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for Reconstruction and Development

What determines banks' customer choice? Evidence from transition countries

Ralph De Haas, Daniel Ferreira, Anita Taci

Summary

This paper explores how bank characteristics and the institutional environment influence the composition of banks' loan portfolios. Using a new data set based on the recent EBRD Banking Environment and Performance Survey (BEPS), which was conducted in 2005 for 220 banks in 20 transition countries, we show that bank characteristics such as ownership and size are important determinants of bank customer focus. In particular, we find that foreign banks are relatively strongly involved in mortgage lending and lending to subsidiaries of foreign companies, while lending relatively less to large domestic firms. We also find that small banks lend relatively more to SMEs than large banks do, while large banks appear to have a comparative advantage in lending to large customers. We do not find much evidence for the hypothesis that better legal credit protection changes bank portfolio composition. An exception is that banks that perceive pledge and mortgage laws to be of high quality focus more on mortgage lending.

Keywords: banking, portfolio composition

JEL classification numbers: F36, G21, K22, P27

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The working paper series has been produced to stimulate debate on the economic transformation of central and eastern Europe and the CIS. Views presented are those of the authors and not necessarily of the EBRD.

INTRODUCTION

During the last decade and a half there have been important changes in the ownership structure and the institutional environment of the banking systems in transition countries. The most striking development regarding ownership structure has been the large-scale penetration of foreign banking groups into the transition region. This has led to an unprecedented level of integration between banking systems in developed – mainly western European – countries and those in transition countries. In many of those transition countries foreign banks dominate the market and their affiliates now form the main source of external finance for households and firms. The progress in the transition from planned economies to market economies has also gradually – but substantially – changed the working environment of banks. Most important is the (uneven) progress countries have made in improving the legal protection of banks as creditors and the enforcement of this protection through the courts.

This paper explores how cross-country variations in ownership structure and the institutional environment explain the role of banks in financing business activity, households, and the government. While earlier research has been able to track the growth of total loans in transition countries, little is known about the composition of bank lending as regards specific customer types. Do foreign banks differ from domestic banks in their loan portfolio composition or is bank size more important than ownership per se? And is the composition of banks' loan portfolios also influenced by the quality of the protection of creditors?

We are able to shed more light on these issues due to a new EBRD survey which allows for a bank-level analysis of credit portfolios and how the institutional environment influences banks. The Banking Environment and Performance Survey (BEPS) were conducted in 2005 with a random sample of 220 banks in 20 transition countries. This dataset has been combined with Bureau van Dijk's BankScope database that contains detailed balance sheet information.

We find that bank characteristics such as ownership and size are important determinants of banks' customer portfolios. For instance, small banks tend to lend relatively more to small and medium-sized enterprises (SMEs) than large banks do, while large banks still have a comparative advantage in lending to large customers. Interestingly, foreign banks lend relatively less to large firms and more to households (in the form of mortgage lending) than do domestic banks. This result runs counter the traditional view that foreign banks in emerging economies prefer to focus on large businesses as their main clients.

We find limited evidence for the hypothesis that better legal protection changes bank portfolio composition. The only robust result is that banks that perceive pledge and mortgage laws to be of high quality focus more on mortgage lending. Although we cannot ascertain causality with certainty, in order to minimise concerns about endogeneity we use two country-level indices of creditor protection as instruments for banks' perception of collateral laws in two-stage procedures. Under the hypothesis that these instruments are valid, the evidence is suggestive of a causal link from the banks' perception of the quality of collateral laws to the loan decision.

The outline of this paper is as follows. Section 1 provides an overview of the literature on the determinants of bank portfolio composition. Section 2 describes our data and empirical methodology, and section 3 summarizes our empirical results. Finally, section 4 concludes.

1. DETERMINANTS OF BANK CREDIT PORTFOLIOS: HYPOTHESES AND RELATED LITERATURE

What determines a bank's customer choice?

In this paper, we use the data collected through the BEPS survey to get a better understanding of what determines the composition of bank portfolios. A substantial amount of literature has demonstrated that more active banking systems are associated with faster economic development. More bank lending leads to capital accumulation and productivity increases, stimulating economic development.

However, the type of customers that banks choose to focus on, in other words the composition of their lending portfolios, may have important implications for the effect that aggregate bank lending has on economic development. In a transition context, for instance, academics and international financial institutions have focused on the amount of bank financing to small and medium-sized enterprises (SMEs). SME financing is of great importance in transition countries, as small firms play an important role in the restructuring process by absorbing employees that lose their jobs in privatised, restructured or bankrupt state-owned enterprises (Kowalski and Janc, 1999). Moreover, Calvo and Coricelli (1993) and Pawlowska and Mullineux (1999) show that the sharp decline in bank credit to Polish SMEs at the beginning of the transition process has significantly contributed to the heavy decline in output in this country. Carlin and Richthofen (1995) find that the rapid growth of the SME sector, and the availability of sufficient external funding for these firms, has contributed to the integration of the former East and West Germany. It may therefore be important to understand what determines banks' willingness and ability to lend to SMEs as opposed to other customer types such as large corporate customers or retail clients. Against this background, we consider three main potential determinants of bank portfolio composition: bank ownership, bank size and the legal environment that banks operate in.

Bank ownership

There are reasons to believe that the entry of foreign banks may lead to a change in the supply of credit to SMEs. Given that the knowledge foreign banks have of local markets is relatively limited, they may prefer to grant credit only to large and foreign-owned firms that are viewed as being most transparent and less risky. Foreign banks may also have more difficulties in processing "soft" information, such as information on the trustworthiness of a potential client, over greater distances and through more hierarchical layers. This may especially be the case if the foreign head office is in a country with a significantly different culture and language. They will therefore prefer to grant most loans on a transaction-by-transaction basis, using standardised decision methodologies. Such methods to assess creditworthiness tend to use "hard" information such as financial ratios calculated on the basis of firms' financial statements (Berger et al, 2001).

Foreign banks may also focus more on serving multinational corporations from their home country. Domestic banks, on the other hand, may have a deeper understanding of the local business sector and will be able to base their credit decisions on soft and more qualitative information that is available on local and smaller firms. Small domestic banks may be better suited to collecting such information over time when dealing with smaller clients (Berger and Udell, 1995, 2002). They may also have a greater commitment to local prosperity (Collender and Shaffer, 2003). Therefore the increased presence of foreign banks in transition countries may have led to less credit to SMEs.

However, differences between bank ownership types may have gradually disappeared during the transition process, as many foreign banks entered the region through mergers with domestic banks. Also, the distinction between hard and soft information may be too simple. Large banks may have a comparative advantage in using transaction technologies such as credit scoring and asset-based lending that can be used to finance smaller and more opaque customers, offsetting their disadvantage in relationship lending (Berger and Udell, 2006). Transaction technologies such as credit scoring that use hard information can be successfully applied to provide credit to opaque SMEs without the need to develop relationships (especially when credit scores are mainly based on the owner's personal history rather than on information on the SME itself). Similarly, foreign banks may use asset-based lending technologies, in which the bank looks mainly at the underlying assets as the primary source of repayment (Berger and Udell, 2006) rather than at the overall creditworthiness of the borrower. By using such technologies, large and foreign banks may also expand SME credit (Berger and Udell, 2006). Credit scoring may therefore allow foreign banks to lend to SMEs without having to develop relationships in order to extract soft information.

Bank size

Besides ownership, the size of a bank may also influence its customer profile. The reasoning is similar to the ownership argument. Larger banks may have a comparative advantage in lending to larger customers as they can exploit scale economies in evaluating the hard information that tends to be available on such customers.

Smaller banks, however, may not be able to lend to larger companies because of size limitations. They are, for instance, more constrained by regulatory lending limits. Small banks may also have a comparative advantage in processing soft information on SMEs and small businesses may only be served on the basis of direct contact and soft information (Petersen and Rajan, 2002). Again, to the extent that large banks may use technologies such as credit scoring and asset-based lending to get around the "soft information problem", they may actually be well suited to lending to SMEs. Long-term relationships enable banks to collect information about borrowers' capacity to repay, thus reducing the cost of providing credit. The consolidation process in transition countries may therefore have led to a reduced focus of (larger) banks on SME financing.

The legal environment

The legal environment in which banks operate may influence their lending composition. The "lending infrastructure of a country" (Berger and Udell, 2006) determines to what extent certain lending technologies can be used and, thus, to what extent banks are limited to certain types of lending. An important part of this infrastructure includes the commercial and bankruptcy laws that determine banks' creditor rights and their enforcement by the courts. La Porta et al (1997, 1998) show that such legal institutions differ markedly between countries and are an important determinant of the amount of external financing that is available for the business sector.

Legal institutions may also affect the composition of bank lending. For instance, asset-based lending technologies, where the value of collateral is more important than the financial ratios of the borrower, are used by many large banks to lend to relatively opaque SMEs (Berger and Udell, 2006). Weak commercial laws on security interests (such as movable and immovable assets) and the enforcement of such collateral rights may make asset-based lending (for example to SMEs) less attractive. Similarly, weak restrictions on the sharing of information and the unavailability of credit bureaus may limit the use of credit-scoring technologies. When

there is hardly any public information available on firms past payment performance (for example through credit bureaus) this may severely limit the supply of bank credit to less transparent clients.

Empirical evidence

Empirical evidence on the determinants of bank portfolio composition is available for some individual countries – mainly the United States – and for cross-sections of countries. Some of these studies confirm the hypothesis that foreign banks and large banks lend less to informationally opaque SMEs. In the United States, foreign banks tend to supply less credit to small firms (Berger and Udell, 2002, DeYoung et al, 1999). Keeton (1996) finds, again for the United States only, that banks that form part of an out-of-state holding bank are less likely to grant credit to local businesses. Berger et al (2001) study SME financing in Argentina. They find that foreign-owned banks and large banks have more difficulties in lending to small firms, although this result only holds for foreign banks that are headquartered in a geographically distant nation.

More recently, empirical studies have used more differentiated approaches than the aforementioned studies, which were mostly based on static analyses of different types of banks or of banks' lending before and directly after a merger or acquisition. These newer studies show that foreign banks may actually lead to more SME credit in the medium term. Berger et al (1998) show for the United States that, while consolidation initially reduces SME financing, the refocusing and restructuring efforts of the acquiring banks fully or partly offset this negative effect later on. Acquiring banks may, for instance, promulgate new lending procedures and technologies to collect and process information. Increasingly, this may enable relatively opaque SMEs – hitherto deprived of foreign bank credit – to receive funding from foreign-owned banks (Petersen and Rajan, 2002).

Using data from a large cross-country survey of enterprises – including transition countries – Clarke et al (2001) find that foreign bank entry improves financing conditions for enterprises of all sizes, although larger firms benefit more. Unfortunately, given the authors' empirical set-up, they are unable to decide which of the two interpretations of this result is correct: either foreign banks provide credit to both large firms and SMEs, or foreign bank competition for large customers leads domestic banks to move down the market and increase SME credit. Clarke et al (2005) analyse bank-level data for Argentina, Chile, Colombia and Peru. They find that small foreign banks generally lend less to small businesses (as a share of total lending) than private domestic banks. However, in Chile and Colombia, large foreign banks actually lend slightly more to SMEs than large domestic banks. In addition, in both Argentina and Chile, SME credit has been growing faster at foreign banks with a large local presence than at large domestic banks. This last result is consistent with the notion that large foreign banks – using credit-scoring methodologies, enhanced computer power and improved data availability – will increase small-business lending (Mester, 1997). Some other recent studies that focus on foreign banking in developing countries also conclude that an increasing presence of foreign banks leads to a greater availability of credit to SMEs (Beck et al, 2004; Berger et al, 2004).

Unfortunately, there exist only very few empirical studies on foreign bank entry and SME credit in transition economies. This is mainly due to a lack of systematic data on the composition of banks' credit portfolios in this region. Kraft (2002) argues on the basis of interviews with foreign bank managers that foreign bank entry has not led to a decrease in SME financing in Croatia. Giannetti and Ongena (2007) combine firm-level data with country-

level data on bank lending and find for a set of transition countries that foreign bank lending stimulates overall growth in firm sales and assets, but this effect is dampened for small firms. The BEPS survey that is used in this paper is the first source of bank-level data on the composition of banks' credit portfolios in the transition region.

2. DATA AND METHODOLOGY

Data

In this paper we combine two main data sources: the Business Environment and Performance Survey (BEPS) and BankScope. BEPS is a new EBRD survey on bank activities and the influence of the institutional environment on these activities. It was conducted in 2005 and based on a random sample of 423 banks in 20 transition countries (banks in relatively small countries and in Russia were oversampled). Almost 55 per cent of the contacted banks (63 per cent excluding Russia) were willing to participate in the study. For these banks a common questionnaire, translated into each local language, was presented to a senior bank officer in a face-to-face interview. The first part of the questionnaire – regarding financial information – was shared with the banks in advance, while the other part – containing qualitative questions on bankers’ judgments of the institutional environment – was only shared during the interview. The survey obtained detailed data on the credit and deposit activities of a random sample of 220 banks. Their geographical distribution is given in Table 1.

Table 1: Number of banks in the sample per country

| Country | Number of banks | Country | Number of banks |
|------------------------|-----------------|-----------------------|-----------------|
| Albania | 5 | Lithuania | 7 |
| Belarus | 9 | Moldova | 9 |
| Bosnia and Herzegovina | 13 | FYR Macedonia | 6 |
| Bulgaria | 13 | Poland | 15 |
| Croatia | 12 | Romania | 13 |
| Czech Republic | 8 | Russia | 30 |
| Estonia | 6 | Serbia and Montenegro | 19 |
| Hungary | 6 | Slovak Republic | 8 |
| Kazakhstan | 9 | Slovenia | 7 |
| Latvia | 17 | Ukraine | 6 |
| | | Total | 220 |

Source: BEPS

Note: The survey was carried out before Montenegro was recognised as an independent state in June 2006.

We linked these survey data to bank-level information on balance sheets and profit and loss accounts taken from Bureau van Dijk’s BankScope database. This allows us to get a detailed picture of the portfolio of each individual bank. Because the BEPS survey includes questions on the allocation of loans across different customer types, we were able to construct a set of dependent variables that measure the loan proportions allocated to the following customers: mortgage lending, other household lending, SMEs (1 to 249 employees), large enterprises (250 or more employees), state-owned enterprises, and other customers (including state-owned agencies).

BEPS also provides information on bank ownership and it distinguishes between four ownership categories: (i) private banks with majority domestic ownership, (ii) newly created foreign banks (greenfield foreign banks), (iii) privatised banks with majority foreign ownership, and (iv) state-owned banks.

Table 2 displays summary statistics for all variables used in the regressions in this paper. In the total sample, 7 per cent of banks were still state-owned, 55 per cent were foreign owned and 38 per cent were in private domestic hands. Table 3 provides descriptive information on the relationship between bank ownership and portfolio composition in 2004. It shows that foreign banks were relatively more actively involved in lending to households than domestic banks (on average 30 per cent of the loan portfolio compared with 18 per cent). SMEs comprise the most important customer category for almost all types of banks. Private banks' business with state-owned enterprises is very limited (on average 3 per cent), while – perhaps predictably – state-owned banks still allocate a considerable part of their loan portfolio to state-owned enterprises (14 per cent) and other clients, which included governments and government agencies (27 per cent).

Table 2: Summary statistics

| Variable | No. of observations | Mean | Std. Dev. | Min | Max |
|--------------------------------|---------------------|-------|-----------|------|-------|
| Mortgage lending (%) | 167 | 9.14 | 15.69 | 0 | 100 |
| SME lending (%) | 125 | 41.79 | 27.99 | 0 | 100 |
| Large firm lending (%) | 125 | 19.51 | 22.06 | 0 | 88 |
| Foreign subsidiary lending (%) | 124 | 4.32 | 11.87 | 0 | 90 |
| State-owned lending (%) | 194 | 3.75 | 10.30 | 0 | 76 |
| Greenfield foreign bank | 212 | 0.41 | 0.49 | 0 | 1 |
| Privatised foreign bank | 212 | 0.14 | 0.35 | 0 | 1 |
| State bank | 216 | 0.07 | 0.25 | 0 | 1 |
| Bank size | 213 | 12.76 | 1.57 | 8.89 | 16.98 |
| Per capita GDP | 220 | 4.94 | 3.23 | 0.77 | 16.17 |
| Perception of collateral law | 206 | 3.71 | 0.95 | 1 | 6 |
| Depth of credit information | 220 | 2.29 | 1.89 | 0 | 5 |
| EBRD enforcement index | 220 | 6.48 | 2.18 | 1.50 | 9.79 |

Sources: BEPS and BankScope

Note: This table shows the summary statistics of all variables used in the paper. The sample consists of a cross-section of banks in 20 transition countries in 2004. The first five variables are the proportion (in total bank lending) of mortgage lending and of lending to small and medium firms, to large firms, to subsidiaries of foreign companies, and to state-owned firms. *Greenfield foreign* is a dummy variable that takes the value of 1 if the bank is owned by foreigners and was never previously owned by the country's government. *Privatised foreign* is a dummy variable that takes the value of 1 if the bank is owned by foreigners but was previously a state bank. *State bank* is a dummy variable that takes the value of 1 if the bank is owned by the country's government. *Bank size* is defined as the logarithm of total bank assets in 2003 (from BankScope). Per capita GDP is in thousands of US dollars (as at 2004). *Perception of collateral law* is a subjective index of the banks' perception of mortgage and pledge laws (from BEPS). The last two variables are the World Bank Doing Business indicator on "depth of credit information" for 2004 and the EBRD legal indicator on the enforcement of charged assets.

Table 3: Portfolio composition by bank type (in per cent of total lending, 2004)

| | Greenfield foreign banks | Privatised foreign banks | Private domestic banks | State-owned domestic banks | Small banks | Large banks |
|-------------------------|--------------------------|--------------------------|------------------------|----------------------------|-------------|-------------|
| Mortgages | 12.1 | 11.7 | 5.8 | 1.6 | 7.7 | 14.7 |
| Other consumer lending | 18.3 | 18.1 | 14.0 | 16.4 | 15.4 | 15.4 |
| SMEs | 41.1 | 27.0 | 47.0 | 31.3 | 56.9 | 28.4 |
| Large enterprises | 15.0 | 23.7 | 27.4 | 9.0 | 12.5 | 26.3 |
| State-owned enterprises | 3.6 | 3.8 | 2.4 | 14.2 | 4.3 | 3.4 |
| Other | 9.9 | 15.6 | 3.5 | 27.4 | 3.2 | 11.8 |
| Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

Sources: BEPS and BankScope

Note: This table shows the average lending portfolio composition by bank type. The sample consists of a cross-section of banks in 20 transition countries in 2004. A bank is classified as “small” when its total assets are less than US\$ 200 million and as “large” when its assets exceed US\$ 1 billion.

Large banks lend more – in terms of portfolio composition – to large enterprises and governments. They lend markedly less to small enterprises and provide less non-mortgage household credit. Small banks lend on average 57 per cent of their portfolio to SMEs, whereas the largest banks only allocate 28 per cent of all loans to SMEs.

Regional differences are also quite substantial. In central eastern Europe and the Baltic states (CEB) in particular, lending to households has to a large extent (45 per cent) been related to mortgage financing, whereas mortgages made up only 32 per cent and 13 per cent of all household lending in south-eastern Europe (SEE) and the Commonwealth of Independent States (CIS), respectively.

During the BEPS survey senior bank management was also asked about its perceptions of the security rights of lenders, the bankruptcy law and its application, the quality of the courts, and the effectiveness of regulatory policy. BEPS respondents were given a series of questions or statements about their perception of the quality of their legal environment and were asked to provide responses to each question on a six-point scale (with a higher number reflecting a more positive view). For the questions on the perceptions of pledge laws and mortgage laws that we use in this paper, the respondents were asked to rate on a scale running from “strongly disagree” (1) to “strongly agree” (6) whether these laws:

- provide an adequate scope for security
- enable an efficient creation and perfection of security rights
- enable an efficient enforcement of security rights
- adequately protect secured creditor rights.

We average the scores on the questions to arrive at a general measure of respondents’ confidence in the pledge law and mortgage law, which we refer to as the “perceived quality of collateral law”. The data show that bank managers across different regions turn out to have very different perceptions of the quality of their legal environment, with bankers in CEB having the most positive views on average. However, there are also substantial differences between countries within a region. For example, while overall perception indices in Russia and

Ukraine are the lowest among all transition countries, the perception of the banking environment in Belarus, Kazakhstan and Moldova are comparable to some countries in CEB. Similarly, the perceptions about the legal environment in Bulgaria, FYR Macedonia and Romania are similar to those in countries like the Czech Republic, Poland and Slovenia. This indicates that a country's level of economic development and banks' average perception of the quality of the legal creditor protection are not perfectly correlated.

Laws tend to be seen as weaker throughout the CIS and SEE. In CEB, the legal environment is rated as weak among bankers in the Czech Republic, Lithuania, Poland and Slovenia. Looking at the ownership of banks, it becomes clear that while scores in CEB remain the strongest across all bank ownership types, within CEB managers in privatised foreign banks rate the legal system relatively low. In the CIS domestic banks tend to be more positive about the legal environment than either the greenfield or privatised foreign banks. By contrast, in SEE, privatised foreign banks are the ones that evaluate the legal environment the most positively. While state-owned domestic banks in CEB have a positive perception of the legal environment, in SEE these are the banks with the worst perception.

Empirical strategy

As discussed in the previous section, the economic literature singles out three main determinants that may influence what type of customers banks choose to focus on: bank ownership structure, bank size and the institutional environment. The information gathered from the BEPS survey allows us to disentangle these determinants and see which ones matter the most for portfolio composition in practice. To do so, we estimate both Ordinary Least Squares (OLS) and two-stage least squares (2SLS) regressions. In the latter instrumental variables (IV) approach, we instrument banks' perceived quality of the institutional environment by two objective institutional measures (see below). This was done because banks' perception of institutions may be affected by the specific type of customers they focus on and, consequently, simultaneity may exist.

In the first stage of the IV regressions, the dependent variable is our index of banks' perception of the quality of collateral laws, which is constructed using the data from the BEPS survey (i, j subscripts indicate firm and country, respectively):

$$CollatLaw_{ij} = \alpha + \beta_1 \cdot ENFORCE_j + \beta_2 \cdot DEPTH_j + \sum_{n=1}^3 \gamma_n OwnDum_{ij} + Size_{ij} + \varphi \cdot GDP/Cap_j + \varepsilon_{ij} \quad (1)$$

The explanatory variables in this first stage include two objective country-level legal indicators, three bank ownership dummies, bank size and GDP per capita. The first objective country-level legal indicator is the World Bank Doing Business indicator on "depth of credit information" for 2004, $DEPTH_j$. For each country it measures the scope, quality and access of credit information. The second objective legal indicator is the EBRD legal indicator on the enforcement of charged assets, $ENFORCE_j$. The data to construct this second indicator are taken from the EBRD Legal Transition Programme (EBRD Legal Survey, 2004). The indicator comprises information on the amount that can be expected to be recovered from a debtor, the time needed to realise recovery and the simplicity of the associated legal process. The bank ownership dummies identify greenfield foreign banks, privatised foreign banks and state-owned banks, leaving private domestic banks as the control group. Bank size is defined as the logarithm of total bank assets. Although newly created foreign banks and domestic private

banks tend to be somewhat smaller in size on average, there is no strong correlation between bank size and its ownership.

In Table 4 we report the results from the estimation of (1) using all available data. Both the depth of credit information and the EBRD index are positively correlated with our subjective index, as expected. The high t-statistics suggest that our proposed instruments are not weak. Furthermore, the two instruments are not highly correlated with each other ($p=0.18$), which helps in testing for over-identifying restrictions.

Table 4: Determinants of the perception of collateral law

| | OLS estimates |
|-----------------------------|--------------------|
| Depth of credit information | 0.13*** (3.65) |
| EBRD enforcement index | 0.12*** (4.05) |
| Greenfield foreign bank | -0.23* (-1.66) |
| Privatised foreign bank | -0.53** (-2.52) |
| State bank | -0.19 (-0.54) |
| Bank size | 0.12** (2.57) |
| Per capita GDP | -0.06** (-2.43) |
| Constant | 1.48** (2.54) |
| Observations | 191 |
| Adjusted R-squared | 0.13 |
| F(7, 183) | 5.52*** |

Sources: BEPS and BankScope

Note: This table shows the results of an OLS regression of the perception of collateral law on country-level variables measuring credit protection, bank characteristics (ownership structure and size), and per capita GDP. The sample consists of a cross-section of banks in 20 transition countries in 2004. The regression model in this table is the same that is used in the first stage of all IV procedures in the paper. All variables are described in Table 2. The omitted ownership group is formed by private domestic banks. Robust t-statistics are in parentheses. Asterisks indicate significance at 0.01 (***), 0.05 (**), and 0.10 (*) levels.

The economic arguments for our instruments are as follows. Country-level variables that measure the legal protection of creditor rights should only affect bank behaviour to the extent that they affect banks' *perceptions* of the quality of such laws. Thus, under the assumption that our perception variable is broad enough to capture most aspects of the laws protecting banks as creditors, the two instruments should be excluded from the right-hand side of regressions of banks' lending choices on the perception of collateral laws and other determinants.

Of course, it is not possible to test for the validity of these exclusion restrictions. However, because we have two different instruments, we can perform tests of over-identifying restrictions under the null that both our instruments are valid. A rejection of the null would cast doubt on the validity of the instruments. Because both instruments are constructed on the basis of different rationales, the over-identifying restriction tests are more compelling, because if one of the instruments is valid, the test serves as a test of the validity of the other instrument.

In the second stage regressions, $PCollatLaw_{ij}$ – the predicted value of $CollatLaw_{ij}$ from the first stage – is used as an independent variable to explain a set of $PROP_{ij}$ variables which measure the (log-transformed) proportion of mortgage lending, SME lending, lending to large firms, lending to subsidiaries of foreign firms and lending to state-owned enterprises, respectively:

$$PROP_{ij} = \alpha + \beta \cdot PCollatLaw_{ij} + \sum_{n=1}^3 \gamma_n OwnDum_{ij} + Size_{ij} + \varphi \cdot GDP / Cap_j + \eta_{ij} \quad (2)$$

where

$$PROP_{ij} = \ln \left(\frac{1 + p_{ij}}{101 - p_{ij}} \right)$$

where p_{ij} is the percentage of loans to each specific client type.¹ In addition we include the bank-specific ownership and size determinants. In all regressions we use GDP per capita to control for the level of economic development of the country where the bank operates.

¹ We use the logistic transformation because percentages are bounded between 0 and 100, and we add 1 to both numerators and denominators to allow for banks that have either 0 per cent or 100 per cent in loans to a given type of client.

3. EMPIRICAL RESULTS

Tables 5 to 7 show our empirical results on what determines bank customer focus: the proportion of mortgage lending (Table 5), the proportion of SME and large-firm lending (Table 6), and the proportion of lending to subsidiaries of foreign firms and to state-owned enterprises (Table 7). For each dependent variable there are two regressions: an OLS regression and an IV regression.

The results as reported in Table 5 show that foreign banks, both greenfield foreign banks and privatised foreign banks, are significantly more involved in mortgage lending than private domestic banks are. State banks appear to be less involved in this type of business, although this result is not significant in the IV regression. This reflects that foreign banks have been actively involved and leading in developing the mortgage markets in the transition region, markets that were completely absent before the end of communism. Many banking groups from western Europe have “exported” their know-how on mortgage lending to their new eastern markets in search for new retail customers. Domestic private and state-owned banks, on the other hand, have not been able to keep up with this development and have lagged behind in introducing mortgages. There is no clear effect of bank size on the relative importance of mortgage lending, whereas there is some evidence that better collateral laws lead to banks’ increased focus on mortgage lending.

Table 5: Determinants of the proportion of mortgage lending

| | (1) OLS | (2) IV |
|------------------------------|---------------------|---------------------|
| Greenfield foreign bank | 0.69** (2.57) | 0.73** (2.41) |
| Privatised foreign bank | 0.77** (2.56) | 0.88** (2.30) |
| State bank | -0.91*** (-2.98) | -0.92 (-1.47) |
| Bank size | 0.11 (1.17) | -0.02 (-0.18) |
| Per capita GDP | 0.08** (2.16) | 0.08* (1.69) |
| Perception of collateral law | 0.21 (1.22) | 1.20*** (2.78) |
| Constant | -5.78*** (-6.27) | -7.76*** (-5.96) |
| Observations | 156 | 156 |
| Adjusted R-squared | 0.16 | - |
| J-statistic (p-value) | - | 1.22 (0.27) |

Sources: BEPS and BankScope

Note: This table shows the results of OLS and IV regressions of the (logistic transformation of) the proportion of mortgage lending in total bank lending on bank characteristics (ownership structure and size), per capita GDP, and an index of banks’ perception of the quality of collateral laws. The sample consists of a cross-section of banks in 20 transition countries in 2004. All variables are described in Table 2. The omitted ownership group is formed by private domestic banks. In column 2, the instruments for the perception of collateral law are the World Bank Doing Business indicator on “depth of credit information” for 2004 and the EBRD legal indicator on the enforcement of charged assets. In column 2, we report a Hansen J-test statistic of over-identifying restrictions along with its p-value (using robust standard errors). Robust t-statistics are in parentheses. Asterisks indicate significance at 0.01 (***), 0.05 (**), and 0.10 (*) levels.

We report at the bottom of the table the J-statistic of a test of over-identifying restrictions and its correspondent p-value. The test does not reject the null that our two instruments are jointly valid under the traditional confidence levels, which increases our confidence in the IV procedure.

To evaluate the economic significance of our findings, we compute the marginal effects of the relevant variables evaluated at the means of the data.² For a bank with the average proportion of mortgage loans in our sample, the greenfield foreign banks' lending proportion to mortgages is 6 percentage points larger than the domestic banks' proportion of mortgage loans (the analogous effect for privatised foreign banks is 7 percentage points). A one-standard-deviation increase in the perception of collateral law increases the proportion of mortgage lending by roughly 9 percentage points for the average bank.

Table 6: Determinants of the proportion of lending to private domestic firms

| | (1) SME firms OLS | (2) SME firms IV | (3) Large firms OLS | (4) Large firms IV |
|------------------------------|-------------------------|------------------------|---------------------------|--------------------------|
| Greenfield foreign bank | -0.35 (-1.02) | -0.35 (-1.08) | -0.87** (-2.51) | -0.89** (-2.57) |
| Privatised foreign bank | -0.67 (-1.05) | -0.67 (-1.04) | -0.72 (-1.44) | -0.71 (-1.34) |
| State bank | 0.18 (0.15) | 0.25 (0.22) | -1.31 (-1.62) | -1.13 (-1.14) |
| Bank size | -0.36*** (-2.71) | -0.35*** (-2.67) | 0.44*** (3.31) | 0.46*** (3.25) |
| Per capita GDP | 0.02 (0.41) | 0.03 (0.60) | -0.09 (-1.53) | -0.07 (-1.19) |
| Perception of collateral law | -0.18 (-1.06) | -0.40 (-0.90) | -0.19 (-1.06) | -0.74 (-1.55) |
| Constant | 4.75*** (3.10) | 5.41*** (2.68) | -5.94*** (-3.82) | -4.27** (-2.23) |
| Observations | 113 | 113 | 113 | 113 |
| Adjusted R-squared | 0.10 | - | 0.13 | - |
| J-statistic (p-value) | - | 0.13 (0.72) | - | 0.38 (0.54) |

Sources: BEPS and BankScope

Note: This table shows the results of OLS and IV regressions of the (logistic transformation of) the proportion of lending to private domestic firms in total bank lending on bank characteristics (ownership structure and size), per capita GDP, and an index of banks' perception of the quality of collateral laws. Results are shown for small and medium-sized enterprises (columns 1 and 2) and large firms (columns 3 and 4). The sample consists of a cross-section of banks in 20 transition economy countries in 2004. All variables are described in Table 2. The omitted ownership group is formed by private domestic banks. In columns 2 and 4, the instruments for the perception of collateral law are the World Bank Doing Business indicator on "depth of credit information" for 2004 and the EBRD legal indicator on the enforcement of charged assets. In columns 2 and 4, we report a Hansen J-test statistic of over-identifying restrictions along with its p-value (using robust standard errors). Robust t-statistics are in parentheses. Asterisks indicate significance at 0.01 (***), 0.05 (**), and 0.10 (*) levels.

² Because of the logistic transformation, the marginal effects are not constant. In order to compute them, one must multiply each estimated coefficient by $y(1-y)$, where y is the dependent variable in proportions (that is, divided by 100).

In Table 6 we report the results of regressions of lending to private domestic firms, broken down by SMEs and large firms. Ownership structure is not significantly related to the proportion of SME lending, while greenfield foreign banks appear to lend relatively less to large firms than private domestic banks do. For a bank with the average proportion of lending to large firms in our sample, being a greenfield foreign bank means that it would lend 14 percentage points less to large firms than a domestic private bank would. The joint results in Tables 5 and 6 strongly suggest that greenfield foreign banks are more focused on mortgage lending and less on large firm lending than domestic private banks are. A similar pattern arises for privatised foreign banks, although the statistical significance in this case is weak.

From Table 6 we find that bank size is by far the most robust determinant of the proportion of SME and large firm lending: small banks lend more to SMEs and less to large firms, whereas large banks lend less to SMEs and more to large firms. Apparently, large banks still have a comparative advantage in lending to larger customers as they can exploit scale economies in evaluating the “hard” information that tends to be available on such customers. However, small banks are still relatively efficient in processing “soft” information on SMEs.

In order to assess the economic significance of the “bank size effect,” we consider the effect of a one-standard-deviation increase in our measure of bank size (log of book assets) for a bank with an average loan portfolio. This increase in size would decrease the proportion of lending to SMEs by roughly 13 percentage points and simultaneously increase the proportion of lending to large firms by 11 percentage points. Because the difference between these two effects is not statistically different from zero, we cannot reject the hypothesis that, as bank size increases, banks substitute loans to large firms for loans to SMEs at a roughly one-to-one ratio.

Note that our findings do not imply that large banks do not lend at all to SMEs. To the extent that large banks in transition countries have been using technologies such as credit scoring to get around the “soft information problem”, they may actually have expanded their SME lending. However, our results indicate clearly that when compared with small banks, large banks have a clear focus on larger clients and lend relatively more to these larger customers.

The results in Table 6 also tell us that banks’ perceptions about the quality of collateral laws do not appear to have a significant effect on the proportion of their lending to SMEs and to large firms.³ Again, one possibility is that this is a consequence of SME financing being often performed using credit-scoring technologies that rely much less on the availability of collateral than other forms of financing (such as mortgage lending).

Finally, in Table 7 we show the results for the proportion of lending to subsidiaries of private firms and to state-owned firms. The interesting result here is that greenfield foreign banks are also relatively involved in lending to subsidiaries of foreign firms. All the results taken together thus suggest that many foreign banks have set up greenfield establishments in transition countries that either started to build up a retail franchise (for example Raiffeisen Bank) or started with a clear focus on serving subsidiaries of multinationals, often from the home country of the bank (for example ABN AMRO Bank).

³ We cannot reject the null that our instruments are jointly valid in over-identification tests in either case.

Table 7: Determinants of the proportion of lending to foreign subsidiaries and state-owned companies

| | (1) Foreign subsid OLS | (2) Foreign subsid IV | (3) State-owned OLS | (4) State-owned IV |
|------------------------------|------------------------------|-----------------------------|---------------------------|--------------------------|
| Greenfield foreign bank | 0.71*** (2.99) | 0.72*** (2.95) | 0.07 (0.37) | 0.04 (0.21) |
| Privatised foreign bank | 1.01 (1.62) | 0.99 (1.53) | 0.46 (1.59) | 0.40 (1.33) |
| State bank | 0.73 (1.15) | 0.60 (1.22) | 1.70** (2.27) | 1.66** (2.18) |
| Bank size | 0.10 (0.89) | 0.08 (0.76) | -0.02 (-0.28) | 0.04 (0.63) |
| Per capita GDP | -0.03 (-0.77) | -0.05 (-1.04) | 0.03 (1.21) | 0.03 (1.25) |
| Perception of collateral law | 0.04 (0.32) | 0.44 (1.18) | -0.16* (-1.86) | -0.63** (-2.05) |
| Constant | -5.60*** (-4.08) | -6.81*** (-3.31) | -3.34*** (-4.58) | -2.36** (-2.10) |
| Observations | 112 | 112 | 178 | 178 |
| Adjusted R-squared | 0.06 | - | 0.08 | - |
| J-statistic (p-value) | - | 0.82(0.36) | - | 4.29 (0.04) |

Sources: BEPS and BankScope

Note: This table shows the results of OLS and IV regressions of the (logistic transformation of) the proportion of lending to foreign subsidiaries (columns 1 and 2) and state-owned firms (columns 3 and 4) in total bank lending on bank characteristics (ownership structure and size), per capita GDP, and an index of banks' perception of the quality of collateral laws. The sample consists of a cross-section of banks in 20 transition economy countries in 2004. All variables are described in Table 2. The omitted ownership group is formed by private domestic banks. In columns 2 and 4, the instruments for the perception of collateral law are the World Bank Doing Business indicator on "depth of credit information" for 2004 and the EBRD legal indicator on the enforcement of charged assets. In columns 2 and 4, we report a Hansen J-test statistic of over-identifying restrictions along with its p-value (using robust standard errors). Robust t-statistics are in parentheses. Asterisks indicate significance at 0.01 (***), 0.05 (**), and 0.10 (*) levels.

In many transition countries the largest firms still tend to be domestically owned, and often state-owned, and served by domestic banks. Indeed, Table 7 shows that, in line with expectations, state-owned banks lend relatively more to state-owned enterprises. This table also provides some weak evidence that when the legal protection of creditors improves, the share of lending to state-owned enterprises decreases.

4. CONCLUSIONS

Our results suggest that bank characteristics, such as ownership and size, are important determinants of banks' customer focus. However, we find only weak support for the importance of banks' perceptions of the institutional environment in the decisions they make regarding their portfolios.

We find that foreign banks are relatively strongly involved in mortgage lending and lending to subsidiaries of foreign firms, while lending relatively less to large domestic firms. Moreover, size matters for customer focus. Small banks lend relatively more to SMEs than large banks, while large banks have a comparative advantage in lending to large customers. Perhaps unsurprisingly, state-owned banks still lend more to state-owned enterprises than private banks do.

We do not find strong evidence for the hypothesis that better legal protection changes banks' portfolio composition. While earlier studies on the finance-growth nexus show an important causal effect of legal creditor protection on the amount of bank lending, we do not find such an effect on the type of bank lending. This implies that, in general, all types of bank customers tend to profit from legal improvements. The only exception to this finding is that – controlling for endogeneity – banks that perceive pledge and mortgage laws to be of high quality tend to focus more on mortgage lending.

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