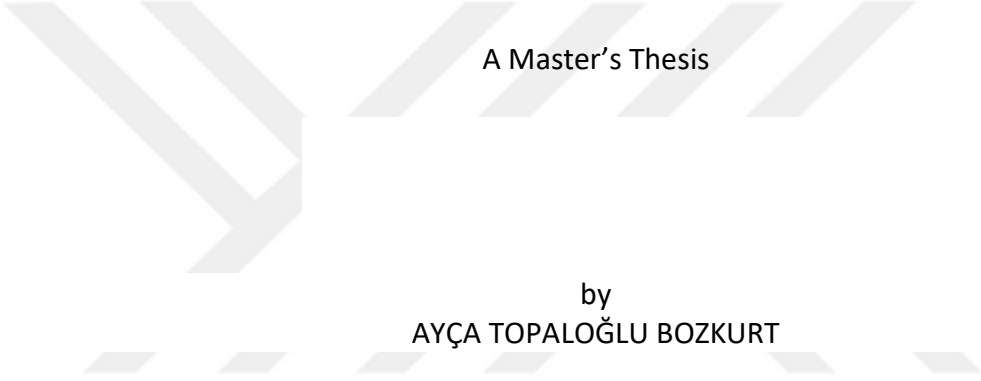


DOES INCREASING FOREIGN CONTROL IN THE BANKING SECTOR
HAVE AN IMPACT ON BANKS' LOAN RATES?
EVIDENCE FROM TURKEY



A Master's Thesis

by
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Department of
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İhsan Doğramacı Bilkent University
Ankara
May 2017

In memory of my beloved uncle, Halil Yazıcı

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MASTER OF SCIENCE

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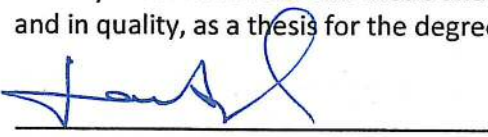
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I certify that I have read this thesis and have found that it is fully adequate, in scope and in quality, as a thesis for the degree of Master of Science in Management.



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Supervisor

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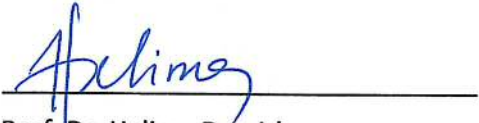
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ABSTRACT

DOES INCREASING FOREIGN CONTROL IN THE BANKING SECTOR HAVE AN IMPACT ON BANKS' LOAN RATES? EVIDENCE FROM TURKEY

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May 2017

Foreign bank presence has been a growing trend in Turkey since 2000. Considering the fact that almost all of the entries are through acquisition of small-sized banks in the industry, we argue that this kind of a foreign entry to the Turkish banking sector may have little impact on the productivity or efficiency of the banking sector. We hypothesize that these banks have exercised very aggressive pricing strategies to benefit from growing loan demand for commercial loans, personal loans, vehicle and housing loans.

Thus, in the thesis, we study the association between foreign bank presence and loan prices in the Turkish banking sector during the time period between December 2002 and September 2016. Different than previous studies, we use unique data, i.e., weighted average loan interest rates for commercial, personal, vehicle and housing loans of 19 deposit banks that was collected by Central Bank of the Republic of Turkey.

Empirical results indicate that the foreign presence has a significant impact on the lending rates of Turkish banking sector regardless of the loan type. The impact is seen to be higher for large

banks compared to small banks. We also find that the direction of the relation is varying among loan types. Particularly, there exist a negative relation between foreign presence and lending rates of commercial loans and a positive relation with vehicle and housing loans. Beyond a certain level of foreign presence, a competitive pricing in the credit market is found to reverse its direction suggesting regulatory agencies to monitor new foreign entries in Turkey.

Keywords: Bank Loan Rates, Foreign Bank Presence, Loan Types, Panel Data Analysis



ÖZET

BANKACILIK SEKTÖRÜNDE YABANCI KONTROLÜ ARTIŞININ BANKALARIN KREDİ FAİZ ORANLARI ÜZERİNDE ETKİSİ VAR MI? TÜRKİYE ÖRNEĞİ

Topaloğlu Bozkurt, Ayça

Yüksek Lisans, İşletme Bölümü

Tez Danışmanı: Doç. Dr. Süheyla Özyıldırım

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Yabancı banka varlığı, 2000'lerden beri Türkiye'de artan bir eğilim sergilemektedir. Yabancı banka girişlerinin neredeyse tamamının, sektördeki küçük ölçekli bankaların satın alınması şeklinde gerçekleşmesi, söz konusu yabancı girişlerinin, Türk bankacılık sektörünün karlılık ve verimliliğine olan etkisinin sınırlı düzeyde olabileceğini düşündürmektedir. Diğer taraftan, bankaların artan kredi taleplerinden pay alabilmek için oldukça agresif fiyatlama stratejileri izlediği değerlendirilmektedir.

Bu bağlamda, bu tezde, Aralık 2002-Eylül 2016 arasındaki dönem boyunca, Türk bankacılık sektöründeki yabancı banka payının artması ile kredi fiyatları arasındaki ilişki incelenmiştir. Daha önceki çalışmalardan farklı olarak, Türkiye Cumhuriyet Merkez Bankası'nca bankalardan temin edilen ticari, ihtiyaç, taşıt ve konut kredilerinin ağırlıklı ortalama faiz oranlarına ilişkin 19 mevduat bankasına ait özgün bir veri seti kullanılmıştır.

Ampirik sonuçlar, yabancı banka varlığının, bütün kredi türlerinde, Türk bankacılık sektörünün kredi faiz oranları üzerinde istatiki olarak anlamlı düzeyde etkisinin olduğunu işaret etmektedir. Söz konusu etki, küçük bankalara nazaran büyük bankalarda daha

yüksektir. Diğer taraftan, etkinin yönü, kredi türlerine göre ayrılmaktadır. Detayda, yabancı banka varlığı ile ticari kredi faiz oranları arasında negatif yönde ve taşıt ve konut kredileri ile ise pozitif yönde bir ilişki bulunmuştur. Yabancı banka varlığının belirli bir seviyenin ötesine geçmesi durumunda, kredi piyasasındaki rekabetçi fiyatlamanın yönünün değişmesi, Türkiye’deki yeni yabancı banka girişlerinin düzenleyici kurumlarca takip edilmesinin faydalı olabileceğini göstermektedir.

Anahtar Kelimeler: Banka Kredi Faiz Oranları, Kredi Türleri, Panel Veri Analizleri, Yabancı Banka Varlığı

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CHAPTER 1

INTRODUCTION

Increasing international trade has resulted in the rising international banking activities to provide funding needs of these transactions (Aliber, 1984). Globalization of the financial services, increasing arbitrage opportunities and liberalization of the economies with decreasing entry costs are among the main reasons for foreign bank entry to domestic banking sector (Çakar, 2003). Strikingly, financial crises have also been responsible from the increasing foreign activities in the banking sectors of countries especially in the emerging world.

In the literature, there are very few theoretical papers that show the motivation of these banks in the host countries. More recently, Althammer and Haselmann (2011) highlight that during the period of economic instability, foreign banks involvement in emerging markets increased. According to their theoretical model, the reason behind this result is that during crisis period having hard information becomes superior to having soft information for being more profitable. Hence, foreign banks tend to increase their shares in these periods because they are in an advantageous position to gather more hard information by means of having better screening technologies compared to domestic banks which have the advantage of possessing more soft information relative to foreign banks.

Lehner (2009), however, focuses on the entry mode of foreign banks to explain their presence in the host countries. In her theoretical model, it is shown that foreign bank entry mode depends on financial development, i.e., screening efficiency and financing conditions in the host country and the size of host banking market. A foreign bank enters a country via cross border lending or acquisition if host country's banking system is less developed, i.e., inefficient in screening potential borrowers in the host country. However, the greenfield entry seems to be valid only in financially developed and larger banking markets. In a related paper, Van Tassel and Vishwasrao (2007) show that it is optimal for a foreign bank to enter by acquisition instead of greenfield investment as long as customer base is inherited via acquisition. The authors highlight that the main motivation of a foreign bank is to "capture information endowment" in a host country.

Since the early 1990s, foreign banks have become important in the financial systems of emerging economies (Claessens & Van Horen, 2014). In addition to the limited theoretical studies that try to explain the presence of foreign banks via different mode of entry in a host country, the literature about the impact of these banks on domestic financial system is somewhat controversial. Regardless of the effects of entry mode and the economic and financial structure of the home or host country, Levine (1996) argues that foreign banks improve the quality and accessibility of financial services in domestic banking sector by increasing competition and transferring modern banking skills and technology. They may improve the bank supervision and the legal framework. In addition, they may raise international funding opportunities in the domestic economy. Kim and Lee states that "foreign bank entry through the opening of branches tends to render the domestic banking market more competitive and thereby force domestic banks to operate efficiently" (2004: 22). On the other hand, Stiglitz (1993) draws attention that foreign entry brings some costs to the banks, borrowers and government authorities. He indicates that banks may encounter with additional cost under increased competition with large and more reputable foreign banks. In addition, borrowers may be exposed to decreased credit accession since foreign banks prefer to fund mostly

multinational firms. Finally he emphasizes the possible declining control of the government over the financial system to provide some directed credits to small enterprises, for housing and for exports as a result of increased foreign entry.

Being an emerging economy, Turkey has also been exposed to foreign bank entry via acquisition from the beginning of 2000s. After the crises of November 2000 and February 2001, an economic program was implemented in Turkish economy including a series of structural reforms and radical changes in economic policies providing the sound banking sector and financial stability. “With the successful implementation of the economic program, increased confidence, political stability and EU accession prospects, foreign bank participation in the Turkish banking system has become a reality after many years” (Başçı, 2006: 367). Throughout the sample period of this study, December 2002 to September 2016, the average of annual real GDP growth was 4.3 percent, while averages of annual asset and credit growth of the banking sector were 21 and 31.5 percent respectively indicating the growing demand for bank loans. On the other hand, relatively high net interest margins of Turkish banking sector compared with other emerging economies presented advantageous market conditions. As a result of these developments, foreign interest for Turkish banking sector gained its momentum over the last 16 years revealing the increasing asset share of foreign banks over the total banking sector from 3.04 percent at the end of 2002 to 14.8 percent as of September 2016.¹

The composition of the foreign investment in the banking sector also changed with the changing role of banking sector in Turkey throughout the period. Loans to deposit ratio increased from 31.5. percent at the beginning to 114.1 percent at the end of the sample period. The ratio of the holdings of total public debt securities to total assets diminished

¹ Data includes the shares of investment banks and branches of foreign banks established outside of the Turkey. Garanti Bank is considered as domestic bank since foreign ownership is defined as having more than 50 percent of foreign share over total shares.

from 30.9 percent to 4.7 percent since at the end of 2002 indicating banks' tendency toward their main role of intermediation in the economy. During this time period, foreign banks have acquired domestic banks to take the advantage of their existing customer portfolio and branch networks, though in the beginning they preferred to enter the Turkish banking sector via opening subsidiaries (see Denizer & Gültekin (2000) and Denizer (2000) for the existence of foreign banks since 1960s).

Table 1 shows that the asset share of foreign banks continuously increased, while the mode of entry changed from de novo investment toward acquisition.

Table 1. Entry Mode of Foreign Bank and Their Asset Share

End of Year	Foreing Branches	Foreign Banks	Total Banks*	Total Foreign Banks' Asset Share
1980	3	2	43	2.9%
1990	15	11	66	3.5%
2000	13	9	79	5.4%
2005	7	9	48	5.4%
2010	6	16	46	14.4%
2016.09	6	19	47	14.8%

Source: Turkish Banking Association, excluding participation banks

Since 2000, foreign banks have entered the Turkish banking sector by the acquisition of domestic banks rather than greenfield or de novo investment and have not changed the total number of banks in the Turkish banking system. In this thesis, we argue that this mode of entry might have a distinct impact on Turkish banking industry. More specifically, we argue that the main contribution of this kind of foreign entry to the banking sector might be related to prices rather than productivity or efficiency of the sector. Similarly, in their recent study about the cost efficiency of Turkish commercial banks, Güneş and Yıldırım find that “on average foreign banks are roughly equally

efficient as domestic private banks, with both groups being more efficient than state-owned banks” (2016: 136). As highlighted by Aydın (2007), demand for loans in Turkey is mostly inelastic to prices due to high switching costs, a small number of borrowing options in the financial sector and absence of deep financial system. However, the entry of these banks may have affected each of these factors especially switching cost and/or banks funding capacity and we can see the impact of the presence of foreign banks on the realized loan rates. In this thesis, we argue that foreign banks enter Turkish banking sector through acquiring medium-sized or small local banks to increase the size of the credit market, i.e., sell more loans and also to capture more market share through offering better prices, i.e., having more borrowers.

In the literature, it has been widely emphasized that lending rates reflect costs of using the financial system by borrowers (see e.g., Degryse, Havrylchyk, Jurzyk, & Kozak, 2012). Thus, understanding the behavior of lending rates has great importance especially for macroeconomic performance along with the provision and protection of financial stability. In this thesis, we address this issue by examining the presence of foreign banks on the determination of lending rates in Turkey over the time period of December 2002 to September 2016. Considering the fact that there might be further globalization in our banking industry, the investigation of the impact of foreign banks on loan rates and credit markets may have some policy implications to ensure economic and financial stability in Turkey in the future.²

In the empirical literature, there is a track of evidence that examine lending rates using either interest margins or returns compiled from the balance sheet items of the banks. In this study, we use unique loan rate data which are collected by Central Bank of the Republic of Turkey from each loan transaction for commercial, personal, vehicle and

² If more than 50 percent of the shares of a bank is owned by foreigners, than the bank is classified as being a foreign bank. In addition, if a bank is defined as “foreign”, all of its assets are regarded as foreign, regardless of its share.

housing. In this way, we use price of each loan “granted” by either a domestic or a foreign bank in Turkey. Moreover, since we have monthly data, we believe that our results are more robust as loan rates inherently have high frequency.

Our empirical results indicate that the impact of foreign presence on lending rates varies considerably among loan types. First, we find that foreign presence is significantly and negatively associated with the commercial loan rates. Second, we see that it is significantly and positively related with the vehicle and housing loans. This reversed impact of foreign presence may account for the dominance power of domestic banks on vehicle and housing loans. On the other hand, the impact of foreign share on lending rates of personal loans is found to be insignificant. Moreover, our findings suggest that as foreign bank share rises above “the optimal level” in the commercial loans market, the banking sector starts exercising more oligopolistic power and hence rates start rising. This finding may have some policy implication since the impact of foreign presence may have adverse effects on the cost of intermediation with the dominance of these banks in the sector. We can suggest that the authorities responsible from the financial stability of the banking sector should monitor the entrance of new foreign banks in order to improve the competitive nature of the Turkish banking industry in the future.

This thesis proceeds as follows. Section 2 offers a brief review of studies and then Section 3 describes the data and methodology used in the study with the existing literature. After the empirical results and robustness checks revealed by the panel data estimation techniques in Section 4, finally Section 5 concludes.

CHAPTER II

LITERATURE REVIEW

Though literature has several studies focusing on the effects of foreign bank presence on net interest margin of the banks both from the multinational and national perspectives, there is a paucity of research that examine the impact of foreign banks on loan rates or spreads. Obviously, the main reason for limited amount of research is the lack of available micro data on the prices -i.e. interest rates. On the other hand, studies related with net interest margin shed light on investigating the impacts of foreign entry on rates. Net interest margin is an indicator for the cost of intermediation of banks. However, loan rates or interest rate spreads show directly pricing strategies of the banks. Most of the foreign bank literature states that foreign banks could charge lower lending rates as they operate more efficiently than domestic banks in emerging economies.³ Moreover, foreign banks may incur lower rates because they can access international capital markets more easily relative to domestic banks. Furthermore, because of their reputation or perception that they are less fragile, they may confront with the lower deposit cost compared to domestic banks.

In this section, we present studies based on the multi-county and single-country cases.

³ See Claessens & Van Horen (2014) for comprehensive review on the trends and impacts of foreign banks in the world.

Then the findings of studies related with the impact of foreign presence on Turkish banking sector are summarized. Finally, literature investigating the banks' setting behavior of loan rates and impact of foreign presence on them is reported.

Using a very comprehensive set of countries for 1980-1995, Claessens, Demirguc-Kunt and Huizinga (2001) show that foreign banks in developing countries have higher profitability, interest margins, and tax payments than domestic banks while those in developed countries have lower ones. Even though the effect of foreign entry is found to be insignificant with respect to net interest margin or loan loss provision of domestic banks, foreign entry is significantly and negatively associated with the before tax profits, non-interest income and overhead cost of domestic banks regardless of differentiating between countries. The results are argued to suggest greater efficiency of domestic banks with foreign entry. Contrary, Hassan, Sanchez, Ngene and Ashraf (2012) provide evidence that foreign bank entry is associated with reduced profit margins and increased operating costs of domestic banks in countries with less developed capital markets. Chen and Liao (2011) examine the impact of foreign bank entry in terms of both the host and home country, using the bank level data of 70 countries over the period 1992–2006 and finds that foreign banks are more profitable than domestic banks when they operate in a host country whose banking sector is less competitive and when the parent bank in the home country is highly profitable.

There are also several country based studies investigating the impact of foreign banks on domestic banking sector. For example, Kim and Lee (2004), depending on the mode of entry, search for the efficiency effect of foreign bank entry on private domestic banking sector in Korea, over the 1987-2000 period. They find that in the case of opening branches, cost efficiency of domestic banks increases with foreign entry. However, in the case of foreign entry via merger and acquisition or greenfield investment, private domestic banks faced with lower profits. Findings of Manlagnit

(2011) present evidence that the dominance of competition resulted from foreign bank presence leads to reduction in the profitability and overhead costs of domestic commercial banks in Philippines. According to Clarke, Cull, D'Amato and Molinari (1999), domestic banks in Argentina experience declining net margins and increasing overhead costs in the area of mortgage lending, while they experienced little changes in other loans during an especially intense period of entry in the mid-1990s.

The evidence related to foreign bank presence are rather limited in Turkey. Denizer (2000) investigates the impact of foreign bank presence on Turkish banking sector for the period between 1980 and 1997. He argues that there were two main reasons for foreign bank entry to Turkish banking sector. Because of the liberalization process in 1980s, Turkish economy began to require more advanced financial services and foreign trade financing. On the other hand, the positive market perceptions, resulted from the expectation that customs union agreement would be signed, about the maintenance of liberal policy environment and relatively rapid economic growth increased the foreign interest in Turkish banking sector. His empirical findings show that return on assets and the overhead expenses of domestic commercial banks decreases with foreign bank entry. He concludes that foreign bank entry enhances competition, increases efficiency and resource utilization and reduces domestic bank's profitability. However, the impact of foreign entry on net interest margin is found to be insignificant. According to Çakar (2003), financing needs of the international firms operating in Turkey and foreign trade potential of Turkish economy are among the main reasons why foreign entry to Turkish banking sector gained its momentum after 1980. In the empirical part of the study, she analyzes the impact of foreign entry on Turkish banking sector for the period of 1996Q2-2001Q4 and finds that asset share of foreign banks affects the return on assets of domestic banks positively. Unlike these studies, Isik and Hassan (2002) focus on the efficiencies of Turkish banking sector over the 1988-1996 period. Their analyses with input prices show that foreign banks pay higher wages and benefits than domestic banks. In addition, foreign banks are found to pay much higher prices for capital as a

result of their usage of more-state-of art technology and newer equipment and building than domestic banks and significantly more X-efficient than domestic banks.

The literature on loan pricing has been also limited to the availability of data.

Gambacorta (2004) finds heterogeneity in the price setting behavior of Italian Banks by using certain bank specific characteristics as well as macro variables. Though the impact of foreign presence on loan rates is not investigated, the study is inspiring for the usage of bank-specific characteristics to explain lending rates along with the macro variables. This study reveals that more liquid and well capitalized banks and banks with higher proportion of long term lending react less to a monetary shock, while pass through on the deposit rates depends on banks' liability structure. In addition, in the long run heterogeneity does not have any impact on the long run elasticities of banking rates to the money market rate.

More recently, Claey's and Hainz (2014) in their theoretic and empirical study focus on the effects of foreign entry on lending rates based on the different modes of entry; greenfield investment or acquisition of domestic banks. In their theoretical model, they investigate how different mode of entry affects the asymmetric distribution of information about the existing and new customer base among domestic and foreign banks. They find that asymmetric distribution of information determines the degree of competition effect. Moreover, customer portfolio composition of the banks, i.e. whether portfolio consists of new firms, good old firms with track record or good firms without track records, affects the competition on bank lending rates. In the empirical part with their sample of banks from 10 Eastern European countries for the period 1995-2003, they find that in the case of greenfield investment, domestic lending rates are lower and the downward effect of the foreign entry is higher on domestic banks because of the increased competition effect.

Degryse et al. (2012) demonstrate that banks' ownership does not have an influence on lending rates after controlling for portfolio compositions of domestic and foreign banks. In their empirical study, they test performance and portfolio composition hypothesis using unique quarterly data of Polish commercial banks between 1996 and 2006. Their findings show that foreign banks differ from domestic ones in terms of their portfolio composition, namely borrower opacity, loan maturity, and currency. Hence with the existing differentiation, they argue that foreign banks do not charge lower lending rates compared to domestic ones. In addition, they show that greenfield investment entry leads domestic banks to reallocate their loans toward more opaque customers causing them to have riskier portfolio.

Martinez Peria and Mody (2004) focus on the spillover effect of foreign banks which is proxied by the asset share of foreign banks for defining the overall effect of foreign presence on banks spreads, i.e. the difference between loan rate and deposit rate. They hypothesize that the impact would be ambiguous, since foreign presence may cause both domestic banks to reduce or raise the spreads. Domestic banks are expected to reduce their spreads as a result of increased efficiency following foreign bank entry via competition effect or as a result of foregone spread they charged before. On the other hand, domestic banks may increase their spreads as a result of change in their customer composition toward to more opaque ones on which they have informational advantage over foreign banks. Examining bank spreads of five countries in Latin America during 1997-2000, they find that foreign banks have lower spreads compared to domestic ones. In addition, the impact is realized through the effect of foreign participation on administrative cost and more pronounced if the mode of entry is de novo rather than acquisition. Moreover, they present evidence that bank concentration directly and positively affects the spreads and costs.

Unite and Sullivan (2003) study the impact of foreign entry on interest rate spreads, operating expenses and banking riskiness, proxied by the ratio of loan loss provisions or reserves to total assets, in Philippine domestic banking market during 1990-1998. They find that only spreads of domestic banks that are affiliated to a family business group are lowered with foreign bank entry. In addition they document that operating expenses decrease with foreign bank entry but riskiness increases. They emphasize that their study confirms the findings of Claessens et al. (2001) that foreign entry resulted with higher efficiency and led domestic banks toward more risky customers as a result of the increased competition. However, they also show that the impact of foreign penetration on interest rate spreads and bank efficiency is limited.

CHAPTER III

DATA, MODEL AND METHODOLOGY

3.1 Data

The study covers monthly panel data of 19 commercial banks out of total 52 banks in Turkey owing 89.6 percent of total asset share of the overall banking sector for the period between December 2002 to September 2016.^{4,5,6} Among 19 banks, 3 of them are state banks, 8 of them are privately owned domestic banks and remaining 8 banks are foreign owned.⁷

Since the main variable of interest is the Turkish Lira loan rates of commercial banks (see Table 2 for the source of all variables), we first define bank loan rate and how it is classified in our empirical study.

⁴ Banks included are Akbank, Alternatifbank, Anadolubank, Burgan Bank, Denizbank, ICBC, HSBC, ING, QNB Finansbank, Şekerbank, T.C. Ziraat Bankası, T. Garanti Bankası, T. Halk Bankası, T. İş Bankası, T. Vakıflar Bankası, Türk Ekonomi Bankası, Turkish Bank, Turkland Bank and Yapı ve Kredi Bankası.

⁵ As of September, of 2016

⁶ In this study, we exclude investment banks and participation banks. Moreover, branches of foreign banks are also excluded because of their limited number of transactions.

⁷ If more than 50 percent of the total shares of a bank owned by foreigners, than the bank is classified as being foreign bank. In addition, all of these foreign banks are completely owned by foreigners except ICBC, of which foreign share is 93 percent as of September, 2016.

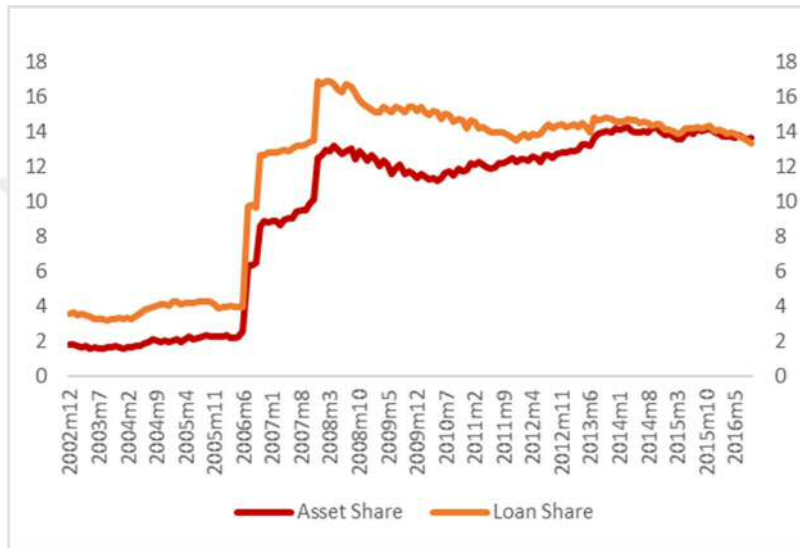
Table 2. Definitions and Sources of Data Series

Variable	Definition	Source
CL	Lending rates of commercial loans with short term maturity	CBRT
PL1	Lending rates of personal loans with short term maturity	CBRT
PL2	Lending rates of personal loans with medium term maturity	CBRT
PL3	Lending rates of personal loans with long term maturity	CBRT
VL	Lending rates of vehicle loans with short term maturity	CBRT
HL	Lending rates of housing loans with long term maturity	CBRT
FS	Total assets of foreign banks divided by total assets of all banks in the sample	CBRT
NPL	The ratio of gross non-performing loans to total loans	CBRT
LIQ	The ratio of liquid assets to total assets	CBRT
EOA	The ratio of shareholders' equity to total assets	CBRT
LNAS	Natural logarithm of total assets	CBRT
NEXP	The ratio of non-interest expenditures to total assets	CBRT
CRED	The ratio of loans to total assets	CBRT
NREV	The ratio of non-interest revenues to total revenues	CBRT
RGDP	Yearly real GDP growth	TURKSTAT
INF	Inflation rate, yearly change in the consumer price index	TURKSTAT
VIX	Morgan Stanley's Volatility index	Bloomberg
FR	Rate of weighted average cost of funding from CBRT	CBRT

Loan rates are grouped loan rates for commercial loans (CL), personal loans (PL), vehicle loans (VL) and housing loans (HL). They are analyzed with their different maturity periods depending on the reporting standardization. Reports of loan rates include three different maturity compositions, short term (up to one year), medium term (from one year to two years) and long term (higher than two years). Because 90 percent of commercial loans have short term maturity and 64 percent of the vehicle and 90 percent of housing loans have long term maturity, only rates of these loans with the dominant maturity are examined in the analyses. On the other hand, personal loans are more homogenously distributed over different maturities, hence they are analyzed separately according to each maturity type.

In the empirical analysis, foreign bank presence is measured by employing the variable of foreign asset share (FS), which is calculated by dividing foreign banks' total assets to the total assets of all banks in the sample. In the study, the changes in ownership status are taken into account along with the period. In other words, the bank is classified as

domestic bank before the foreign acquisition, and classified as foreign bank since then. Since the beginning of the period, the asset and loan shares of foreign banks increased continuously with hikes occurring at the time of acquisition of the domestic banks (Figure 1).^{8,9}



Source: CBRT

Figure 1. Asset and Loan Shares of Foreign Banks

Based on previous studies, several bank-specific variables are used to explain the variation in the loan rates.¹⁰ Non-performing loans ratio (NPL) is used to control for

⁸ Table of acquisition of domestic banks is provided in Appendix A.

⁹ Higher increase in foreign loan share compared to asset share may indicate their tendency to focus on credit market.

¹⁰ In the beginning of the empirical analysis, we have larger set of variables however, the variables are eliminated due to high correlations with the remaining variables (or the size of variance inflation factor (VIF) higher than 5 signaling multicollinearity problem as well). In this manner, the variables of return over assets (ROA), market share, foreign funds/total assets, deposits/ total assets, total assets in foreign exchange/ total liabilities excluding share holders' equity in foreign exchange as a proxy for FX open position (Ganioglu and Us, 2014), total costs/ total assets and credits/deposits as a proxy for long term liquidity risk (Alper and Capacioglu, 2016) are all excluded from the regressions. In addition, some sectoral or macro variables are also discarded in this respect. Herfindahl-Hirschman Index for measuring competition in the banking sector, CBRT's real sector confidence index as a proxy for expectations and house price index as a proxy for measuring collateral effect are among those variables.

credit risk exposure.¹¹ Banks with higher NPL ratios (riskier banks) are expected to implement higher loan rates. Liquidity risk, defined as the inability of banks to accommodate decreases in liabilities or to fund increases on the assets' side of the balance sheet (Sufian & Habibullah, 2010), is proxied by the ratio of liquid assets to total assets (LIQ).¹² Higher LIQ means lower liquidity risk. The impact of LIQ on the loan rates is indeterminate. To be more liquid, banks may prefer to grant fewer loans by applying higher rates. On the other hand, banks would rather give credits which generate higher returns than investing on liquid assets, hence making the relationship between liquidity and loan rates to be negative. Capital to asset ratio (EOA) is added for measuring the strength of the banks against their overall riskiness. Lower capitalization may signal riskier banks with tendency of offering higher loan rates. On the other hand, higher capitalization may enable banks to exercise higher loan rates by the indirect effect of reputation (Kim, Kristiansen & Vale, 2005). Natural logarithm of total assets (LNAS) is used for measuring the impact of bank size on loan rates. Assets size may account for different characteristics between large and small banks, in addition to the economies of scale (Hasan & Xie, 2013). The impact of LNAS on loan rates is ambiguous also. If increased size is associated with more diversification toward riskier portfolios, then the relation becomes positive (Sufian & Habibullah, 2010). Moreover, as in the case of EOA, large banks may charge higher loan rates than small banks, as they are more reputable or too big to fail. However, increased asset size may result in economies of scale enabling to charge lower rates. The share of non-interest expenditure over assets (NEXP) is included as a proxy for the operating cost efficiency of the banks.¹³ Credits over total asset ratio (CRED) is used to account for the impact of the amount of credits on applied rates. Banks may have also non-lending activities, such as investment

¹¹ Definitions of the variables are given in the Table 2.

¹² LIQ is calculated by dividing sum of cash, receivables from Central Bank, money markets and banks, and government debt securities not used as collateral to total assets. Because the holdings of government debt securities are highly volatile, LIQ is compiled from the monthly averages of the daily data. In addition, the ratio is also calculated by excluding the sum of government securities for robustness to interest rate exposure, and the results are similar.

¹³ Non-interest expenditures include personal expenses, provisions, fees and commissions paid and depreciation expenses.

banking and brokerage services (Claessens et al., 2001). Therefore, business-mix of the banks is represented by the variable of the share of non-interest revenues over total revenues (NREV).¹⁴

In addition to these bank-specific variables, four macroeconomic variables, annual growth rate of real GDP (RGDP), inflation rates (INF), volatility index (VIX) and weighted average funding rate of CBT (FR), are included into econometric model. RGDP is used for controlling loan demand. It is expected that there is a positive relation between the loan rates and RGDP.¹⁵ INF is included for controlling the loan rate adjustment to inflationary pressures and expected to be positive. On the other hand, VIX is used for controlling the possible impact of foreign perceptions which affects liquidity conditions (interest rates) in the domestic economy via financial flows.¹⁶ Finally, FR is included as being the cost of the one of the most important funding channel for banks and besides accounting for the effect of transmission mechanism on loan rates.¹⁷

The bank-specific data are obtained from the balance sheets, income statements or interest rate reporting of the selected commercial banks. Except RGDP and loan rates, all data are on a monthly basis. Because RGDP data are inherently on a quarterly basis, it is converted to monthly frequency via the Industrial Production Index by using the Fernandez Methodology (1981). However, data of loan rates are at weekly frequency

¹⁴ Non-interest revenues include charges, fees, commissions, dividend income, foreign exchange profits, capital market transactions profits, revenues from the sales of assets and other non-interest revenues.

¹⁵ Weighted average cost of funding rate, began to be announced by CBRT from October 2011, is used since then. Before that, it is calculated as the average monthly lending rate based on the daily overnight interest rates.

¹⁶ The increase in the VIX index, hence the rise in the price of the option, is associated with a decrease in risk appetite. That is, as VIX increases, access to foreign fund resources is negatively affected (Kalafatlılar & Keleş, 2011).

¹⁷ Since deposits rates are highly correlated with average cost of funding rate (FR) and do not significantly differ across banks groups, the deposit rates are not subtracted from the loan rates, rather the impact of funding rate is added to regressions as control variable. Moreover, as indicated in the survey study of Alper, Mutluer-Kurul, Karaşahin and Atasoy (2011) banks more focus on the policy rate of CBRT compared to deposit rates while determining on their cost of funding.

and converted to monthly frequency by taking weighted averages of the loan rates according to amounts of the loans given in each week in a month. All variables except RGDP are in nominal terms.¹⁸

Before econometric estimations, we plot each variable to detect outliers. We found that Yapı Kredi Bank data is missing over the period September 2005 and September 2006, as we also see that NPL ratios of the state banks are extremely large as a result of the turnover of the duty losses emerged in crises of 2000 and 2001. These data of NPL are applied to missing value for the beginning of the sample period.¹⁹

The descriptive statistics of the series are represented in the panel data format in Table 3 and by size groups in Table 4.^{20,21,22} As seen from the number of observations, commercial loans has the highest number of data among all loan types. Moreover, as it can be seen from the statistics of assets size, there exist a considerable difference among banks.

¹⁸ By utilizing X-12 ARIMA techniques to the series separately for each bank, it is determined that the series do not show seasonality

¹⁹ Outliers in the data related with the income statements of HSBC and Turkish Bank are also applied to missing values over the period March 2005-February 2006 and June 2006-March 2012, respectively.

²⁰ Negative values in within statistics account for the deviation from each bank' average.

²¹ The graphs of the bank-specific variables are shown in Appendix B, according to banks groupings determined by the asset size and ownership status of banks. Hence, groups are composed with state, domestic private large, domestic private small and foreign banks which are all small.

²² Correlation matrix of the variables are represented in Appendix C.

Table 3. Summary Statistics of Variables in Panel Regressions

Variable		Mean	Std. Dev.	Min	Max	Observations
CL	overall	18.79	10.10	1.98	75.00	N = 3154
	between		2.18	15.37	23.89	n = 19
	within		9.88	2.12	72.56	T = 166
PL1	overall	20.73	11.12	2.22	144.00	N = 2659
	between		3.00	15.52	25.91	n = 19
	within		10.76	-0.12	138.82	T-bar = 139.9
PL2	overall	19.43	7.65	1.23	57.94	N = 2560
	between		2.05	14.74	21.71	n = 19
	within		7.42	-0.28	59.77	T-bar = 134.7
PL3	overall	18.72	6.42	4.59	58.79	N = 2310
	between		2.14	14.76	21.96	n = 19
	within		6.08	6.74	56.68	T-bar = 121.6
VL	overall	17.24	6.28	7.22	54.46	N = 2260
	between		1.62	13.88	20.34	n = 19
	within		6.15	6.62	53.18	T-bar = 118.9
HL	overall	15.93	7.32	4.47	58.67	N = 2351
	between		1.68	12.30	18.14	n = 19
	within		7.16	2.46	56.91	T-bar = 123.7
FS	overall	9.63	4.79	1.55	14.30	N = 3154
	between		0.00	9.63	9.63	n = 19
	within		4.79	1.55	14.30	T = 166
NPL	overall	3.92	2.53	0.38	22.50	N = 2736
	between		1.47	2.14	6.90	n = 19
	within		2.09	-0.46	20.12	T = 144
LIQ	overall	24.03	11.56	7.60	71.13	N = 3141
	between		7.78	16.11	46.46	n = 19
	within		8.71	-6.67	57.07	T-bar = 165.3

Table 3 (cnt'd)

Variable		Mean	Std. Dev.	Min	Max	Observations
EOA	overall	12.15	3.56	3.25	35.54	N = 3071
	between		2.36	9.26	17.18	n = 19
	within		2.79	4.98	30.51	T-bar = 161.6
ASSETS*	overall	47.31	64.26	0.13	329.75	N = 3154
	between		48.23	0.74	136.65	n = 19
	within		43.88	-57.20	240.41	T = 166
NEXP	overall	5.56	1.93	2.15	15.90	N = 2889
	between		1.38	3.30	8.59	n = 19
	within		1.39	1.51	15.07	T-bar = 152.1
CRED	overall	53.07	15.11	3.64	81.07	N = 3154
	between		8.71	33.50	64.40	n = 19
	within		12.51	11.92	90.80	T = 166
NREV	overall	21.17	7.07	2.80	84.94	N = 2889
	between		4.89	11.89	28.42	n = 19
	within		5.25	1.02	85.57	T-bar = 152.1
RGDP	overall	4.49	4.07	-7.86	9.94	N = 2717
	between		0.00	4.49	4.49	n = 19
	within		4.07	-7.86	9.94	T = 143
INF	overall	9.29	4.10	3.99	27.08	N = 3135
	between		0.00	9.29	9.29	n = 19
	within		4.10	3.99	27.08	T = 165
VIX	overall	19.46	8.62	10.82	62.64	N = 3154
	between		0.00	19.46	19.46	n = 19
	within		8.62	10.82	62.64	T = 166
FR	overall	14.28	10.39	4.84	51.00	N = 3154
	between		0.00	14.28	14.28	n = 19
	within		10.39	4.84	51.00	T = 166

*In Billion TL. However, natural logarithm of total assets is used in the empirical study.

Table 4. Summary Statistics of Variables in Panel Regressions, by Size Groups

Variable		Mean	St. Dev.	Min	Max	Median	Observations
CL	Small	18.94	9.17	6.00	71.81	17.11	1992
	Large	18.53	11.53	1.98	75.00	15.29	1162
	All	18.79	10.10	1.98	75.00	16.29	3154
PL1	Small	20.08	9.80	2.30	72.00	17.52	1600
	Large	21.72	12.81	2.22	144.00	19.74	1059
	All	20.73	11.12	2.22	144.00	18.06	2659
PL2	Small	19.20	7.28	8.32	57.00	17.38	1520
	Large	19.77	8.16	1.23	57.94	17.39	1040
	All	19.43	7.65	1.23	57.94	17.39	2560
PL3	Small	18.71	6.22	9.73	56.42	17.40	1300
	Large	18.72	6.67	4.59	58.79	17.05	1010
	All	18.72	6.42	4.59	58.79	17.24	2310
VL	Small	17.31	6.47	8.91	54.46	15.98	1197
	Large	17.16	6.07	7.22	49.60	15.53	1063
	All	17.24	6.28	7.22	54.46	15.84	2260
HL	Small	15.56	6.90	4.47	57.90	13.76	1267
	Large	16.37	7.77	7.92	58.67	13.77	1084
	All	15.93	7.32	4.47	58.67	13.76	2351
NPL	Small	3.96	2.34	0.38	16.45	3.51	1728
	Large	3.86	2.82	1.16	22.50	3.25	1008
	All	3.92	2.53	0.38	22.50	3.41	2736
LIQ	Small	20.12	7.39	7.60	49.56	18.53	1992
	Large	30.81	14.07	9.56	71.13	26.91	1149
	All	24.03	11.56	7.60	71.13	20.40	3141
EOA	Small	12.43	3.98	3.25	35.54	11.74	1922
	Large	11.67	2.64	5.96	20.67	11.39	1149
	All	12.15	3.56	3.25	35.54	11.57	3071
ASSETS	Small	13.75	18.76	0.13	94.75	5.74	1992
	Large	104.85	73.25	12.73	329.75	84.86	1162
	All	12.15	3.56	3.25	35.54	11.57	3071
NEXP	Small	6.24	1.91	2.41	15.90	5.94	1836
	Large	4.38	1.31	2.15	9.23	4.02	1053
	All	5.56	1.93	2.15	15.90	5.35	2889
CRED	Small	56.40	14.26	3.64	81.07	61.06	1992
	Large	47.37	14.82	6.82	68.25	51.27	1162
	All	53.07	15.11	3.64	81.07	58.02	3154
NREV	Small	21.47	7.31	2.80	84.94	21.78	1836
	Large	20.64	6.62	4.82	44.21	20.50	1053
	All	21.17	7.07	2.80	84.94	21.27	2889

3.2 Model

Lending rates in general represent autoregressive process. Hence, lags of loan rates are included as explanatory variable in order to obtain white noise residuals. In line with Gambacorta (2004) for explaining interest rates on short term lending, we use difference generalized method of moments (GMM) methodology developed by Arellano and Bond (1991). This methodology handles endogeneity bias caused by the use of lagged dependent variables as covariate.

Thus, difference GMM methodology is applied to the following dynamic specification:

$$LR_{it} = \mu_i + \delta T_t + \sum_{j=1}^2 \theta_j LR_{i,t-j} + \beta_1 FS_t + \beta_2 FS_squared_t + \alpha X_{it} + \gamma Y_t + \varepsilon_{it} \quad (1)$$

where i and t denote banks and monthly periods, respectively. μ_i is unobserved bank-specific fixed effects and ε_{it} is the disturbance term, and they are assumed to be independent for each i over all t . Arellano-Bond difference GMM estimator allows for μ_i to correlate with the other covariates.

LR_{it} is used to represent six different loan rates: CL (loan rates of commercial loans), PL1 (loan rates of personal loans with short term maturity), PL2 (loan rates of personal loans with medium term maturity), PL3 (loan rates of personal loans with long term maturity), VL (loan rates of vehicle loans), and HL (loan rates of housing loans) as explained in Table 2. T_t is a linear trend. $LR_{i,t-j}$ denotes loan rates with a lag of j -month. FS_t and $FS_squared_t$ are foreign asset share and square of the foreign asset share in the banking sector at time t , respectively. $X_{i,t}$ represents a matrix of the bank-specific characteristics (NPL, LIQ, EOA, LNAS, NEXP, CRED, NREV) for bank i and at time t , Y_t is a vector macro-economic variables at time t (RGDP, INF, VIX, FR) and ε_{it} is the i.i.d.

error term over the whole sample with variance σ_ε^2 . $\delta, \theta_j, \beta_1, \beta_2, \alpha$ and γ are corresponding parameters to be estimated.

3.3 Methodology

Estimation techniques for panel data models have been used extensively as the longitudinal data becomes available and panel data econometrics has progressed. Initially pooled ordinary least squares (OLS), fixed effects model via OLS, least squares dummy variable estimation (LSDV) and random effects model with GLS estimation are used for analyzing panel data observations. Including both cross-sectional units and times series component, panel data estimation improves the efficiency of estimates. Moreover, this techniques account for unobserved heterogeneity among cross sectional units which are omitted variables in cross sectional estimations. On the other hand, these models are unable to provide unbiased estimates in case of endogeneity which Wooldridge (2010) defines as any situation where an explanatory variable is correlated with the disturbance.

Models including lag of dependent variable as covariates create endogeneity problem inherently. However, Arellano and Bond (1991) provides consistent estimates by utilizing difference GMM methodology to these dynamic equations from panel data with unobserved fixed effects. "Arellano-Bond estimation starts by transforming all regressors, usually by differencing, and uses the generalized method of moments (GMM) (Hansen 1982), and is called difference GMM" (Roodman, 2009: 86). This methodology uses large instrument matrix consisting of lags of dependent, predetermined and endogenous variables as well as first differences of strictly

exogenous variables to derive GMM estimators.²³ In addition, these instruments should be correlated with regressors and uncorrelated with the errors.

For testing the validity of the model, Arellano-Bond test for autocorrelation in the first-differenced errors and the Sargan test for the validity of overidentifying restrictions should be implemented. Arellano-Bond estimators require serially uncorrelated errors however, when differenced, the first-differenced errors become serially correlated at order one. Hence for the validity of the model, differenced-residuals should not represent serial correlation at higher orders than one. Furthermore, Sargan test statistic is valid only under the condition of having i.i.d. errors.

Since difference-GMM methodology provides consistent estimators for models with lagged dependent variables as covariates and allows for the banks-specific fixed effects to correlate with other regressors, this methodology seems to well-suited for our dynamic model specification (1). The estimation results and related statistics for Arellano-Bond test and Sargan test statistics are represented in the section V, empirical results.

²³“A variable, x_{it} , is said to be strictly exogenous if $E[x_{it}\epsilon_{is}] = 0$ for all t and s . If $E[x_{it}\epsilon_{is}] \neq 0$ for $s < t$ but $E[x_{it}\epsilon_{is}] = 0$ for all $s \geq t$, the variable is said to be predetermined. Intuitively, if the error term at time t has some feedback on the subsequent realizations of x_{it} , x_{it} is a predetermined variable. If $E[x_{it}\epsilon_{is}] \neq 0$ for $s \leq t$ but $E[x_{it}\epsilon_{is}] = 0$ for all $s > t$, the variable is said to be endogenous. By this definition, endogenous variables differ from predetermined variables only in that the former allow for correlation between the x_{it} and the ϵ_{it} at time t , whereas the latter do not” (Stata Longitudinal Data/Panel Data Reference Manual, n.d: 35-36).

CHAPTER IV

EMPIRICAL RESULTS

In this section, main findings of the regression results are summarized. We estimate the same model for each loan type: commercial, personal, vehicle and housing loans over the sample period of December 2002 to September 2016. As explained in section III, the lending rate of personal loans is estimated for each maturity type separately, while the lending rate of commercial loans and vehicle or housing loans are estimated for predominant maturity, short term for the former and long term for the remaining loans. Thus, we examine the impact of foreign presence on lending rates of various loan type for Turkish commercial banks.

In addition to examining the relation between globalization of banking sector and its impact on loan rates using 19 commercial banks operating in Turkey during the sample period, we study the same relation under different grouping of these banks. The banking sector seems to be disaggregated into two main homogeneous grouping according to bank asset size in Turkey: large versus small banks.²⁴ Since the asset size of all state banks are large while that of all foreign banks are small, state and domestic large private banks are grouped as large banks whereas foreign and domestic small private banks are handled together as being small. Therefore, the impact of foreign

²⁴ Graphs are figured in Appendix B. All of the state banks and domestic large private banks are remained as domestic throughout the sample period, while there exist some transitions between domestic small private banks and foreign banks, from being domestic to foreign.

presence on loan rates is also empirically analyzed for these groups separately. Apart from this classification, the effect of the foreign banks' asset share on the domestic banks' loan prices has been examined being compatible with the earlier studies.

Given the estimation results, main findings with regards to interest rates of different loan types are summarized below.

4.1 Interest Rates of Commercial Loans

Foreign presence as measured by the share of foreign banks' total assets in total assets of all banks in the sample, is found to be significantly negatively associated with the commercial loan rates regardless of the banking group (Table 5). We observe that the impact is higher for large banks compared to small ones. This finding can be explained by the competitive pressure of foreign banks, which accounts for the significant part of the small banks.

It is very interesting that foreign banks are found to be creating more competitive pressure on large banks. One may expect no significant change on the loan rates of domestic small banks because most of the commercial loan borrowers might have some relationship lending with their banks especially for commercial loan type. In the literature, there are several evidences that there is significant cost due to availability of soft information for small bank customers (Berger & Udell, 2002).²⁵ However, since foreign banks enter the domestic market via acquisition, borrowers seem to be benefiting price wars among domestic small banks and foreign-owned small banks.

²⁵ Berger and Udell (2002) defines relationship lending as loan officer's accumulation of soft information of borrowers. In general, commercial loans are considered as relationship lending since borrowers/firm would have continuing borrower-lending relation with their banks. On the other hand, vehicle and housing loans cannot be consider as more arms' length.

Moreover, Ioannidou and Ongena (2010) show that customers benefit significantly in Bolivia by switching banks. Hence, we can argue that foreign presence in Turkey helps lending rates to decline for commercial loans. However, coefficient of the variable of foreign share square indicates that the impact of foreign presence on loan rates becomes significantly positive as foreign share is accelerated. This implies that there exists an optimal level of foreign bank share up to which the foreign presence creates competitive pressure on loan rates resulting in diminishing rates. On the other hand, as foreign bank share rises above the optimal level, the banking sector begins to operate in an oligopolistic structure and hence rates rise.

In general, all control variables are found to be in line with our expectations. First, we observe that the relation between bank characteristic and lending rates varies according to bank size. In particular, there is a significant positive relation between credit and liquidity risk (inverse of LIQ) with the interest rates of commercial loans conforming the risk-return trade off. We may argue that risky banks, i.e. banks with high rate of Non-performing loans (NPL) seem to have more risky borrowers and hence ask significantly higher loan rates. Nevertheless, the impact of NPL turns to be insignificant for both large and small banks, while that of LIQ is insignificant only for small banks. The insignificant relation for large banks can be explained by “too-big-to-fail” nature of large banks but insignificant association for risky small banks needs to be further analysis. Another interesting finding is that the impact of capital-to-asset ratio (EOA) is found to be insignificant for sample with all banks. As it can be seen from the graphs of EOA by ownership, Turkish banking sector has already very high EOA for all types of banks and it seems that better capitalization has no significant impact on lending rates.²⁶

²⁶ See Appendix B.

Table 5. Difference GMM Results for Lending Rates of Short Term Commercial Loans

	All Banks	Large Banks	Small Banks	Domestic Banks
Dependent Variable	CL	CL	CL	CL
CL(-1)	0.776*** (0.0549)	0.702*** (0.0855)	0.818*** (0.0461)	0.735*** (0.0731)
CL(-2)	0.0704 (0.0430)	0.141** (0.0613)	-0.0112 (0.0365)	0.114** (0.0536)
FS	-0.163*** (0.0477)	-0.314*** (0.0911)	-0.131** (0.0548)	-0.216*** (0.0752)
FS_squared	0.00634** (0.00308)	0.0132** (0.00582)	0.00479 (0.00363)	0.0103** (0.00442)
NPL	0.0726*** (0.0211)	-0.0124 (0.0326)	0.0552 (0.0562)	0.0570*** (0.0216)
LIQ	-0.0147** (0.00702)	-0.0576*** (0.0180)	-0.0104 (0.00765)	-0.0248** (0.0126)
EOA	-0.0181 (0.0195)	-0.0441 (0.0397)	-0.0306 (0.0259)	-0.0338 (0.0403)
LNAS	0.450*** (0.153)	-0.302 (1.394)	0.290 (0.190)	0.628** (0.295)
NEXP	-0.0168 (0.0515)	-0.300* (0.172)	0.0349 (0.0635)	-0.00953 (0.0878)
CRED	0.00394 (0.00834)	-0.0684*** (0.0258)	0.0141** (0.00612)	-0.0273* (0.0148)
NREV	0.0246*** (0.00730)	0.0189 (0.0254)	0.0250*** (0.00859)	0.0152 (0.0163)
FR	0.189*** (0.0245)	0.206*** (0.0266)	0.223*** (0.0272)	0.190*** (0.0278)
VIX	0.0299*** (0.00467)	0.0167** (0.00731)	0.0402*** (0.00595)	0.0189*** (0.00608)
INF	0.0598*** (0.0187)	0.0603** (0.0307)	0.0551** (0.0230)	0.0470** (0.0234)
RGDP	0.0625*** (0.0150)	0.0330 (0.0269)	0.0655*** (0.0248)	0.0697*** (0.0204)
trend	0.00456 (0.00295)	0.0177 (0.0216)	0.00744* (0.00380)	0.00510 (0.00486)
Observations	2,588	968	1,620	1,465
Number of id	19	7	12	11
Wald χ^2 (p value)	0.000	0.000	0.000	0.000
Arellano-Bond AR(1) Test (p value)	0.000	0.014	0.002	0.004
Arellano-Bond AR(2) Test (p value)	0.978	0.132	0.117	0.228
Sargan Test (p value)	0.247	0.513	0.116	0.411

Robust standard errors in parentheses

*, ** and *** denote significance at 10%, 5% and 1 % levels, respectively.

The coefficient of asset size (LNAS) is found to be significant only with the estimations including all and domestic banks. The sign of LNAS indicates that asset size is positively

associated with the commercial loan rates. This can be explained by reputational effect or again by “too-big-to fail” nature of large banks. Efficiency measure, proxied by NEXP, appears to be insignificant for the rates except in large banks’ estimations, which has only 10 percent level of significance however. The association between loan to asset ratio and lending rate is significant and negative for large banks but positive for small banks. Finally, we observe that NREV is significantly positively associated with commercial lending rates for small banks. De Young & Tera empirically finds that “the development of new financial technologies such as cashless transactions and mutual funds are associated with higher levels of noninterest income in the banking system” (2003: 5). This explanation may account for our results as well, since foreign banks, which are expected to operate with new technologies, constitutes more than 65 percent of the assets size of all small banks in our sample for the whole period.

The study includes four main macro controls: RGDP (real GDP growth) for controlling the loan demand, INF (yearly change in the consumer price index) for controlling the loan rate adjustment to inflationary pressures, VIX (volatility index) for controlling the changing conditions of access to foreign funding and FR (rate of weighted average cost of funding from CBRT) for controlling cost of funding and the effect of monetary policy. The impact of macro variables on the rates are in lines with our expectations. The impact of RGDP and INF on interest rates for commercial loans is found to be significant positive. Among few studies that only focus on loan rates, Gambacorta (2004) shows that real GDP and inflation have significant and positive impact on the determination of interest rate on bank loans in Italy. Kashyap, Stein and Wilcox (1993) argue that better economic conditions increase credit demand since there would be more profitable projects to invest and the immediate impact of increasing credit demand is higher lending rates. Moreover, Martinez Peria and Mody address to studies of Bernanke & Gertler (1989) and Kiyotaki & Moore (1997) that “changes in output can affect lending rates, and consequently spreads, because borrowers’ creditworthiness is countercyclical. As output growth slows down, creditworthiness deteriorates and, other

things equal, this is likely to be reflected in higher bank loan rates and spreads” (2004: 12). In addition to these variables, the impact of FR on commercial lending rate is also found to be significantly positive. “An increase in the money market rate raises the opportunity cost of other forms of financing (i.e. bonds), making lending more attractive. This mechanism also boosts loan demand and increases the interest rate on loans” (Gambacorta, 2004: 17). Finally, in compatible with Başkaya, Giovanni, Kalemli-Özcan and Ulu (2017), VIX is found to be significantly and positively associated with the interest rates for commercial loans. They indicate that “during periods of high global risk appetite (low VIX), capital inflows into Turkey are higher (relative to periods of high VIX), and these low-VIX driven exogenous capital inflows lead to a decrease in nominal and real borrowing costs in Turkey” (Başkaya et al., 2017:2). On the other hand, except INF, the impacts of macro variables are higher for small banks compared to large banks.

Finally, though significant coefficients of the first lags of dependent variables represent the high persistency of rates, the disappearing significance of the lagged variable in higher lags indicates the persistency accounts for one-month period.

4.2 Interest Rates of Personal Loans

Contrary to other loan types, the share of personal loans with different maturity periods (short term (up to one year), medium term (from one year to two years) and long term (higher than two years)) is close to that of each other. For this reason, the impact of foreign share is analyzed according to maturity types, which may give additional information about the effect of the maturity length on loan rates. As seen from Tables 6-8, the impact of foreign share becomes insignificant for interest rates of personal loans, while that of foreign share squared turn to significant with increasing maturities. However, significances remain the same across different maturity groups for domestic

banks, but the coefficient of FS-squared slightly decreases as maturity becomes longer. On the other hand, the impact of lagged variables increases with rising maturities.

Among bank-specific variables, we have some interesting results as well. In particular, we find that well-capitalized banks significantly lower their interest rates on personal loans in all maturity types. These findings suggest that stronger banks are able to charge lower rates for personal loans with higher maturities. Similar to the findings for commercial loans, we observe that the size of banks has a positive impact on interest rates for personal loans of almost all maturities.

As it can be seen from the Tables 6-8, except INF, the impact of macro variables kept their significance, however, the coefficients of these variables are relatively smaller when personal loans become longer durations. The impact of INF is insignificant for the short term personal loans, while it becomes significant for higher maturities.

Table 6. Difference GMM Results for Lending Rates of Short Term Personal Loans

	All Banks	Large Banks	Small Banks	Domestic Banks
Dependent Variable	PL1	PL1	PL1	PL1
PL1(-1)	0.451*** (0.0954)	0.392*** (0.151)	0.472*** (0.123)	0.449*** (0.133)
PL1(-2)	0.328*** (0.0815)	0.341*** (0.111)	0.297*** (0.0979)	0.306*** (0.110)
FS	-0.156* (0.0890)	-0.0540 (0.172)	-0.185*** (0.0679)	0.0327 (0.0875)
FS_squared	-0.00302 (0.00580)	-0.0106 (0.0127)	0.000545 (0.00578)	-0.0126* (0.00742)
NPL	0.0250 (0.0353)	0.111 (0.0684)	0.0405 (0.0366)	0.0787*** (0.0294)
LIQ	0.0150 (0.0226)	0.0158 (0.0290)	0.0220 (0.0351)	0.00750 (0.0182)
EOA	-0.0498 (0.0381)	-0.121 (0.0901)	-0.0225 (0.0341)	-0.111* (0.0576)
LNAS	0.572 (0.362)	4.117* (2.475)	0.490** (0.232)	1.927** (0.978)
NEXP	0.267** (0.108)	0.639 (0.407)	0.220*** (0.0850)	0.629*** (0.169)
CRED	0.00335 (0.0272)	-0.00382 (0.0391)	-0.00520 (0.0298)	-0.0143 (0.0311)
NREV	-0.00209 (0.0173)	-0.152* (0.0812)	0.0263** (0.0122)	-0.0830*** (0.0379)
FR	0.298*** (0.0284)	0.301*** (0.0341)	0.343*** (0.0348)	0.310*** (0.0384)
VIX	0.0427*** (0.00578)	0.0430*** (0.0115)	0.0396*** (0.00737)	0.0429*** (0.00975)
INF	0.0109 (0.0313)	0.00461 (0.0379)	0.00482 (0.0431)	-0.0270 (0.0343)
RGDP	0.0645*** (0.0179)	0.130*** (0.0420)	0.0460** (0.0180)	0.126*** (0.0246)
trend	0.0324*** (0.00587)	0.00109 (0.0270)	0.0294*** (0.00559)	0.0269** (0.0126)
Observations	2,228	874	1,354	1,233
Number of id	19	7	12	11
Wald χ^2	0.000	0.031	0.000	0.000
Arellano-Bond AR(1) Test (p value)	0.001	0.015	0.031	0.004
Arellano-Bond AR(2) Test (p value)	0.049	0.237	0.084	0.197
Sargan Test (p value)	0.168	0.483	0.104	0.312

Robust standard errors in parentheses

*, ** and *** denote significance at 10%, 5% and 1 % levels, respectively.

Table 7. Difference GMM Results for Lending Rates of Medium Term Personal Loans

	All Banks	Large Banks	Small Banks	Domestic Banks
Dependent Variable	PL2	PL2	PL2	PL2
PL2(-1)	0.661*** (0.0899)	0.554*** (0.125)	0.747*** (0.0881)	0.598*** (0.115)
PL2(-2)	0.113 (0.0820)	0.206* (0.113)	0.0217 (0.0721)	0.165 (0.108)
FS	-0.0148 (0.0653)	0.0813 (0.149)	-0.0687 (0.0537)	0.130 (0.108)
FS_squared	-0.00500 (0.00387)	-0.0128 (0.0102)	-0.00169 (0.00255)	-0.0120* (0.00713)
NPL	0.0831** (0.0383)	0.153*** (0.0403)	0.0321 (0.0388)	0.134*** (0.0372)
LIQ	0.00753 (0.0146)	-0.00365 (0.0273)	0.0193 (0.0181)	-9.78e-05 (0.0169)
EOA	-0.0591** (0.0293)	-0.143** (0.0637)	-0.0312 (0.0299)	-0.115*** (0.0385)
LNAS	0.740*** (0.214)	0.574 (1.111)	0.859*** (0.272)	1.021 (0.655)
NEXP	0.0382 (0.0776)	-0.128 (0.198)	0.0753 (0.0696)	0.150 (0.115)
CRED	0.00355 (0.0142)	0.00949 (0.0334)	-0.00188 (0.0150)	0.00443 (0.0214)
NREV	0.0187 (0.0122)	0.0132 (0.0510)	0.0206* (0.0120)	0.00184 (0.0256)
FR	0.206*** (0.0264)	0.221*** (0.0502)	0.203*** (0.0290)	0.220*** (0.0413)
VIX	0.0331*** (0.00422)	0.0298*** (0.00639)	0.0332*** (0.00543)	0.0303*** (0.00545)
INF	0.0773*** (0.0180)	0.0943*** (0.0257)	0.0704*** (0.0259)	0.0706*** (0.0216)
RGDP	0.0207* (0.0116)	0.0292* (0.0169)	0.0104 (0.0140)	0.0486*** (0.00939)
trend	0.00142 (0.00363)	0.00438 (0.0196)	-0.000571 (0.00360)	-0.00147 (0.0106)
Observations	2,202	890	1,312	1,246
Number of id	19	7	12	11
Wald χ^2	0.000	0.000	0.000	0.000
Arellano-Bond AR(1) Test (p value)	0.001	0.038	0.003	0.003
Arellano-Bond AR(2) Test (p value)	0.258	0.294	0.759	0.759
Sargan Test (p value)	0.176	0.419	0.135	0.135

Robust standard errors in parentheses

*, ** and *** denote significance at 10%, 5% and 1 % levels, respectively.

Table 8. Difference GMM Results for Lending Rates of Long Term Personal Loans

	All Banks	Large Banks	Small Banks	Domestic Banks
Dependent Variable	PL3	PL3	PL3	PL3
PL3(-1)	0.793*** (0.0617)	0.799*** (0.101)	0.766*** (0.0816)	0.770*** (0.0685)
PL3(-2)	0.0220 (0.0661)	0.0373 (0.107)	0.00417 (0.0704)	0.0404 (0.0756)
FS	0.0401 (0.0551)	0.0978 (0.0833)	-0.0269 (0.0705)	0.130 (0.0800)
FS_squared	-0.00762** (0.00309)	-0.0119** (0.00581)	-0.00534 (0.00408)	-0.0117** (0.00518)
NPL	0.0759** (0.0305)	0.0921** (0.0400)	0.0478 (0.0297)	0.0720 (0.0452)
LIQ	0.0134 (0.0127)	0.0101 (0.0223)	0.0232* (0.0132)	0.00363 (0.0191)
EOA	-0.0903*** (0.0199)	-0.133*** (0.0370)	-0.0818*** (0.0232)	-0.117*** (0.0322)
LNAS	0.954*** (0.265)	-0.298 (1.230)	1.416*** (0.223)	0.592 (0.769)
NEXP	-0.0120 (0.0684)	-0.183 (0.140)	0.0353 (0.0709)	0.0177 (0.111)
CRED	0.0169 (0.0111)	0.0166 (0.0200)	0.0164 (0.0125)	-0.00142 (0.0232)
NREV	0.0274*** (0.0102)	0.0399 (0.0343)	0.0306*** (0.0117)	0.00574 (0.0189)
FR	0.161*** (0.0186)	0.164*** (0.0285)	0.174*** (0.0313)	0.179*** (0.0320)
VIX	0.0313*** (0.00423)	0.0276*** (0.00516)	0.0365*** (0.00495)	0.0286*** (0.00591)
INF	0.0681*** (0.0170)	0.0660** (0.0289)	0.0746*** (0.0215)	0.0627*** (0.0231)
RGDP	0.0206* (0.0110)	0.0228* (0.0122)	0.00517 (0.0171)	0.0423*** (0.0105)
trend	-0.00537 (0.00413)	0.0132 (0.0193)	-0.0115*** (0.00361)	0.00291 (0.0124)
Observations	2,065	913	1,152	1,232
Number of id	19	7	12	11
Wald χ^2	0.000	0.000	0.000	0.000
Arellano-Bond AR(1) Test (p value)	0.002	0.043	0.015	0.020
Arellano-Bond AR(2) Test (p value)	0.554	0.289	0.361	0.550
Sargan Test (p value)	0.128	0.221	0.178	0.177

Robust standard errors in parentheses

*, ** and *** denote significance at 10%, 5% and 1 % levels, respectively.

4.3 Interest Rates of Vehicle Loans

Similar to the regressions for the other loan types, we observe the persistency of loan rates which is higher for small banks compared to large banks. As mentioned before vehicle loans are different than commercial and personal loans. Berger and Udell (2002) classifies vehicle and mortgage loans as transaction-drive loans and shows that their pricing is different than commercial loans. In this study, we also find a major difference in the pricing of these loans by the increasing share of foreign banks in our banking industry. In particular, we observe that foreign share has significant and adverse positive effect on interest rate for vehicle loans and this relation improve only slightly-when share of foreign banks increases further.

As seen from Table 9, the change of signs of interest rate with FS and FS-squared is in contrary to the case of commercial loans. The main explanation for this reversed impact may account for the dominance power of domestic banks on vehicle loans.²⁷ In other words, foreign share adds to the oligopolistic structure of the sector and results in rising rates for personal loans.²⁸ We may argue that this relation can be considered as a supporting evidence for the vehicle loans to be transaction-driven, i.e., no lender/borrower relationship effect. By the acquisition of domestic private banks, foreign owners of these banks may help boosting demand for vehicle loans and hence interest rate on these loans significantly increases. However, since we have no data for demand for vehicle loans, we are unable to see the direct effect of these loans on

²⁷ For all loan types, large banks all of which are domestic, has an important share compared to small banks. However, the share of them is much higher in vehicle loans compared to commercial loans. In addition, as it is represented in the graph of lending rates of vehicle loans, foreign banks charge higher rates for vehicle loans relative to other banks groups, which constitutes domestic banks.

²⁸ The decision of the Competition Board dated 08.03.2013 and numbered 13-13 / 198-100 proves the formation of cartel among 12 banks. Those banks include all of the state banks, all of large domestic private banks and four foreign banks, and one of small domestic banks.

interest rate. Another interesting finding is that increased foreign share improves the competitiveness causing rates to decline.

Table 9. Difference GMM Results for Lending Rates of Long Term Vehicle Loans

	All Banks	Large Banks	Small Banks	Domestic Banks
Dependent Variable	VL	VL	VL	VL
VL(-1)	0.665*** (0.138)	0.586*** (0.186)	0.764*** (0.0737)	0.627*** (0.161)
VL(-2)	0.0183 (0.110)	0.0683 (0.136)	-0.0871 (0.0572)	0.0477 (0.126)
FS	0.179*** (0.0611)	0.268*** (0.101)	0.149* (0.0881)	0.231*** (0.0877)
FS_squared	-0.0162*** (0.00369)	-0.0212*** (0.00674)	-0.0143*** (0.00507)	-0.0186*** (0.00538)
NPL	-0.000481 (0.0368)	-0.0906** (0.0424)	0.00236 (0.0529)	-0.0280 (0.0209)
LIQ	-0.00378 (0.0126)	-0.0231 (0.0197)	0.0107 (0.00795)	-0.00805 (0.0170)
EOA	-0.0928*** (0.0185)	-0.0947*** (0.0332)	-0.0808*** (0.0197)	-0.0845*** (0.0266)
LNAS	0.364* (0.215)	0.251 (1.224)	0.383* (0.209)	0.382 (0.288)
NEXP	0.0206 (0.0558)	0.217 (0.133)	-0.0286 (0.0563)	0.0676 (0.0588)
CRED	-0.0144 (0.0115)	-0.0234 (0.0243)	-0.0174 (0.0162)	-0.0134 (0.0203)
NREV	0.0123 (0.0108)	-0.0548*** (0.0105)	0.0262** (0.0125)	-0.00357 (0.0191)
FR	0.278*** (0.0373)	0.293*** (0.0639)	0.275*** (0.0291)	0.292*** (0.0483)
VIX	0.0408*** (0.00428)	0.0424*** (0.00694)	0.0397*** (0.00441)	0.0407*** (0.00498)
INF	0.0806*** (0.0174)	0.0523 (0.0413)	0.0943*** (0.0154)	0.0634** (0.0279)
RGDP	-0.0233** (0.0107)	-0.000792 (0.00987)	-0.0410** (0.0165)	-0.0123 (0.0129)
trend	0.0122*** (0.00386)	0.0132 (0.0168)	0.0109*** (0.00382)	0.0114** (0.00526)
Observations	1,924	945	979	1,287
Number of id	18	7	11	10
Wald χ^2	0.000	0.000	0.001	0.000
Arellano-Bond AR(1) Test (p value)	0.012	0.065	0.021	0.029
Arellano-Bond AR(2) Test (p value)	0.291	0.315	0.754	0.361
Sargan Test (p value)	0.124	0.305	0.025	0.271

Robust standard errors in parentheses

*, ** and *** denote significance at 10%, 5% and 1 % levels, respectively.

Since all of the vehicle loans in our sample is long term, we may compare these results with our findings on personal loans with long term maturity. In this regard, except NREV, the impacts of banks' specific variable on vehicle loan rates are similar to the regression results of long-term personal loans. The impacts of macro variables are in line with our expectations apart from RGDP. More explicitly, both the inflationary and cost adjustments are higher in vehicle loans. However, interest rates on vehicle loans significantly decrease during the expansionary periods. The impact of RGDP is significantly negative, i.e. with increasing demand for vehicle loans the rates are diminishing.

4.4 Interest Rates of Housing Loans

In terms of the impact of foreign share on loan rates, we have similar results for housing and vehicle loans as represented in Table 9 and Table 10. In contrast to our expectations regarding the impact of other variables on the interest rates, the housing loans are more similar to personal loans with long term maturity compared to vehicle loans.

The persistency of the prices continues to be significantly positive as it is in all other regressions. In addition, with decreasing significance levels, foreign share is positively associated with loan rates as it is in vehicle loans. Furthermore, the inflationary impact on prices is highest in the housing loans among all consumer loans. The impact of RGDP becomes positive again, while it is only significant for domestic banks.

Table 10. Difference GMM Results for Lending Rates of Long Term Housing Loans

	All Banks	Large Banks	Small Banks	Domestic Banks
Dependent Variable	HL	HL	HL	HL
HL(-1)	0.756*** (0.115)	0.666*** (0.138)	0.872*** (0.0355)	0.704*** (0.130)
HL(-2)	-0.000989 (0.135)	0.122 (0.160)	-0.183*** (0.0339)	0.0579 (0.157)
FS	0.113** (0.0535)	0.159* (0.0859)	0.0686 (0.101)	0.182** (0.0764)
FS_squared	-0.00877*** (0.00328)	-0.0115** (0.00540)	-0.00768 (0.00638)	-0.0118*** (0.00445)
NPL	0.113*** (0.0321)	0.133*** (0.0297)	0.0799* (0.0482)	0.0935*** (0.0313)
LIQ	0.00967 (0.0132)	0.0179 (0.0233)	0.00375 (0.00678)	0.00671 (0.0206)
EOA	-0.0862*** (0.0204)	-0.126*** (0.0390)	-0.0622** (0.0253)	-0.0962*** (0.0327)
LNAS	0.558* (0.320)	0.0261 (1.092)	0.963** (0.377)	-0.0458 (0.393)
NEXP	-0.0766 (0.0621)	-0.152 (0.193)	-0.0133 (0.0593)	-0.0874 (0.116)
CRED	0.00911 (0.0143)	0.0113 (0.0207)	-0.00254 (0.0167)	-0.0132 (0.0193)
NREV	0.0280** (0.0141)	0.0439 (0.0409)	0.0244** (0.0118)	0.0284 (0.0260)
FR	0.198*** (0.0204)	0.167*** (0.0260)	0.254*** (0.0309)	0.193*** (0.0253)
VIX	0.0322*** (0.00244)	0.0283*** (0.00406)	0.0377*** (0.00330)	0.0302*** (0.00257)
INF	0.0837*** (0.0137)	0.0902*** (0.0260)	0.0842*** (0.0185)	0.0858*** (0.0200)
RGDP	0.0131 (0.0109)	0.0192 (0.0127)	-0.00124 (0.0147)	0.0228** (0.0114)
trend	-0.00207 (0.00509)	0.00766 (0.0178)	-0.00642 (0.00649)	0.0105 (0.00693)
Observations	2,026	954	1,072	1,303
Number of id	18	7	11	10
Wald χ^2	0.000	0.000	0.000	0.000
Arellano-Bond AR(1) Test (p value)	0.024	0.101	0.006	0.055
Arellano-Bond AR(2) Test (p value)	0.147	0.478	0.064	0.482
Sargan Test (p value)	0.088	0.220	0.036	0.132

Robust standard errors in parentheses

*, ** and *** denote significance at 10%, 5% and 1 % levels, respectively.

4.5 Robustness Checks for Empirical Results

We conduct two robustness checks using interest rates of commercial loan data. First, we use an alternative estimation method. Roodman indicates that in cases where the time component of the sample is quite high relative to number of panels, “dynamic panel bias becomes insignificant, and a more straightforward fixed-effects estimator works” (2009: 128). Hence, as a first robustness checks, fixed effects estimation is performed. As it is seen from Table 11, fixed effects estimation (FE) results are mostly in line with our previous results for commercial loan rates. The coefficients on foreign presence and foreign_squared change only slightly via FE. Hence, FE confirms our previous findings that there exist a significant and positive relation between lending rates of commercial loans and foreign presence and the impact is reversed as foreign share accelerates.

As a second robustness check, we use an alternative dependent variable, spread. One may suspect that price setting behavior of banks determined by their targeted spreads and ask for the impact of foreign presence on the spreads rather than prices. To account for this impact, same model (1) estimated for the spreads between lending rates of commercial loans and deposit rates via difference GMM. As Table 12 shows, the impact of foreign presence on spreads are in a similar manner with lending rates, the impact is significantly positive on spreads, and turns to negative with increased foreign presence.

Table 11. Fixed Effects Estimation Results for Lending Rates of Commercial Loans

	All Banks	Large Banks	Small Banks	Domestic Banks
Dependent Variable	CL	CL	CL	CL
CL(-1)	0.777*** (0.0562)	0.709*** (0.0910)	0.820*** (0.0481)	0.738*** (0.0767)
CL(-2)	0.0692 (0.0433)	0.140* (0.0665)	-0.0100 (0.0383)	0.112* (0.0557)
FS	-0.156*** (0.0469)	-0.296** (0.0954)	-0.124** (0.0562)	-0.208** (0.0698)
FS_squared	0.00601* (0.00315)	0.0125* (0.00644)	0.00432 (0.00371)	0.0102** (0.00457)
NPL	0.0734*** (0.0228)	0.0129 (0.0399)	0.0557 (0.0599)	0.0648*** (0.0187)
LIQ	-0.0119* (0.00652)	-0.0347** (0.00951)	-0.0156 (0.00907)	-0.0121 (0.0110)
EOA	-0.0260 (0.0196)	-0.0763 (0.0455)	-0.0275 (0.0280)	-0.0519 (0.0380)
LNAS	0.423*** (0.127)	0.102 (1.430)	0.370* (0.179)	0.466 (0.263)
NEXP	-0.0257 (0.0565)	-0.286 (0.182)	0.0326 (0.0669)	-0.0165 (0.0985)
CRED	0.00564 (0.00693)	-0.0433** (0.0157)	0.00799 (0.00827)	-0.0148 (0.0104)
NREV	0.0258*** (0.00804)	0.0319 (0.0295)	0.0237** (0.00916)	0.0200 (0.0190)
FR	0.186*** (0.0252)	0.195*** (0.0241)	0.220*** (0.0282)	0.182*** (0.0284)
VIX	0.0302*** (0.00481)	0.0173* (0.00793)	0.0391*** (0.00624)	0.0200** (0.00662)
INF	0.0618*** (0.0198)	0.0608 (0.0356)	0.0556** (0.0238)	0.0487* (0.0259)
RGDP	0.0607*** (0.0154)	0.0305 (0.0290)	0.0657** (0.0252)	0.0683** (0.0222)
trend	0.00459 (0.00294)	0.0114 (0.0224)	0.00624 (0.00384)	0.00664 (0.00474)
Constant	-8.074*** (2.094)	2.320 (24.75)	-7.302** (2.818)	-7.536* (4.001)
Observations	2,610	976	1,634	1,478
R-squared	0.911	0.910	0.916	0.914
Number of id	19	7	12	11

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 12. Difference GMM Results for Spreads Between Lending Rates of Commercial Loans and Deposit Rates

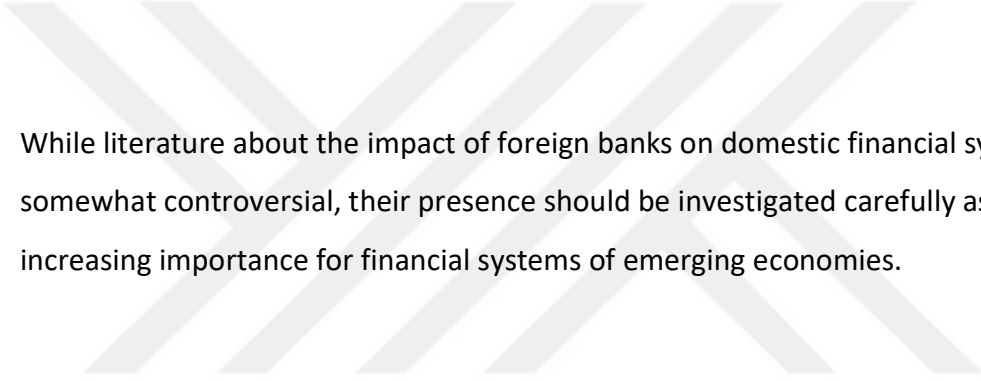
	All Banks	Large Banks	Small Banks	Domestic Banks
Dependent Variable	Spread	Spread	Spread	Spread
Spread (-1)	0.719*** (0.0501)	0.682*** (0.0789)	0.724*** (0.0546)	0.696*** (0.0637)
Spread (-2)	0.164*** (0.0396)	0.186*** (0.0603)	0.116*** (0.0426)	0.189*** (0.0487)
FS	-0.208*** (0.0516)	-0.342*** (0.0990)	-0.196*** (0.0612)	-0.259*** (0.0854)
FS_squared	0.0102*** (0.00307)	0.0178*** (0.00607)	0.00960*** (0.00363)	0.0142*** (0.00468)
NPL	0.0568*** (0.0168)	-0.0168 (0.0344)	0.0544* (0.0312)	0.0400** (0.0166)
LIQ	-0.0102 (0.00857)	-0.0538*** (0.0206)	0.00393 (0.00680)	-0.0257* (0.0134)
EOA	-0.00151 (0.0157)	0.0284 (0.0436)	-0.0235 (0.0189)	-0.00495 (0.0308)
LNAS	0.342** (0.157)	-1.331 (1.267)	0.368* (0.191)	0.531 (0.334)
NEXP	0.00991 (0.0425)	-0.270* (0.152)	0.0576 (0.0587)	0.0144 (0.0627)
CRED	0.00291 (0.00977)	-0.0727*** (0.0278)	0.0169*** (0.00648)	-0.0253 (0.0196)
NREV	0.0102 (0.00792)	-0.0122 (0.0221)	0.0152 (0.0104)	-0.00556 (0.0134)
FR	0.0481*** (0.00835)	0.0574*** (0.0180)	0.0471*** (0.0119)	0.0535*** (0.0141)
VIX	0.0304*** (0.00480)	0.0212*** (0.00753)	0.0387*** (0.00575)	0.0195*** (0.00642)
INF	-0.0129 (0.0201)	-0.00909 (0.0295)	-0.0129 (0.0242)	-0.0307 (0.0243)
RGDP	0.0374** (0.0154)	0.0157 (0.0281)	0.0437* (0.0241)	0.0436** (0.0200)
trend	0.00114 (0.00257)	0.0279 (0.0193)	-0.000109 (0.00310)	-0.000319 (0.00585)
Observations	2,588	968	1,620	1,465
Number of id	19	7	12	11
Wald χ^2 (p value)	0.000	0.000	0.000	0.000
Arellano-Bond AR(1) Test (p value)	0.0002	0.0157	0.0018	0.0034
Arellano-Bond AR(2) Test (p value)	0.2492	0.1176	0.4877	0.1082

Robust standard errors in parentheses

*, ** and *** denote significance at 10%, 5% and 1 % levels, respectively.

CHAPTER V

CONCLUSION



While literature about the impact of foreign banks on domestic financial system is somewhat controversial, their presence should be investigated carefully as it has an increasing importance for financial systems of emerging economies.

After the crises of November 2000 and February 2001, an economic program was implemented in Turkish economy including a series of structural reforms and radical changes in economic policies providing the sound banking sector and financial stability. As a result of these developments, foreign interest to Turkish banking sector gained its momentum over the last 16 years.

Foreign banks have entered the Turkish banking sector by the acquisition of domestic banks rather than greenfield or de novo investment since the beginning of 2000s.²⁹ Their entrance did not notably change the total number of banks in the banking sector. In Turkey, the market structure of commercial banking industry seems to be very distinct. There are large state banks and large private banks, and small banks. Even though large (state and private) banks dominate the market especially by setting the

²⁹ Even in 2017, a Spanish bank, BBVA, became “leading” shareholder of one bank in Turkey.

prices (both deposit and loan rates) in the sector, one can argue that small banks have been very competitive since they have been operational in the market for more than 100 years. Considering the fact that almost all of the acquired banks are small-sized banks in the industry, we argue that this kind of foreign entry to the Turkish banking sector may have little impact on the productivity or efficiency of the sector however it may have some notable impact on the pricing of the various types of bank loans. Thus, in the study, we examine whether foreign bank presence has significant impact on loan prices or not.

Lending rates reflect the costs of using the financial system by borrowers (Degryse et al., 2012) and they have great importance for macroeconomic performance along with the provision and protection of financial stability. Hence, understanding the impact of foreign banks on loan rates and the credit markets may have some policy implications for ensuring economic and financial stability. In this study, we investigate the relation between increasing foreign control in the Turkish banking sector and loan rates using monthly bank level data over the time period between December 2002 and September 2016. In line with the previous studies that study interest rates, the dynamic model of panel data is estimated by examining the difference-generalized method of moments (GMM) methodology developed by Arellano and Bond (1991).

We use same model for lending rates of various types of loans: commercial, personal, vehicle and housing loans. Since Turkish banking sector seems to be disaggregated into two main homogeneous grouping according to bank asset size, the estimations are also examined for banks groups of small and large banks. In addition, estimation results for the impact of foreign presence on domestic banks are also provided for a comparison of the previous studies. Moreover, because lending rates depend directly on their length of maturity, only rates of these loans with the dominant maturity, if any, is examined in the analyses. Hence, lending rates of short term commercial loans, short term personal

loans, medium term personal loans, long term personal loans, long term vehicle loans and long term housing loans are determined to be analyzed separately.

Our main variable of interest, foreign presence is calculated by dividing foreign banks' total assets to the total assets of all banks in the sample. We have both level and a quadratic polynomial of foreign bank presence. In this way, we try to explore whether the impact of foreign presence changes significantly with the acceleration in foreign presence. Moreover, in line with the theoretical and empirical studies, several banks-specific variables are included to the model. These variables are credit risk, liquidity risk, capital-to-asset ratio, asset size, cost efficiency, loans-to-assets ratio and non-interest revenues to total revenues. Furthermore, annual growth rate of real GDP, inflation rate, volatility index and weighted average funding rate of the Central Bank of the Republic of Turkey are introduced to control for macroeconomic changes.

The estimation results show that foreign presence is significantly and negatively associated with the commercial loan rates regardless of the banking group. However, the impact is higher for large banks compared to small ones. These findings suggest that presence of foreign banks has created significant competitive pressure on Turkish domestic banks and helped firms to borrow at lower rates during the sample period. However, the coefficient of foreign share squared indicates that further dominance of these banks has significant and positive impact on commercial loan rates. This implies that there exists an optimal level of foreign bank share up to which the foreign presence creates competitive pressure on loan rates resulting in diminishing rates. On the other hand, as foreign bank share rises above the optimal level, the banking sector begins to operate in oligopolistic structure and hence rates start rising.

We also find that the impact of foreign share on lending rates of personal loans is insignificant while that of foreign square turns to significant with increasing maturities.

Nevertheless, the significances remain same across different maturity groups for domestic banks, while the coefficient of foreign presence squared slightly decreases as maturity becomes longer. On the other hand, regression results show that the impact of foreign share on loan rates for housing and vehicle loan rates is different than commercial and personal loans. By the presence of foreign banks in the banking industry, the loan rates for vehicle and housing loans increases significantly. However, higher presence of these banks significantly lower the loan rates for commercial loans. The explanation for this reversed impact of foreign presence on these loans may account for the dominance power of domestic banks on vehicle and housing loans. In other words, foreign share adds to the oligopolistic structure of the sector and results in rising rates for vehicle and housing loans. Furthermore, increased foreign share improves the competitiveness causing rates to decline. Interestingly, for all loan types, we observe the persistency of loan rates which is higher for small banks compared to large banks.

In conclusion, our study reveals that the foreign presence has a significant impact on the lending rates of Turkish banking sector regardless of the loan type. In addition, the impact is seen to be higher for large banks compared to small banks. On the other hand, the direction of the relation is different among loan types. Particularly, there exist a negative relation between foreign presence and lending rates of commercial and personal loans, while a positive relation with vehicle and housing loans. The distinction among loan types is also seen in the impact of acceleration in foreign presence on the lending rates.

Overall, we may suggest that since these findings document that the impact of foreign presence may change as the dominance of foreign banks in the sector, the authorities responsible from the financial stability of the banking sector should monitor the share of foreign banks cautiously and consider the varying impact for different loan types.

There is some significant caveat of this study that exist in similar studies, i.e, differentiating loan demand from loan supply. For further policy analysis, the study can be extended for detecting additional factors such as borrower information that might be impacting banks' loan rates.



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APPENDIX A: Acquisition of Domestic Banks

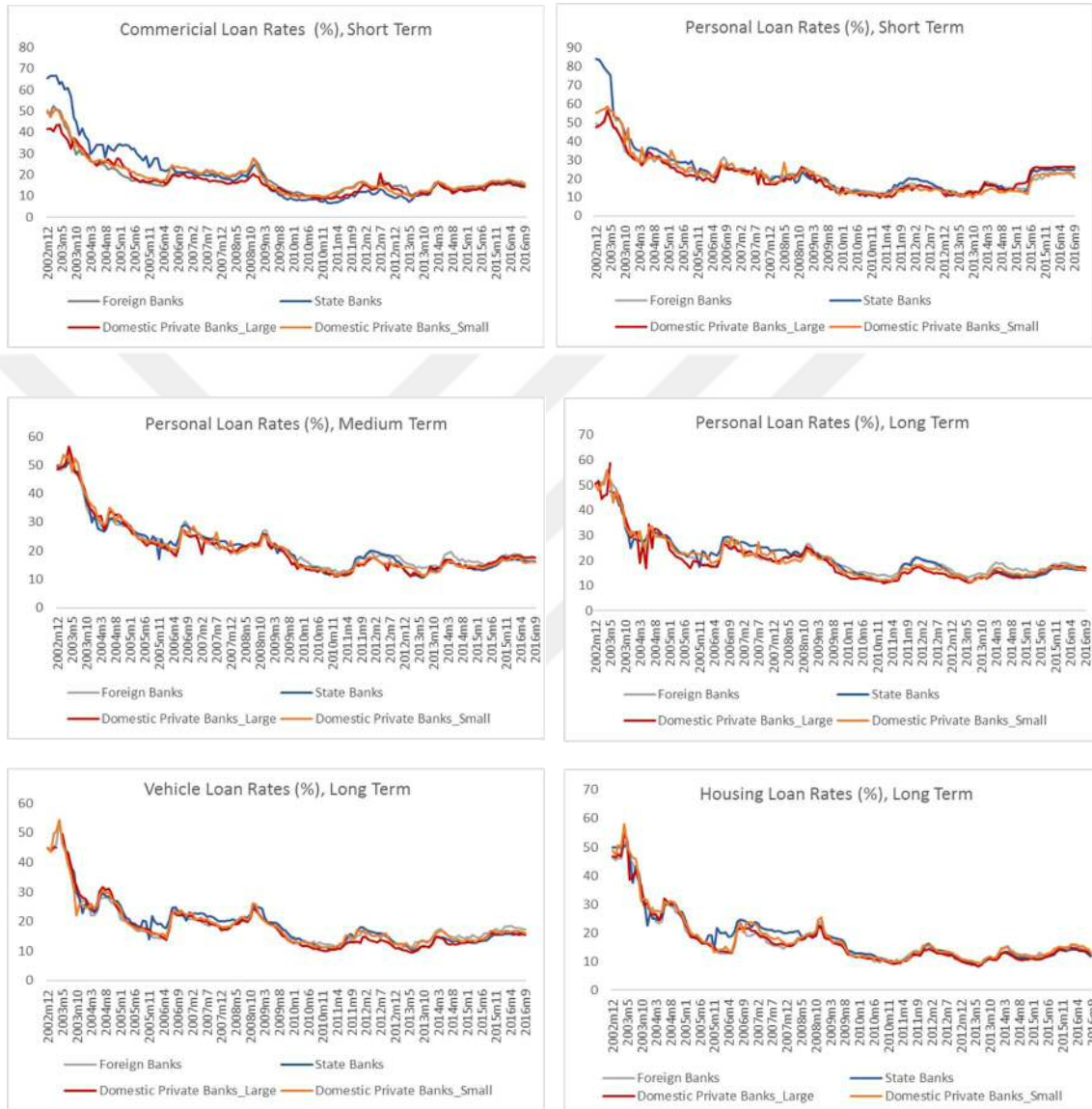
Date of first acquisition by foreign banks	Acquired Bank	Name of the bank after acquisition	Home country of the last owner	Name of the last owner
July 2006	Finansbank ¹	QNB Finansbank	Qatar	QNB (Qatar National Bank)
October 2006	Denizbank ²	Denizbank	Russia	Sberbank
March 2007	Tekfenbank ³	Burgan Bank	Kuwait	Burgan Bank
April 2007	MNG Bank	Turkland	Jordan and Lebanon	Arab Bank (50%) & BankMed(50%)
December 2007	Oyak Bank	ING	Netherlands	ING
July 2013	Alternatif Bank	Alternatif Bank	Qatar	The Commercial Bank
May 2015	Tekstil Bank	ICBC Turkey Bank	China	ICBC (Industrial and Commercial Bank of China)

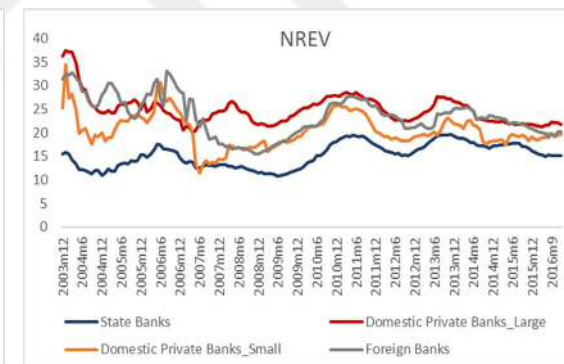
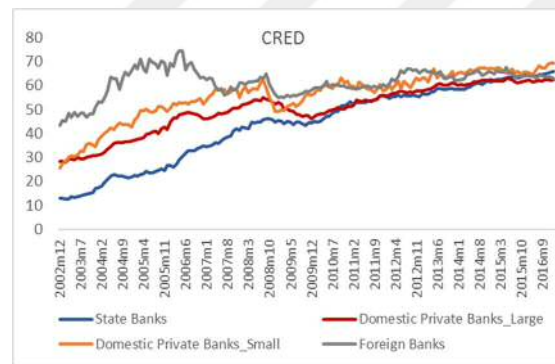
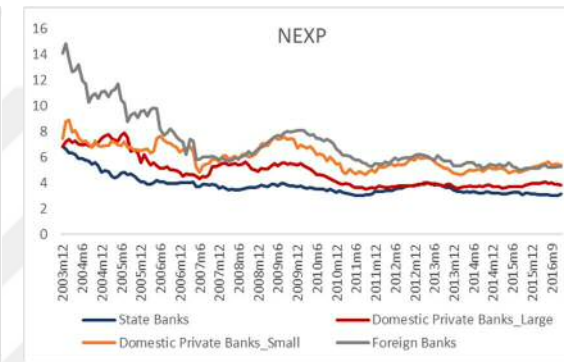
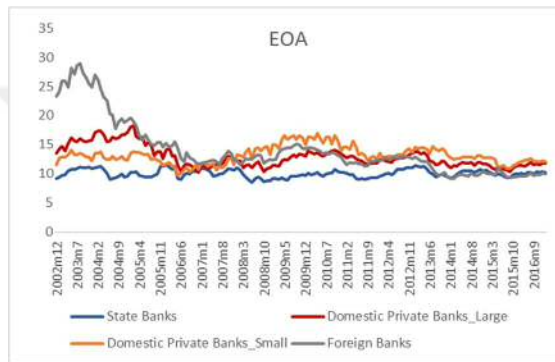
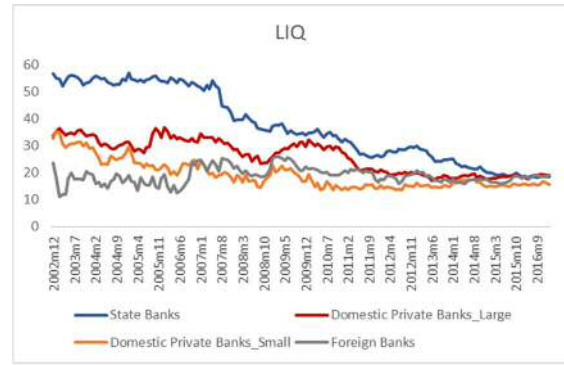
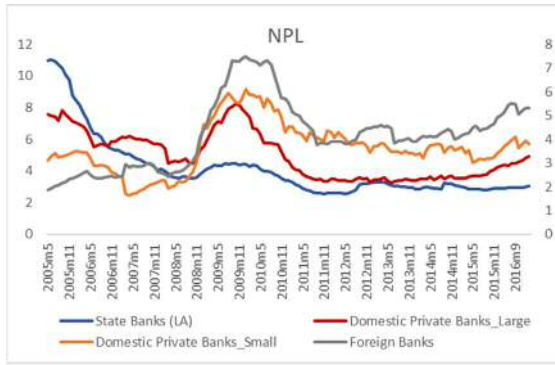
¹ First acquired by National Bank of Greece in July 2006, then by QNB in June 2016

² First acquired by Dexia Participation Belgique SA in October 2006 , then Sberbank in September 2012

³ First acquired by Eurobank EFG in March 2007 , then Burgan Bank in December 2012

APPENDIX B: Time Series of Several Bank Related Variables, by Ownership





APPENDIX C: Correlation Matrix

	FS	FS_squared	NPL	LIQ	EOA	LNAS	NEXP	CRED	NREV	FR	VIX	INF	RGDP
FS	1												
FS_squared	0.98	1.00											
NPL	-0.26	-0.26	1.00										
LIQ	-0.51	-0.53	0.09	1.00									
EOA	-0.18	-0.22	0.16	-0.20	1.00								
LNAS	0.28	0.31	-0.33	0.23	-0.32	1.00							
NEXP	-0.29	-0.31	0.55	-0.19	0.27	-0.61	1.00						
CRED	0.56	0.56	-0.19	-0.87	0.09	-0.22	0.16	1.00					
NREV	0.08	0.09	0.17	-0.38	0.12	-0.05	0.39	0.30	1.00				
FR	-0.56	-0.57	0.03	0.42	-0.02	-0.15	0.21	-0.40	-0.19	1.00			
VIX	0.16	0.10	-0.01	-0.01	0.01	-0.02	0.06	-0.03	-0.11	0.12	1.00		
INF	-0.11	-0.11	-0.08	0.09	-0.10	-0.03	0.03	-0.07	-0.08	0.47	0.07	1.00	
RGDP	-0.35	-0.34	-0.07	0.09	-0.04	-0.09	-0.09	-0.10	0.22	0.16	-0.26	0.23	1.00