



**CEPII**

**CENTRE  
D'ÉTUDES PROSPECTIVES  
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INTERNATIONALES**

No 2008 – 15  
September

The effect of foreign bank entry on the cost of  
credit in transition economies.  
Which borrowers benefit the most ?  
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Hans Degryse, Olena Havrylchyk, Emilia Jurzyk, Sylwester Kozak

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**THE EFFECT OF FOREIGN BANK ENTRY ON THE COST OF CREDIT IN TRANSITION ECONOMIES. WHICH BORROWERS BENEFIT THE MOST?**

**NON-TECHNICAL SUMMARY**

In the last two decades we have witnessed a high penetration of foreign banks into financial markets of transition and developing economies of Eastern Europe, Latin America, and Asia. The most dramatic change took place in Central and Eastern European countries (CEECs), where more than 70 percent of banking assets are now in the hands of foreign investors. This phenomenon has led to a heated debate about costs and benefits of foreign bank ownership. The existing empirical evidence shows that lending rates of foreign banks are lower than those of domestic institutions (Martinez Peria and Mody (2004) Claey's and Hainz (2007)). However, this empirical finding can be interpreted in two different ways. First of all, lower lending rates of foreign institutions can be explained by their superior performance due to higher cost-efficiency, better risk management and cheaper cost of funds due to access to international capital markets ("performance" hypothesis). Alternatively, this can be explained by "portfolio composition" hypothesis. Dell'Aricecia and Marquez (2004) argue that foreign banks have advantages in targeting more transparent new clients, whereas domestic banks are better placed to lend to opaque firms based on soft information. Taking into account that lending rates in market segments for more transparent clients are lower due to higher competitiveness of these segments, the lower lending rates of foreign banks could be related to their specific portfolio composition tilted towards large corporations. The portfolio composition effect can additionally manifest itself in other dimensions of the loan contract such as the maturity and currency structure of loans.

To our knowledge there has been no attempt to distinguish between "performance" and "portfolio composition" hypotheses for lending rates of banks with different ownership structure and mode of entry. The reason for this lies in the lack of data on the composition of banks' loan portfolios. In this study we aim to fill this gap by using a unique database of detailed information on Polish banks, provided by the National Bank of Poland.

Our results provide support to the hypothesis that foreign banks, particularly greenfield ones, are more willing to extend loans to transparent borrowers (e.g. large private firms). At the same time domestic private banks specialize in loans to non-transparent borrowers, such as small entrepreneurs. We also find that foreign banks, particularly greenfield ones, are more prone to extend loans in foreign currency, even though the share of these loans has been declining recently.

Our findings support the "portfolio composition" hypothesis, and thus contradict studies that argue that greenfield banks charge lower lending rates than private domestic banks due to their superior performance. Moreover, earlier studies argue that there is a convergence of interest rates between banks of different types of ownership. We show that this effect is also due to portfolio composition, as the share of transparent borrowers has fallen from 80 percent of loan portfolio of greenfield banks in 1996 to around 56 percent ten years later.

Our results have important policy implications. We show that lifting barriers to foreign bank entry is not associated with significantly reduced lending rates for borrowers, neither transparent nor opaque ones. In order to reduce lending rates, other reforms should be implemented

that ensure low inflation, increase competition on the market, etc. In order to reduce cost of credit for small entrepreneurs, reforms should focus on establishment of credit registries for small entrepreneurs, clarification of laws that cover the seizure of collateral in case of borrower's delinquency and reform of the court system which is still very costly and time-consuming.

**ABSTRACT**

We employ a unique dataset to study the impact of foreign bank ownership and mode of entry on banks' lending rates to transparent and opaque borrowers. We find that greenfield banks charge lower lending rates on average and we test for two hypotheses that can explain the lower cost of credit of these institutions: (1) superior performance or (2) different portfolio composition with a focus on more transparent borrowers. Our analysis shows that bank ownership and mode of entry have a large impact on banks' portfolio composition in terms of borrowers, maturity, and currency. After controlling for these differences, we do not find any impact of foreign bank ownership and mode of entry on lending rates, which is in line with the "portfolio composition hypothesis".

*JEL Classification:* G21, G28, G34, L11

*Keywords:* banks, ownership, loan pricing

**OUVERTURE AUX BANQUES ÉTRANGÈRES ET BAISSÉ DU COÛT DU CRÉDIT DANS LES ÉCONOMIES EN TRANSITION. QUI SONT LES PRINCIPAUX BÉNÉFICIAIRES ?**

**RESUME NON TECHNIQUE**

Les deux dernières décennies ont vu une forte pénétration des banques étrangères dans les économies en développement d'Amérique latine ou d'Asie ainsi que dans les pays en transition d'Europe de l'Est. Le mouvement a été particulièrement important dans ces derniers - plus de 70 pourcent du secteur bancaire des pays d'Europe centrale et orientale (PECO) sont aujourd'hui détenus par des banques étrangères - entraînant un vif débat sur ses coûts et ses bénéfices.

Les taux pratiqués par les banques étrangères sont plus bas que ceux pratiqués par les banques nationales (Martinez Peria and Mody (2004) ; Claeys and Hainz (2007)). Cet écart est généralement expliqué par une meilleure performance des banques étrangères provenant d'une gestion efficace des coûts et des risques et par un accès moins coûteux aux marchés internationaux de capitaux (hypothèse de performance). Une explication concurrente repose sur l'hypothèse de composition de portefeuille : selon Dell'Ariccia et Marquez (2004) les banques étrangères sont mieux placées pour attirer les clients plus "transparents" (pour lesquels les taux d'emprunt est plus faible) tandis que les banques domestiques, moins exigeantes quant à la qualité de l'information, attire davantage une clientèle plus "opaque". Les taux plus bas pratiqués par les banques étrangères pourraient alors être liés à la composition spécifique de leur portefeuille, comprenant notamment une forte proportion de grandes entreprises. Cet effet de composition peut, de plus, se manifester dans d'autres dimensions du prêt telle que la maturité ou la composition par devise.

A notre connaissance, il n'y a pas eu de tentative pour distinguer l'impact des effets de "performance" et de "composition de portefeuille" dans le comportement de prêts de banques selon leur structure de propriété et leur mode d'entrée. Ceci provient du manque de données disponibles sur la composition des portefeuilles de prêts. Cette étude cherche à éclairer cette question en utilisant une base originale d'informations détaillées sur les banques polonaises fournie par la Banque nationale de Pologne.

Ces données confirment l'hypothèse que les banques étrangères, particulièrement les greenfields, accordent majoritairement des prêts aux emprunteurs plus transparents (par exemple les grandes entreprises privées). A l'inverse, les banques privées domestiques se spécialisent dans les prêts à des emprunteurs moins transparents comme des petits entrepreneurs. Par ailleurs, les banques étrangères, notamment les greenfields, prêtent plus volontiers en devises, mais la part de ces prêts a diminué récemment.

Nos résultats confirment l'hypothèse d'un effet de composition, écartant l'hypothèse d'une meilleure performance des banques étrangères souvent mise en avant dans la littérature. En outre, les études précédentes expliquent la convergence des taux d'intérêt entre les différents types de banques par l'adoption des meilleures pratiques par les banques locales. Nous montrons que cet effet est également dû à la composition de portefeuille (la proportion des emprunteurs " transparents " dans leur portefeuille des banques greenfield est passée de 80 pourcent en 1996 à 56 pourcent dix ans plus tard).

Nos résultats ont des implications importantes pour la politique économique. Nous montrons que la levée des obstacles à l'installation de banques étrangères ne conduit pas à une baisse des taux d'emprunt, ni pour les firmes transparentes ni pour les firmes opaques. Afin de réduire des taux débiteurs, d'autres réformes devraient être envisagées : maîtrise de l'inflation, augmentation la concurrence du secteur bancaire, etc. Concernant les petits entrepreneurs, les réformes devraient se concentrer sur la création d'un registre des crédits pour les petits entrepreneurs, la clarification du cadre légal concernant la saisie de la garantie en cas de défaut et la réduction du coût et de la durée des procédures judiciaires.

#### **RESUME COURT**

Nous utilisons une base de données originale pour étudier l'impact de la propriété étrangère et du mode d'entrée des banques étrangères sur les taux du crédit accordé. Nous trouvons que les banques greenfield appliquent des taux plus bas en moyenne et nous testons deux explications : (1) une meilleure performance (2) une composition différente du portefeuille du fait notamment d'une sélection des emprunteurs plus transparents. Notre analyse montre que la propriété et le mode d'entrée ont un impact sensible sur la composition des portefeuilles des banques en termes de type d'emprunteurs, de maturité et de devises et que cette différence de composition explique les écarts de taux d'emprunt, confirmant ainsi "l'hypothèse de composition en portefeuille".

*Classification JEL* : G21, G28, G34, L11

*Mots clés* : banques, IDE bancaires, taux d'emprunt.

**THE EFFECT OF FOREIGN BANK ENTRY ON THE COST OF CREDIT IN  
TRANSITION ECONOMIES.**

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**1. INTRODUCTION**

The existing empirical evidence shows that lending rates of foreign banks in developing countries are lower than those of domestic institutions. This is particularly true for new banks that entered the market via greenfield investment and are not burdened with non-performing loans and inefficient organizational structure (Martinez Peria & Mody (2004); Claey's & Hainz (2007)). Employing a unique dataset on loan rates charged by banks with different types of ownership to transparent and opaque borrowers, we find that this empirical finding stems from a portfolio composition effect and not from foreign banks charging lower loan rates than domestic private banks to the same type of borrowers.

The observed result that loan rates of foreign banks in developing countries are lower than those of domestic ones can be interpreted in two different ways. The most common explanation states that the lower lending rates of greenfield institutions reflect their superior performance. This is consistent with Berger's (2000) global advantage hypothesis, according to which some efficiently managed foreign institutions are able to overcome cross-border disadvantages and operate more efficiently than the domestic institutions in other nations. We name this effect to the "performance

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<sup>2</sup>The authors would like to thank Agnès Bénassy-Quéré, Martin Brown, Martine Carré-Talon, Tomasz Chmielewski, Marta Golajewska, Adam Glogowski, Vasso Ioannidou, Matthias Koehler, Guy Laroque, Alina Luca, Steven Ongena, Damiaan Persyn, Viorel Roscovan, Dobromil Serwa, as well as participants at the XVI Tor Vergata Conference on Banking and Finance, 2008 FMA European Conference, 6th INFINITI Conference on Banking and Finance, and seminars at the National Bank of Poland, CEPII, and Tilburg University for many helpful comments and suggestions. The paper was completed while Olena Havrylchik and Emilia Jurzyk were visiting the National Bank of Poland, whose hospitality is gratefully appreciated. Emilia Jurzyk gratefully acknowledges financial support from the Research Council of the KU Leuven, in the framework of Central and Eastern European Initiatives. The remaining errors are the sole responsibility of the authors.

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hypothesis”.

At the same time, foreign banks are often accused of “cherry picking” the best borrowers, and in general, of lending more to large transparent firms at the expense of SMEs. This argument has been formalized by Dell’Ariccia & Marquez (2004) who model the tradeoff between cost-advantage for foreign entrants versus informational advantage for incumbent banks. They argue that foreign banks have advantages in targeting more transparent new clients (transactions-based lending), whereas domestic banks are better placed to lend to firms based on soft information (relationship lending). Taking into account that lending rates in market segments for more transparent clients are lower due to higher competitiveness, the documented lower lending rates of greenfield banks could be related to their specific portfolio composition tilted towards large corporations. We call this the “portfolio composition” hypothesis and indeed, there is some empirical evidence that foreign-owned banks are less likely to lend to informationally opaque small businesses than domestically-owned banks (Berger, Klapper & Udell (2001); Clarke, Cull, Martinez Peria & Sanchez (2005); Gormley (2007*b*); Mian (2006)).

The portfolio composition effect can additionally manifest itself in other dimensions of the loan contract such as collateral requirements (Sengupta (2007)), or the maturity (Ortiz-Molina & Penas (2008)) and currency (Brown, Ongena & Yesin (2008)) of loans. In the last years, loans in foreign currencies have gained popularity in a number of transition countries due to their perceived lower costs. Indeed, interest rates on loans in domestic currencies have been higher than the ones in foreign currencies in most transition economies, and borrowers - willing to take on foreign exchange and interest rate risks - have preferred loans denominated in foreign currencies. In some countries appreciation of the domestic currency made loans in foreign currency appear even cheaper. Foreign banks are often blamed for the supply of foreign currency denominated loans, since they have a better access to international capital markets and to their parent institutions. There is also a widely held concern that foreign bank lending involves short-term “hot” money that is readily retracted during crises (Doolley & Shin (2000)). Consequently, we control for loan currency and maturity since they might have a significant impact on the lending rate.

We differentiate between foreign banks that entered the market via greenfield investment (greenfield banks) and foreign banks that acquired an existing domestic institution (takeover banks), because foreign banks’ behavior is heavily influenced by their mode of entry. Foreign banks that enter by taking over an existing institution might encounter difficulties when trying to improve credit standards or risk management procedures, as the acquired institutions are burdened by non-performing loans and non-transparent organizational structure, whereas greenfield banks may be free of such concerns. Greenfield banks, however, might be disadvantaged in their access to

soft information, whereas takeover banks possess relationships with the incumbent firms inherited from the acquired institution. Both arguments lead to the situation where greenfield banks would offer on average lower lending rates, however it is impossible at this stage to explain whether this comes from "performance" or "portfolio composition" effects.

The effect of bank ownership on the cost of credit for different types of borrowers is an important question, since high lending rates might be prohibitive for some borrowers and in turn damage economic growth. Calvo and Coricelli (1993) argue that the credit contraction in Central and Eastern Europe can explain partly the heavy decline in output in this region in the period 1989-1990. Therefore, the observed lower interest rates of foreign banks might speak in favor of removing entry barriers for foreign banks. However, it is important to examine whether foreign banks charge lower lending rates to all borrowers, or only to large transparent firms possibly at the expense of opaque small entrepreneurs which may continue to suffer from the informational capture of incumbent banks. In most countries SMEs account for majority of firms in the economy and significant share of employment (Hallberg (2001); Ayyagari & Demirguc-Kunt (2007)), hence their access to financing has important implications for the level of economic development and growth.

To our knowledge there has been no attempt to study the impacts of both the "performance" and "portfolio composition" hypotheses for lending rates of banks with different ownership structure and mode of entry. The reason lies in the lack of data on the composition of banks' loan portfolios. In this study we aim to fill this gap by using a unique database of detailed information on Polish banks, provided by the National Bank of Poland. Our dataset contains quarterly information on all Polish banks for the period between December 1996 and December 2006. In addition to traditional information from balance sheets and income statements, we have data on interest income, loan amounts, non-performing loans, and currency and maturity of loans granted to two distinct groups of borrowers: large private firms and small entrepreneurs. In the paper we focus on the differences between foreign and domestic banks. Additionally, we differentiate between two modes of foreign bank entry, namely acquisition of a domestic institution and a greenfield investment. Finally, we also control for state bank ownership.

The Polish banking market constitutes a good testing ground for this exercise. Currently the share of foreign investors in Polish banks amounts to 74 percent, and banks of all types of ownership and mode of entry are represented. Poland is home to the largest banking industry among new EU members, it carries many characteristics of other banking markets in Central and Eastern European countries (CEECs), and it did not experience financial distress in the analyzed period.

Our findings support the "portfolio composition" hypothesis, and thus contradict

studies that argue that greenfield banks charge lower lending rates than private domestic banks due to their superior performance. Previous results stem from the fact that greenfield banks have higher share of the most transparent borrowers, whose cost of credit is lower, than that of opaque borrowers. Moreover, earlier studies argue that there is a convergence of interest rates between banks of different types of ownership, whereas we show that this effect is also due to portfolio composition, as, with time, greenfield banks start lending less to transparent borrowers and extending more loans in local currency. Their average lending rate rises but due to a pure portfolio effect and not convergence in performance.

The rest of this paper is organized as follows. Section 2. describes theoretical considerations and reviews the existing empirical literature. In Section 3. we present our data and compute descriptive statistics. Section 4. describes our empirical findings and Section 5. concludes.

## **2. THEORETICAL CONSIDERATIONS AND EXISTING EMPIRICAL EVIDENCE**

Most empirical studies for developing and transition countries show that greenfield banks succeed in charging lower lending rates and spreads than domestic banks and foreign banks that entered via acquisitions (takeover banks). Martinez Peria & Mody (2004), for example, study banking markets in five Latin American countries during the late 1990s and find that foreign banks have lower spreads than domestic banks and takeover banks have higher spreads than greenfield banks. Claeys & Hainz (2007) document that greenfield banks charge the lowest lending rates in ten CEECs. These empirical findings can be explained by two main complementary hypotheses.

Berger, DeYoung, Genay & Udell (2000) formulates the global advantage hypothesis, according to which some efficiently managed foreign institutions are able to overcome cross-border disadvantages (distance, monitoring costs, differences in institutional environment, language and culture) and operate more efficiently than their domestic competitors. These organizations may have higher efficiency when operating in other nations as they are able to spread their superior managerial skills or best-practice policies and procedures over more resources, thus lowering costs. They may also raise revenues through superior investment or risk management skills, by providing better service quality/variety that some customers prefer, or by obtaining diversification of risks that allows them to undertake higher risk-higher expected return investments.

The “performance” effect should be especially strong for foreign banks entering transition economies that have nascent banking markets characterized by low competition and efficiency. Indeed, there are a number of studies that show that foreign

banks have higher efficiency (Bonin, Hasan & Wachtel (2005); Weill (2003)), experience faster and more stable loan growth (De Haas & Van Lelyveld (2006)), and enjoy higher profitability than domestic banks (Havrylchyk & Jurzyk (2007)). Most of these studies also show that greenfield banks exhibit a particularly superior performance due to the fact that they did not inherit bad loans and inefficient organizational structures. This is not the case for takeover banks which need transitional time in order to modernize their lending practices and clean up loan portfolio which is left from previous owners. There exists anecdotal evidence that some foreign owners do not reform the acquired institution immediately after the purchase, but only after it starts experiencing problems.

Foreign banks in transition and developing economies additionally benefit from their better access to international capital markets and funding from their parent companies. This diminishes their cost of funds, which in turn should be translated into lower lending rates, benefiting borrowers. Moreover, foreign banks might enjoy lower cost of deposits due to their superior reputation.

**Hypothesis 1:** *Performance hypothesis. Foreign banks charge lower lending rates due to their comparative advantages in efficiency, risk management, corporate governance, and cost of funding. Greenfield banks might charge additionally lower rates because they are not burdened by old non-performing loans and inefficient organizational structures.*

The superior performance of foreign banks stems primarily from lending techniques that rely on hard information. Several theoretical and empirical papers argue that foreign banks have a comparative advantage in lending to large transparent firms that have long credit history and detailed financial statement information (Dell'Araccia & Marquez (2004); Gormley (2007a); Gormley (2007b); Sengupta (2007)). In contrast, domestic banks use “relationship lending” to gain knowledge about opaque firms that can produce less hard information about the quality of the firm, but can provide soft information (Berger et al. (2001); Degryse, Laeven & Ongena (2007)).<sup>6</sup> Moreover, foreign banks are better suited to lend to multinational corporations from their home countries.

Besides having a disadvantage in using soft information, foreign banks, and in particular greenfield institutions, might be less willing to do so. This idea is proposed

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<sup>6</sup>Hard and soft information differ with respect to the degree of transferability. Thus, hard information on the other hand refers to credible and publicly verifiable data, such as firms' balance sheets, credit history, collateral and guarantees. On the other hand, soft information cannot be verified by a third person and is gained as a result of the relationship between a bank and a borrower. For example, through repeated interviews with an owner of a young firm, a bank manager might be convinced that the firm's owner is a smart, honest and hard working entrepreneur with a high probability of success. However, this soft information cannot be transferred to other potential lenders (Petersen, 2004).

by Stein (2002) who argues that organizations with more hierarchical structures are more likely to rely on hard information as opposed to organizations with flatter structures. The reason is that flatter organizations have better control and information on their managers, and thus can afford to give them more discretion, which allows them to use soft information. Berger, Miller, Petersen, Rajan & Stein (2005) explains the logic of the Stein's model with a banking example. In small banks, managers know that they have control of their capital and funds and their research of local lending opportunities will be rewarded. Therefore, they invest a lot of time in collecting soft information, whose quality is a function of incentives. In large banks, local subsidiaries might have fewer incentives to collect soft information, because the capital allocation decisions are done in the headquarters, where it might be decided to reallocate capital to a different subsidiary because overall lending opportunities are better there. A local subsidiary cannot credibly communicate soft information and therefore its efforts are wasted. Ex ante, this implies that managers do less research in a hierarchical setting.

The modeling in Stein (2002) and Berger et al. (2005) can be easily applied to foreign banks, which are usually part of large multinational banking groups, and where communication of soft information is obstructed not only by the hierarchy, but also by cultural and linguistic barriers. We can also assume that funds are more easily moved to/from greenfield institutions than to/from takeover banks that have large deposit networks and are thus more independent in their financing. This would additionally diminish the incentives of managers of greenfield institutions to invest time in gathering soft information and engaging in relationship lending.

Dell'Araccia & Marquez (2004) show that lending rates on loans to transparent borrowers are lower than those for opaque clients due to differences in the borrowers' elasticity of demand for credit. Transparent borrowers have a more elastic demand because they can signal their information to outside lenders, which leads to higher competition and, thus, lower cost of funds for large transparent firms. Opaque firms, on the other hand, cannot signal their worth and are captured by their creditors leading to higher borrowing costs for them.

The above two results - the fact that foreign banks would prefer to lend to more transparent borrowers and that lending rates for this type of client is lower - could explain why we observe a negative impact of foreign bank ownership on lending rates. We can additionally hypothesize that greenfield banks have the best comparative advantage in lending to transparent clients, whereas foreign banks that entered via acquisition of domestic institutions also possess access the soft information and skills to lend to more opaque customers, which allows them to extract rents (Claeys & Hainz (2007)). This would mean that greenfield banks would offer lower lending rates than takeover banks for transparent borrowers and would aim to shy away from

opaque borrowers where soft information is important.

**Hypothesis 2:** *Portfolio Composition hypothesis. Foreign banks have on average lower lending rates due to different composition of their portfolios. Greenfield banks in particular have a lot of advantages in processing hard information and less motivation to engage in lending relationship. As a result, they target transparent institutions and charge them lower interest rates. In contrast, domestic banks have comparative advantages in lending to opaque firms based on soft information, which allows them to extract larger rents from those borrowers.*

New studies question the argument that large and foreign banks are not capable to lend to SMEs (Berger & Black (2008); Berger & Udell (2006); de la Torre, Martinez Peria & Schmukler (2008)) On the contrary, latest advances in credit scoring methodologies coupled with enhanced computer power and increased data availability make transaction lending technologies to be well suited for funding small firms (Mester (1997); Petersen & Rajan (2002)). This is especially true when credit scores are based on the owner's personal consumer data obtained from consumer credit bureaus, which is combined with data on the SMEs collected by the financial institutions. These studies still agree that small domestic banks have an advantage to gather and process soft information, but they argue that large and foreign banks are also able to lend to SMEs, but using "hard" information-based technologies. In this case, we should not observe differences in portfolio allocations of loans between different types of banks.

The existing studies on foreign bank entry and lending to SMEs in CEECs do not provide direct evidence on whether foreign banks' lending is biased towards large transparent borrowers. De Haas & Naaborg (2006) conduct focused interviews with managers of foreign parent banks and their affiliates in Central and Eastern Europe and document that foreign banks expanded into SME and retail markets. Giannetti & Ongena (2008) use firm level data and find that foreign bank presence in Central and Eastern Europe stimulates growth of financial loans, and even though large firms benefit more from foreign lending, smaller companies profit as well. But it is not clear whether loans to SMEs are supplied by foreign banks or whether domestic institutions decided to expand to this sector because of increased competition in the market for transparent borrowers.

### **Controlling for maturity and currency of loans**

While ability and willingness of foreign banks to lend to different types of borrowers is relatively well described in the literature, the impact of foreign bank ownership and mode of entry on loan maturity and currency is less investigated. However, foreign

banks are very often blamed for bringing hot money into the country, which can be easily withdrawn in case of crisis.

In theory, the impact of maturity on cost of credit is ambiguous as it reflects two opposite effects. A borrower that issues short-term debt can face costly liquidations at expiration which motivates him to opt for longer-term debt. At the same time, lenders prefer to give short term loans because of agency problems, such as asset substitution and underinvestment. As a result, borrowers are willing to incur and lenders demand higher lending rates for loans with longer maturity. Alternatively, lenders might ration credit to risky borrowers and force them to take short-term loans, which would decrease average lending rates on long-term loans. Empirical evidence supports both hypotheses for corporate loans and bonds (Gottesman & Roberts (2004); Helwege & Turner (1999)). For an individual firm the spread typically increases with maturity, reflecting rising uncertainty. At the same time, safer firms tend to issue longer-dated bonds or are able to have access to long term bank credit, which causes the average spread to decline with maturity.<sup>7</sup>

Currency composition of loan portfolios is another important determinant of lending rates. In fact the popularity of loans denominated in foreign currencies stems from lower lending rates that are charged on this type of loans. Brown et al. (2008) show that opaque firms have an additional incentive to declare that their revenues are in foreign currency in order to profit from cheaper cost of credit. This interest rate advantage can be considered a compensation for the inherent foreign exchange risk. For instance, Beer, Ongena & Peter (2008) find that more risk-loving households are more likely to take a loan in a foreign currency. However, a survey undertaken in 11 CEECs shows that most borrowers, particularly households and SMEs, are not aware of involved currency risk (ECB (2006)). This is due to historically low exchange rate volatility in some countries, which created a belief in de facto low foreign exchange rate risk. The willingness to borrow in foreign currency is additionally enhanced by appreciation of the local currency which is also true for Poland.

The ability and willingness of banks to supply loans in foreign currency depends primarily on their access to foreign funds and/or hedging opportunities.<sup>8</sup> In this re-

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<sup>7</sup>In our empirical work we consider Poland where the situation is additionally complicated because yield curves were downward-sloping till 2003, reflecting market expectations of diminishing inflation and interest rate convergence to the EU level. Short-term interest rates declined dramatically from 20.6% at the end of 1996 till 5.7% in 2003, with a yield curve taking an upward shape after 2003. In such economic environment, firms would agree to take long-term loans only if they had lower interest rate than short-term ones. It should be noted that this situation was not unique and is still observed in some CEECs.

<sup>8</sup>Very often loans that are contracted in foreign currency are actually extended to borrowers in domestic currency, even though they have all the characteristics of foreign currency loans, namely interest rate and exchange rate risks. In this case banks are not obliged to have access to foreign currency funding, but rather they should be able to hedge their exposure to foreign currency risk, which is easiest for

spect, foreign banks have an advantage over domestically-owned banks, since they have better access to international capital markets, including their own parent banks. The share of interbank liabilities of greenfield banks from non-resident banks has increased in our sample from 7 to 20 percent of total banks' assets, reflecting an increasing attractiveness of Poland for foreign investors. At the same time, the share of non-resident interbank liabilities of domestic banks, both private and state-owned, was virtually zero.

To sum up, we expect that loan maturity and currency play an important role in explaining lending costs. Since foreign banks are more likely to lend short term and in foreign currency, we have to control for these portfolio characteristics in order to distinguish between performance and portfolio composition hypotheses.

### 3. DATA AND DESCRIPTIVE STATISTICS

We test our hypotheses using a unique dataset that was kindly provided by the National Bank of Poland. It contains quarterly information on 110 Polish banks<sup>9</sup> between December 1996 and December 2006. In addition to standard information from balance sheets and income statements (like bank assets, capitalization, costs and profits), it contains data on interest income, amount of granted loans, and non-performing loans for two borrower types: private firms and individual entrepreneurs. Our data gives us a unique opportunity to construct effective interest rates, market shares, Herfindahl index, non performing loans for each borrower type separately.

The distinction between the two groups of borrowers mentioned above is grounded in Polish law. Bank classifies lender as a private firm if the firm is owned by private investors (either entirely, or where the private share exceeds 50 percent), and is either subject to commercial law or is subject to civil law and employs more than 9 workers. Additionally, such firms have to comply with accounting regulations that require full bookkeeping. Individual entrepreneurs, on the other hand, are small firms employing up to 9 workers, they are subject to civil law, and use simplified accounting procedures.<sup>10</sup>

In theory, transparent firms have reliable financial statements, long credit history, and good collateral, which help the bank to evaluate borrower's creditworthiness. We are confident that private firms in our sample correspond to this definition, hence we

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banks with good standing on international financial markets.

<sup>9</sup>We define a bank Polish if it is registered in Poland and the National Bank of Poland collects information on it.

<sup>10</sup>Actually, we have data on three additional groups of borrowers: individuals, public firms, and farmers. Due to the difficulties in classifying these borrowers in terms of transparency, we decided to use only the two groups mentioned in the text.

label them transparent borrowers.<sup>11</sup> We classify our entrepreneurs as opaque because they are small and often young entities, and that makes it problematic for a bank to judge their capacity and willingness to repay. This is particularly acute problem in developing and transition countries, where many small firms are informal. It implies that a firm might have larger turnover and assets than it declares officially, but it also implies that the firm has unrecorded, contingent senior liabilities to its employees (de la Torre et al. (2008)).

The Polish banking sector provides a good testing ground to test the two aforementioned hypotheses, because similar to other CEECs, it experienced massive foreign direct investments. At the end of 2006, the share of foreign investors in Polish banking constituted 74 percent. This is less than in other major CEECs countries, such as Hungary with more than 80 percent of banking assets in foreign hands, and Czech Republic and Slovakia where foreign banks control more than 95 percent of assets. Relatively smaller presence of foreign banks in Poland gives us an additional strong argument to use Poland as a case study, since there are still local private and state-owned banks left which we can use as a benchmark.

During 1996-2006, there were a number of domestic mergers and acquisitions in the Polish banking sector, hence we treat merged institutions as two before the merger and as one afterwards.<sup>12</sup> For our estimations we have deleted the four first quarters of operations for both greenfield and takeover banks in order to exclude the initial setting-up and transformation period.

In Table 1 we present variable definitions, and in Table 2 we report descriptive statistics for the variables that we employ in our regression analysis. Based on our data, we are able to calculate not only the interest rates for different types of borrowers, but also banks' individual market shares and the Herfindahl index for transparent and opaque borrowers. In addition, we have information about maturity and currency of loans with respect to borrower type.

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<sup>11</sup>Even though all firms which employ more than 9 workers are included in our definition, the average statistics are clearly driven by large firms.

<sup>12</sup>We also investigated the impacts of domestic mergers on banks' lending rates. We did so by including in our loan rate regressions a dummy that takes a value of one if the bank had undergone a domestic merger, and zero otherwise. Our initial estimations showed that this variable was never statistically significant and, therefore, we decided to exclude it from our final results.

Table 1: Variable definitions

| <b>Variable</b>              | <b>Definition</b>                                                                                                                                                                                                                         |
|------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| State-owned                  | A dummy variable which takes the value of one if more than 50 percent of the bank is owned by the state                                                                                                                                   |
| Takeover                     | A dummy variable which takes the value of one if more than 50 percent of the bank is owned by the foreign investor, which entered the market via acquisition of an existing bank                                                          |
| Greenfield                   | A dummy variable which takes the value of one if more than 50 percent of the bank is owned by the foreign investor, which entered the market via establishing a new bank                                                                  |
| Age                          | Age of a bank since the time it was established (for greenfield banks) or acquired (for takeover banks)                                                                                                                                   |
| Lending rate                 | The ratio of interest income on net loans. This variable is calculated for all borrowers, and for the following two types of borrowers: private firms and entrepreneurs. Calculated at quarterly level unless stated explicitly otherwise |
| NPL                          | The ratio of non-performing loans to total loans, calculated as a deviation from the median. This variable is calculated for all borrowers, and for the two types of borrowers: private firms and entrepreneurs                           |
| Market share                 | Share of loans of a bank in the total loans of banking sector in host country. This variable is calculated for all borrowers, and for the following two types of borrowers: private firms and entrepreneurs                               |
| Capitalization               | The level of risk adjusted capital                                                                                                                                                                                                        |
| Cost                         | The ratio of personnel and administrative costs to assets                                                                                                                                                                                 |
| Herfindahl Index             | Herfindahl index, calculated as the sum of squared shares of loans. This variable is calculated for all borrowers, and for private corporations and entrepreneurs separately                                                              |
| Share private (entrepreneur) | The ratio of loans to private firms (entrepreneurs) in bank's portfolio                                                                                                                                                                   |
| FX loans                     | The ratio of loans in foreign currency in bank's loan portfolio. This variable is calculated for all borrowers, and for private corporations and entrepreneurs separately                                                                 |
| Short-term loans             | The ratio of loans with maturity less than 1 year in bank's loan portfolio. This variable is calculated for all borrowers, and for private corporations and entrepreneurs separately                                                      |
| Long-term loans              | The ratio of loans with maturity over 5 years in bank's loan portfolio. This variable is calculated for all borrowers, and for private corporations and entrepreneurs separately                                                          |
| GDP                          | Real quarterly growth rate of GDP                                                                                                                                                                                                         |
| Inflation                    | Quarterly inflation rate                                                                                                                                                                                                                  |
| Real interest rate           | Real short-term interest rate                                                                                                                                                                                                             |

*The effect of foreign bank entry on the cost of credit in transition economies.*

Table 2: Descriptive statistics

| Variable                                      | Obs. | Mean  | Std. Dev. | A   | B   |
|-----------------------------------------------|------|-------|-----------|-----|-----|
| Annualized lending rate                       | 2073 | 0.174 | 0.126     |     |     |
| Annualized lending rates on loans issued by   |      |       |           |     |     |
| Greenfield                                    | 632  | 0.147 | 0.089     | *** |     |
| Takeover                                      | 605  | 0.165 | 0.161     | *** |     |
| State-owned                                   | 307  | 0.174 | 0.086     | *** |     |
| Private                                       | 529  | 0.217 | 0.126     |     |     |
| Annualized lending rates on loans to          |      |       |           |     |     |
| Private firms                                 | 2151 | 0.167 | 0.141     |     |     |
| by greenfield                                 | 618  | 0.152 | 0.138     | *** |     |
| by takeover                                   | 600  | 0.155 | 0.153     | *** |     |
| by state-owned                                | 307  | 0.161 | 0.085     | *** |     |
| by private                                    | 524  | 0.212 | 0.155     |     |     |
| Entrepreneurs                                 | 1836 | 0.190 | 0.170     |     | *** |
| by greenfield                                 | 329  | 0.145 | 0.199     | *** |     |
| by takeover                                   | 598  | 0.173 | 0.152     | *** |     |
| by state-owned                                | 307  | 0.197 | 0.197     | *** |     |
| by private                                    | 523  | 0.235 | 0.180     |     |     |
| NPL                                           | 2151 | 0.368 | 1.233     |     |     |
| NPL by bank type                              |      |       |           |     |     |
| Greenfield                                    | 644  | 0.227 | 1.377     | *** |     |
| Takeover                                      | 614  | 0.252 | 1.073     | *** |     |
| State                                         | 330  | 0.311 | 0.911     | *** |     |
| Private                                       | 563  | 0.689 | 1.327     |     |     |
| NPL by type of credit                         |      |       |           |     |     |
| Private firms                                 | 2144 | 0.440 | 1.426     |     |     |
| Entrepreneurs                                 | 1870 | 0.468 | 1.648     |     |     |
| Herfindahl Index                              | 2270 | 0.072 | 0.009     |     |     |
| Private firms                                 | 2270 | 0.068 | 0.009     |     |     |
| Entrepreneurs                                 | 2270 | 0.070 | 0.012     |     | *** |
| Market share                                  | 2269 | 0.017 | 0.031     |     |     |
| Share of loans in bank's portfolio to         |      |       |           |     |     |
| Private firms                                 | 2151 | 0.488 | 0.305     |     |     |
| Entrepreneurs                                 | 2151 | 0.112 | 0.116     |     | *** |
| Share of loans in bank's portfolio in FX      |      |       |           |     |     |
| Private firms                                 | 2132 | 0.193 | 0.199     |     |     |
| Entrepreneurs                                 | 1819 | 0.150 | 0.209     |     | *** |
| Share of short-term loans in bank's portfolio |      |       |           |     |     |
| Private firms                                 | 2132 | 0.522 | 0.259     |     |     |
| Entrepreneurs                                 | 1819 | 0.415 | 0.259     |     | *** |
| Share of long-term loans in bank's portfolio  |      |       |           |     |     |
| Private firms                                 | 2132 | 0.183 | 0.195     |     |     |
| Entrepreneurs                                 | 1819 | 0.138 | 0.155     |     | *** |
| GDP growth                                    | 2160 | 0.016 | 0.086     |     |     |
| Inflation                                     | 2160 | 0.015 | 0.015     |     |     |
| Real interest rate                            | 2160 | 0.018 | 0.013     |     |     |

\*\*\*, \*\*, and \* correspond to 1%, 5% and 10% significance levels that the difference: in column A between greenfield, takeover, state-owned and private banks, and in column B between private firms and entrepreneurs is different from zero. Lending rates are annualized in this table.

### 3.1. Number of banks and market shares

Figure 1 provides information about the number of banks and market shares with respect to ownership and mode of entry: private domestic banks, state-owned domestic banks, greenfield foreign banks and takeover foreign banks. In each case, we use a threshold of 50% in order to designate a bank to a specific ownership group. For example, a bank is called state-owned if more than 50 percent of its capital is owned by the state. A foreign bank is considered greenfield if it has been established in Poland as a new institution, and takeover since quarter  $t$  if it has been acquired by an existing institution in that period. We observe that the role of domestic institutions, both private and state-owned, has declined, whereas the number of takeover banks and their market share have increased significantly. The number of greenfield banks has increased as well, but their market share has remained stable in the analyzed period.

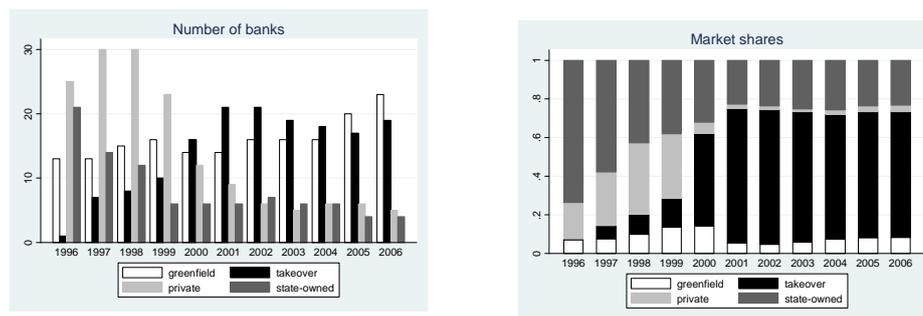


Figure 1: Number of banks and Market Shares of takeover, greenfield, and domestic banks

### 3.2. Bank portfolios - clients

In Figure 2 we present the share of each type of borrower in banks' portfolios. This figure confirms our expectations that banks' ownership structure significantly influences the types of clients that a bank targets. This is particularly evident for greenfield banks that primarily target the most transparent borrowers (private firms), even though their share in the banks' portfolios has declined from 80 percent of loan portfolio in 1996 to 56 percent ten years later. As a contrast, domestic private banks have only 34 percent of their portfolio targeted to transparent borrowers, and this share has remained constant over the analyzed period. At the same time, these banks lend more to opaque small firms (entrepreneurs) than foreign banks - which confirms our

expectations that domestic private banks have comparative advantages in lending to small non-transparent businesses.

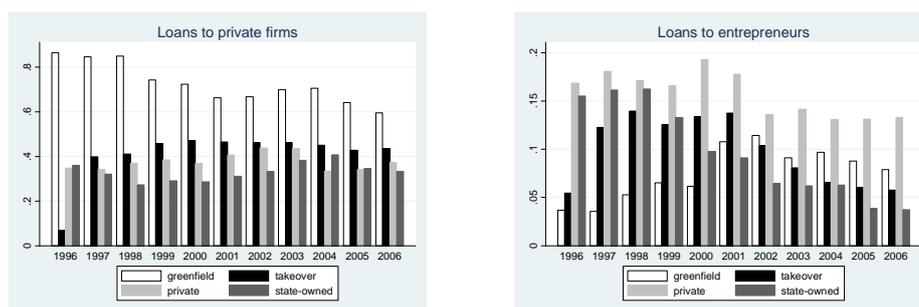


Figure 2: The share of loans to different types of borrowers in banks' portfolios

Our findings should not be interpreted as a proof that foreign banks do not lend to SMEs at all. In fact, most of SMEs loans come from takeover banks, followed by state-owned and greenfield banks. This reflects market shares of each type of bank, as domestic private banks constituted only 5 percent of total banking assets in 2006. Modern lending technologies have helped foreign banks to overcome informational asymmetries and they are also willing to lend to small entrepreneurs. This is consistent with the recent arguments that relationship lending is not the only way to overcome opaqueness of small entrepreneurs, and lending technologies that are based on hard information can also be used (see e.g. Berger and Black, 2008). Still, the borrower mix of each type of bank remains distinctly different, as private banks still have less of the transparent borrowers in their portfolios than foreign banks, especially greenfield ones. But the most likely reason for this might be not the disadvantage of foreign banks in lending to opaque clients, but rather their comparative advantage in lending to transparent ones, which forces domestic banks to focus on more risky and opaque borrowers (Dell'Ariscia & Marquez (2004)).

### 3.3. Bank portfolios - maturity

Figure 3 shows the maturity composition of banks' portfolios. We define loans with maturity up to one year as short-term loans, and above five years as long-term loans. We find that maturity of loans has increased significantly in all types of banks, and currently in all banks, more than 40 percent of outstanding loans are long-term loans, except for greenfield institutions. There is an indication that loan maturity of foreign

banks, particularly greenfield institutions, is shorter than this of domestic banks. This is in line with frequent fears that foreign banks bring short-term money, which can be easily reversed in case of economic distress. Interestingly, state-owned banks have the largest share of long-term loans, which might be explained by less stringent portfolio management techniques and their lower volatility of deposits due to implicit government guarantees.

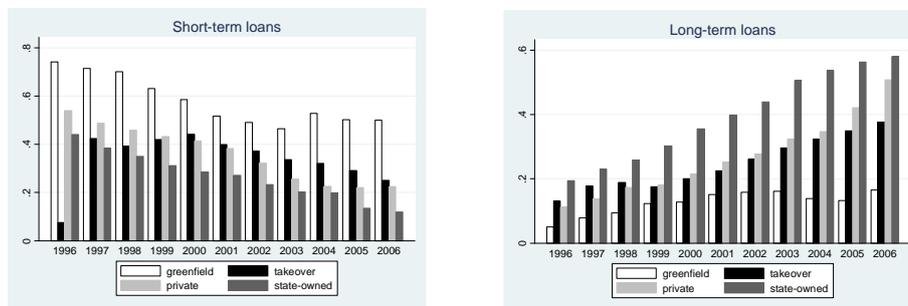


Figure 3: The share of short-term and long-term loans in banks' portfolios

### 3.4. Bank portfolios - currency

Next we turn to currency composition of loan portfolios for different types of banks. One of the characteristics of many CEECs is the high proportion of loans denominated in foreign currency. Their share ranges from around 10-20 percent in Czech Republic and Slovakia to 60-70 percent in the Baltic states. As we see in Figure 4, in 2006 Polish banks extended 23 percent of their loans in foreign currency, which is not very high in comparison to other CEECs. Still, this poses significant risks for the banking sector, as many borrowers are not hedged against currency and interest rate risks.<sup>13</sup> As expected, foreign banks give more loans in foreign currency than domestic banks, which is probably due to their better access to international capital markets

<sup>13</sup>Interestingly, many loans in foreign currencies are extended in Swiss Francs, on which lending rates are even lower than on Euro loans. This characteristic is shared by other countries in CEECs, such as Hungary and Slovenia. This trend comes from Austria where most of loans in foreign currency are denominated in Swiss Franc. Originally this was constrained to regions bordering Switzerland where firms and individuals had a natural hedge against currency risk since their profits and income were often in Swiss Franc. However, now lending in Swiss Franc is extended to other part of Austria and to CEECs where Austrian banks have a strong presence.

and parent companies. At the same time, loans in foreign currency peaked in 2000-2003 when 30 and 36 percent of loans of takeover and greenfield banks, respectively, were foreign currency denominated, and their importance has declined afterwards.

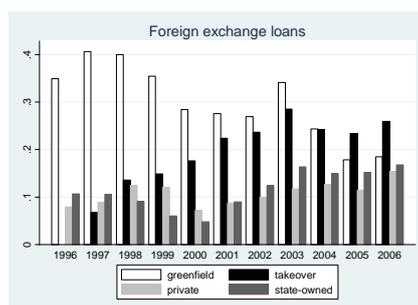


Figure 4: The share of foreign exchange loans in banks' portfolios

### 3.5. Interest rate variables

Our calculations of interest rates charged by banks of different types of ownership and mode of entry show that greenfield banks charge the lowest interest rates: 14.7 percent on average, whereas private domestic banks charge the highest: 21.7 percent. Takeover banks offer lower lending rates than both types of domestic banks, but charge more than the rates of greenfield institutions. These results are in line with the existing literature. We also test the differences in rates of greenfield, takeover, and state-owned banks with respect to rates charged by domestic private banks, and find that all the differences are statistically significant.

Next we compare interest rates on loans to different types of borrowers. Lending rates offered to private firms - the most transparent borrowers - are significantly lower than lending rates charged to entrepreneurs. The difference between them amounts to 2.3 percentage points on average and is statistically significant. This is in line with the theoretical considerations that lending rates in the competitive markets with the smallest informational asymmetries should be the lowest whereas lending rates for opaque borrowers are the highest due to high switching costs.<sup>14</sup>

<sup>14</sup>While there was a general trend for all lending rates to decrease in the analyzed period, the spread between lending rates to the most transparent borrowers - private firms - and the most opaque borrowers - entrepreneurs - has not changed in a statistically significant manner. We expected opaque borrowers in our sample to become more transparent over time, which would narrow the spread between them and transparent borrowers. At the same time, we can expect that foreign banks increase competition more

Taking into account borrower composition of banks' portfolios and different lending rates for these borrowers, we can already make preliminary conclusions and make an attempt to explain the differences in the average lending rates charged by banks with different types of ownership. First, lower lending rates of greenfield banks appear to be the result of their loan portfolio composition, i.e. heavy focus on markets with the lowest degree of information asymmetry (private firms), and highest share of loans granted in foreign currencies (which would be the cheapest). On the other hand, higher lending rates of private banks could be due to the fact that they give loans to entrepreneurs, the most opaque borrowers which bring the highest rents but are also most risky.

#### 4. ECONOMETRIC METHODOLOGY AND EMPIRICAL FINDINGS

##### 4.1. Baseline model

First, we estimate a baseline lending rate model with specification similar to other studies, so that we can compare these results with the existing literature (Martinez Peria & Mody (2004); Claeys & Hainz (2007)). In this specification, we use lending rate for all borrowers as a dependent variable and examine the effect of bank ownership and mode of entry on costs of loans for an average borrower, controlling for bank characteristics, macroeconomic environment and market structure.

To be more formal, we estimate the following model:

$$L_{it} = \alpha_0 + \alpha_1 \text{Ownership}_{it-1} + \alpha_2 \text{Bank Characteristics}_{it-1} + \alpha_3 \text{Macro}_{t-1} + \alpha_4 \text{Market Structure}_{t-1} + \text{Season}_t + \varepsilon_{it} \quad (1)$$

where  $L_{it}$  is the lending rate of bank  $i$  at time  $t$ ,  $\text{Ownership}_{it}$  - dummy variables that capture the effect of bank ownership (state) and mode of foreign bank entry (takeover and greenfield) for bank  $i$  at time  $t$ ,  $\text{Bank\_Characteristics}_{it}$  - variables for capitalization, costs, and the share of non-performing loans in the portfolio of bank  $i$  at  $t$ ,  $\text{Macro}$  - variables for inflation, real short-term interest rate and real GDP growth at  $t$ ,  $\text{Market\_Structure}_t$  - variables that control for market concentration and market power at  $t$ . We lag all explanatory variables and also include seasonal dummies. All variable definitions are given in Table 1.

Since our dataset is in panel version, initially we have to choose between panel and pooled estimation methods. The former, however, presents significant problems: while the Hausman tests indicates that we should allow for unobserved fixed effects

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in the transparent segment of the market, which would widen the spread. Since there is no observable change in the spread, the above forces might counterbalance each other.

in the error term, fixed effects estimation does not allow us to estimate the time-invariant coefficients (i.e. effect of greenfield ownership). In the same time, random effect estimation will produce inconsistent parameter estimates. Consequently, we opt for a pooled model with clustered error terms. We also check the robustness of our results by estimating our regressions using Beck & Katz (1995) panel-corrected standard errors methodology, allowing for heterogeneity and autoregressive process of order 1 in the standard errors. Our results reported below are robust to this procedure and are available upon request.

Taking into account the relatively long data span for each bank (ten years of quarterly observations), we have to investigate the time series properties of our data. We test for non-stationarity using a panel unit root tests of Levin, Lin & Chia-Shang (2002), Im, Pesaran & Shin (2003), Maddala & Wu (1999) and Hadri (2000). The null hypotheses of the first three tests is the existence of the unit root, whereas Hadri (2000) tests the null hypotheses of stationarity of time series. We find that all time series in the sample are stationary.

The results of estimating our model are presented in the first column of Table 3. We find that greenfield banks charge their borrowers 0.8 percentage points per quarter less (or 3.2 percentage points annually), whereas takeover banks do not charge less than domestic private institutions, which are omitted in our estimations and, thus, serve as a benchmark. Among bank specific variables, the deviation from the median non-performing loans, costs, and market share are significant and have the expected signs. Banks that have higher costs and face higher credit risk are more likely to charge higher lending rates. Large banks appear to reap economies of scale, which they transfer to their customers in the form of lower lending rates.

In line with the literature that analyzes whether benefits of foreign ownership are constant over time, we split our takeover and greenfield variables separately into dummies that take the value of 1 if a bank was established (for greenfield) or acquired (for takeover) less than three years ago and banks that are over three years old. Our findings (column 2) show that the impact of greenfield mode of foreign entry disappears with age, which is usually interpreted in the literature as convergence between banks of different types of ownership due to competition. Our results corroborate previous finding in the literature and, therefore, our data reflects the situation as in other developing and transition countries and does not just deal with a particular Polish case (Martinez Peria & Mody (2004); Claey's & Hainz (2007)).

Our data allows us to take two steps to remedy the shortcomings of the general model that has been employed in the literature. As mentioned earlier, the disadvantage of the above general model is the lack of information on borrower type, which therefore does not allow to identify the reasons for lower lending rates of greenfield banks, i.e. their superior performance or their portfolio composition targeted to more trans-

parent borrowers. Our first step to remedy this is to include the share of transparent and opaque borrowers in banks' portfolio into our baseline regression. The results, presented in column 3 of Table 3, clearly show that the impact of bank ownership and foreign banks' mode of entry disappears: there remain no differences in average lending rates between banks. It seems, therefore, that the previous findings suffered from the omitted variable bias, which rendered some of the ownership variables significant. Our results also hold if we account for the dynamic effects (column 4): we do not find evidence of convergence in foreign bank's interest rates. Consequently, our findings present us with an initial proof of portfolio composition hypothesis.

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Table 3: Average bank lending rate and foreign ownership

|                                | 1                   | 2                   | 3                    | 4                    |
|--------------------------------|---------------------|---------------------|----------------------|----------------------|
| Takeover                       | 0.002<br>[0.005]    |                     | 0.005<br>[0.005]     |                      |
| Greenfield                     | -0.008*<br>[0.004]  |                     | 0.004<br>[0.005]     |                      |
| State-owned                    | -0.002<br>[0.005]   | -0.002<br>[0.005]   | -0.004<br>[0.004]    | -0.004<br>[0.004]    |
| Takeover*Age (up to 3 years)   |                     | 0.007<br>[0.009]    |                      | 0.009<br>[0.009]     |
| Takeover*Age (over 3 years)    |                     | -0.002<br>[0.005]   |                      | 0.002<br>[0.004]     |
| Greenfield*Age (up to 3 years) |                     | -0.016**<br>[0.007] |                      | -0.007<br>[0.005]    |
| Greenfield*Age (over 3 years)  |                     | -0.007<br>[0.004]   |                      | 0.006<br>[0.005]     |
| Share private                  |                     |                     | -0.037***<br>[0.013] | -0.038***<br>[0.013] |
| Share entrepreneur             |                     |                     | -0.012<br>[0.009]    | -0.013<br>[0.009]    |
| Capitalization                 | 0.009<br>[0.014]    | 0.011<br>[0.014]    | 0.012<br>[0.015]     | 0.015<br>[0.015]     |
| Cost                           | 0.624***<br>[0.119] | 0.708***<br>[0.129] | 0.161<br>[0.171]     | 0.282*<br>[0.152]    |
| NPL                            | 0.010*<br>[0.005]   | 0.010**<br>[0.005]  | 0.011**<br>[0.005]   | 0.011**<br>[0.005]   |
| Market share                   | -0.104**<br>[0.047] | -0.099**<br>[0.043] | -0.097**<br>[0.041]  | -0.093**<br>[0.039]  |
| Herfindahl Index               | 0.250***<br>[0.090] | 0.226**<br>[0.104]  | 0.246***<br>[0.089]  | 0.231**<br>[0.100]   |
| GDP                            | -0.036*<br>[0.019]  | -0.038**<br>[0.019] | -0.006<br>[0.018]    | -0.011<br>[0.018]    |
| Inflation                      | 0.684***<br>[0.089] | 0.643***<br>[0.121] | 0.721***<br>[0.076]  | 0.691***<br>[0.102]  |
| Real interest rate             | 0.646***<br>[0.116] | 0.563***<br>[0.171] | 0.724***<br>[0.091]  | 0.650***<br>[0.137]  |
| Observations                   | 2073                | 2073                | 2073                 | 2073                 |
| No. of banks                   | 106                 | 106                 | 106                  | 106                  |
| R-squared                      | 0.32                | 0.33                | 0.40                 | 0.41                 |

The dependent variable is the bank-specific average lending rate. The table lists coefficients and standard errors (in parentheses) from regression with pooled OLS with robust standard errors clustered on banks. All dependent variables except for ownership dummies are lagged by one quarter. Regressions include seasonal dummies. Definitions of variables are provided in Table 1. \*\*\*, \*\*, and \* correspond to 1%, 5% and 10% significance levels

#### **4.2. Specifications for each borrower type**

Our second step to further test the portfolio composition hypothesis is to estimate our model separately for private firms and entrepreneurs. Since we then estimate our models with homogeneous borrowers in each sample, the composition effect is removed from our estimations and we succeed to observe the pure effect of bank ownership and mode of entry on lending rates for each homogeneous group of borrowers. As a result, any remaining differences between banks with respect to ownership would serve as an evidence for our performance hypothesis. If we do not find such differences, this will be a proof for the portfolio composition hypothesis.

We present our results for transparent borrowers - private firms - in Table 4, and for opaque ones - entrepreneurs - in Table 5. Our results (column 1 in both tables) show that, once we control for the portfolio composition effect, the mode of entry of foreign banks is not an important determinant of lending rates. This means that foreign bank ownership has no impact on lending rates within a specific homogeneous borrower group. This contradicts the existing literature on the impact of foreign banks on bank lending rates (Martinez Peria & Mody (2004); Claeys & Hainz (2007) De Haas & Van Lelyveld (2006)). Our different results stem from the fact that previous studies were not able to control for portfolio composition of banks' loan portfolios.

#### **4.3. Specifications for each borrower type controlling for currency and maturity**

As mentioned above, currency and maturity may also have an important impact on interest rates charged by banks. To control for currency denomination of loans, we augment our model with a variable that controls for the share of loans in foreign currency in banks' portfolios (column 2 in both Tables). As expected, higher share of foreign currency loans has a negative impact on average lending rates. However, this fact has only a slight impact on our final results. We still find that foreign bank ownership and mode of entry do not have an impact on lending rates. However, our results indicate that state-owned banks offer on average lower lending rates once we control for loan currency. Expressed in annual terms, the difference amounts to 2.4 percentage points, and is both statistically and economically significant. As it was shown in the descriptive statistics, state-owned banks extend more loans in domestic currency than foreign banks. Since these loans are on average more expensive than foreign currency loans, the failure to control for this factor makes loans extended by state-owned banks appear to be more expensive as well.

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Table 4: Loans to private firms: average lending rate and foreign ownership

|                    | Private<br>1         | Private<br>2         | Private<br>3         | Private<br>4         |
|--------------------|----------------------|----------------------|----------------------|----------------------|
| Takeover           | 0.002<br>[0.005]     | 0.004<br>[0.004]     | 0.001<br>[0.004]     | 0.003<br>[0.004]     |
| Greenfield         | -0.0001<br>[0.005]   | 0.005<br>[0.004]     | -0.001<br>[0.005]    | 0.004<br>[0.005]     |
| State-owned        | -0.006<br>[0.004]    | -0.007**<br>[0.004]  | -0.004<br>[0.003]    | -0.006**<br>[0.003]  |
| FX loans           |                      | -0.035***<br>[0.006] |                      | -0.034***<br>[0.006] |
| Short-term loans   |                      |                      | -0.003<br>[0.011]    | -0.001<br>[0.009]    |
| Long-term loans    |                      |                      | -0.016<br>[0.012]    | -0.009<br>[0.010]    |
| Capitalization     | -0.010**<br>[0.005]  | -0.005<br>[0.004]    | -0.008*<br>[0.004]   | -0.004<br>[0.003]    |
| Cost               | 0.691**<br>[0.269]   | 0.455**<br>[0.217]   | 0.573**<br>[0.233]   | 0.431*<br>[0.219]    |
| NPL                | 0.007***<br>[0.001]  | 0.006***<br>[0.001]  | 0.006***<br>[0.001]  | 0.006***<br>[0.001]  |
| Market share       | -0.151***<br>[0.037] | -0.070***<br>[0.021] | -0.114***<br>[0.038] | -0.056**<br>[0.026]  |
| Herfindahl Index   | 0.289***<br>[0.102]  | 0.252***<br>[0.094]  | 0.253***<br>[0.092]  | 0.244***<br>[0.092]  |
| GDP                | -0.069*<br>[0.037]   | -0.056<br>[0.036]    | -0.065*<br>[0.036]   | -0.054<br>[0.036]    |
| Inflation          | 0.660***<br>[0.093]  | 0.712***<br>[0.078]  | 0.640***<br>[0.095]  | 0.684***<br>[0.091]  |
| Real interest rate | 0.738***<br>[0.085]  | 0.845***<br>[0.073]  | 0.742***<br>[0.086]  | 0.825***<br>[0.083]  |
| Observations       | 2049                 | 2044                 | 2044                 | 2044                 |
| No. of banks       | 104                  | 104                  | 104                  | 104                  |
| R-squared          | 0.26                 | 0.31                 | 0.28                 | 0.31                 |

The dependent variable is the bank-specific interest rate on loans to private firms. The table lists coefficients and standard errors (in parentheses) from regression with pooled OLS with robust standard errors clustered on banks. Herfindahl Index, Market share, FX loans, Short-term loans and Long-term loans are calculated for private firms. All dependent variables except for ownership dummies are lagged by one quarter. Regressions include seasonal dummies. Definitions of variables are provided in Table 1. \*\*\*, \*\*, and \* correspond to 1%, 5% and 10% significance levels.

Table 5: Loans to entrepreneurs: average lending rate and foreign ownership

|                    | Entrepr.<br>1        | Entrepr.<br>2        | Entrepr.<br>3        | Entrepr.<br>4        |
|--------------------|----------------------|----------------------|----------------------|----------------------|
| Takeover           | 0.0002<br>[0.006]    | 0.002<br>[0.005]     | 0.0002<br>[0.006]    | 0.002<br>[0.005]     |
| Greenfield         | -0.005<br>[0.006]    | -0.002<br>[0.006]    | -0.004<br>[0.006]    | -0.0004<br>[0.006]   |
| State-owned        | -0.004<br>[0.005]    | -0.004<br>[0.005]    | -0.004<br>[0.005]    | -0.004<br>[0.005]    |
| FX loans           |                      | -0.034***<br>[0.005] |                      | -0.035***<br>[0.005] |
| Short-term loans   |                      |                      | 0.004<br>[0.008]     | 0.004<br>[0.007]     |
| Long-term loans    |                      |                      | 0.005<br>[0.020]     | 0.011<br>[0.020]     |
| Capitalization     | 0.016<br>[0.020]     | 0.018<br>[0.020]     | 0.018<br>[0.019]     | 0.018<br>[0.019]     |
| Cost               | 0.939*<br>[0.513]    | 0.787<br>[0.512]     | 0.941*<br>[0.533]    | 0.816<br>[0.524]     |
| NPL                | 0.009***<br>[0.003]  | 0.009***<br>[0.003]  | 0.009***<br>[0.003]  | 0.009***<br>[0.003]  |
| Market share       | -0.102***<br>[0.035] | -0.068***<br>[0.024] | -0.098***<br>[0.035] | -0.073***<br>[0.026] |
| Herfindahl Index   | 0.099<br>[0.104]     | 0.135<br>[0.100]     | 0.124<br>[0.102]     | 0.139<br>[0.100]     |
| GDP                | -0.137***<br>[0.051] | -0.126**<br>[0.050]  | -0.140***<br>[0.052] | -0.128**<br>[0.051]  |
| Inflation          | 0.658***<br>[0.135]  | 0.631***<br>[0.129]  | 0.669***<br>[0.129]  | 0.645***<br>[0.123]  |
| Real interest rate | 0.495**<br>[0.201]   | 0.522**<br>[0.202]   | 0.508**<br>[0.195]   | 0.534***<br>[0.194]  |
| Observations       | 1744                 | 1726                 | 1726                 | 1726                 |
| No. of banks       | 98                   | 98                   | 98                   |                      |
| R-squared          | 0.21                 | 0.24                 | 0.21                 | 0.24                 |

The dependent variable is the bank-specific interest rate on loans to entrepreneurs. The table lists coefficients and standard errors (in parentheses) from regression with pooled OLS with robust standard errors clustered on banks. Herfindahl Index, Market share, FX loans, Short-term loans and Long-term loans are calculated for entrepreneurs. All dependent variables except for ownership dummies are lagged by one quarter. Regressions include seasonal dummies. Definitions of variables are provided in Table 1. \*\*\*, \*\*, and \* correspond to 1%, 5% and 10% significance levels

To control for loan maturity we augment our model with variables that capture the share of short-term and long-term loans in banks' portfolios (column 3 in Tables 6

and 7). Our results show that maturity is not a significant determinant of lending rates, which is probably due to complexity of various factors that play in different direction. More importantly however, when we look at the impact of foreign bank ownership and the mode of entry on lending rates after controlling for loan maturity, our results are robust. It is also the case if we control for both currency and maturity simultaneously (column 4).

#### **4.4. Does bank age influence lending rates?**

Even though we do not find an impact of foreign bank ownership and mode of entry on banks' lending rates within homogeneous borrower groups, we still would like to analyze whether there is a temporary effect and maybe whether banks with longer presence in the market are more able to capitalize on their advantages. To do this, we again split our takeover and greenfield variables separately into dummies that take the value of 1 if bank was newly established (for greenfield) or acquired (for takeover) less than three years ago in a given period and banks that are over three years old. The results are presented in Tables 5a and 5b for transparent - private firms - and opaque - entrepreneurs - borrowers, respectively.

Our findings suggest that bank age does not play an important role and even after many years of operations, lending rates of foreign banks are not different from those of domestic private banks. Our results are very robust to different specifications of variables accounting for age dynamics. To check the stability of our results we use different thresholds for splitting banks' age, or use interaction variable between age and foreign bank dummies assuming a linear relationship. We also interacted foreign bank dummies with a trend variable or split foreign bank variables into dummies corresponding to different time periods. These (unreported) results suggest the absence of age or time dynamic effects.

Our results are contrary to the existing literature, which shows that lending rates of greenfield banks are lower on average but converge with lending rates of other banks in the longer term. We argue that previous findings are due to changing portfolio composition of foreign banks, and not due to convergence in performance. If we look at the descriptive statistics in Section 3, we observe that greenfield banks decreased the share of their loans to large private firms, and more recently, they started to extend less loans in foreign currency. Both of these factors should contribute to an increase of average lending rates of greenfield banks over the analyzed period, but this is purely a portfolio composition effect.

Table 6: Lending rates to private firms: age effects

|                                | Private<br>1 | Private<br>2 | Private<br>3 | Private<br>4 |
|--------------------------------|--------------|--------------|--------------|--------------|
| Takeover*Age (up to 3 years)   | 0.005        | 0.006        | 0.004        | 0.005        |
|                                | 0.005        | 0.004        | 0.004        | 0.004        |
| Takeover*Age (over 3 years)    | 0.0001       | 0.002        | -0.001       | 0.001        |
|                                | [0.006]      | [0.005]      | [0.005]      | [0.005]      |
| Greenfield*Age (up to 3 years) | -0.004       | 0.001        | -0.004       | 0.001        |
|                                | [0.007]      | [0.007]      | [0.007]      | [0.007]      |
| Greenfield*Age (over 3 years)  | 0.0001       | 0.005        | -0.001       | 0.004        |
|                                | [0.004]      | [0.004]      | [0.005]      | [0.005]      |
| State-owned                    | -0.006       | -0.007**     | -0.004       | -0.007**     |
|                                | [0.004]      | [0.004]      | [0.003]      | [0.003]      |
| FX loans                       |              | -0.035***    |              | -0.034***    |
|                                |              | [0.006]      |              | [0.006]      |
| Short-term loans               |              |              | -0.003       | -0.001       |
|                                |              |              | [0.010]      | [0.009]      |
| Long-term loans                |              |              | -0.017       | -0.01        |
|                                |              |              | [0.012]      | [0.009]      |
| Capitalization                 | -0.009*      | -0.004       | -0.007       | -0.003       |
|                                | [0.005]      | [0.004]      | [0.004]      | [0.004]      |
| Cost                           | 0.723***     | 0.494**      | 0.597**      | 0.465**      |
|                                | [0.269]      | [0.214]      | [0.230]      | [0.216]      |
| NPL                            | 0.007***     | 0.006***     | 0.006***     | 0.006***     |
|                                | [0.001]      | [0.001]      | [0.001]      | [0.001]      |
| Market share                   | -0.148***    | -0.067***    | -0.110***    | -0.052*      |
|                                | [0.036]      | [0.021]      | [0.038]      | [0.026]      |
| Herfindahl Index               | 0.292***     | 0.255***     | 0.255***     | 0.247***     |
|                                | [0.103]      | [0.095]      | [0.093]      | [0.093]      |
| GDP                            | -0.068*      | -0.057       | -0.064*      | -0.054       |
|                                | [0.038]      | [0.036]      | [0.037]      | [0.036]      |
| Inflation                      | 0.644***     | 0.700***     | 0.700***     | 0.666***     |
|                                | [0.100]      | [0.082]      | [0.103]      | [0.099]      |
| Real interest rate             | 0.700***     | 0.814***     | 0.705***     | 0.787***     |
|                                | [0.092]      | [0.075]      | [0.092]      | [0.089]      |
| Observations                   | 2049         | 2044         | 2044         | 2044         |
| No. of banks                   | 104          | 104          | 104          | 104          |
| R-squared                      | 0.26         | 0.31         | 0.28         | 0.31         |

The dependent variable is the bank-specific interest rate on loans to private firms. The table lists coefficients and standard errors (in parentheses) from regression with pooled OLS with robust standard errors clustered on banks. Herfindahl Index, Market share, FX loans, Short-term loans and Long-term loans are calculated for private firms. All dependent variables except for ownership dummies are lagged by one quarter. Regressions include seasonal dummies. Definitions of variables are provided in Table 1. \*\*\*, \*\*, and \* correspond to 1%, 5% and 10% significance levels

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Table 7: Lending rates to entrepreneurs: age effects

|                                | Entrepr.<br>1        | Entrepr.<br>2        | Entrepr.<br>3        | Entrepr.<br>4        |
|--------------------------------|----------------------|----------------------|----------------------|----------------------|
| Takeover*Age (up to 3 years)   | 0.003<br>0.006       | 0.003<br>0.005       | 0.002<br>0.005       | 0.003<br>0.005       |
| Takeover*Age (over 3 years)    | -0.002<br>[0.007]    | 0.001<br>[0.006]     | -0.002<br>[0.006]    | 0.001<br>[0.006]     |
| Greenfield*Age (up to 3 years) | -0.019*<br>[0.010]   | -0.015<br>[0.010]    | -0.018*<br>[0.010]   | -0.014<br>[0.009]    |
| Greenfield*Age (over 3 years)  | -0.003<br>[0.007]    | 0.001<br>[0.006]     | -0.001<br>[0.006]    | 0.002<br>[0.006]     |
| State-owned                    | -0.004<br>[0.005]    | -0.004<br>[0.005]    | -0.004<br>[0.005]    | -0.004<br>[0.005]    |
| FX loans                       |                      | -0.034***<br>[0.005] |                      | -0.034***<br>[0.005] |
| Short-term loans               |                      |                      | 0.002<br>[0.008]     | 0.002<br>[0.007]     |
| Long-term loans                |                      |                      | 0.003<br>[0.019]     | 0.009<br>[0.02]      |
| Capitalization                 | 0.018<br>[0.020]     | 0.019<br>[0.020]     | 0.018<br>[0.019]     | 0.019<br>[0.019]     |
| Cost                           | 1.067*<br>[0.546]    | 0.928*<br>[0.552]    | 1.074*<br>[0.566]    | 0.948*<br>[0.558]    |
| NPL                            | 0.009***<br>[0.003]  | 0.009***<br>[0.003]  | 0.009***<br>[0.003]  | 0.009***<br>[0.003]  |
| Market share                   | -0.098***<br>[0.034] | -0.065***<br>[0.024] | -0.093***<br>[0.034] | -0.068***<br>[0.026] |
| Herfindahl Index               | 0.102<br>[0.109]     | 0.148<br>[0.105]     | 0.133<br>[0.105]     | 0.151<br>[0.104]     |
| GDP                            | -0.144***<br>[0.053] | -0.135**<br>[0.053]  | -0.148***<br>[0.054] | -0.137**<br>[0.053]  |
| Inflation                      | 0.634***<br>[0.152]  | 0.625***<br>[0.144]  | 0.662***<br>[0.141]  | 0.646***<br>[0.134]  |
| Real interest rate             | 0.442*<br>[0.224]    | 0.489**<br>[0.223]   | 0.472**<br>[0.212]   | 0.509**<br>[0.209]   |
| Observations                   | 1744                 | 1726                 | 1726                 | 1726                 |
| No. of banks                   | 98                   | 98                   | 98                   | 98                   |
| R-squared                      | 0.21                 | 0.24                 | 0.22                 | 0.24                 |

The dependent variable is the bank-specific interest rate on loans to entrepreneurs. The table lists coefficients and standard errors (in parentheses) from regression with pooled OLS with robust standard errors clustered on banks. Herfindahl Index, Market Share, FX loans, Short-term loans and Long-term loans are calculated for entrepreneurs. All dependent variables except for ownership dummies are lagged by one quarter. Regressions include seasonal dummies. Definitions of variables are provided in Table 1. \*\*\*, \*\*, and \* correspond to 1%, 5% and 10% significance levels.

#### **4.5. Estimation with intermediation margins**

Up to now, we have focused our analysis on lending rates. As a robustness check, we estimate the impact of foreign bank ownership on intermediation margins, which are indicators of the costs of intermediation of funds between depositors and borrowers. We compute intermediation margins as differences between lending rates for each type of borrower and an average deposit rate. It should be noted that deposit funds are not the only funds available to banks, and foreign greenfield banks rely a lot on local and international interbank markets, whose cost of funds is not reported. Nevertheless, the deposit rate should still reflect the cost of banks' funding.

We estimate models with intermediation margins as dependent variables and the results of our exercise are presented separately for transparent and opaque borrowers in Tables 8 - 9, respectively. For each borrower, we first estimate a regression with controls for the currency (column 1), maturity (column 2), both currency and maturity (column 3), and possible dynamic effects (column 4). In none of the specifications the impact of greenfield, takeover or public ownership is significant. Consequently, our findings support our previous argument that after we control for portfolio composition effects such as borrower type, loan maturity and currency, greenfield banks do not extend loans at lower lending rates than domestic private banks.

#### **4.6. Findings for state-owned banks**

While we primarily focus on foreign banks in our study, we think that it is also worthwhile to consider our findings for state-owned banks.

According to the “development view”, state-owned banks are created not to maximize profits, but rather to fulfill certain social functions and increase general welfare (Atkinson and Stiglitz (1980); Stiglitz (1993)). If this is case, we would expect that state-owned banks grant loss-making loans to subsidize “social projects” and lend to borrowers which are normally excluded from the credit market, such as opaque entrepreneurs. However, our results show that state-owned banks charge lower lending rates only to private firms, which is more in line with the prevailing view among economists that state-owned banks suffer from political interference, corruption and moral hazard (Shleifer & Vishny (1998)). Our results are, therefore, in line with the literature. Sapienza (2002) shows that state-owned Italian banks charge lower interest rates than privately-owned banks. Even though state banks favor firms in depressed areas, their lending is affected by the election results. Khwaja & Mian (2005) finds that politically connected firms borrow twice as much and have 50 percent higher default rates, which would lead to lower effective lending rates. Such preferential treatment occurs exclusively in government banks, as private banks do not provide political favors. This is in line with our finding that state owned banks offer lower

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lending rates only to large firms, and not to small entrepreneurs.

Table 8: Bank spreads and foreign ownership: private firms

|                                | Private<br>1         | Private<br>2        | Private<br>3         | Private<br>4        |
|--------------------------------|----------------------|---------------------|----------------------|---------------------|
| Takeover                       | 0.004<br>[0.004]     | 0.002<br>[0.004]    | 0.003<br>[0.004]     |                     |
| Greenfield                     | 0.005<br>[0.004]     | 0.001<br>[0.004]    | 0.005<br>[0.004]     |                     |
| State-owned                    | -0.004<br>[0.004]    | -0.002<br>[0.003]   | -0.004<br>[0.003]    | -0.004<br>[0.003]   |
| Takeover*Age (up to 3 years)   |                      |                     | 0.006<br>[0.004]     |                     |
| Takeover*Age (over 3 years)    |                      |                     | 0.001<br>[0.005]     |                     |
| Greenfield*Age (up to 3 years) |                      |                     | 0<br>[0.006]         |                     |
| Greenfield*Age (over 3 years)  |                      |                     | 0.005<br>[0.004]     |                     |
| FX loans                       | -0.023***<br>[0.005] |                     | -0.022***<br>[0.005] | [0.005]             |
| Short-term loans               |                      | -0.005<br>[0.009]   | -0.004<br>[0.008]    | -0.004<br>[0.008]   |
| Long-term loans                |                      | -0.014<br>[0.010]   | -0.009<br>[0.008]    | -0.01<br>[0.008]    |
| Capitalization                 | -0.006<br>[0.004]    | -0.007*<br>[0.004]  | -0.005<br>[0.004]    | -0.003<br>[0.004]   |
| Cost                           | 0.426**<br>[0.210]   | 0.492**<br>[0.216]  | 0.399*<br>[0.212]    | 0.443**<br>[0.211]  |
| NPL                            | 0.007***<br>[0.001]  | 0.007***<br>[0.001] | 0.007***<br>[0.001]  | 0.007***<br>[0.001] |
| Market share                   | -0.047*<br>[0.024]   | -0.071**<br>[0.032] | -0.033<br>[0.027]    | -0.029<br>[0.027]   |
| Herfindahl Index               | 0.275***<br>[0.104]  | 0.275***<br>[0.101] | 0.269***<br>[0.102]  | 0.272***<br>[0.102] |
| GDP                            | -0.044<br>[0.034]    | -0.049<br>[0.034]   | -0.042<br>[0.033]    | -0.042<br>[0.033]   |
| Inflation                      | 0.132<br>[0.082]     | 0.082<br>[0.097]    | 0.111<br>[0.095]     | 0.093<br>[0.104]    |
| Real interest rate             | 0.264***<br>[0.074]  | 0.195**<br>[0.085]  | 0.249***<br>[0.082]  | 0.211**<br>[0.089]  |
| Observations                   | 2041                 | 2041                | 2041                 | 2041                |
| No. of banks                   | 104                  | 104                 | 104                  | 104                 |
| R-squared                      | 0.16                 | 0.16                | 0.16                 | 0.16                |

The dependent variable is the bank spreads for private firms and entrepreneurs with respect to Polish interbank rate. \*\*\*, \*\*, and \* correspond to 1%, 5% and 10% significance levels.

Table 9: Bank spreads and foreign ownership: entrepreneurs

|                                | Entrepr.<br>1        | Entrepr.<br>2       | Entrepr.<br>3        | Entrepr.<br>4        |
|--------------------------------|----------------------|---------------------|----------------------|----------------------|
| Takeover                       | 0.002<br>[0.005]     | 0.001<br>[0.005]    | 0.003<br>[0.005]     |                      |
| Greenfield                     | -0.001<br>[0.006]    | -0.001<br>[0.006]   | 0.002<br>[0.005]     |                      |
| State-owned                    | -0.002<br>[0.005]    | -0.001<br>[0.005]   | -0.001<br>[0.005]    | -0.001<br>[0.005]    |
| Takeover*Age (up to 3 years)   |                      |                     |                      | 0.004<br>[0.005]     |
| Takeover*Age (over 3 years)    |                      |                     |                      | 0.002<br>[0.006]     |
| Greenfield*Age (up to 3 years) |                      |                     |                      | -0.012<br>[0.010]    |
| Greenfield*Age (over 3 years)  |                      |                     |                      | 0.004<br>[0.005]     |
| FX loans                       | -0.026***<br>[0.005] |                     | -0.027***<br>[0.005] | -0.027***<br>[0.005] |
| Short-term loans               |                      | 0.004<br>[0.008]    | 0.004<br>[0.007]     | 0.002<br>[0.007]     |
| Long-term loans                |                      | 0.015<br>[0.020]    | 0.019<br>[0.020]     | 0.018<br>[0.020]     |
| Capitalization                 | 0.024<br>[0.020]     | 0.023<br>[0.019]    | 0.023<br>[0.019]     | 0.024<br>[0.019]     |
| Cost                           | 0.688<br>[0.520]     | 0.832<br>[0.537]    | 0.732<br>[0.530]     | 0.866<br>[0.567]     |
| NPL                            | 0.009***<br>[0.003]  | 0.010***<br>[0.003] | 0.009***<br>[0.003]  | 0.009***<br>[0.003]  |
| Market share                   | -0.03<br>[0.025]     | -0.057*<br>[0.034]  | -0.037<br>[0.028]    | -0.033<br>[0.027]    |
| Herfindahl Index               | 0.115<br>[0.097]     | 0.109<br>[0.098]    | 0.121<br>[0.097]     | 0.133<br>[0.100]     |
| GDP                            | -0.108**<br>[0.050]  | -0.122**<br>[0.051] | -0.112**<br>[0.050]  | -0.121**<br>[0.053]  |
| Inflation                      | 0.062<br>[0.137]     | 0.12<br>[0.138]     | 0.101<br>[0.132]     | 0.102<br>[0.144]     |
| Real interest rate             | -0.036<br>[0.205]    | -0.023<br>[0.199]   | -0.002<br>[0.197]    | -0.025<br>[0.215]    |
| Observations                   | 1723                 | 1723                | 1723                 | 1723                 |
| No. of banks                   | 98                   | 98                  | 98                   | 98                   |
| R-squared                      | 0.15                 | 0.14                | 0.15                 | 0.16                 |

The dependent variable is the bank spreads for private firms and entrepreneurs with respect to Polish interbank rate. Herfindahl Index, Market Share, FX loans, Short-term loans and Long-term loans are calculated for entrepreneurs. All dependent variables except for ownership dummies are lagged by one quarter. Regressions include seasonal dummies. \*\*\*, \*\*, and \* correspond to 1%, 5% and 10% significance levels.

## 5. CONCLUSIONS

In our study, we document that banks of different types of ownership have different borrower mix in their lending portfolios. For example, foreign banks, particularly greenfield ones, are more willing to extend loans to transparent borrowers (e.g. large private firms), albeit their share has fallen from 80 percent of loan portfolio of greenfield banks in 1996 to around 56 percent ten years later. At the same time domestic private banks specialize in loans to non-transparent borrowers, such as small entrepreneurs. We also find that foreign banks, particularly greenfield ones, are more prone to extend loans in foreign currency, even though the share of these loans has been declining recently.

In our paper we analyze the impact of bank ownership and mode of entry on lending rates of banks. In line with the existing literature we first find that the average lending rate of greenfield banks is lower than that of domestic private institutions and we find no impact of foreign banks that entered via acquisitions. However, we show that this effect can be explained by "portfolio composition" hypothesis, as greenfield banks offer more loans to transparent borrowers that have lower cost of credit. When the interest rates offered to separate groups of borrowers are analyzed, the effect of foreign ownership disappears. Our results are robust even when we control for portfolio composition with respect to loan currency and maturity.

Our results do not support the "performance" hypothesis. Even after many years of operations, foreign banks charge the same lending rates as domestic private banks, once we control for borrower mix of their loan portfolios. Previous studies that documented convergence in lending rates between greenfield and domestic banks were just capturing changes in portfolio composition of greenfield banks. As transparent borrowers and foreign currency loans take a smaller share of greenfield banks' portfolios, their average lending rate was bound to increase. But this is a pure portfolio composition effect.

In terms of methodology, we show the importance of controlling for borrower mix in banks portfolios, and there is a need to reevaluate the literature on foreign banks' advantages in this light. Can the superior performance of foreign banks documented in earlier studies be explained by portfolio composition effects? Probably yes, since loans to more transparent borrowers are less labor-intensive and carry less risk, which would explain higher efficiency of foreign banks.

Our findings have very important policy implications, because we show that borrowers obtain the same lending rates from foreign or domestic banks. Given the prevailing conviction that foreign banks are more efficient and have better risk management techniques, we show that they do not pass these benefits to borrowers in terms of lower lending rates. Alternatively, foreign bank presence might have induced domes-

tic banks to charge lower lending rates either by accepting lower profits or due to spillovers of risk management and cost optimization techniques. As a result, their lending rates are in line with the rates offered by foreign banks.

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