authors.

20. Regression results are available from the authors.

We find that a banker's willingness to accept collateral is associated with the quality of the legal system. When banks find themselves in a good institutional environment, they accept collateral as a security for lending contracts that involve a high degree of asymmetric information. If bankers have low perceptions of the quality of their environment they will not enter such contracts and rather channel their funds to large and government-owned enterprises. Finally, we find that not only the legal environment but also the perception bankers have concerning the legal system matters for the allocation of bank lending. We find that banks that operate in a better legal environment lend proportionally more to SMEs and give out more mortgages. Further, we find that in a good legal environment the proportion of lending to large enterprises, government, and other household lending is lower.

APPENDIX A: DEFINITION AND SOURCES OF VARIABLES

Variable	Definition	Mean	St. dev.	Source
I. BEPS and LTP legal indicators				
<i>Collateral Acceptance</i>	see Appendix B	3.73	1.19	BEPS survey
<i>LTP Direct Indicator</i>	see Section 2.3	19.54	6.61	LTP survey
<i>BEPS Law Perception</i>	see Appendix D	16.96	4.58	BEPS survey
<i>BEPS Collateral Perception</i>	see Appendix C	15.16	3.98	BEPS survey
II. Control variables				
EU	value of one if bank is located in a EU country (zero otherwise)	0.34	0.47	BEPS survey
SEE	value of one if bank is located in a SEE country (zero otherwise)	0.37	0.48	BEPS survey
log(Assets)	total assets	13.13	1.59	Bank Scope (2006)
GDP pc	GDP per capita in 1,000s US\$	3.18	2.17	World Bank (2006)
Inflation	GDP price deflator in annual %	9.22	6.60	World Bank (2006)
Credit information index	index that measures rules affecting the scope, access, and quality of credit information	2.42	2.05	World Bank (2007)
Domestic credit	domestic credit as % of GDP	37.74	15.12	World Bank (2006)
GDP growth	GDP growth rate in annual %	6.93	2.07	World Bank (2006)
Interest spread	lending rate minus deposit rate	5.86	2.53	World Bank (2006)
Time	calendar days to resolve the dispute	449.20	287.14	World Bank (2007)
Cost	cost in court fees and attorney fees as percentage of debt value	14.10	4.58	World Bank (2007)
Efficiency	measure of the efficiency of debt enforcement	42.66	16.95	Djankov et al. (2008)
Private sector	size of the private sector in %	65.52	12.57	World Bank (2006)
III. Instruments				
GOV	value of one if bank is owned by government (zero otherwise)	0.08	0.28	BEPS survey/ hand collected
FOR	value of one if bank is foreign owned (zero otherwise)	0.53	0.50	BEPS survey/ hand collected

APPENDIX B: CONSTRUCTION OF *BEPS COLLATERAL ACCEPTANCE*

The survey asks bankers how frequently they accept different types of assets (land and buildings) as collateral on a scale of 1 (never) to 6 (always). The responses were averaged so the overall indicator ranges from 1 to 6. The indicator scores provide an ordinal ranking rather than an objective numerical measure of intensity. For this reason, we create dummy variables that separate responses into high (scores from 4 to 6) and low (scores from 1 to 3) groups for the acceptance of collateral measures. Specifically, the dummy variables for the *BEPS Collateral Acceptance* take the value of one if a bank accepts assets frequently as collateral and zero otherwise.

APPENDIX C: CONSTRUCTION OF *BEPS COLLATERAL PERCEPTION*

Measures of perceptions of the banking environment were constructed from three other questions. The questionnaire included questions concerning a banker's perception of laws related to movable assets and to immovable assets. For both questions, four statements were presented to which the responding bank executive indicated the extent of his or her agreement on a scale from 1 (strongly disagree) to 6 (strongly agree). These four statements are illustrated in the questionnaire excerpt shown below. We added the scores (using averages for missing responses) in order to get an overall measure of respondents' confidence in the collateral laws for immovable assets. This yields our indicator *BEPS Collateral Perception*.

Thinking of the laws on the books in your country in 2004 related to pledges (loans secured by immovable assets), to what extent do you agree with the following statements?

- The laws provide adequate scope of security (e.g., types of assets received as collateral, types of debt that can be secured)
- The laws enable efficient creation and perfection of security rights (simple, cheap, fast)
- The laws enable efficient enforcement of security rights (simple, cheap, fast)
- The laws adequately protect secured creditor rights

APPENDIX D: CONSTRUCTION OF *BEPS LAW PERCEPTION*

Finally, we use a question related to the ability of the court system to resolve business disputes. Respondents were asked to express their agreement with five statements on a scale from 1 (never) to 6 (always). These five statements are illustrated in the questionnaire excerpt below.

How often do you associate the following descriptions with the court system in resolving business disputes?

- Fair and impartial
- Honest and uncorrupted
- Quick and efficient
- Affordable
- Able to enforce its decisions

We added the scores of these five statements (using averages for missing responses) in order to get an overall measure of respondents' confidence in the court system (*BEPS Law Perception*).

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