LUND UNIVERSITY
School of Economics and Management

Master in Economic Development

Foreign Bank Participation in Mexico:

A performance analysis for the period 2000-2017

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Abstract: Many economists agree that financial development and economic growth have a positive relationship, that financial structures have been critical for many countries to achieve modern economic growth. In the past decades, foreign investment has become more widespread in the entrepreneurial world, and the banking sector has not been an exception. Mexico experimented during the late 1990's an unprecedented case of foreign investment in its banking sector that triggered many discussions regarding its consequences to financial development and economic growth. Several investigations were performed around the topic, and most of the conclusions suggest that bank performance declined after foreign bank participation. Nonetheless, previous studies were performed for a period in which the financial market conditions might not have been the appropriate ones since the country had recently experienced a financial crisis. Throughout this paper, research using similar procedures as previous ones but with recent data is presented and discussed. The outcome denotes that the overall performance of foreign banks in Mexico did not decline. Additionally, the evidence bestows that there are many similarities between foreign and domestic bank performance trends, suggesting that the origin of a bank's ownership has not been determinant for different patterns of behavior.

Keywords: Bank performance, financial depth, financial development, financial globalization, financial outreach, financial productivity, foreign banks, Mexican banks.

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List of Abbreviations

ATM	Automated Teller Machine
BCG	Bank Consumption and Housing Credit to GDP Depth Indicator
BDG	Bank Deposits to GDP Depth Indicator
BPC	Bank Private Non-Financial Credit to Total Credit Depth Indicator
BPG	Bank Private Non-Financial Credit to GDP Depth Indicator
B&A	Beck et al.
B&M	Beck & Martinez
CNBV	Mexican National Banking and Securities Commission
FDI	Foreign Direct Investment
GDP	Gross Domestic Product
INEGI	Mexico's National Institute of Statistics, Geography, and Information
K&L	King and Levin
MFC	Mexican 1994-1995 Financial Crisis also known as Tequila Crisis
MXN	Mexican Peso Currency
M&A	Micco et al.
POS	Point of Sale Machine
ROA	Return on Assets
ROE	Return on Equity
TAP	Total Assets Adjustment Procedure
TIIE	Mexican Interbank Equilibrium Interest Annual Rate
USD	United States of America Dollar Currency

1 Introduction

1.1 Background

1.1.1 History of banks and its role in economic growth

Banks, as separate entities in the branch of commerce and active participants in the advancement of civilization, have existed for more than 300 years. However, the operation of banking as less organized forms has existed for many centuries, almost since the beginning of society. As this modern world has gradually taken shape, banking has acquired further significance than what could have been anticipated at any period during the early history of civilization. As of today, banking is an essential foundation on which modern civilization is built on (Hoggson, 1926).

In the industrialization process of some Western European economies, the capital was scarce and diffused, there was distrust in industrial activities, the entrepreneurial talent was uncommon, and there was a great need for bigness. These circumstances among others were significant pressure factors for the development of the banking system. Beginning with France's industrialization process and most notably in Germany, banks played an essential role by magnifying many European countries' development processes. Banks not only played a role as capital allocators, but they also participated extensively in entrepreneurial and managerial decisions in industrial enterprises (Gerschenkron, 1962).

Banks have substantial importance in the structure of the modern economic world. As intermediaries between depositors and debtors, they may have a critical role in the allocation of capital which is essential for economic development. Accordingly, Banks can be significant factors for successful economic growth in developing countries.

1.1.2 History of banks in Mexico

In Mexico, formal banking activities did not begin until twenty years after its 1810's independence with the formation of the Banco de Avío Industrial in 1830. The bank was created by a presidential decree promoting the national industry. However, it was closed twelve years later by the former president due to scarce and expensive loans. Banks in Mexico did not develop significantly until the late 1800's (Asociación de Bancos de México, 2014a). Nevertheless, banking activities in Mexico were severely affected by the 1907 world financial crisis and later on by the post-effects of the 1910 Mexican revolution (Cárdenas Sánchez, 2015).

Mexico´s bank sector experienced a more stable and continuous development process after the first quarter of the 20th century. However, since then, there have been some noteworthy events that have influenced and shaped it considerably to the operational and structural form it has nowadays.

In 1982, the president-in-office determined to nationalize all existing private banks, reorienting its operation towards state interests. Later on, in the early 1990's with a new president in turn motivated by Washington Consensus policies (Instituto Mexicano de Ejecutivos de Finanzas, 2014), the banks returned to private ownership. The new owners with an entrepreneurial background in brokerage houses and industry, and with limited banking experience aggressively promoted lending without the proper credit skills (Schulz, 2006). Fueled by expansive economic growth measures undertaken by the former president, the banking system experienced unprecedented growth rates (Asociación de Bancos de México, 2014b).

The devaluation of the peso in December 1994 triggered the Mexican Financial Crisis [MFC]. Interest rates increased by more than five times and reached annual rate levels above hundred percent (Banco de México, 2018). Bank activities were severely affected by a rapid increase in non-performing loans and a decline in bank lending (Schulz, 2006). Consequently, the financial situation of the existing banks was severely deteriorated. The former government, concerned that the banking system could collapse, implemented capitalization and restructuring programs. Many banks were intervened, and others were financially aided (Asociación de Bancos de México, 2014b; Cárdenas Sánchez, 2015; Instituto Mexicano de Ejecutivos de Finanzas, 2014; Schulz, 2006).

Mexico's economic recovery began in 1996 and with it, the renovation of the banking system. Moreover, based on previous recent reforms on banking regulation (Asociación de Bancos de México, 2014b), and most likely motivated by a fragile after-crisis financial situation within banks and its shareholders, the government turned to foreign investors to improve capitalization. Foreign participation in Mexican banks became increasingly relevant (Schulz, 2006).

Furthermore, together with the reforms on banking regulation that facilitated foreign direct investment [FDI] in the banking sector, the government similarly introduced modifications that authorized the creation of new banks through concessions to domestic entrepreneurs (Asociación de Bancos de México, 2014b). The presence of the new banks founded under this process was irrelevant by the time of the MFC and post-crisis period but in the upcoming years their significance to the banking system enlarged (Comisión Nacional Bancaria y de Valores, 2017).

1.1.3 Financial Globalization

At the beginning of the 1990's, there were very positive expectations about globalization. During a six-year period, the capital flows to developed countries increased six times. With the World Trade Organization established in 1995, the foundations of international commerce were molded, and globalization was expected to bring prosperity to all. However, as

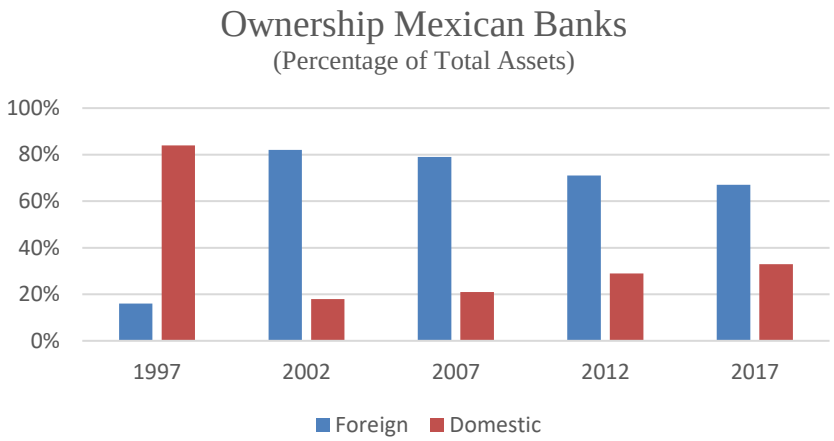

Figure 1.1 Ownership Mexican Banks (Comisión Nacional Bancaria y de Valores, 2000-2017)

globalization permeated throughout the world; it generated unbalanced results between and within countries. Wealth has been created, but many nations and individuals are not benefiting from it (Stiglitz, 2006).

Furthermore, international integration of the banking industry has not been the exception. During the decade before the 2008 global financial crisis, globalization within the banking sector was noteworthy. It predominantly manifested in a rise in cross-border lending and in increasing participation of foreign banks in different countries' financial systems. (The World Bank, 2018). During the 1995-2002 period, the share of foreign banks worldwide increased from 20% to 32% (Micco, Panizza & Yañez, 2007). However, in developing countries, foreign bank participation was more noticeably (The World Bank, 2018).

Mexico was not an exception of the impact of globalization on the banking sector, to the contrary, it is an unprecedented case in the level of foreign control for an economy with the size as that of Mexico's. The primary cause that led to this situation was that the government turned to foreign investors to improve the capitalization and overall competitiveness of Mexican banks since most banks required adequate reserves due to the effects of the MFC. The results were extraordinary. By 2002 more than 82% of the Mexican banking assets were owned by foreign financial institutions while in 1997 they had 16%, and in 1995 before the MFC, less than 1% (Schulz, 2006). Figure 1.1 displays the evolution of foreign investment in the Mexican banking system for the past two decades.

1.2 Research Problem

Foreign bank participation and foreign control over national financial systems have triggered an intense debate about the possible repercussions (Beck & Martinez, 2010; Gormley, 2007; Micco, Panizza & Yañez, 2007; Schulz, 2006; Stiglitz, 2003; The World Bank, 2018). Those that criticize FDI in the banking sector claim that foreign banks have focused on maximizing profits by increasing commissions and fees and by selecting the most profitable customers and leaving the small and medium enterprises out of the credit market. They suggest that

foreign banks do not contribute to developing the domestic market. Consequently, there are constraints for economic growth and development. Furthermore, domestic banks can be more sensible than foreign ones to support central bank policies to expand credit when an economy needs stimulation and contract it when there are signs of overheating (Stiglitz, 2003). Those that support FDI in the banking sector maintain that foreign participation fetches risk diversification, skills, technology, management know-how, and a vital and stable source of capital.

Mexico's unprecedented case of foreign control over its financial system has been part of this debate and was examined. Research performed on the consequences of foreign bank participation suggests that, following the entrance of foreign banks, banking sector outreach performance declined (Beck & Martinez, 2010). Moreover, the positive effects are limited to a recapitalization of the banking sector after the financial crisis, an improvement on the asset quality of Mexican banks, and an accelerated reduction of non-performing loans (Schulz, 2006).

However, research performed on Mexico's case was executed with data from a timeframe (1995-2005) that includes the MFC and post-crisis period. During this time range, the primary Mexican annual loan reference interest rate [TIIE] did not experience levels below 20% until the year 2000. Moreover, it did not stabilize under 10% levels until 2002 (Banco de México, 2018). Figure 1.2 illustrates the TIIE interest rate from the MFC to date.

Consequently, it is possible that previous research performed on Mexico's case was executed during a timeframe in which the market conditions were not suitable for financial development. Hence, previous research findings might have modified when market conditions improved and stabilized. This consideration leads to the first research question for this paper:

(1) Did foreign bank performance trends continued when the interest rates stabilized, and presumably, there were more appropriate market conditions for financial development?

Furthermore, the evidence provided by previous research is limited to the behavior of foreign banks. There is no information on how banks with domestic ownership performed. It is

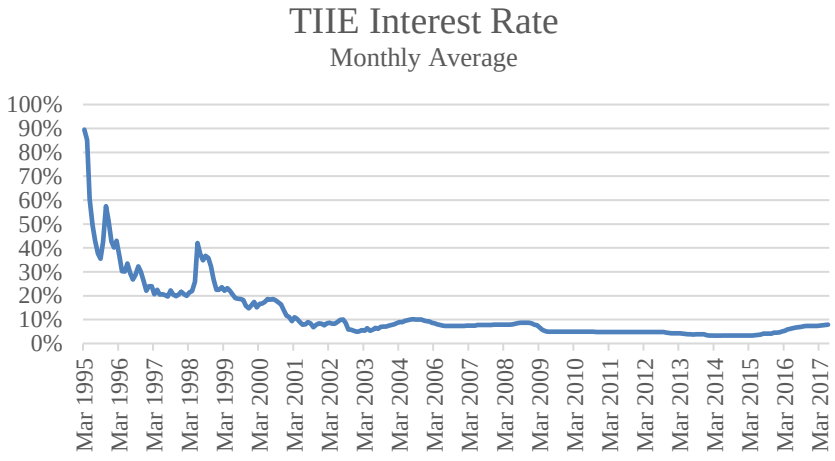

Figure 1.2 TIIE Interest Rate 1995-2018 (Banco de México, 2018)

possible that these banks conducted similarly to foreign banks. Consequently, the origin of a banks' ownership, might not cause differences in performance trends. This second consideration leads to the second research question for this paper:

(2) Has performance in the Mexican banking sector been different between foreign-owned banks and domestic-owned ones?

1.3 Aim and Scope

Foreign bank participation in national banking systems has been a controversial topic since foreign bank participation began increasing in the late 1990's. Several studies have been completed for different countries with different results. In Mexico, research done on the topic suggests that the positive effects are related to a strengthening in the capital of the banking system, but with a decline in banking performance. However, existing investigations were executed during a time range that possibly was not ideal for banking development due to volatile and high-interest rates. Additionally, prior studies do not evaluate if there was a difference in banking performance among banks with Mexican ownership which could lead to imply that foreign ownership was the cause for the decline in banking performance.

This research aims to execute a banking performance analysis on the leading foreign and domestic banks that operated in Mexico during the years 2000 till 2017, distinguishing them by their ownership origin. The objective is to identify if previous findings on foreign banking performance trends continue and if there are differences in pattern behavior between foreign and domestic owned banks.

This study centers on investigating the ten most relevant banks operating in Mexico considering their total assets as of December 2017. As of this date, five of them were owned by foreign entities and the remaining five by Mexican stakeholders.

1.4 Outline of the Thesis

This thesis is organized as follows. Section 2 provides information on relevant theory and concepts regarding financial development and its importance for economic growth, on how financial development can be measured, and lastly, on how financial globalization may affect a national economy. Subsequently, a summary of two studies on foreign bank participation in Mexico is bestowed. Additionally, a multi-country investigation on bank ownership and performance is presented. Section 3 begins by describing the data sources and the data collection procedures used by the institutions responsible for generating the information. Afterward, some clarifications on the criteria employed for this research to select specific data together with uncovered data limitations and inconsistencies are described. Section 4 exposes the specific data and methodology used to calculate different financial development performance indicators along with the tools and procedures utilized to analyze the produced

information. Section 5 presents the results of an empirical analysis by organizing it accordingly to the different financial development measurement perspectives. To close this section, a summary of the results focused on the research questions is submitted. Section 6 confers the main conclusions of this investigation separating them by aim, objective and overall results. Finally, the practical implications of this investigation in conjunction with recommended complementary research are offered.

2 Theoretic and Conceptual Framework

There is disagreement among economists about the role of the financial sector for economic growth. Some economists consider that financial matters are not determinant since enterprise leads and finance follows. Consequently, finance does not cause growth. Other economists believe that finance is so evident for economic growth, that occasionally it is ignored in economic growth discussions (Levine, 2005).

Despite these differences among economists, research clarifying the understanding of finance for economic growth should have policy implications, and research revealing the impact of finance in economic growth should influence the priority policymakers assign to financial sector reforms and policy-making (Levine, 2005). Furthermore, financial structures are varieties of institutions. Efficient institutions are imperative to lower transactional costs, and low transactional costs are essential for economic development (North, 1991). Consequently, research on financial institutions' performance should be of relevance.

Correspondingly, due to the aim and scope intended for this research, the offered theory in this section centers on; (1) Literature supporting the significant role of financial intermediaries in economic growth. (2) Suggested procedures to measure financial development. (3) Previous research practiced on the effects of foreign bank participation, particularly in Mexico.

2.1 Financial development and economic growth

Theoretical reasoning and empirical evidence suggest a positive relationship between financial development and economic growth. Additionally, theory and practice indicate that the development of financial markets has been a critical and an inseparable part of economic growth processes. Moreover, the level of financial development is an accurate predictor of the rates of economic growth and capital allocation (Levine, 1997).

Financial structures and economic growth are inseparably linked. Growth provides the resources for financial structures to exist, whereas financial structures allow higher growth rates since they can allocate capital more efficiently. In an early stage of economic development, financial resources are traded in an unorganized way, and economic growth is slow. However, as income increases financial structures develop, accelerating growth and improving economic performance (Greenwood & Jovanovic, 1990).

Financial structures experience structural change during a developing process. Five different sequential stages can be identified during this process. The differences between each stage are related to the type of services, products, regulation, and agents that configure the financial

market. The more advanced the structure is, the more variety and complexity of its components. Developing countries' financial structures are frequently within the first three stages. Nonetheless, the third stage is the most common one among this type of economies. Foreign financial capital is the primary characteristic that differentiates this stage from previous stages. Developed countries are majorly in the fourth stage. Only a few developed economies are in the last stage (Ocampo, Rada & Taylor, 2009).

Financial systems serve a primary role of facilitating the allocation of resources. However, capital allocation and accumulation by itself does not explain much of long-term economic growth. There must also be resource allocation decisions promoting productivity improvements which majorly depend on how financial systems operate. Moreover, the financial system resource allocation role can be divided into five essential functions; (1) Facilitate risk trading, diversification, and management. (2) Produce information for capital allocation decisions and capital allocation. (3) Monitor investments and require corporate governance where capital has been allocated. (4) Mobilize and concentrate savings. (5) Facilitate the exchange of goods and services (Levine, 1997, 2005). Furthermore, there are relevant differences in which how well financial systems can provide these functions. The performance over these functions frequently influences saving and investment decisions, and consequently economic growth (Levine, 2005).

2.2 Measuring financial development

Most of the literature that seeks to measure the degree of development of the financial sector centers on evaluating the impact that financial structures have in an economy. It is commonly referred to as financial depth (Beck, Demirguc-Kunt & Martinez, 2007). Financial depth represents the size that financial intermediaries have compared to specific economic measures. The different indicators constructed around this relationship are designed to identify the level of services that financial intermediaries provide (King & Levine, 1993; Levine, 2005).

King & Levine [K&L] (1993) propose four indicators to measure financial development. The first one is considered the traditional measurement of financial depth and it consists of the ratio that the liquid liabilities of the financial system have towards GDP. The second indicator makes a distinction between financial intermediaries. It examines the relationship between commercial banks and the central bank. The third and fourth indicators relate to how the financial system distributes its assets. It is calculated in two ways; (1) Credit issued to non-financial private firms divided by total credit (excluding credit to banks), and (2) Credit issued to non-financial private firms divided by GDP. The reason for considering only credit to private firms and exclude credit to financial institutions, government, and state-owned enterprises, is based on the belief that credit to non-financial private firms is furtherly engaged with financial institutions' primary functions (Levine, 2005).

Financial outreach represents a different approach to measure financial development than measurements related to financial depth. Financial outreach refers to the availability and

usage of financial services within the population of a specific region. Measuring financial outreach is important because the presence or absence of financial services can be related to different drivers or constraints associated with economic growth as; (1) Absence of financial services may result in credit limitations. Consequently, there can be inefficiencies in the allocation of capital. (2) Successful new firms requiring financial services are part of the process of economic growth. A greater presence of financial services will expand the opportunities for these firms to exist. (3) Access to finance can contribute positively to technological progress and to the generation of ideas since projects regarding these subjects are financeable. Thus, creativity is incentivized. (4) Access to financial services can be visualized at the level of other basic needs as education, health services and safe water (Beck, Demirguc-Kunt & Martinez, 2007).

Evaluating financial outreach requires considering that access to financial services and usage of financial services are different concepts. Access is related to the possibility of using financial services and usage is related to the actual use of financial services. In some cases, economic agents decide not to use financial services because of sociocultural reasons or costs. Therefore, when measuring outreach, these concepts must be differentiated. Moreover, using estimations that consider the relationship between the number of branches or the number of automated teller machines [ATM] to total population will produce demographic penetration indicators. Alternatively, when the number of branches or ATMs is compared to surface measurements as squared kilometers, the estimations will provide geographic penetration indicators. On the other side, estimations on the number of loan and deposit accounts to population and the average size of loan and deposit accounts to GDP per capita will produce penetration indicators regarding the usage of financial products as deposit accounts and credit services (Beck, Demirguc-Kunt & Martinez, 2007).

2.3 Financial Globalization

Successful international integration supported by national policies and effective international cooperation has been noticeable in most of the modern history cases of countries achieving rapid growth, increase in prosperity and poverty reduction (The World Bank, 2018).

FDI has played a significant role in most of the recent successful development stories. Thus, FDI frequently implies the participation of foreign corporations in local markets, and many times regional competition is severely damaged. When regional competition is weak, and competition laws are not enforced efficiently, international enterprises may misuse their dominant market position and execute non-favorable practices as raising prices and not improving labor conditions. Likewise, in the banking sector, restricting credit to domestic firms has been a customary practice of foreign banks in several developing countries (Stiglitz, 2003).

Furthermore, financial globalization comes with opportunities and risks. Specifically, banking internationalization does not guarantee financial development and stability. International banking can bring improvements in capitalization, liquidity, technology, overall efficiency,

and risk sharing, but only if the institutional environment and policies are adequate. In flawed institutional environments, foreign banks may exclusively collect profits without improving the competitiveness and efficiency of the sector. Additionally, bank globalization can be the cause of transmitting financial crisis between economies (The World Bank, 2018).

Lastly, there are concerns regarding foreign banks and their sensitivity to the local central bank economic guidance. Central banks frequently use the financial system to promote overall credit or direct credit to specific sectors when an economy or sector needs to be stimulated, and to overall restrict credit or solely restrict credit to specific overserved sectors when there are signs of overheating. Foreign banks are less likely to be responsive to these type of maneuvers employed by central banks (Stiglitz, 2003).

2.4 Previous Research

Foreign investment in a national banking system has occurred more frequently since the end of the 1990s, more noticeably in developing countries (The World Bank, 2018). Since then, the debate among economists regarding the consequences of foreign ownership and control of a financial system has nourished. Several studies on this matter have been completed, including specific investigations on developing countries as Mexico's case.

Micco et al. [M&A] (2007) executed research in the relationship between bank ownership and bank performance during 1995-2002 for 179 countries around the world utilizing Fitch-IBCA Bankscope data as their primary source. M&A focused their investigation on commercial banks by separating them into three groups according to the type of ownership; (A) Private domestic, (B) Private foreign, and (C) Public. To evaluate the correlation between bank ownership and bank performance, M&A assembled a regression model in which the standard productivity and efficiency indicator ROA, was defined as the performance dependent variable. The type of ownership together with other variables were considered the independent variables. M&A's main findings were as follows; (1) In developing countries, private-owned banks are not necessarily more profitable than state-owned banks. Yet, in undeveloped countries public banks a less profitable. (2) Foreign banks in developing countries tend to be more profitable than private domestic banks with an average higher ROA of 25%. Nevertheless, this does not occur in developed countries. (3) Foreign banks have lower overhead costs than domestic private banks. (4) In developing countries, foreign banks have a lower employment ratio than domestic private and state-owned banks.

Schulz (2006) performed an analysis of foreign bank entry in Mexico from 1997-2004 in which foreign ownership of bank assets expanded from 16 to 82%. His research aims to study the impact of FDI in the Mexican banking system and the productivity variations during this period for those banks that were acquired by foreign corporations. Schulz uses as his primary data the balance sheet and income statement of the commercial banks obtained from the Mexican banking and securities commission [CNBV]. His methodology consists of analyzing panel data using a two-way fixed effects model with a regression function in which bank productivity is a dependent variable of ownership and other bank-specific control variables.

Schulz's main findings are; (1) The primary contribution of foreign bank FDI during the reviewed period was the recapitalization of the banking sector after the MFC. (2) A second significant contribution was the improvements on Mexican Bank's asset quality. (3) FDI had a positive effect on productivity but failed to improve other productivity drivers. (4) Foreign banks' income increased through interest rate margins and fees, but since costs increased due to provisions for non-performing loans the overall effect was neutralized.

Beck & Martinez [B&M] (2010) examined the impact of bank outreach in Mexico from 1997-2005 by focusing in the five largest banks that had recently been acquired by foreign corporations and the largest domestically owned bank. Their research does not evaluate banks in the traditional way using financial depth measures. B&M instead utilize outreach indicators to measure access to, and usage of, banks services and products. Their aim is to identify how banking outreach changed after foreign bank participation in Mexico. B&M's primary source of data is balance sheets and unaudited information on the number of branches and deposit and loan accounts included in reports provided by the CNBV. Their methodology consists in exploiting the variation in their data along the dimensions of time, banks, and municipalities. They as well introduce some regressions, but since the identification in those estimations is weak, they present them only as suggestive evidence. B&M's main conclusion is that there is a decline in bank outreach since the entrance of foreign banks to Mexico. They state that the evidence shows that banks intermediated fewer deposits and loans, and concentrated their operations in rich and urban areas. Moreover, B&M state that vicissitudes in outreach could relate to the need of banks to reduce inefficiencies built before the MFC. However, they claim that this view is not consistent with other evidence that denotes foreign banks did not experiment an increase in productivity, but they did increase their profitability by charging higher fees. Consequently, M&A suggest that the decline in outreach is linked to a deliberate strategy from foreign banks to focus on the upper and most profitable customers which was possible due to limited competition in the Mexican banking sector. Lastly, B&M advice that further research should be performed to confirm that the patterns encountered continue since their sample period is recent to the MFC.

3 Data

3.1 Source Material

Similarly to Beck & Martinez (2010) and Schulz's (2006) research on bank development in Mexico, the primary data for this investigation consists of monthly and quarterly reports from the CNBV which is the chief regulatory and supervisory authority for banks in Mexico.

Banks that operate in Mexico are enforced to submit electronically, on a monthly and quarterly basis, more than 65 standardized reports to Mexican authorities. These reports consist mainly of information regarding financial and operational matters that, prior to being accepted, are validated by software that searches for inconsistencies and errors. Afterward, several other human-executed validations and auditing processes are performed to corroborate the accuracy of the provided information. Banks are evaluated and scored by the CNBV for the opportunity and quality of their reports and can be severely penalized if irregularities are detected (Comisión Nacional Bancaria y de Valores, 2017).

Once the CNBV has received and automatically validated the information delivered by banks, several standardized individual and grouped reports are generated and publicly distributed through the World Wide Web at www.cnbv.gob.mx. Additionally, the CNBV comparably spreads the scores that banks receive for the quality and opportunity of the provided information.

The CNBV reports utilized for this research are; (1) "Boletín Estadístico de Banca Múltiple" which includes monthly financial statements and performance indicators related to financial statements and (2) "R6. Resumen de número de sucursales, cajeros automáticos, personal, TPV y otros por institución" which covers, among other information, quarterly data for the initial years and monthly data for the recent years, on the number of branches, ATMs, point of sale [POS] machines, credit and debit card accounts, and employees. Both reports include information from December 2000 to December 2017 for all the commercial banks that operated in Mexico during that period. However, for this analysis, a dataset with the ten largest banks considering total assets as of December 2017 was constructed. Table 3.1 illustrates the selected banks.

Mexican Top-10 Banks Considering Total Assets

Current Million Pesos as of December 2017

Bank	Ownership	Total Assets	% Total	% Acum	Ranking
Banking System	**N/A**	**8,935,134**	**100.0%**	**N/A**	**N/A**
BBVA Bancomer	Foreign	1,996,755	22.3%	22.3%	1
Santander	Foreign	1,300,810	14.6%	36.9%	2
Banamex - Citibank	Foreign	1,145,967	12.8%	49.7%	3
Banorte	Domestic	1,055,733	11.8%	61.5%	4
HSBC	Foreign	705,595	7.9%	69.4%	5
Scotiabank	Foreign	451,366	5.1%	74.5%	6
Inbursa	Domestic	369,315	4.1%	78.6%	7
Interacciones	Domestic	216,119	2.4%	81.0%	8
Banco del Bajío	Domestic	186,409	2.1%	83.1%	9
Afirme	Domestic	142,014	1.6%	84.7%	10

Table 3.1 Mexican Top-10 Banks Considering Total Assets (Comisión Nacional Bancaria y de Valores, 2017)

Selecting and ranking banks by its total assets, coincides with the procedure used by Beck et al. (2007), Micco et al. (2007), and Schulz (2006) in previous research. Additionally, it is the criteria employed by the CNBV to organize most reports. Assets usually reflect banks' most relevant activities. As visualized in figure 3.1, banks as intermediaries between depositors and debtors frequently receive monetary resources from depositors that are accounted in the liability section of a balance sheet as deposits and in the asset section as available monetary resources. Subsequently, banks invest or lend those resources, and these operations are reflected in the asset section as investments or loans. Thus, it can be assumed that total assets represent an accurate dimension of banking activities.

The selected banks were also classified with an ownership category (foreign or domestic) that was incorporated into the dataset. The ownership origin was obtained from previous research (Beck & Martinez, 2010; Schulz, 2006). Its present validity was confirmed through an interview with a top-level executive from a Mexican bank.

As of December 2017, five of the selected banks were owned by foreign banks and accounted for 62.7% of the banking sector's assets. The remaining five banks were domestically owned and accounted for 22.0% of the total assets. Subsequently, the representativeness of the selected banks accumulated 84.7% of the banking system's assets. The remaining banks not considered for this investigation were thirty-eight entities representing 15.3% of the total sector's assets.

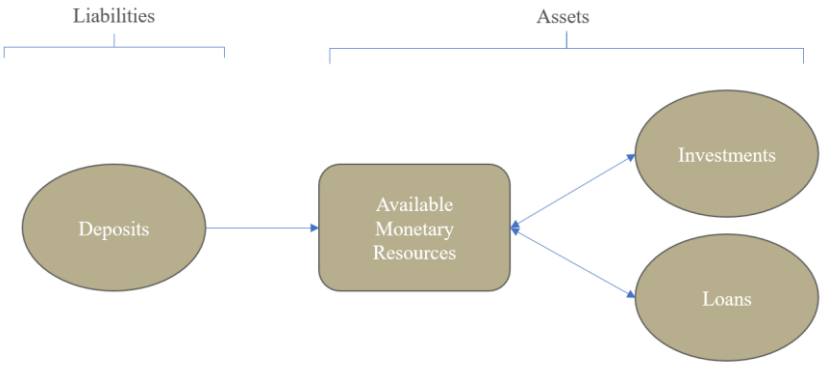

Figure 3.1 Balance Sheet Representation of Main Banking Activities

Furthermore, GDP, price indexes, and population data were obtained from Mexico's National Institute of Statistics, Geography, and Information [INEGI] at www.inegi.org.mx. INEGI is the official authority in Mexico to calculate these indicators. The GDP is estimated quarterly according to international standards. Price indexes are calculated biweekly using December 2010's second half as the base period. Lastly, population is enumerated every five years by census surveys (Instituto Nacional de Estadística y Geografía, 2018).

Currency data from CNBV and INEGI databases was obtained in current Mexican pesos [MXN]. Moreover, it was identified that using constant MXN was more representative for some calculations. Thus, total asset figures were additionally converted to 2010 constant MXN applying INEGI's price indexes.

As specified earlier, population data was available in 5-year intervals. However, since the investigation was executed on a biannual basis, it was assumed that results would be more representative if variations in the population data were considered every six months. Therefore, a linear average growth calculation was executed between each census till the final one in 2015, and population estimations were obtained for the missing periods. For the succeeding semesters, the average semiannual growth between the census of 2015 and 2010 was calculated and adjusted in the same proportion that the average growth reduced between the past two censuses.

Finally, several depth, outreach, and productivity performance indicators were constructed selecting components included in the databases correspondingly with theory and research provided in section 2. The utilized data and the calculation procedures are furtherly explained in the methodology section.

3.2 Data Limitations and Inconsistencies

The CNBV database includes monthly or quarterly information for the period from December 2000 to December 2017. However, some items were incorporated subsequently. Thus, there was missing data for these items in the initial years. In these cases, the timeframe considered for the analysis was reduced to the available period which in most cases initiated in 2009. Contrarywise, some other items as the number of deposit accounts per bank were included up to a specific year and thereafter were not reported. The criteria defined around this inconsistency was to prioritize data included until 2017, and only consider items without updated information if they were meaningful to support arguments on previous research.

Furthermore, due to the extensive monthly data that was available, a periodical selection was determined, and only two periods per year were considered; end of June and end of December. Hence, it is assumed in this investigation that semiannual references are sufficiently significant for evaluating purposes. The contemplated semesters summed 35.

Additionally, while constructing the dataset, it was detected that the CNBV report on the number of branches, number of employees, and number of deposit accounts, considered bank Santander as two separate entities (Santander and Banca Serfín). The explanation for this

discrepancy is that Santander acquired Banca Serfín prior to 2000, but it operated them as separate legal entities and did not unify them until 2005. Therefore, for the years 2000-2004, the data for both banks was grouped and included in the dataset as only one bank.

4 Methods

As clarified in section 1.3 Aim and Scope, this investigation is oriented to provide information that permits defining if findings and trends from previous research, on financial development in Mexico and particularly foreign bank performance, continued during the following years these studies were practiced. The sustaining argument is that the time range considered was recent to the MFC. Possibly, this noteworthy event influenced the results in a form that variated once the crisis's effects diminished. Additionally, this investigation searches to identify if the behavior of domestic owned banks has been different from those held by foreign investors since previous research does not evaluate this possibility.

Consequently, the departing point for the applied methodology in the empirical analysis is grounded on the methods and findings of each particular referred investigation. Moreover, a procedure distinguishing behavior between foreign and domestic banks must be contemplated. Hence, these conditions together with findings obtained in the theoretical investigation regarding measurements for financial development involved applying different methodologies that are explained across this section.

4.1 Financial Depth Measurement

Amongst King & Levin's (1993) proposal to measure financial depth, it was possible to estimate three indicators using information from the databases;

(1) The relationship between liquid liabilities and GDP (BDG Indicator) – Liquid liabilities in the banking sector are related to customer deposit accounts. The CNBV dataset includes two categories for deposits; those that can be immediately accessed by customers which are usually checking and savings accounts and those that are subject to a term to be accessed which are related with investment accounts. To calculate this indicator, both deposit categories were added for each bank. Subsequently, the result was added together with banks that shared the same ownership category. Lastly, the sum of the total deposits per ownership category was divided by total GDP.

(2) The relationship between credit to non-financial private firms and GDP (BPG Indicator) – Credit to non-financial private firms is included in the CNBV dataset in two categories; one for the current loans and another one for the past-due loans. To calculate this indicator, both categories were added for each selected bank. Subsequently, all results for banks sharing the same ownership category were added, and the summation was divided by total GDP.

(3) The relationship between credit to non-financial private firms and total credit (BPC Indicator) – Total credit is included in the CNBV dataset as total current loans and total past-

due loans. These concepts were added together for the overall banking system and replaced GDP in similar calculations as those used for BPG.

Additionally to King & Levin's (1993) proposed financial depth indicators, a fourth depth indicator was calculated considering the relationship between consumption, housing loans, and GDP. King & Levin's (1993; 2005) proposal to use non-financial private credit to measure financial depth is grounded on the argument that the activity of capital allocation to non-financial private firms is higher engaged to the primary functions of financial intermediaries. However, some economists (Dollar, 2013) consider that increasing household consumption can contribute positively to economic growth. As well, housing is related to construction, and performance on credit for housing acquisition is possibly linked to construction activities which have a positive relationship with economic growth (Wells, 1985). Thus, evaluating how banks have performed in consumption and household loans was decided to be relevant for this investigation. The BCG indicator was calculated correspondingly to the BPG indicator with the difference that non-financial private credit was replaced with consumer and household credit.

4.2 Financial Outreach Measurement

Correspondingly with Beck's et al. [B&A] (2007) proposals to measure financial outreach, the following indicators were constructed:

(1) Geographic Branch and ATM penetration indicators – These indicators refer to the number of bank branches and ATMs that are available for every 1,000 km^2. Both indicators are related to financial access. They are estimated dividing the existing branches or ATMs by a region's surface in thousands of square kilometers. For this investigation, the region contemplates the total surface of Mexico. The calculations were implemented for the overall banking system and separately for each ownership category to identify how each group is performing and contributing to the overall indicator. The data on ATMs was only available from 2009-2017. Hence, the analysis was limited to that time range.

(2) Demographic Branch and ATM penetration indicators – Likewise the geographic indicators, these indicators relate to financial access. The calculating procedure was similar to geographic indicators with the difference that, instead of dividing branches or ATMs by the total surface, the division is by the total population expressed in hundreds of thousands. Consequently, these indicators refer to the number of bank branches or bank ATMs that are available for every 100,000 persons.

(3) Credit cards and debit cards per Capita – B&A's proposal suggests measuring financial usage by indicators expressing the association between total loan and total deposits accounts per 1,000 people. However, the CNBV database only includes information on the number of deposit accounts, and this data is only available until to 2010. Yet, the CNBV database considers information on the amount of credit and debit cards accounts from 2009-2017. Credit cards are one of the most typical and massive financial products used by individuals to exploit personal loans. Debit cards

are financial instruments that are an extension of an individual's deposit account to access funds. Thus, utilizing data on these instruments is presumed valid to measure bank outreach usage indicators. Especially for comparisons among banks within the same country where they are equally empowered by regulation to offer these mass financial products. Hence, a modified formula to B&A's indicator proposal was elaborated by dividing the total debit or credit card accounts for each ownership category by the total population expressed in hundreds. B&A's original estimation suggests that the indicator should be obtained for every 1,000 people. Nevertheless, due to a large number of accounts reported in the database, it was determined that the indicator was more straightforward to interpret by using hundreds instead of thousands.

(4) ATM & POS transactions per Capita – B&A proposed some additional financial usage indicators that require information on the average size of deposits or loans. Nonetheless, these concepts were not included in the CNBV database, nor it was possible to calculate them dividing the total amount of deposits or credits by the number of accounts since, as previously explained, there were limitations on the availability of recent data. Still, the CNBV database contains information from 2011-2017 on the number of transactions that were effectuated in ATM and POS machines. ATMs and POSs represent the most common electronic means for the use of debit and credit cards which, as formerly addressed, embody bank's most massive and conventional products. Most likely, indicators using ATM and POS transactions not only reveal trends in the use of financial services but also on the access to financial services. ATM and POS machines imply open-access banking services infrastructure since the usage of these machines can be executed by a customer that withholds a debit or credit card from any bank. It is also feasible that banks that provide a higher number of machines will have a more considerable amount of transactions. Consequently, indicators considering this data will provide information on how banks contribute to bank outreach by allowing any banked individual to access and use financial services through their infrastructure. The indicator utilized for this investigation was calculated by adding the number of transactions on ATMs and POS machines and dividing the result by the total population. Thus, the indicator reflects the monthly transactions on ATMs and POS machines per capita.

Banking outreach through branches, ATMs, and POS machines implies that banks must invest in infrastructure that requires significant monetary resources. Banks, like other business entities, do not have access to monetary resources equally. Presumably, it depends on factors as the economic size of each bank and its shareholders, among other matters. Therefore, it is highly possible that banks invest differently in outreach infrastructure according to their monetary resource capacity. Consequently, comparing the proposed outreach indicators between banks could be biased and guide to incorrect interpretations. Furthermore, it has been argued in this paper that bank's total assets value denotes an adequate dimension of its size and that it is frequently used to compare banks. Under normal circumstances, the size of a bank should be associated with its potential to invest in bank outreach infrastructure, or at least, it should relate to the investment expectations. Thus, additional calculations were performed to aid comparison purposes on the outreach indicators by adjusting them proportionally to the total assets each ownership group possessed at every evaluated point in

time [TAP]. The implemented calculations consisted in dividing each ownership category indicator by a factor that results from dividing the total assets for each category by the total banking system's assets. The procedure implies that adjusted indicators represent an estimation for each ownership category supposing the selected category possessed hundred percent of the banking system's total assets.

4.3 Financial Productivity Measurement

As formerly addressed, the foremost critics of financial globalization claim that foreign banks guide their activities toward profit maximization without contributing to domestic market development. Consequently, there are constraints for economic growth and development. The earlier proposed indicators are mostly related to banks' performance in developing a national financial market, but none of them provide information on their performance to generate profits. Micco's et al. (2007) research on the correlation between ownership and performance proposes a return on assets [ROA] indicator as one of the elements to evaluate profitability and efficiency. ROA is a standard indicator used worldwide to appraise companies. It provides information on how profitable companies are in relation to their total assets. It is estimated by dividing the net income for a specified period by the total average assets for the same period. It is usually converted to an annual rate when the contemplated period is not a full calendar year. Nevertheless, this indicator is already provided in the CNBV database, so no individual calculations were required. However, to calculate the indicator for the ownership category, the indicator for each bank was considered accordingly to the proportion each bank's total assets represented towards the total assets of the corresponding category.

An additional profitability estimation that it is included in the CNBV database, and that is frequently utilized to evaluate companies' performance is the return on equity [ROE] indicator. ROE represents the return rate that stakeholders receive for their capital invested in a company. It is suitable to determine how profitable a business is. Especially when compared to other companies from the same sector or to other investments that have a comparable risk. ROE is estimated by dividing the net income for a specified period by the total average equity for the same period. As ROA, it is generally converted to an annual rate. To calculate each ownership category indicator, a similar procedure was used as that for ROA, but considering the proportions between equities instead of assets.

A third performance indicator offered for this research is related to the association between the individuals each bank employs and it size. One of Schulz's (2006) conclusions on his investigation in foreign bank participation in Mexico is that the effects on employment level seem to be negative. Yet, he suggests that his findings lack statistical significance. Also, it is not clarified in his paper what methodology he follows to analyze employment levels. Schulz does reveal some calculations with employment data but mostly directed to understand variations in employee productivity. However, Micco's et al. (2007) research does address this issue and suggests that employment levels should be compared to total assets. Thus, with information on the number of employees included in the CNBV database for the complete timeframe, an employment ratio was calculated by dividing the total quantity of employees by

the total assets expressed in billions of 2010 constant MXN. M&A's paper does not specify the currency employed for his estimations. Due to the source of his primary data, it is highly possible that it was in USD. Nevertheless, for the calculations in this research, it was determined that using constant MXN was valid since there are no comparisons between countries. Additionally, it was defined that fractioning the amounts to billions of MXN produced and indicator easier to comprehend. Lastly, separate estimations were obtained for each ownership group.

4.4 Data Analysis Procedure

After all concepts in the CNBV and INEGI databases required to calculate financial development indicators were identified and the estimation formulas were defined, the calculations were performed biannually for the complete 2000-2017 timeframe. Subsequently, a comparative trend analysis on the dataset and indicators was performed considering two perspectives; (1) Evolution patterns during the timeframe for each ownership category and (2) Differences in patterns between ownership categories. Under each perspective, a distinct significance was conferred to the time range that concurred with previous research from that of subsequent periods. Furthermore, the following questionnaire was implemented to guide the analysis and results correspondingly with this investigation's main objectives:

(1) Can the trends identified in previous investigations be detected in the time range that overlaps with each research?
(2) Do the trends identified in previous investigations continue after the time range considered for each research?
(3) Is there a difference in trend behavior between foreign and domestic owned banks for the time range considered in previous studies?
(4) Is there a difference in trend behavior between foreign and domestic owned banks for the time range after that considered in previous studies?

Additionally, to aid the process of analyzing the produced indicators, among other analytical tools, the following ones were commonly utilized:

(1) Relative ratio calculations for the development of the indicators during the timeframe using the first available period, usually December 2000, as the base period.
(2) Shredding and representativeness calculations per category and period to determine the contribution and impact of each element to the identified trends.
(3) Crossed analysis of financial depth indicators and their calculating components with the other indicators produced and their components.
(4) Graphical and chart representations.

Furthermore, to assist in the interpretation of results and trends, some of the indicators and analytical tools were discussed with a top-level bank executive with more than 25 years of experience in the Mexican banking sector.

Once the analysis for each indicator was performed and the trends and variations were identified accordingly to this investigation's objectives, a report revealing these findings, the possible explanations, and their relationship with literature review together with previous research, was executed. The succeeding section corresponds to the referred report.

5 Empirical Analysis

Foreign bank participation experienced significant variations after the MFC. In the upcoming years to the crisis, due majorly to government decisions formerly revealed, the trend towards an increasing participation of foreign banks in Mexico was remarkable. As it can be appreciated in figure 1.1, in a five-year period between 1997-2002, the banking system nearly inverted its structure in relation to the ownership origin of the banks that integrated it. However, this trend reversed, and during the past 15 years, the relevance of foreign banks has gradually reduced. By the end of 2017, foreign banks accounted for 67% of the total sector's assets meanwhile in 2002 they represented 82% of the banking system. Inversely, domestic banks increased their representativeness from 18% to 33% during the same period.

Regarding the ten banks selected for this investigation, the pattern behavior was analogous. Figures 5.1 and 5.2 offer a graphical representation of the development these banks experienced during the past 17 years. As it can be observed, after the year 2006 there is a decreasing trend in the proportion these foreign banks represent from the total banking system; reducing from 74% to 63%. This trend is not only evident for total assets; total credits and total deposits have similar behavior.

On the other side, the selected domestic banks experienced an increasing trend. Not only Banorte, which was the only prominent bank that remained domestically owned after the MFC, nearly duplicated its representativeness in the sector. Also, some other domestic banks established after the late 1990's financial reforms, continuously gained relevance and market share. As of December 2017, the selected domestic banks represented 22% of the total sector's assets while in 2000 they accounted for less than 11%.

Even though these are noteworthy findings, market-share and asset-representativeness analysis are not the central objective of this investigation. Instead, several indicators have

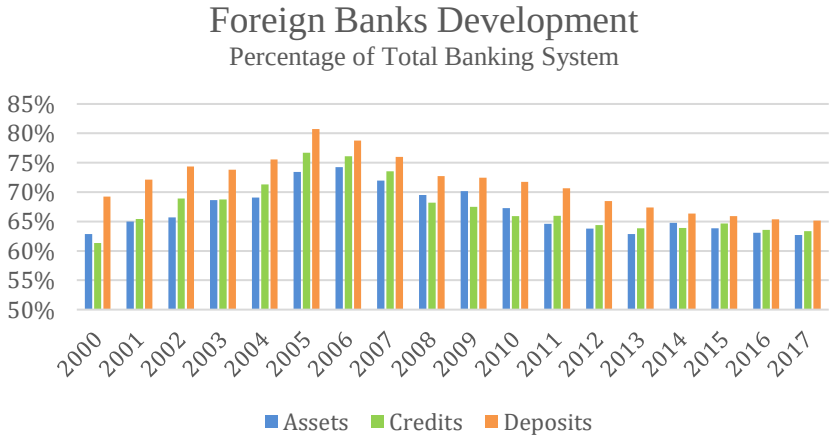

Figure 5.1 Foreign Banks Development 2000-2017 (Comisión Nacional Bancaria y de Valores, 2000-2017)

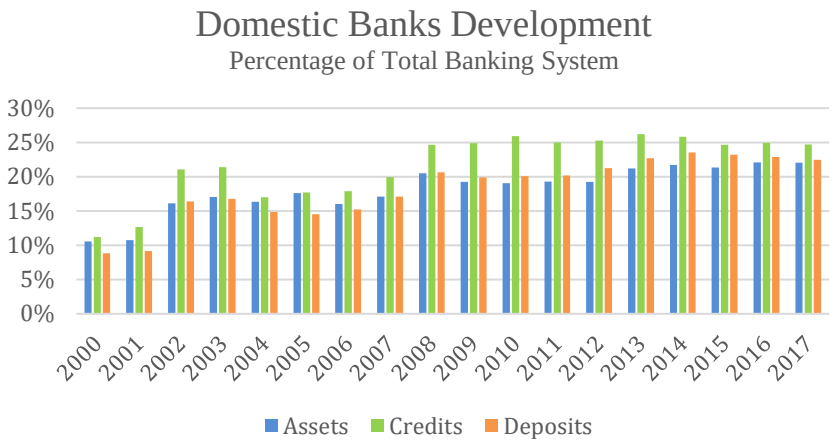

Figure 5.2 Domestic Banks Development 2000-2017 (Comisión Nacional Bancaria y de Valores, 2000-2017)

been proposed throughout this paper to evaluate bank performance correspondingly with the provided theory and previous research. The following part of this section will present the most important results and findings by organizing them correspondingly to the different measurement perspectives. Additionally, meanwhile the most significant findings are revealed, it is also discussed how they relate to theory and research provided throughout this paper.

5.1 Financial Depth Results

Across the methodology section, four different financial depth indicators were proposed to measure financial depth. As it can be visualized in figure 5.3 and the charts provided in Appendix A, from the four indicators, only those related with private non-financial credit (BPG and BPC) reveal a decreasing trend in foreign bank financial depth as manifested in previous research. Foreign banks experienced a decline in credit to non-financial private firms proportionally to GDP and to total credit during the 2002-2005 period. However, the trend eventually reverses, and by the year 2006, all previous reductions have been recovered. From there on BPG and BPC denote a positive trend. Similarly, BDG and BCG indicators reveal a positive trend for foreign banks during the overall period, but without experiencing a decrease in the initial years. Hence, concerning deposits and consumption and housing loans, the trends are inconsistent with previous research findings.

Moreover, as anticipated in the research problem section, negative trends encountered in previous research reversed in the subsequent years, and foreign banks contributed positively to financial development measured by depth indicators. Likewise, the change in pattern behavior in the indicators does not occur until some years after TIIE reaches levels under 10%, which is consistent with this research's question suggesting that foreign banks could have improved their performance on financial development once there were more appropriate market conditions.

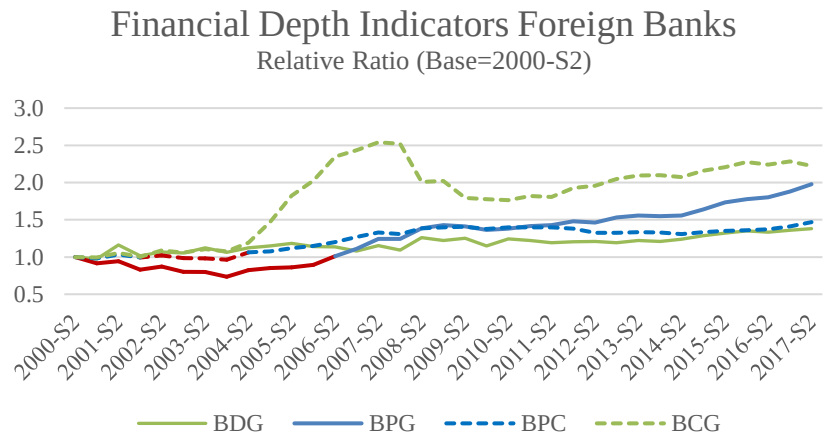

Figure 5.3 Foreign Banks Financial Depth Indicators Relative Ratio (Comisión Nacional Bancaria y de Valores, 2000-2017; Instituto Nacional de Estadística y Geografía, 2018).

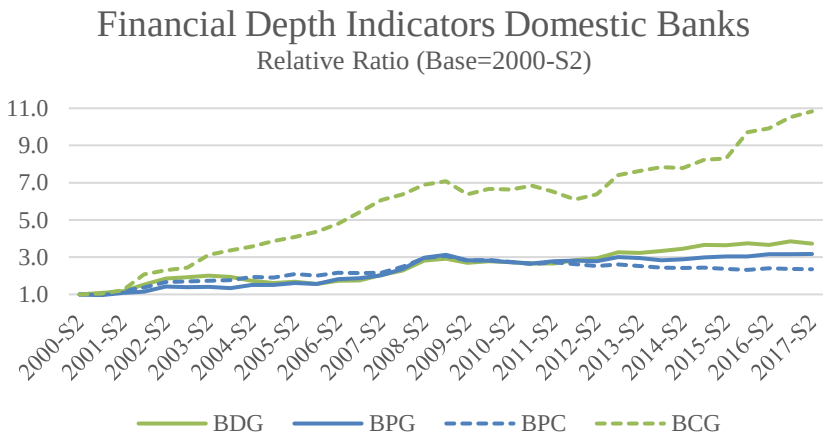

Figure 5.4 Domestic Banks Financial Depth Indicators Relative Ratio (Comisión Nacional Bancaria y de Valores, 2000-2017; Instituto Nacional de Estadística y Geografía, 2018)

Abbreviation Recap: [BDG] Bank Deposits to GDP, [BPG] Bank Private Non-Financial Credit to GDP, [BPC] Bank Private Non-Financial Credit to Total Credit, [BCG] Bank Consumption and Housing Credit to GDP

Concerning differences in pattern behavior between foreign and domestic owned banks, it can be observed in figure 5.4 that domestic banks did not experience a negative trend in non-financial private credit during the initial years of this investigation. The trend on all indicators is positive for the entire timeframe. Moreover, proportionally to the initial indicators each ownership category had, domestic banks experienced higher growth rates than foreign ones. This finding possibly reinforces arguments against foreign bank participation in Mexico stated in previous research. However, if this ought to be used for a discussion, it must be pondered that the charts bestow relative ratios using 2000 as the base year. Most of the domestic banks included for this research were founded scarcely some years before that date. Business entities that are recently founded frequently experience constant and high growth rates since the comparative base to make these calculations is relatively low.

Furthermore, regarding the differences in performance behavior during the overall time range between each ownership category. It can be observed in the cumulative contribution to growth

charts included in Appendix A, that by the end of 2017 foreign banks had outperformed domestic ones in the overall period. Nevertheless, domestic banks had a better performance during most of the evaluated years, especially with non-financial private loans. This fact becomes especially relevant when contemplating that domestic banks were significantly inferior in the size of their assets compared to foreign banks. Domestic banks, with a much lesser size, outperformed foreign banks during most of the evaluated period and, except for the BCG indicator, they almost contributed as much to the overall indicators' growth as foreign banks did.

Theoretical findings advise that foreign banks might incline to profit maximization by selecting the most profitable customers and leaving medium and small companies out of the credit market. Previous research by Beck & Martinez (2010) proposes that their findings guide to believe this happened in Mexico due to the limited competition in the banking sector. The offered evidence on domestic banks outperforming foreign ones during many years with non-financial private credit could be related to these findings. Foreign banks following a deliberated strategy to focus only in the most profitable entities can be related with them experiencing an inferior performance than domestic banks in BPG and BPC indicators for most of the evaluated period. However, theory also suggests that medium and small firms are laid out of the credit market which seems inconsistent with domestic banks' positive performance in BPG and BPC indicators. Most likely, if foreign banks in Mexico followed a strategy to center in the most profitable customers, the evidence indicates that entities left out of the credit market by foreign banks could have received credit services from domestic banks. It is necessary to complete a more in-depth analysis of private credit development to confirm these suppositions. Nevertheless, even though if this were to be true, the most relevant issue is that foreign banks eventually reverted this trend. Possibly, competition from domestic banks in private loans improved Mexico's credit market and reduced the adverse effects suggested in theory.

Lastly, it is also visible in the provided charts that between 2008-2010 there is a pattern behavior variation in credit-related financial depth indicators. It is furtherly notable for foreign banks with consumption and household loans. During 2008 the world experienced what is referred to as the World Financial Crisis which originated in developing countries and spread to some developing ones. A central cause of this crisis was the type of financial instruments that banks were investing in (Griffith-Jones, Ocampo & Stiglitz, 2008). Although Mexican banking regulation did not authorize banks operating in the country to hold or transact with those financial instruments (Comisión Nacional Bancaria y de Valores, 2005), it is probable that the observed pattern behavior is related with this financial crisis. As suggested in theory, globalization can transmit crisis between economies. Thus, it is highly possible that banks' performance in Mexico was negatively affected by a foreign crisis even though the central causes for that crisis were not present in the country.

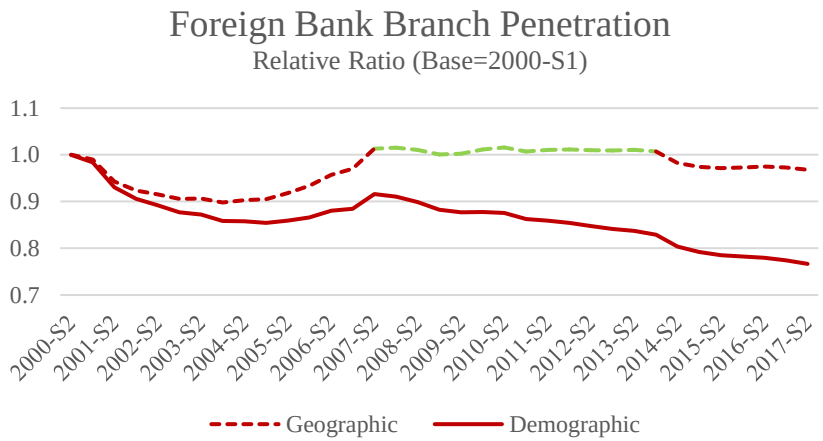

Figure 5.5 Foreign Banks Branch Penetration Relative Ratio (Comisión Nacional Bancaria y de Valores, 2000-2017; Instituto Nacional de Estadística y Geografía, 2018)

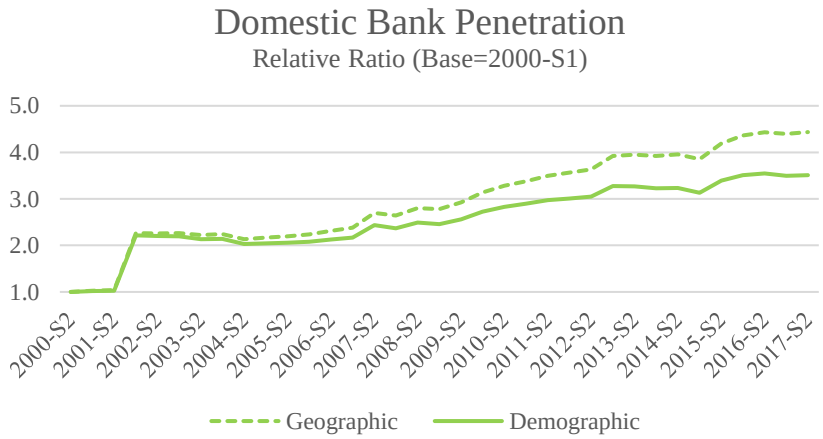

Figure 5.6 Domestic Banks Branch Penetration Relative Ratio (Comisión Nacional Bancaria y de Valores, 2000-2017; Instituto Nacional de Estadística y Geografía, 2018)

5.2 Financial Outreach Results

Throughout the methodology section, seven different outreach indicators were proposed. However, outreach data that overlaps with previous research was only available to evaluate banks on branch outreach performance. Figures 5.5 and 5.6 together with the four first charts included in Appendix B, present a graphical representation of branch penetration indicators through the reviewed time range, distinguishing between foreign and domestic ownership. It is clearly noticeably in all charts that there is a decline in outreach performance for foreign banks; both in geographic as in demographic indicators. This decline is not only evident in the same timeframe as previous research confirming their findings. It is also manifest in the overall period. Foreign banks did not only underperform by not sustaining the same ratio of branches towards total population; the ratio of total branches towards total surface reduced which indicates that foreign banks had fewer branches operating at the end of the reviewed period.

Contrarywise, domestic banks did have a positive contribution to geographic and demographic branch penetration. The overall growth in the number of branches was nearly 4.5 times which represents more than 1,800 new offices in a 17-year period. However, when these figures are compared to the total growth in the number of branches of the sector, it outstands that the selected domestic banks were not the largest contributors since the total growth in the banking system was above 5,700 branches. While reviewing the CNBV database to understand this growth, it was identified that three domestic banks linked to business groups in the retail-store industry contributed with more than 3,300 branches by opening bank offices in many of their storehouses.

Furthermore, the evidence bestows that sectorial geographic and demographic branch penetration in the Mexican banking system improved in the past 17 years. Hence, it was domestic and not foreign banks that contributed to this growth. Previous findings on foreign banks' declining trend in branch outreach are manifest. Moreover, the trend continued during the upcoming years. Nevertheless, the indicators on branch penetration remained higher for foreign banks during the complete period, and by the end of 2017, they were more than 2.5 times those of domestic banks. Foreign banks might not have contributed to improving branch outreach, although, they operated a branch infrastructure that proportionally to population and GDP was much larger than the one offered by domestic banks. However, when the branch penetration indicators are TAP adjusted, the figures are favorable for domestic banks. By the end of the timeframe, domestic banks' branch penetration indicators are nearly 10% higher. Consequently, domestic banks not only contributed with the new branches in the sector but since 2015 they have been operating more branches than foreign ones proportionally to the total assets each ownership category controls.

When analyzing branch penetration, it is important to consider that branches represent the traditional mean for banks to access their customers, but most likely, it is the costliest mean for banks to provide services to their customers. Technological improvements are commonly used to increase productivity and might trigger structural transformation (Chenery, Robinson & Syrquin, 1986; Kuznets, 1973). The banking sector has not been different from other industries around searching technological improvements to increase productivity. Presumably, banks have examined other less costly and more efficient means to provide their services. ATMs, POS machines, credit and debit cards, and more recently internet and mobile-phone banking attest how banks are using technology to increase productivity. Consequently, it can be expected from banks with already existing large branch infrastructure relatively to that of their competitors, that they will exploit other less expensive and efficient bank outreach means to increase access to, and usage of, banking services. The outreach results that are presented in the following part of this section refer to those modern means. It is necessary to evaluate how banks have performed in increasing outreach through these means to comprehend their overall performance in bank penetration.

As it can be visualized in figures 5.7 and 5.8, foreign banks positively contributed to financial outreach throughout the entire timeframe. Foreign banks not only increased their ATM infrastructure, but they also were capable of providing a higher ratio of ATMs per capita as the country's population expanded. During the 9-year period there was available data to calculate these indicators, foreign banks duplicated their number of ATMs representing the location of more than 17,000 machines. Regarding domestic banks, the trend was also

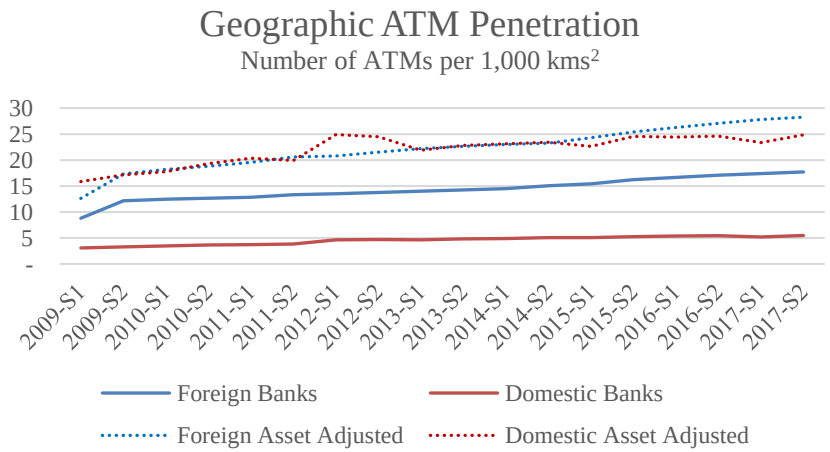

Figure 5.7 Geographic ATM Penetration (Comisión Nacional Bancaria y de Valores, 2009-2017; Instituto Nacional de Estadística y Geografía, 2018)

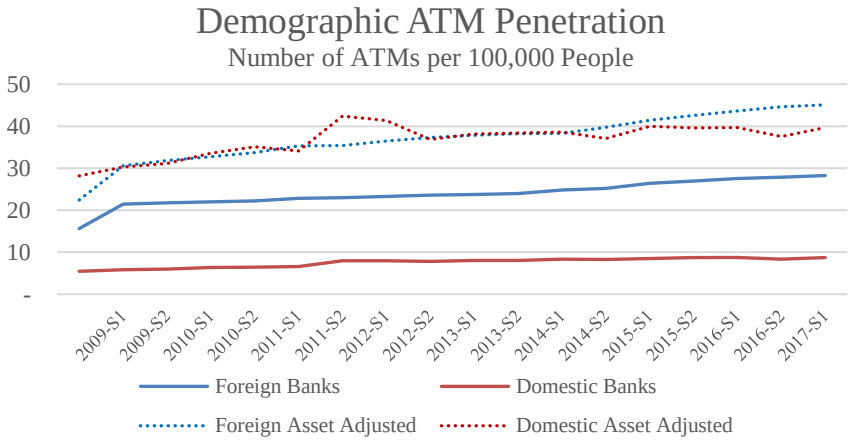

Figure 5.8 Demographic ATM Penetration (Comisión Nacional Bancaria y de Valores, 2009-2017; Instituto Nacional de Estadística y Geografía, 2018)

positive for both indicators. Though, they were not as efficient as foreign banks and only increased their infrastructure in 1.8 times. Even if the indicators are TAP adjusted as proposed in the methodology section, domestic banks had a shoddier performance than their counterpart.

As specified earlier, geographic and demographic indicators on bank branches and ATMs refer to how banks provide access to banking services. Conversely, debit and credit cards relate to how population uses financial services. Figures 5.9 and 5.10 present the evolution that debit and credit card penetration indicators experienced during the past nine years. As it can be observed, foreign banks had an overall improvement in debit card penetration. Nonetheless, this did not happen with credit cards. It is also notable that debit card penetration had a maximum level in the first semester of 2014, and from there on outreach declined gradually. Domestic banks experienced a similar pattern behavior in debit card penetration. Even when the indicator is TAP adjusted, the results between both ownership categories are almost identical.

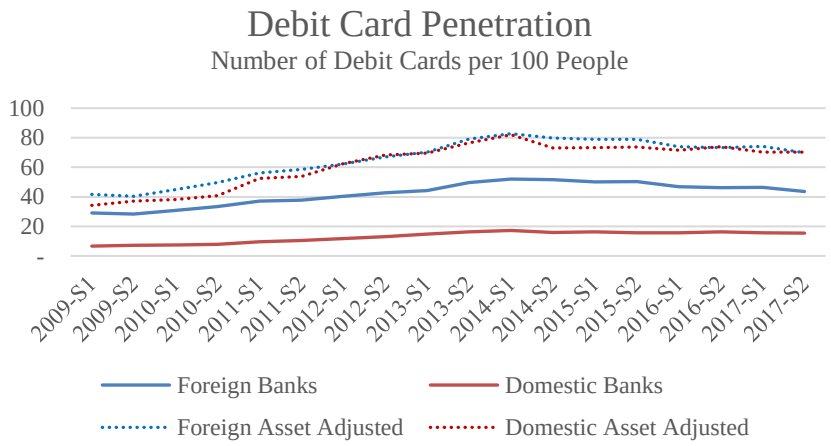

Figure 5.9 Debit Credit Card Penetration (Comisión Nacional Bancaria y de Valores, 2009-2017; Instituto Nacional de Estadística y Geografía, 2018)

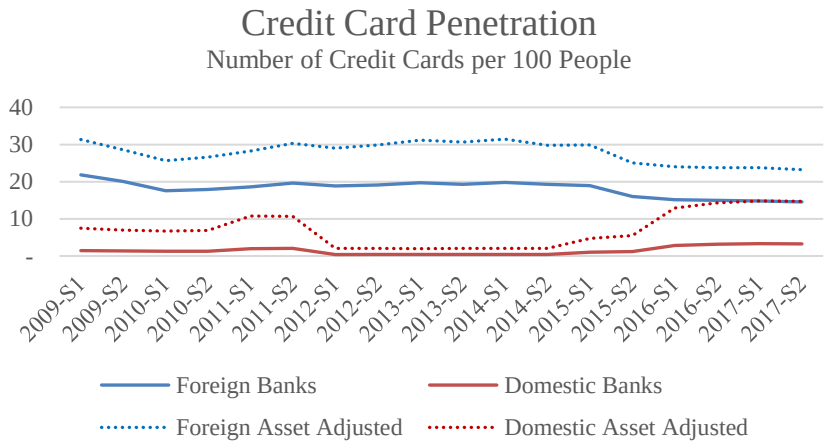

Figure 5.10 Credit Credit Card Penetration (Comisión Nacional Bancaria y de Valores, 2009-2017; Instituto Nacional de Estadística y Geografía, 2018)

Furthermore, while debit card penetration was reviewed for the entire banking sector to understand why it declined for the selected banks during the last three years, it was identified that the overall sector experiences a decline after 2014 but in a much lesser proportion. Moreover, the sectorial indicator denotes a superior performance than that of the reviewed banks. Similarly to branch outreach, the explanation relies on the group of domestic banks with operations in retail stores which had an outstanding performance and contributed with nearly 50% of the sector's debit card growth. Most likely, the positive results these banks experienced increasing their debit card customers is correlated with the extensive branch network they incorporated into the banking system.

Domestic banks, differently than foreign ones, did improve outreach through credit cards. While foreign banks had a total reduction of 6.2 million accounts, domestic ones more than duplicated their accounts by incorporating nearly 2.4 million accounts during the complete time range. However, the overall figures of the banking sector display a reduction of almost one million credit cards. It is not clear what motivated foreign banks to reduce their exposure to credit card accounts. When the data was analyzed individually for each bank, it was identified that the reduction mostly originates from two banks that are the leading credit card

issuers in Mexico; BBVA-Bancomer and Banamex-Citibank. Additionally, it was possible to detect two periods in which this reduction was more noticeable; 2009-2010 and 2015-2017. The 2009-2010 period concurs with prior findings on the decline of non-financial private credit. Thus, a possible explanation is a contamination from the world financial crisis. Moreover, during this period higher credit card past-due ratios were noticed which could have been a motivation for banks to reduce exposure. On the 2015-2017 period, an increase in past-due ratios was not identified. The only significant finding is that by the end of 2015 the Mexican central bank initiated to rise referential interest rates and by December 2017 the TIIE had already increased from 3.32% to 7.51% (Banco de México, 2018). Variations in referential rates affect credit cards' interest rates, and credit cards' past-due ratios can be very sensitive to interest rate variations. Thus, the decrease in credit card outreach might be related to a strategy these banks are following to avoid increasing past-due ratios. However, other foreign banks and domestic ones apparently are not following a similar strategy.

The last proposed outreach indicator is associated with how many transactions per month are individuals, with debit or credit accounts, completing in the ATM and POS open access network banks offer. As previously addressed in the data section, only two periods per year are considered; June and December. As it can be visualized in figure 5.11, there is a notable variation between each semester that most likely is related to an existing seasonality in goods consumption. December, due to Christmas holidays, is frequently a month with the highest annual levels of goods consumption. Possibly, this effect is reflected in ATM and POS transactions.

In the overall period, foreign banks denote a positive trend in transaction penetration which is consistent with trends in ATM and debit card penetration indicators. It can be presumed that if banks increase ATM and POS infrastructure together with additional debit card customers, more transactions per capita will be completed. However, when reviewing the provided charts, it is also perceivable that the positive trend triggers until 2014 which is inconsistent with ATM and debit card penetration trends during 2011-2014. Possibly, infrastructure arose first, and usage befell some years later. Furthermore, the Mexican central bank and banking authorities have compelled banks that operate in Mexico to lower fees in many of their services including those related to ATM and POS transactions. Some new regulations merged

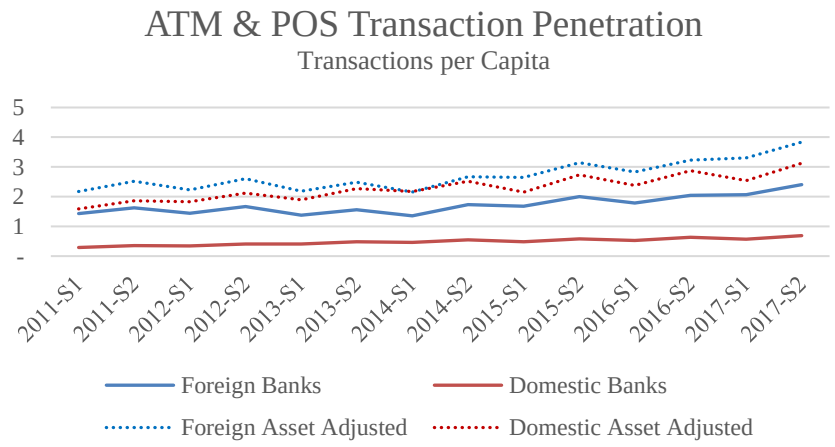

Figure 5.11 ATM & POS Transaction Penetration (Comisión Nacional Bancaria y de Valores, 2011-2017; Instituto Nacional de Estadística y Geografía, 2018)

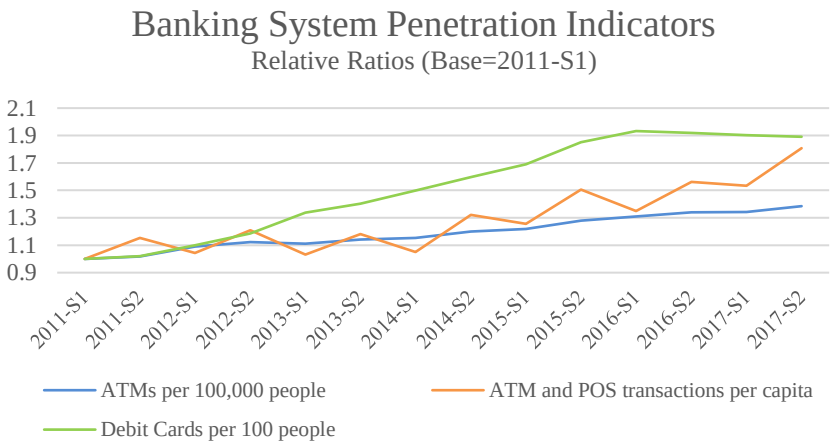

Figure 5.12 Banking System Penetration Indicators (Comisión Nacional Bancaria y de Valores, 2011-2017; Instituto Nacional de Estadística y Geografía, 2018)

which even prohibit banks to charge certain types of fees. As an example, fees on cash withdrawals where the ATM and debit card belong to the same bank are illegal (Banco de México, 2010). It is then possible that these policies gradually had an effect and motivated a higher usage of ATM and POS machines.

Domestic banks' pattern behavior is similar to that of foreign ones but at a much lesser level. Even if the indicator is TAP adjusted, foreign banks overperform domestic ones in transaction penetration. Possibly, if debit cards transactions from customers of domestic banks linked to retail-stores are considered, domestic banks' TAP indicators are comparable to that of foreign ones.

Lastly, it can be perceived from figure 5.12 that ATM and POS transactions for the overall banking sector experienced higher growth rates than ATM infrastructure. It is similarly visible that since 2014 the trend for this penetration indicator is more favorable than debit cards penetration. These trends possibly reflect there is a transformation occurring in the usage of banking services. Customers might be moving towards using electronic means more than traditional ones. Further analysis of these and branch transactions is required to confirm this presumption.

5.3 Financial Productivity Results

Arguments against financial globalization encountered in theory propose that foreign banks may only seek profit maximization when participating in a national banking system without improving the competitiveness and efficiency of the sector. Previous investigations on foreign bank participation in Mexico state that evidence guides to conclude this is occurring. While reviewing ROA and ROE performance indicators, and as it can be observed in figures 5.13 and 5.14, it is not possible to confirm previous findings since there are mixed results within the period that overlaps with previous studies. When the data was reviewed individually, it was identified that the indicators variate significantly between each bank.

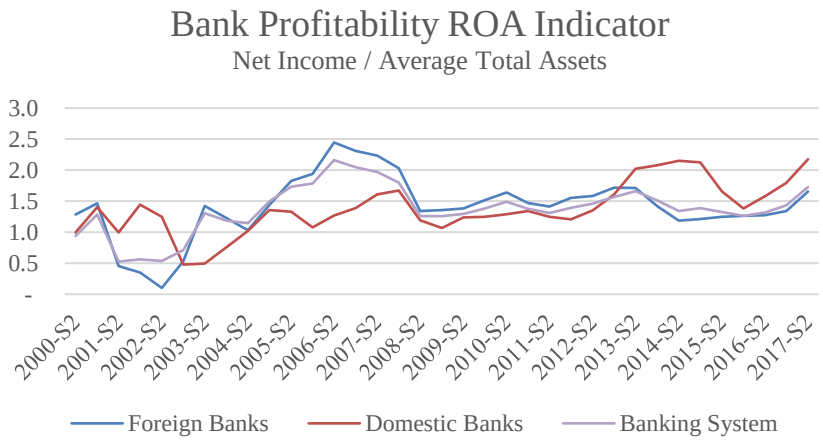

Figure 5.13 ROA Performance Indicators (Comisión Nacional Bancaria y de Valores, 2000-2017)

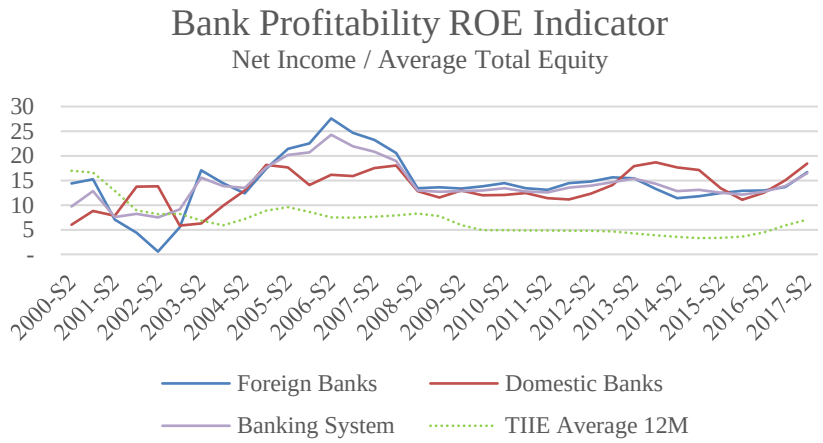

Figure 5.14 ROE Performance Indicators (Comisión Nacional Bancaria y de Valores, 2000-2017)

Some foreign banks even experienced losses during 2001-2003. Additionally, when comparing ROE to the average TIIE rate, which frequently reflects the return rate expected for Mexican government secured bonds issued in local currency, the ROE indicator was underneath it. Consequently, the data and methodology utilized for this research contravene previous findings. Foreign banks' profitability performance, at least when they are considered a group, was inconsistent and even modest during some years considered in previous research. Possibly, conclusions suggesting that foreign banks were merely profit oriented are not entirely accurate.

Furthermore, as of December 2003 foreign banks' profitability performance improves and reaches its highest point in December 2006 with a ROA of 2.5% and a ROE of 27.6% representing almost four times TIIE rates. For the overall time range, ROA averaged 1.4% and ROE 14.5%. Moreover, TIIE rates averaged 7.0% implying that profitability rates obtained by foreign bank stakeholders were twice as much as if they had invested in Mexican government secured funds.

Conceivably, average ROA and ROE indicators can be perceived high for international standards, especially if compared to those that are conventionally seen in developed economies. Nevertheless, these comparisons tend to be relative and biased. A deeper analysis

is required to come to objective conclusions. Most likely, it should compare risk exposure divergences between investments in different sectors and different countries. However, this research does not extend till that span. What was reviewed in this investigation was whether domestic banks had a different pattern behavior. Moreover, as it can be observed in the provided charts, domestic banks' profitability was equivalent to that of foreign banks during the evaluated time range. There are differences in some years, but these differences ensue in both directions, so the overall behavior is similar. The average ROA for domestic banks accounted 1.4% and ROE 13.5%. Consequently, highly profitable or not, banks in Mexico had a similar behavior independently of their ownership category. Thus, profitability performance is possibly more related to other factors different from ownership origin. Moreover, discussions suggesting that foreign banks in Mexico are merely profit-oriented seem to be only one part of the storyline.

Finally, among the different indicators proposed for this research, the last one is related to how banks have performed towards generating employment. As it can be perceived in figure 5.15, there is a declining trend in the employment ratio not only within the foreign ownership category; domestic banks had a similar pattern behavior.

Schulz (2006) reports that the effects on employment rates from foreign bank ownership in Mexico are negative which is consistent with the negative trend observed in foreign banks' employment ratio. However, Micco's et al. (2007) research concludes that foreign banks tend to have lower employment ratios than domestic ones in developing countries. This was not the case for Mexico. Within the 2000-2002 timeframe that overlaps with M&A's research, foreign banks had higher employment ratios than domestic banks. Moreover, the difference between ownership category was higher for that period than for any other subsequent period. Most likely, Mexico's figures do not have significant representativeness in M&A's overall numbers. Therefore, their conclusions differ from the evidence provided in this investigation.

Furthermore, the gap between employment ratios for each ownership category reduces significantly over the evaluated time range. By 2017, it only represented a difference of 1.9 percentage points. Perhaps, understanding this behavior requires considering that all foreign banks selected for this research are the result of FDI that was employed to purchase existing

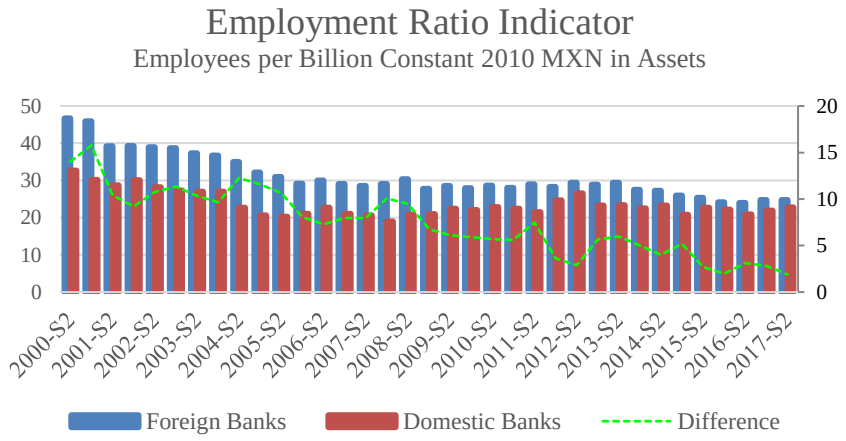

Figure 5.15 Employment Ratio Indicator (Comisión Nacional Bancaria y de Valores, 2011-2017; Instituto Nacional de Estadística y Geografía, 2018)

foremost banks in Mexico (Schulz, 2006). On the other side, the selected domestic banks, except for Banorte, are entities that were created a few years before the period this study considers. It is highly conceivable that banks purchased by foreign investors had existing significant employment ratios and personnel inefficiencies, while most domestic banks initiated with minimum employment ratios and few inefficiencies. Hence, the indicator comparison between ownership categories is feasibly more representative in the later years. Albeit, in the overall period the evidence denotes that foreign banks had higher employment ratios than domestic ones. Consequently, they provided more employment relative to their total assets.

Lastly, the provided charts bestow a clear trend in the selected banks to employ less personnel in relation to asset size. The employment ratio reduced 47% for foreign banks and 30% for domestic ones. It is evident in these figures that banks achieved significant productivity gains. Moreover, these productivity gains together with other findings addressed in this section on how banks and customers are adopting outreach means based on technological improvements indicate that, almost certainly, the Mexican banking system is experiencing a structural transformation process.

5.4 Summary of Results

Throughout this section, several bank performance indicators related to depth, outreach, and productivity were presented. The main findings regarding each individual and group of indicators were discussed. However, this research aims to bestow an overall picture of how foreign banks in Mexico performed, and identify if there were differences in performance between foreign and domestic banks. Moreover, consistently with the research problem stipulated in this investigation, several questions specified in the methodology section were formulated to guide the analysis. Table 5.1 provides a summary of the results that were obtained when each question was formulated while analyzing each indicator's behavior.

As it can be visualized in the provided table, the pattern behaviors detected in previous research on Mexico is noticeable for most of the indicators. BDG, ROA and employment ratio bestow some inconsistencies with previous research as formerly addressed, but for some years the trend is evident. Nonetheless, except for branch penetration indicators, all the trends described in previous research eventually reverse or at least had mixed results after the period considered in previous research. The evidence denotes that the general performance of foreign banks improved after the timeframe considered in previous research. Possibly, as it was proposed in this paper, previous research was executed too close to the MFC. Perhaps, it was required that a longer period elapsed to reach more certain trend patterns. Most likely, the MFC post-crisis effects and the high-interest rates that the country experienced for some years, influenced negatively on foreign bank performance.

Additionally, it can be perceived from the provided table that domestic banks mostly had a similar pattern behavior than foreign ones, even during the period considered in previous research. Presumably, Mexico's case on foreign bank participation shaped the country's

Research Problem Oriented Questionnaire

Visual Interpretation of Results

Financial Depth Indicators	Q-1	Q-2	Q-3	Q-4
Deposits to GDP (BDG)				
Private Non-Financial Credit to GDP (BPG)				
Private Non-Financial Credit to Total Credit (BPC)				
Consumption and Housing Credit to GDP (BCG)				

Financial Outreach	Q-1	Q-2	Q-3	Q-4
Geographic Branch Penetration				
Demographic Branch Penetration				
Geographic ATM Penetration				
Demographic ATM Penetration				
Debit Cards Per Capita				
Credit Cards Per Capita				
ATM and POS Transactions Per Capita				

Financial Productivity	Q-1	Q-2	Q-3	Q-4
Return on Assets (ROA)				
Return on Equity (ROE)				
Employment Ratio				

Yes No Mixed

Q-1 Can the trends identified in previous investigations be detected in the time range that overlaps with each research?
Q-2 Do the trends identified in previous investigations continue after the time range considered for each research?
Q-3 Is there a difference in trend behavior between foreign and domestic owned banks for the time range considered in previous studies?
Q-4 Is there a difference in trend behavior between foreign and domestic owned banks for the time range after that considered in previous studies?

Table 5.1 Research Problem Oriented Questionnaire Results

banking system in many matters. However, the evidence displays that the ownership origin has not been a distinctive factor in determining banks' performance. Conceivably, other sectoral and national conditions have been more influential. As suggested previously in this investigation, the declining trends in foreign bank performance identified in previous research are possibly not related to ownership's origin.

6 Conclusions

6.1 Research Overall Results

Mexico's case on foreign bank participation is unprecedented. Most likely, there is not any other case in the word in which the ownership origin of a country's banking system changed so rapidly and significantly. At least not for a nation with the size of an economy as that of Mexico. It can be expected from an event like this one, that it will trigger many discussions and controversy around it. Almost certainly, this situation motivated research on foreign bank participation in Mexico as those addressed throughout this paper.

Furthermore, as the world has become more global, many individuals and groups have criticized the effects of globalization. A current of thought against globalization is evident in many instances in today's modern world. Possibly, nationalism issues and the fear to change encourages many critics towards globalization that are frequently not well founded and objective. However, these critics are regularly influential since most individuals, in one way or another, share these feelings. It is perhaps simpler to empathize with individuals and public opinion by taking part in critics against globalization.

Previous research in Mexico's banking system seems to incline towards conclusions that support arguments against foreign bank participation in the country. Presumably, previous research on Mexico was influenced by the relevance of the Mexican case together with persuasive currents of thoughts against globalization. Most likely, economists driven by the relevance of this unusual case and tempted to empathize with those individuals and groups against globalization, performed an investigation that was too proximate to the MFC. Conceivably, any investigation conducted under these premises will lead to biased and inconsistent conclusions.

Contrary to what previous research seems to verge, throughout this paper several findings were offered revealing foreign banks in Mexico improved their performance in depth, outreach, and productivity indicators during the past seventeen years. Additionally, evidence on domestic banks undergoing similar behavior trends as foreign banks was presented, implying that the ownership origin of a bank is not necessarily a factor that determines its performance results.

It can be argued that Mexico's banking system could have been better off if banks had maintained domestic ownership. These arguments can be reinforced alleging that the country's banking sector experienced positive performance trends due to the existence and strengthening of domestic banks as the evidence seems to lead to. Moreover, the evidence guides to deem that domestic banks improved market conditions and counteracted preceding limited competition. Conceivably, the role that domestic banks had in Mexico generated

competition conditions that motivated foreign banks to improve their performance in financial development. However, if this ought to be discussed, it is essential to contemplate that the Mexican banking system was critically affected by the MFC. Most possibly, if banks had remained domestic, their financial condition was so feeble that performance results could have been shoddier than with foreign bank participation. Almost certainly, foreign direct investment in the banking system represented a source of capital that was imperative and was not accessible in many other forms.

It is ambiguous if the strategy followed by the Mexican government to turn towards foreign investors to improve capitalization and overall competitiveness of Mexican banks was the best decision for financial development. However, it is manifest that financial development in the country improved since then. Overall, foreign, and domestic bank depth, outreach, and productivity indicators offered during this investigation evidence it. Likewise, findings on performance and growth of domestic banks display that the Mexican banking sector is nowadays more competitive and heterogeneous. Moreover, these improvements in financial development and competitiveness presumably contributed favorably to the country's economic growth.

Lastly, as disclosed in this paper, the evidence suggests that the banking sector is experiencing a structural transformation. Technology is changing worldwide the forms in which banks and other financial intermediaries operate and interact with their customers. Beginning with ATM and POS machines and more recently with internet and mobile phones, financial intermediaries are more efficient reaching and transacting with customers. Most likely, the need for large capitals to provide financial services is becoming less significant. Likewise, the ownership origin of financial entities is becoming less visible and possibly less consequential on the choices clients embrace. Hence, it can be expected that in the forthcoming years competitiveness will continue to improve. Conceivably, the configuration and size of the actual financial structures will experience significant variations. Moreover, if cryptocurrencies become standardized and amply accepted payment methods, there can be many unexpected modifications in the financial industry.

6.2 Research Aims

The primary aim of this research was to execute a performance analysis on the leading foreign and domestic banks in Mexico from 2000-2017. The proposal was to use relevant theory on financial development and previous research on the topic, particularly on Mexico, as the central base to perform this investigation.

Throughout this research, it has been possible to identify several theories supporting the importance of financial structures for economic growth as well as the different functions that financial systems pursue and the stages they undergo. It was acknowledged that there are discussions among economist regarding if financial structures are a consequence of economic growth or vice versa. Moreover, the course these discussions take can have implications on the importance conceded to financial structures. Nevertheless, measuring financial

development is significant since results are valuable for policymaking and prioritizing financial sector reforms.

Likewise, it was possible to locate theory and previous research on procedures to measure financial development. Additionally, specific research and data on Mexico's banking system were obtained. The accessed data allowed estimating many of the performance indicators suggested in theory and separate results by bank ownership category. Also, the database allowed creating new indicators related to electronic banking outreach means. However, due to some data limitations, it was not possible to calculate all indicators for periods that overlap with previous research. Although, the indicators were calculated for the more recent periods which was considered appropriate to achieve these research's objectives.

In conclusion, theory, previous research, and data were successfully obtained, and correspondingly with this research's primary aim, it was possible to execute a performance analysis of the Mexican banking system with consistent and well-supported results.

6.3 Research Objectives

As specified in section one, this investigation's primary objective was to identify if previous research findings on performance trends in the Mexican banking system remained once the adverse effects of the MFC diminished. Moreover, a second objective was to distinguish if there were differences in the performance trends between foreign and domestic owned banks.

Furthermore, a questionnaire was propounded to orient the investigation towards solving the research problem. In section 5.4 a summary table was offered with the questionnaire responses. Except for those indicators were there were data limitations, it was possible to respond to each question for each indicator. The overall results of the questionnaire permitted to reach to conclusions regarding the research problem, and statements with supporting evidence were proposed. Subsequently, the objectives of this research were accomplished.

6.4 Practical Implications and Future Research

This investigation's results concern financial development indicators among the most important banks in Mexico. It is limited to a comparative analysis of the performance these banks experienced during a 17-year period differentiating them by its ownership origin. The obtained evidence bestows that financial development in Mexico improved. However, it does not provide information on how competitive these performance indicators are, nor how improvements in financial development contributed to Mexico's economic growth.

It is highly feasible that performance indicators are dissimilar within countries. Therefore, comparing banking performance between countries can be convenient to define overall competitiveness of a national banking sector. Nowadays that financial globalization has

permeated the world, research on the topic is possibly more representative and can be valuable for policymakers. The same performance indicators proposed for this research should be applicable to execute comparisons between countries if results are rationalized dimensioning and considering countries' specific characteristics. Likewise, if the indicators are separated by ownership's origin, foreign bank performance can be compared amongst different countries.

Additionally, as clarified above, it cannot be inferred from this investigation's results if improvements in Mexico's financial development had positive repercussions to economic growth. Theory states that economic growth and financial development are positively linked. However, some other economists affirm that finance matters do not cause growth since they are a consequence of entrepreneurial development. Consequently, future research evidencing the relationship between economic growth and financial development is valuable for this undergoing discussion. If results on specific banking activities can be linked to specific effects in economic growth, findings would be most valuable for policymaking. Perhaps, it can be identified how some particular banking activities contributed to a country's GDP or how specific technological improvements on bank services reduced costs and facilitated transactions.

Finally, as evidenced in this investigation, the validity of previous research findings modified rapidly after the studies were completed. Possibly, as suggested earlier, previous research was performed precipitately due to Mexico's outstanding case together with the enticement to support popular currents of thought. Most likely, all individuals are susceptible to conduct in this direction, and therefore judgments can be biased. As professionals, we permanently need to be conscious of this condition. More importantly, considering that economic matters usually implicate time to outline. In the long run, decisions and conclusions assumed prudently, with sufficient data, and well-supported evidence will be more meaningful and furtherly recognized than impulsive ones oriented to empathize with popular currents of thought.

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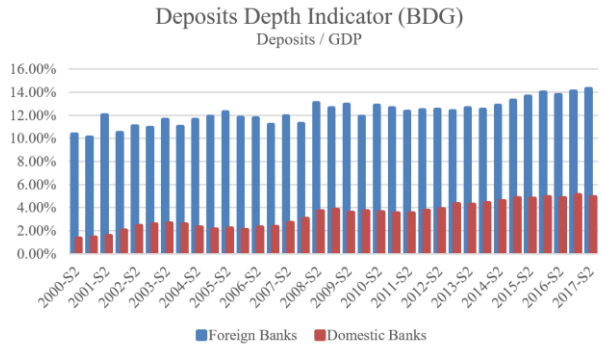
Appendix A – Financial Depth Indicators



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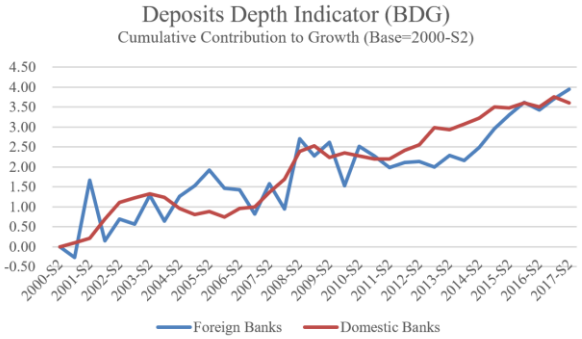

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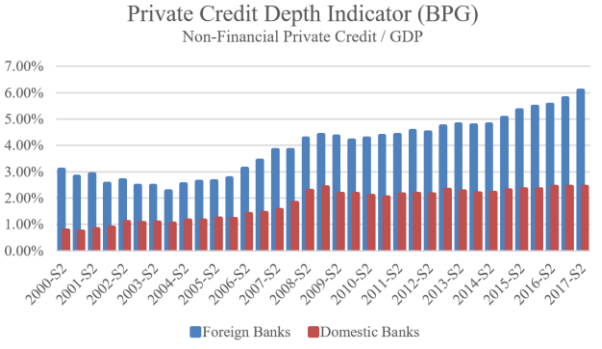

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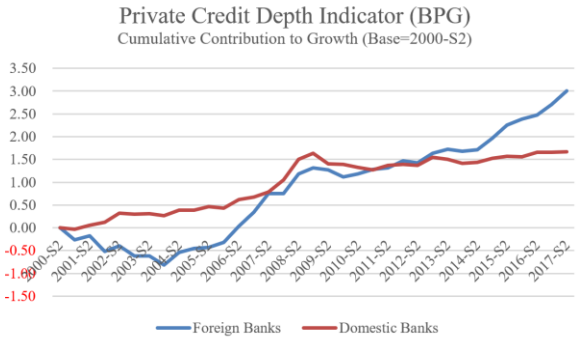

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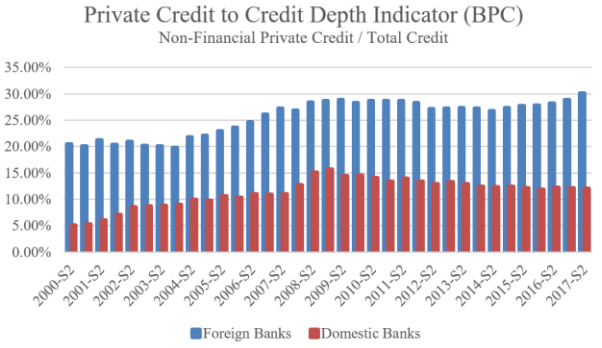
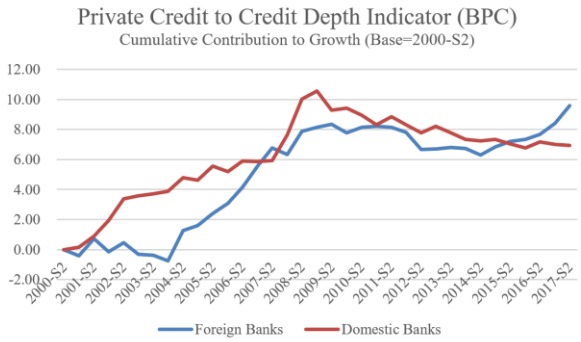


Source: CNBV and INEGI



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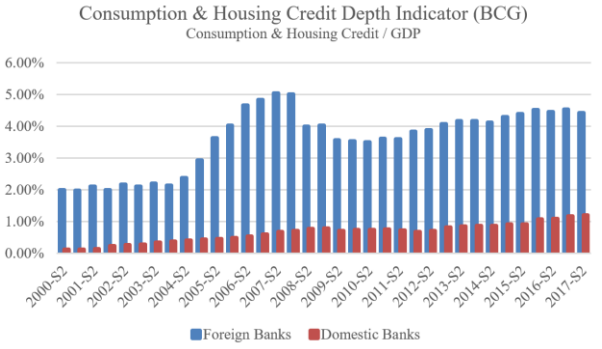

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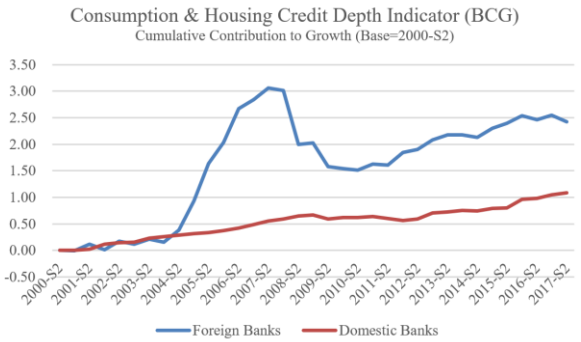
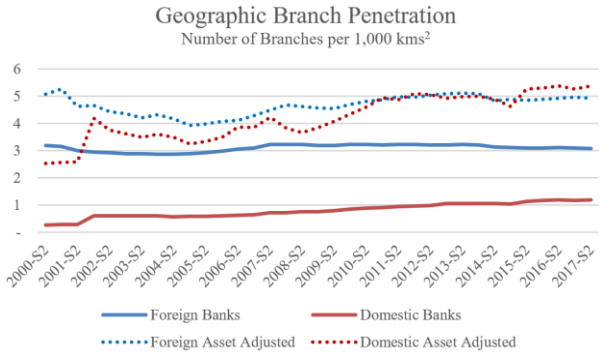


Source: CNBV and INEGI

Appendix B – Financial Outreach Indicators



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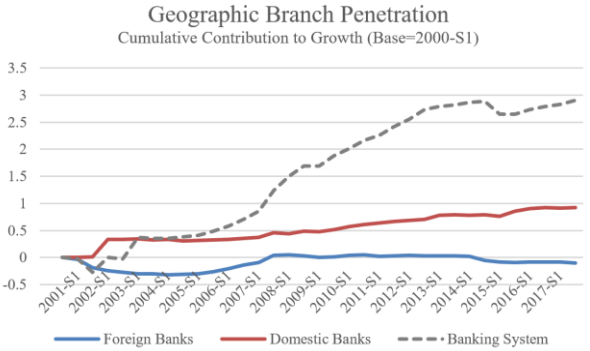

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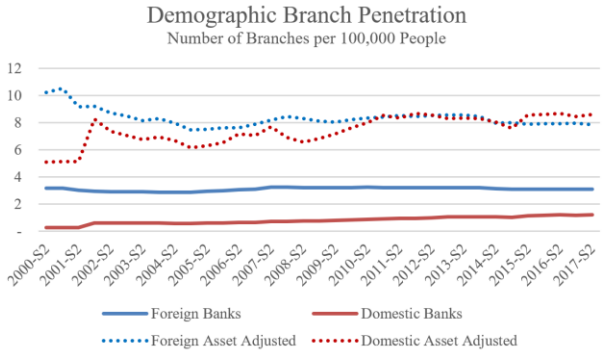

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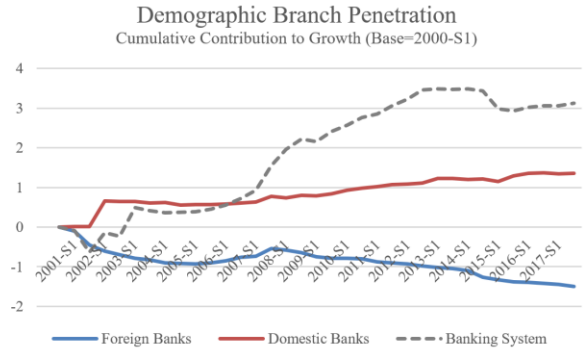

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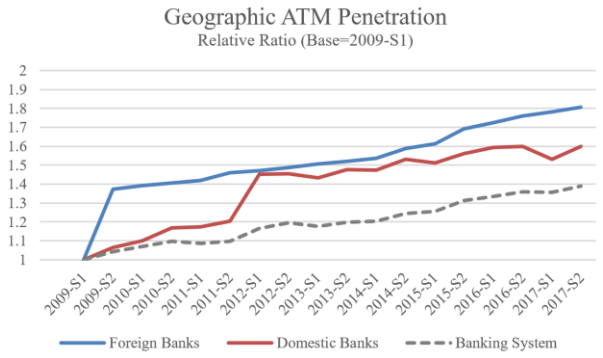

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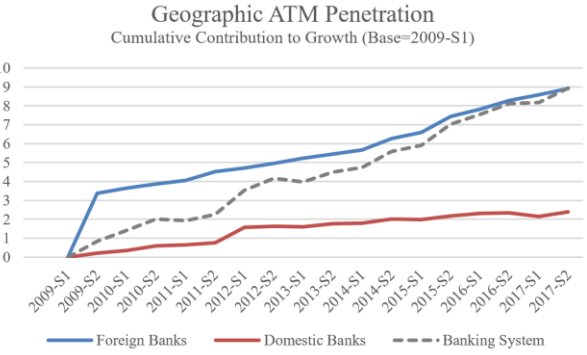

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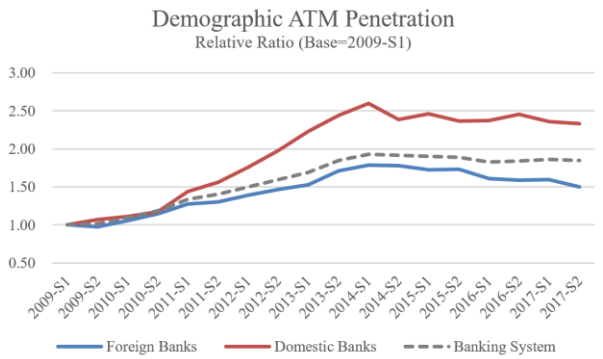

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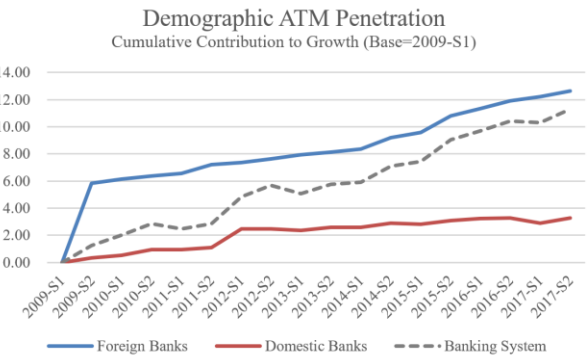

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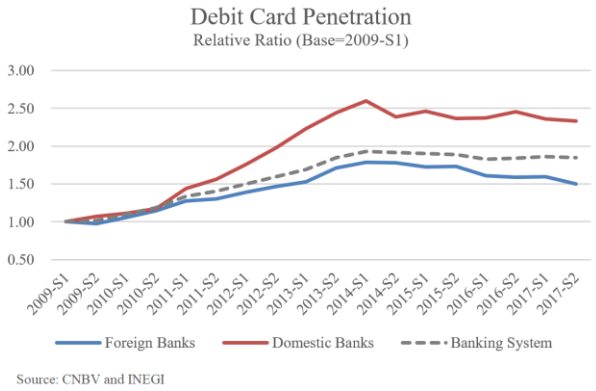

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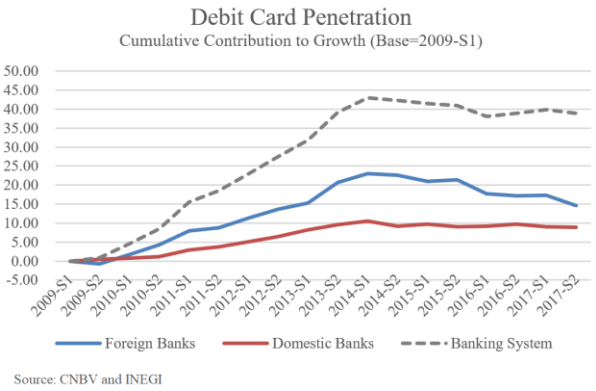

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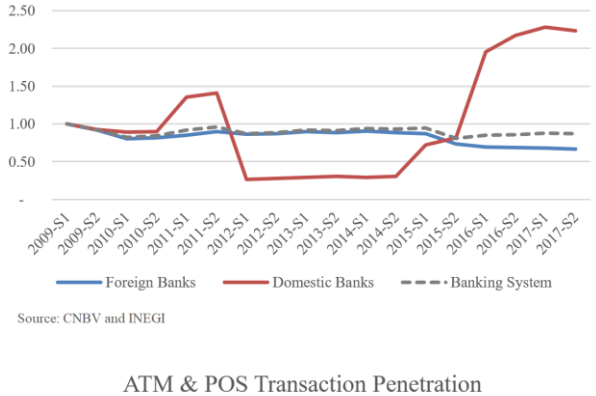

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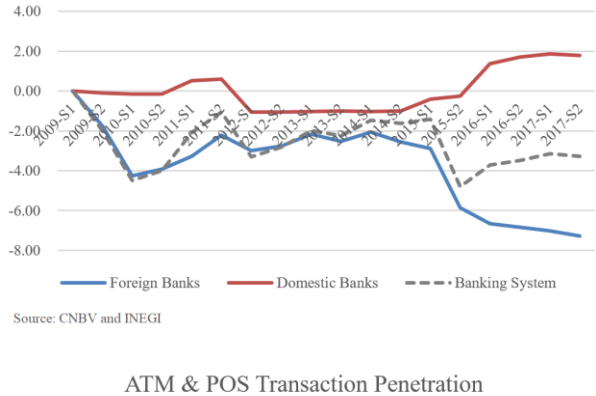

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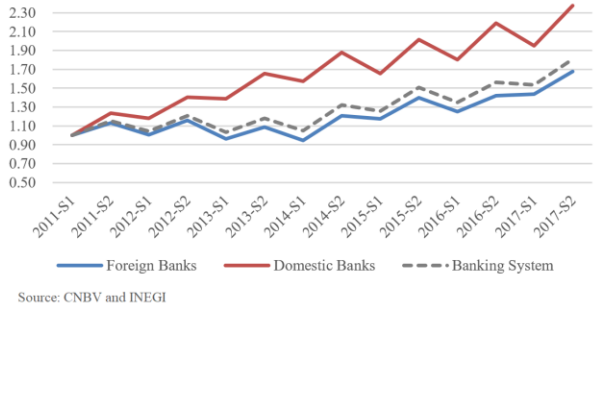

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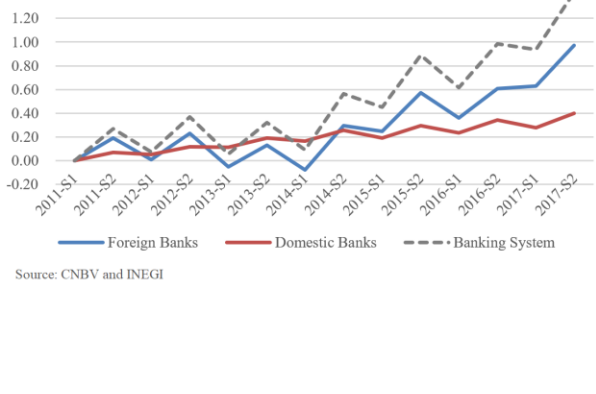
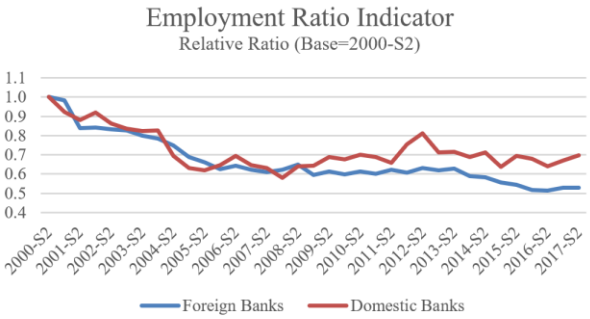


Source: CNBV and INEGI

Appendix C – Financial Productivity Indicators



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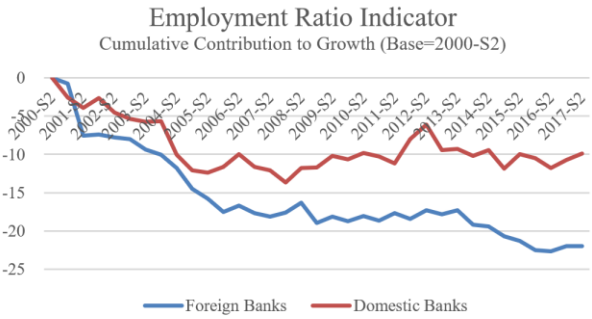

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