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Chile's Banking System: A Decade Of Change

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CHILE'S BANKING SYSTEM: A DECADE OF CHANGE

by

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ABSTRACT

In this paper, I investigate a decade of change between foreign and domestic banks in the Chilean banking system from 2001-2013. Using the Backward and Forward Stepwise Selection method to construct my panel regressions, I compare my findings to those of previous author(s) found in the literature. I consider the factors that determine interest rate spreads, and find that all banks have become more efficient since 2000 and that non-performing loans for both domestic and foreign banks lead to higher bank spreads. I find also, that bank concentration leads to higher spreads for domestic banks. This paper theorizes that diversification of the banking system with the establishment of niche banks can lead to the reduction of bank concentration when placed in selectively highly concentrated sectors of the economy. Further, diversification allows for increased competition in those sectors, without affecting the other sectors of the economy and the overall health of the banking system. I find that concentration among the Top-5 banks in the Chilean banking system has decreased since 2000.

CHAPTER I

INTRODUCTION

The Heritage Foundation Index of Economic Freedom[1] ranks 186 countries each year based on ten economic freedoms (the index assigns a score to each economic freedom, using a scale from 0 to 100 points), and then gives each country an overall economic freedom score from 0 to 100 points. The world average between 1995 and 2013 is 58.9 points. Chile has been well above this since the index began. Chile's largest improvement based on the ten economic freedoms has been in the Freedom from Corruption category raising its score from 50 points in 1995 to 72 points in 2013. The Heritage Foundation (2014) ranked Chile as the 7th freest economy in the world for 2013.

In recent years, Chile has taken steps to expand its economy and to make its country more attractive to foreign investors. In May 2010, Chile became the first Latin American country to join the Organization for Economic Co-operation and Development[2] (OECD). In 2011, Chile, Peru, and Columbia combined their stock exchanges to form the Integrated Latin American Market[3] (MILA) to enhance economic growth for all three countries. In 2012, Chile, Peru, Columbia, and Mexico formed the Pacific Alliance[4]; which would make it the world's eighth largest economy (if treated as a single country) representing 36% of Latin America's total GDP and roughly 50% of its exports. The four nations have eliminated 92% of trade tariffs between them and are working to reduce tariffs to 0 percent. The goal of the Pacific Alliance (2012) is to build an area of deep economic integration and to move

gradually toward the free circulation of goods, services, capital, and persons. Since 1995, Chile's economy and hence its banking system, has experienced significant growth in assets, deposits, and loans; while, the banking system has been shrinking at a significant rate during this same time period. Brock and Suarez (2000) define bank spreads as an attempt to capture the cost of financial intermediation – that is, the difference between what banks charge borrowers and what they pay depositors. The objective of this paper is to evaluate the Chilean banking system and the factors that determine bank spreads from 1995-2000 and then compare those findings to the factors that determine bank spreads from 2001-2013.

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[1]The Heritage Foundation started the Index of Economic Freedom in 1995. The Index covers 10 freedoms – from property rights to entrepreneurship – in 186 countries. More information can be found at www.heritage.org

[2]The Organization for Economic Co-operation and Development can be found at www.oecd.org/chile/

[3]The Integrated Latin American Market (MILA) was established in 2012 with Chile, Peru and Columbia combining their individual stock exchanges. Mexico merged its stock exchange with MILA in 2014. More information can be found at http://alianzapacifico.net/en/

[4]The Pacific Alliance can be found at http://alianzapacifico.net/en/

This paper builds on the research performed previously by other author(s); but more so, on the research performed by Martinez Peria and Mody (2004) who conduct an econometric analysis using panel regressions on the impact of foreign bank participation and concentration on bank spreads for five Latin American countries; Argentina, Chile, Columbia, Mexico, and Peru during the period 1995-2000. The author(s) find that foreign banks are able to charge lower spreads and have lower costs than domestic banks. Further, they find that foreign banks that acquired domestic institutions have higher spreads than those that established de novo (start-up) operations, suggesting either some market segmentation or differences in pricing strategies to gain market share.

Dell' Ariccia& Marquez (2003) conduct a study of Chilean banks for the same time period 1995-2000, and find that domestic banks faced with greater competition from foreign banks, may shift their credit allocation towards market sectors that are more opaque, and where their competitors face greater adverse selection problems, allowing them to retain a larger market share and charge higher margins. They refer to this reallocation of a banks' portfolio as a "flight to captivity", where spreads on bank loans are higher in markets subject to larger information asymmetries.

I find for all banks, that non-performing loans are significant. For domestic banks, I find that non-performing loans are significant at the 1 percent level; a one standard deviation increase in bank market share results in a .05 standard deviation increase in bank spreads. For foreign banks, I find that non-performing loans are significant at the 5 percent level; a one standard deviation increase in bank market share results in a .06 standard deviation increase in bank spreads. Martinez Peria and Mody (2004) find that administrative costs are significant at the 1 percent level for all banks and have a large impact on bank spreads; a one standard deviation increase in

bank market share results in a .6 standard deviation increase in bank spreads. I find that both domestic and foreign banks have become more efficient, and that administrative costs are no longer significant from 2001-2013.

The Chilean Banking System, 1995-2000

In this section, we provide a comprehensive summary of the Chilean economy between 1995 and 2000. We start with Table 1, which reports select macroeconomic indicators. In the existing literature, Focarelli and Pozzolo (2000) find that foreign banks prefer to expand to countries where the expected rate of economic growth is higher. Chile experienced strong economic growth from 1995–2000 with the exception of 1999. Annual GDP growth was 10.6 percent in 1995 before it began to taper off starting in 1996, until it reached -0.8 percent in 1999 and then reversed course rebounding to 4.5 percent in 2000. The national savings rate decreased slightly from 24.5 percent in 1995 to 21.2 percent in 2000. Per capita income grew from $4,320 in 1995 to $4,920 in 2000, a 13.6 percent increase. Inflation decreased from 8.2 percent in 1995 to 4.5 percent in 2000, while real interest rates rose from 7 percent in 1995 to 17.9 percent in 1998, but then decreased to 4.1 percent in 2000. The United Nations (2004) reports that most of the foreign direct investment (FDI) flowing into Chile since 1990, has been from the United States (29%), Spain (20%) and Canada (15%), and that the largest portions of these investment funds has been allocated to electricity (21%), banking (15%), manufacturing (12%), and communications (9%). FDI as a percent of GDP was 4.1 percent ($US 3.5 billion) in 1995 increased to 12 percent ($US 8.7 billion) in 1999 before decreasing to 6.1 percent ($US 4.8 billion) in 2000.

Table 1. Chile's Macroeconomic Indicators.

	1995	1996	1997	1998	1999	2000
Annual GDP Growth (%)	10.6	7.4	6.6	3.2	-0.8	4.5
National Savings Rate (%)	24.5	23.9	22.7	21.4	21.2	21.2
Per Capita Income ($US)	4320	4930	5380	5250	4910	4920
Inflation (%)	8.2	6.6	6.1	4.7	2.3	4.5
Real Interest Rates (%)	7.0	14.3	10.9	17.9	9.9	4.1
Foreign Direct Investment (% GDP)	4.1	6.4	6.4	5.8	12.0	6.1

Source: World Bank

The Heritage Foundation (2014) finds that Chile largely maintained the market-based institutions and economic policies established by General Augusto Pinochet[5] (Chile's 30th President) from 1973-1990. From Table 2, we can see that Chile improved its overall Heritage Foundation Index score from 71.2 points in 1995 to 74.7 points in 2000. Chile's largest improvement was with its monetary policy, increasing its score from 66.1 points in 1995 to 80.1 points in 2000. However, both Chile's fiscal policy and government spending scores decreased from 1995-2000. Fiscal policy decreased from 79.4 points in 1995 to 73.2 points in 2000; while, government spending decreased slightly from 87.0 points in 1995 to 85.5 points in 2000.

[5]General Augusto Pinochet was responsible for changing many economic reform policies based on the advice of the "Chicago Boys". This period of time is commonly referred to as the "Miracle of Chile".

Table 2. Chile's Overall, Fiscal, Monetary, and Government Spending Scores.

	1995	1996	1997	1998	1999	2000
Chile's Overall Score	71.2	72.6	75.9	74.9	74.1	74.7
Fiscal Policy	79.4	89.8	73.5	73.0	73.0	73.2
Monetary Policy	66.1	68.0	75.6	77.1	78.7	80.1
Government Spending	87.0	85.9	86.6	88.1	87.1	85.5

Source: The Heritage Foundation

Starting in 2019, Basel III requires all financial institutions to have a minimum tier 1 capital ratio of 6 percent and a capital to risk-weighted asset (CAR) ratio of 10.5 percent. As we can see in Table 3, the Chilean banking system has been well above these requirements since 1998. In 1998, CAR is 10.6 percent and tier 1 capital is 12.5 percent. In 2000, CAR is 13.3 percent and tier 1 capital is 10.5%. Non-performing loans increased from 1.2 percent in 1997 to 1.9 percent in 2000. Chilean banks return on equity decreased to its lowest level of 9.4 percent in 1999, but increased to 12.7 percent in 2000. The banking system's liquid assets increased from 16.6 percent in 1997 to 16.9 percent in 2000. Martinez Peria and Mody (2004) find that banks that either decide or are required by regulation to hold a high proportion of their assets in the form of liquid assets seem to charge higher spreads. The author(s) find liquid assets to be significant at the 1 percent level for all banks from 1995-2000. I find that liquid assets are still significant for foreign banks from 2001-2013; however, the impact on spreads is small; a one standard deviation increase in liquidity raises spreads by.008 standard deviation. Liquidity is no longer significant for domestic banks, however.

Table 3. Financial Soundness Indicators (%).

	1995	1996	1997	1998	1999	2000
Regulatory Capital to Risk-Weighted Assets (CAR)	n.a.	n.a	n.a.	12.5	13.5	13.3
Tier 1 Capital	n.a.	n.a.	11.0	10.6	10.5	10.5
Non-Performing Loans	1.0	1.0	1.2	1.6	1.8	1.9
Return on Assets	0.8	1.1	1.0	0.9	0.7	1.0
Equity	13.9	16.6	13.7	11.5	9.4	12.7
Liquidity	n.a.	n.a.	16.6	15.2	17.7	16.9

Source: Authur's calculations
IMF Chile: Financial system stability assessment 2004
Central Bank of Chile

Chile's banking system reaped significant growth from 1995-2000. Table 4, shows that foreign banks share of loans grew substantially from 13.7 percent to 45.1 percent during this time period. The top-3 banks market share increased 12 percent from 36.6 percent in 1995 to 41.1 percent in 2000. The top-5 banks market share increased 19 percent from 51.9 percent in 1995 to 61.8 percent in 2000. Also, the Herfindahl index (HHI) which measures market concentration, increased from 789 points in 1995 to 923 points in 2000. The total number of banks decreased from 31 to 27 in Chile during the same time period; while, the number of foreign banks stayed relatively constant at 17.

Table 4. Chile's Banking System.

	1995	1996	1997	1998	1999	2000
Foreign Bank Share of Loans (%)	13.7	16.7	20.3	21.5	37.7	45.1
Top-3 Bank Share of Loans (%)	36.6	35.7	42.5	42.1	41.5	41.1
Top-5 Bank Share of Loans (%)	51.9	52.6	62.5	62.1	61.9	61.8
Herfindahl Index (Loans)	789	796	983	973	961	923
Number of Banks	31	31	29	29	29	27
Number of Foreign Banks	17	17	17	17	18	17

Source: Martinez Peria and Mody (2004)
Note: A foreign bank is defined to have at least 50 percent foreign ownership.
Note: A HHI of less than 1500 points is considered to be un-concentrated and a highly competitivebanking system.
Note: The total number of foreign banks excludes Banco Estado, Chile's National Bank.

Chilean bank spreads for 1995-2000 varied between 4.5 and 5 percent except for in 2000 when domestic banks spreads rose to 6 percent. Martinez Peria and Mody (2004) find that foreign and domestic spreads appear to move very much in tandem in Chile. Their study shows that macroeconomic factors or similar cost structures may be affecting all banks in the system, as well as the possibility that foreign and domestic banks are competing with each other for customers. Brock and Suarez (2000) explore the determinants of bank spreads in Latin America (including Chile), during the mid-1990s and find that banks that orient their services towards retail operation involve the establishment of a larger number of branches, equipment, and personnel to serve the retail customer. These larger costs usually translate into a higher bank spread. More so, than banks that are more oriented towards wholesale markets. I suspect that many foreign banks in Chile are motivated to merge or acquire domestic banks, (who have established branches, equipment, and personnel in the

retail marketplace), as a way to increase profits much faster and perhaps less costly than trying to compete as de novo retail operations. In return, domestic banks have access to new products and services, better technology, and a foothold in international markets through the merger of a foreign bank. Figure 1, shows that domestic and foreign bank spreads move very much in tandem. With the number of mergers and acquisitions since 1981, it is very likely that both domestic and foreign banks are competing for the same customers.

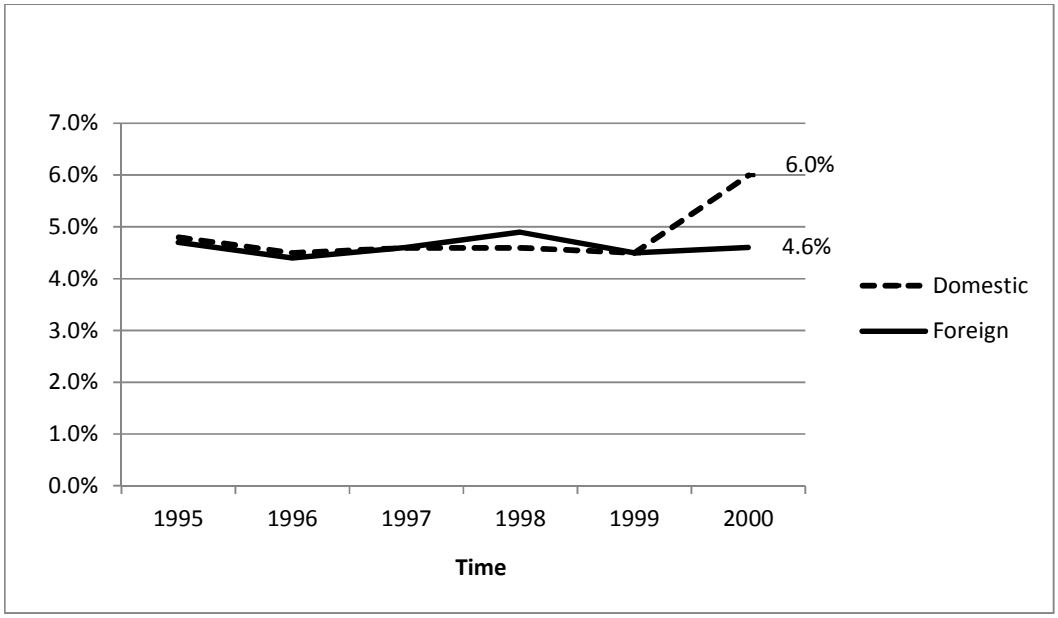

Figure 1. Chilean Bank Spreads 1995-2000

Source: Martinez Peria and Mody, 2004

The Chilean Banking System, 2000-2013

We now turn our attention to the Chilean banking system from 2001-2013 to investigate a decade of change between domestic and foreign banks and their impact on spreads. As we can see from Table 5, Chile showed strong macroeconomic indicators from 2001-2013 other than for a short period after the 2008 world financial

crisis. In 2009, annual GDP growth and inflation dipped to -1.0 percent and -2.6 percent respectively. However, both made a quick recovery in 2010 with GDP growth reaching 5.8 percent and inflation returning to 3.0 percent. The national savings rate bounced between 20.8 percent in 2003 and 25.3 percent in 2006 before leveling off to 21.1 percent in 2013. Per capita income increased greatly from $4,760 in 2001 to a high of $15, 230 in 2013 while real interest rates rose to a high of 12.7% in 2008 and then retreated back to 7.4% in 2013. FDI increased from 5.8 percent of GDP ($US 4.2 billion) in 2001 to 7.3 percent of GDP ($US 20 billion) in 2013. From a macroeconomic perspective, it appears that the Chilean economy came away from the 2008 financial crisis virtually unscathed.

Table 5. Chile's Macroeconomic Indicators.

	2001	2003	2005	2007	2009	2011	2013
Annual GDP Growth (%)	3.3	4.0	5.6	5.2	-1.0	5.8	4.1
National Savings Rate (%)	21.5	20.8	23.5	24.7	22.4	22.3	21.1
Per Capita Income ($US)	4760	4570	6250	8630	9940	12290	15230
Inflation (%)	2.6	1.1	3.7	7.8	-2.6	3.0	1.5
Real Interest Rates (%)	7.8	0.3	-0.8	3.7	3.3	5.5	7.4
Foreign Direct Investment (% GDP)	5.8	5.5	5.6	7.2	7.5	9.3	7.3

Source: World Bank
Note: Table (even years) is available in the Appendix.

From 2001-2009, the Heritage Foundation (2014) finds that Chile continued to use the market-based institutions and economic policies established by General Augusto Pinochet. In 2010, Sebastian Pinera[6] was elected as Chile's 36th President. Shortly after his election, he raised corporate taxes and is considered to be more conservative than was General Pinochet. Viewing table 6, we can see that Chile's Heritage Foundation Index overall score improved further from 75.1 points in 2001 to

its highest score of 79 points in 2013. Chile's fiscal and monetary policy scores increased as well during this same time period. The index score for Chile's fiscal policy increased from 73.7 points in 2001 to 77.6 points in 2013, and Chile's monetary policy index score increased from 82.4 points in 2001 to 84.6 points in 2013. Chile's index score for government spending decreased slightly from 84.1 points in 2001 to 83.7 points in 2013.

Table 6. Chile's Overall, Fiscal, Monetary, and Government Spending Scores.

	2001	2003	2005	2007	2009	2011	2013
Chile's Overall Score	75.1	76.0	77.8	77.7	78.3	77.4	79.0
Fiscal Policy	73.7	75.0	78.3	78.8	78.2	77.7	77.6
Monetary Policy	82.4	83.0	84.4	79.8	77.3	77.9	84.6
Government Spending	84.1	81.8	84.8	87.9	90.1	86.6	83.7

Source: The Heritage Foundation

From 2001-2013, the Chilean banking system continued to show strong financial soundness indicators even in the wake of the 2008 world financial crisis. From Table 7, we can see that CAR and tier 1 ratios remained well above Basel III requirements from 2001-2013. The banking system's liquid assets during this time period reached a high of 21.3 percent in 2009 before declining to a low of 13.2 percent in 2013. Both return on assets (ROA) and equity bounced back from their 1999 lows to soar to their highest levels in 2011 with ROA reaching 1.6 percent and equity reaching 20.8 percent. The banking system reached a new high (since 1997) for non-performing loans of 3.0 percent in 2009 before decreasing to 2.1 percent in 2013.

[6]Sebastian Pinera is a businessman and politician who served as Chile's President from 2010-2014.

Table 7. Financial Soundness Indicators.

	2001	2003	2005	2007	2009	2011	2013
Regulatory Capital to Risk-Weighted Assets (CAR)	12.7	14.5	13.0	12.2	14.3	13.9	13.0
Tier 1 Capital	9.9	11.5	10.0	9.4	10.9	10.1	9.7
Non-Performing Loans	1.8	2.0	0.9	0.8	3.0	2.3	2.1
Return on Assets	1.3	1.3	1.3	1.1	1.2	1.6	1.5
Equity	17.7	16.4	17.0	15.7	15.2	20.8	18.4
Liquid Assets	17.2	16.9	19.8	15.5	21.3	15.2	13.2

Source: IMF Chile: Financial system stability assessment 2004
IMF Chile: Financial system stability assessment 2011
IMF Chile: Country Report Chie No. 14/218. 2014
St. Louis Federal Reserve
World Bank
Author's calculations

Note: Table (even years) is available in the Appendix.

In Table 8, we observe that Chile's banking system concentrated further from 2001-2013 with the total number of banks decreasing from 25 to 22 and the number of foreign banks decreasing from 15 to 12. Foreign banks share of loans grew slightly from 43.9 percent to a high of 52.1 percent in 2011, before decreasing to 46.1 percent in 2013. Concentration of the top-3 and top-5 banks market share of loans continued to increase to record highs of 56.1 percent and 76.0 percent in 2007 before decreasing (possibly due to the 2008 World Financial Crisis) to 41.5 percent and 59.7 percent respectively in 2013.

Table 8. Chile's Banking System.

	2001	2003	2005	2007	2009	2011	2013
Total Number of Banks	25	25	25	25	24	23	22
Number of Foreign Banks	15	13	13	14	13	13	12
Foreign Bank Share of Loans (%)	43.9	44.4	41	47.8	48.7	52.1	46.1
Top-3 Bank Share of Loans (%)	42	50.8	51.3	56.1	44.4	45.1	41.5
Top-5 Bank Share of Loans (%)	61.7	69.2	73.3	76.0	63.5	63.1	59.7

Source: Superintendence of Banks
Author's calculations
Note: Table (even years) is available in the Appendix.
Note: The total number of foreign banks excludes Banco Estado, Chile's National Bank.
Note: A foreign bank is defined to have at least 50 percent foreign Ownership Bank.

Figure 2, shows that foreign and domestic spreads continue to move very much in tandem in Chile as they did from 1995-2000. Foreign bank spreads lagged domestic bank spreads in the early 2000s, but their spreads have been higher than those of domestic banks since 2009. Martinez Peria and Mody (2004) theorize that macroeconomic factors or similar cost structures may be affecting all banks in the system, as well as the possibility that foreign and domestic banks are competing with each other for the same customers. The author(s) do not find inflation, real GDP growth, or real market interest rates to be significant from 1995-2000. I find that real GDP growth to be significant at the 10 percent level for domestic banks only; however, the impact on spreads is very small. A one standard deviation increase in real GDP growth lowers spreads by.00000003 standard deviation. Also, I find that inflation and real market interest rates are not significant for either model. Based on the results of Martinez Peria and Mody (2004) and my own results, it is a possibility

that foreign and domestic banks are competing with each other for the same customers.

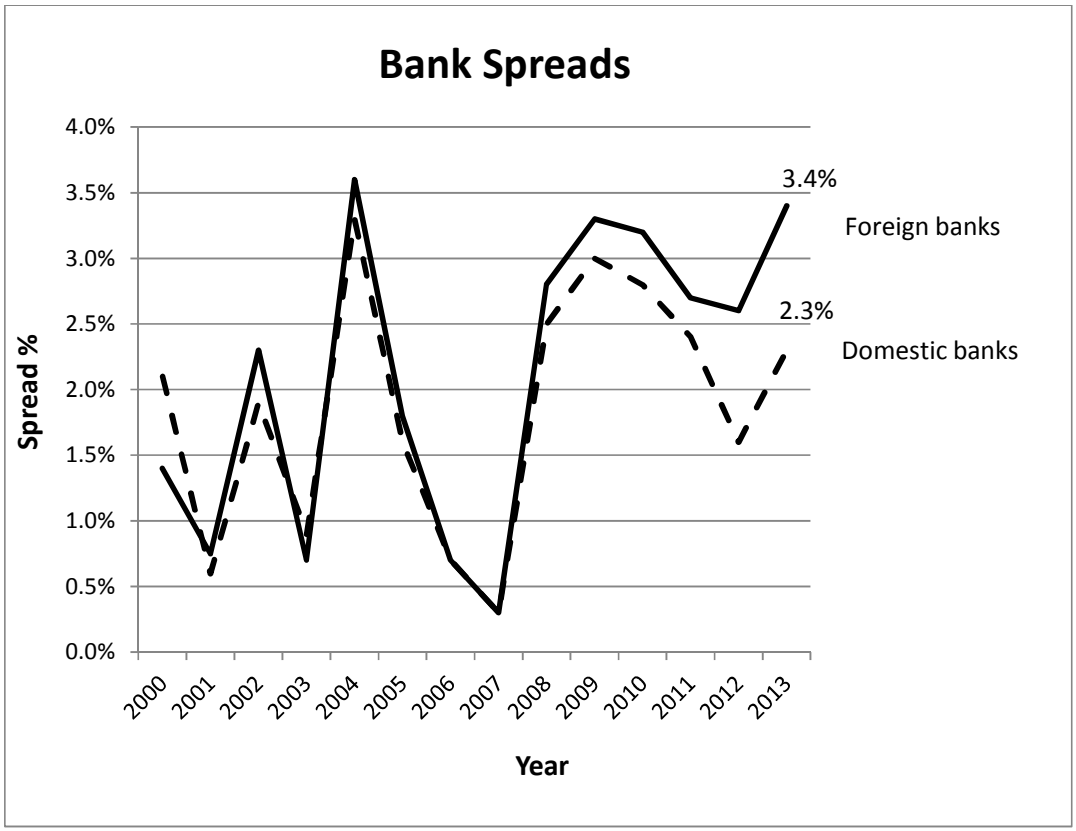

Figure 2. Chilean Bank Spreads 2000-2013

Source: Author's calculations

CHAPTER II

EMPIRICAL METHODOLOGY AND RESULTS

I use panel data with time fixed-effects to explain changes in spreads over time for my empirical analysis, to study the impact that foreign banks have had on Chilean bank spreads from 2001-2013. To estimate the changes in Chilean bank spreads, I build on the research conducted by Martinez Peria and Mody (2004) who define the dependent variable - bank spread, as the total interest received from banks on loans divided by average loans, minus total interest paid on deposits divided by average deposits.

$$\text{Spread}_{i,t\,(\text{domestic})} = a_0 + a_1\text{Administrative Costs}_{i,t} + a_2\text{Crisis}_{i,t} + a_3\text{Equity}_{i,t} + a_4\text{Fiscal}_{i,t} + a_5\text{GDP Growth Rate}_{i,t} + a_6\text{Government}_{i,t} + a_7\text{Inflation}_{i,t} + a_8\text{Liquidity}_{i,t} + a_9\text{NPL's}_{i,t} + a_{10}\text{NPL's}_{i,t} + a_{11}\text{Real Interest Rates}_{i,t} + a_{12}\text{Top-5 Loans}_{i,t} + e_{i,t}$$

$$\text{Spread}_{i,t(\text{Foreign})} = a_0 + a_1\text{Administrative Costs}_{i,t} + a_2\text{Crisis}_{i,t} + a_3\text{Equity}_{i,t} + a_4\text{FDI}_{i,t} + a_5\text{Government}_{i,t} + a_6\text{Inflation}_{i,t} + a_7\text{Liquidity}_{i,t} + a_8\text{Monetary}_{i,t} + a_9\text{NPL's}_{i,t} + a_{10}\text{Pension}_{i,t} + a_{11}\text{ROA}_{i,t} + a_{12}\text{Top-5 Loans}_{i,t} + e_{i,t}$$

Where i refers to the bank id, and t refers to the time period under consideration.

Using the Backward and Forward Stepwise Selection method, I reduce my independent macroeconomic, government policies, government spending, and bank-

specific variables from 49 to 12 for my domestic and foreign bank models. Data for my macroeconomic variables was obtained from the World Bank statistical database. Data for my government policies and spending variables was obtained from the Heritage Foundation; while, data for my bank-specific variables was obtained from various sources cited and using bank balance sheet and income statements from the Chilean Superintendence of Banks and Financial Institutions (SBIF) for years 2001-2013.

Macroeconomic Variables

Inflation is defined by the World Bank as the ratio of GDP in current local currency divided by GDP in constant local currency. Chile's inflation rate averaged 5.3 percent from 1995-2000 and 5.1 percent from 2001-2013. In the literature, Brock and Suarez (2000) find the inflation rate to be significant at the 5 percent level and that a higher inflation rate raises the bank spread in Chile. However, I find that the inflation rate is no longer significant for the Chilean banking system from 2001-2013. The 2008 world financial crisis variable is a dummy that takes the value 1 for all banks in 2008; otherwise, it takes the value 0 for each year between 2001 and 2013. I suspect that the Crisis would have some affect on banks spreads for Chilean banks and may have been the cause for higher bank spreads in 2008 and 2009. However, my preliminary investigation shows that the 2008 world financial crisis variable is not significant for Chilean banks during this time period.

The World Bank defines foreign direct investment (FDI) as net inflows (new investment inflows less disinvestment) in the reporting economy from foreign investors, and is divided by GDP. In 1995, FDI was US$3 billion and in 2013, FDI had increased to US$20 billion. Chile's record high for FDI is US$28 billion, set in 2012. The International Monetary Fund (2003) finds that International banks both

help to originate, as well as widen the market for FDI financing through syndication to institutional investors and sales of loans in secondary markets. All of Chile's foreign banks are considered to be international banks. Based on the IMF's findings, I would expect the FDI variable to be significant for foreign banks, more so, than for domestic banks. I find that FDI is not significant for domestic banks; however, I find that FDI is significant for foreign banks at the 10 percent level and raises spreads, but the impact is very small.

The pension variable is defined as short-term (usually a month to several years) bank term-deposits from Chilean Pension Funds. Ahumada and Cetorelli (2003) conduct a study from 1994 to 2001 on the effect of cross-industry ownership on pricing behavior of deposit and lending operations of banking institutions in Chile. The author(s) find that banks affiliated (ownership) with a Chilean Pension Fund, exhibit a substantially larger deposit base and enjoy higher spreads overall than unaffiliated banks. Since 2001, four foreign banks continue to have an affiliation with Pension Funds. I incorporate the pension variable into my foreign bank model to see if foreign banks still enjoy higher spreads from 2001-2013. My analysis shows that foreign banks no longer enjoy higher spreads because of their affiliation with Pension Funds. This may be one reason that explains why all the foreign banks in Chile have sold their pension funds.

The World Bank defines real GDP growth rate as a measure of economic growth adjusted for inflation. In the literature, Chortareas, Garza-Garcia, and Girardone, (2011) conduct a study to in Latin America (including Chile) with a sample of 2,300 bank observations covering the period 1999-2006 and find that higher GDP growth in Chile lowers bank spreads. The author(s) mention that this implies that for Chile and other Latin American countries, a better macroeconomic

environment decreases spreads, possibly by reducing the lending rate as a result of the lower credit risk of corporate and private borrowers. Although, I find that real GDP growth is negatively correlated with spreads for domestic banks; this variable is no longer significant at the 10 percent level.

The World Bank defines the real interest rate as the lending interest rate adjusted for inflation. Gelos (2006) examines the determinants of bank interest margins using bank and country level data from 85 countries, including 14 Latin American economies from 1999-2002. The author(s) finds that the level of interest rates are strongly positively associated with higher spreads. I find that the real interest rate is no longer significant for domestic banks.

Fiscal, Monetary, and Government Spending Variables

I incorporate two variables into my domestic bank model, Chile's fiscal freedom and government spending scores. For my foreign bank model, I incorporate Chile's monetary freedom score. These three variables can be found in the Heritage Foundation's Index of Economic Freedom. The Heritage Foundation defines fiscal freedom as a measure of the tax burden imposed by government. It includes both the direct tax burden in terms of the top tax rates on individual and corporate incomes and the overall amount of tax revenue as a percentage of GDP. Tables 9 and 10 show that Chile's fiscal freedom policy score in 1995 was 79.4 percent. In 2013, Chile's score had fallen to 77.6 percent. The foundation defines monetary freedom as a measure of price stability. Chile's monetary freedom policy score in 1995 was 66.1 percent. In 2013, Chile's score had increased to 84.6 percent. The foundation defines government spending as government expenditures including consumption and transfers. Chile's government spending score was 87.0 percent in 1995. In 2013,

Chile's score had fallen to 83.7 percent. My preliminary results do not find these variables to be significant at the 10 percent level for either model.

Bank-Specific Variables

The administrative costs variable is the ratio of administrative costs including payroll, commissions, and other operating expenses divided by total assets. Martinez Peria and Mody (2004) find that administrative costs are significant at the 1 percent level between 1995 and 2000 for all banks, but especially among foreign banks in the Chilean banking system. The author(s) find that administrative costs have a large impact on bank spreads: a one standard deviation change in administrative costs for all banks results in a .652 standard deviation change increase in spreads. We would expect foreign banks to have high start-up costs (especially as a de novo operation or from a merger or acquisition of a domestic bank) when first entering the banking system, but become more efficient like their parent companies over time. Claessens, Demirguc-Kunt, and Huizinga (2001) use 7900 bank observations from 80 countries from 1988-1995 and find that banks with high overhead costs exhibit a lack of efficient management and that foreign bank entry seems to improve the efficiency of domestic banks over time. My analysis shows that both domestic and foreign banks are more efficient overall and that administrative costs are no longer significant for either, between 2001 and 2013.

The non-performing loans variable is the ratio of non-performing loans (90 days past due) divided by total loans. In the literature, Brock and Suarez (2000) explore the determinants of bank spreads in Latin America (including Chile) during the mid-1990s and find that except for Columbia, non-performing loans are associated with lower spreads. This result could be the result of inadequate provisioning for loan losses or it could reflect the fact that banks with a high proportion of bad loans may

lower spreads (raise deposit rates and lower loan rates) as a way of trying to grow out of their troubles. Our preliminary investigation finds that the non-performing loans are significant at the 1 percent level for domestic banks and significant at the 5 percent level for foreign banks from 2001-2013. For domestic banks, a one standard deviation increase in non-performing loans results in a .05 standard deviation increase in bank spreads. For foreign banks, a one standard deviation increase in non-performing loans results in a .06 standard deviation increase in bank spreads.

The liquidity variable is the ratio of liquid assets (cash and central bank reserves) divided by total assets. This ratio is used to measure the bank's ability to pay its short-term obligations. Chile's banking system has had liquidity ratios above 15 percent since 1997. It has just been recently that they have fallen under 15 percent, to 13.3 percent in 2012 and 13.2 percent in 2013. Shortly after the 2008 world financial crisis, Chile's banks increased their liquidity ratios to the highest levels in a decade. In 2009 the ratio was 21.3 percent and in 2010 the ratio was 20.5 percent. Claessens and van Horen (2012) conduct a study of 137 countries (including Chile) over the period of 1995-2009 and find that foreign banks have more liquidity than domestic banks do. The author(s) suggest that foreign banks may be operating more conservatively compared to domestic banks. I find also, that foreign banks in Chile have higher liquidity ratios than domestic banks. Liquidity for foreign banks is significant at the 1 percent level; a one standard deviation increase in liquidity results in a .008 standard deviation increase in bank spreads. However, for domestic banks liquidity is not significant from 2001-2013.

From a profitability standpoint, I incorporate both Return on Assets and Equity variables in both models. The return on assets (ROA) variable is the ratio of net income divided by total assets. This ratio is used to measure how efficient bank's are

at using their assets to generate profits. The equity variable is the ratio of bank capital plus reserves divided by total assets. This ratio measures the bank's long-term ability to grow and pay back its debt. Moguillansky, Studart and Vergara (2004) conduct a study of foreign banks in Latin America (including Chile) from 1990-2001 and find that there are no statistically significant differences in profitability between domestic and foreign banks, whether measured as the return on assets or as the return on equity. My analysis results are similar to those of the author(s) for domestic banks; however, I find that both ROA and equity are significant at the 5 percent level and both increase spreads for Chile's foreign banks from 2001-2013.

Table 9. Panel Regressions for Chilean Domestic Bank Spreads.

Variable	P-Value	T-Statistic	Increase/Decrease in Spreads
Administation Costs	.146	-1.46	-.0000000009
Crisis	.165	-1.40	-.00093
Equity	.951	-0.06	-.00011
Fiscal	.799	-0.25	-.000002
GDP Growth Rate	**.088**	-1.73	-.000000031
Government	.276	1.09	.00007
Inflation	.328	-0.98	-.00005
Liquidity	.300	1.04	.00037
Non-Performing Loans	**.000**	3.84	.04755
Market Interest Rates	.201	1.29	.00007
Return on Assets	.623	0.49	.00598
Top-5 Market Share (Loans)	**.087**	1.73	.00295
R-Squared	0.56		
F-Test	5.91		

Note: P-Values in bold are significant at the 1%, 5%, or 10% level.

The Top-5 bank market share of loans variable is defined as the share of loans held by the five largest banks in the system. Martinez Peria and Mody (2004) find that both the top-5 market share of loans and the HHI variables are significant at the 1 percent level for domestic banks. The author's do not find either variable to be significant for foreign banks between 1995 and 2000. My preliminary results show that the top-5 variable is significant at the 10 percent level for domestic banks between 2001 and 2013. A one standard deviation increase in the top-5 bank market share results in a .003 standard deviation increase in bank spreads. However, the HHI variable is not significant.

Table 10. Panel Regressions for Chilean Foreign Bank Spreads.

Variable	P-Value	T-Statistic	Increase/Decrease in Spreads
Administation Costs	.818	0.23	.00000000016
Crisis	.987	-0.02	-.000017
Equity	**.018**	2.40	.00921
FDI	**.054**	1.95	.00000012
Government	.504	0.67	.00012
Inflation	.890	-0.14	-.000021
Liquidity	**.000**	3.73	.00838
Monetary	.201	1.29	.00015
Non-Performing Loans	**.026**	2.26	.05948
Pension Term Deposits	.345	0.95	.000091
Return on Assets	**.052**	1.97	.03536
Top-5 Market Share (Loans)	.946	0.07	.00024
R-Squared	0.32		
F-Test	11.39		

Note: P-Values in bold are significant at the 1%, 5%, or 10% levels.

Has the Chilean Banking System Become More Concentrated?

Figure 3, shows that the gap between the total number of banks and the number of foreign banks has been steadily getting narrower since 1982. In 1982, there were 43 banks in the Chilean banking system, but in 2013 there were just 22 banks remaining. In 1982, foreign banks represented 44% of total banks while in 2013 foreign banks represented 55% of total banks. The Chilean banking system has experienced explosive growth in banking assets, going from US $63 billion in 1995 to US $304 billion in 2013, a 382% increase. Loans have grown at a faster pace than assets, growing from US $27 billion in 1995 to US $234 billion in 2013, a 766% increase.

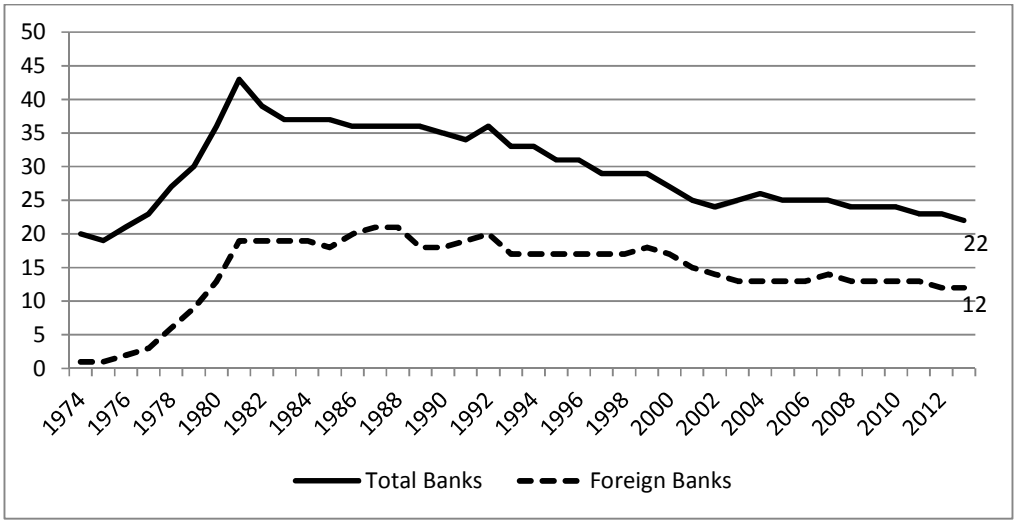

Figure 3. The Chilean Banking System.

Source: Superintendence of Banks

Martinez Peria and Mody (2004) find that the HHI, top-3 bank share, and the top-5 bank market share of loans is significant at the 1 percent level for domestic banks. The author(s) find that concentration leads to higher Chilean bank spreads from 1995-2000. In the literature, Karasulu (2007) conducts a study of 29 emerging

economies banking systems (including Chile) from 1995-2004 and finds that the Chilean banking system is concentrated, but the degree of competition is smaller than other emerging economies in the sample. The author(s) finds also, that Chilean banks have spreads that are about 2 percentage points higher than the rest of the sample. My preliminary results show that the top-5 largest bank with the largest share of the loans market is significant at the 10 percent level for domestic banks between 2001 and 2013. However, I find that the top-3 largest bank[7] variable is not significant for domestic banks for this same time period. For foreign banks, none of the variables are significant. My results show that concentration levels have decreased in the Chilean banking system, especially for domestic banks from 2001-2013.

In 1997, Chile's Congress updated the banking laws to make foreign bank entry easier. Also, the International Monetary Fund (2004) finds that in 2001, the Superintendence of Banks and Financial Institutions (SBIF) lowered minimum paid-in capital requirements, in order to promote the development of niche banks and improve competition. Between 2002 and 2004, six new foreign niche banks entered the market to compete in the retail, investment, foreign exchange, and leasing & factoring financing segments. During this short time period from 2002-2004, the total number of banks reversed course for the first time since 1995 and increased from 24 to 26. However, because of multiple mergers during this same time period, the total number of banks did not increase to 30.

[7]The top-3 largest bank variable has a p-value of 0.107 when substituted for the top-5 largest bank variable.

Figure 4, shows concentration levels of loans increasing for both the top-three and top-five largest banks from 1995-2007 before starting to decrease in 2008. It may well be that the 2008 world financial crisis helped reverse the course of loan growth among the top-3 and top-5 largest banks. The figure shows the top-3 and top-5 largest banks losing market share back to 1997 levels through 2013.

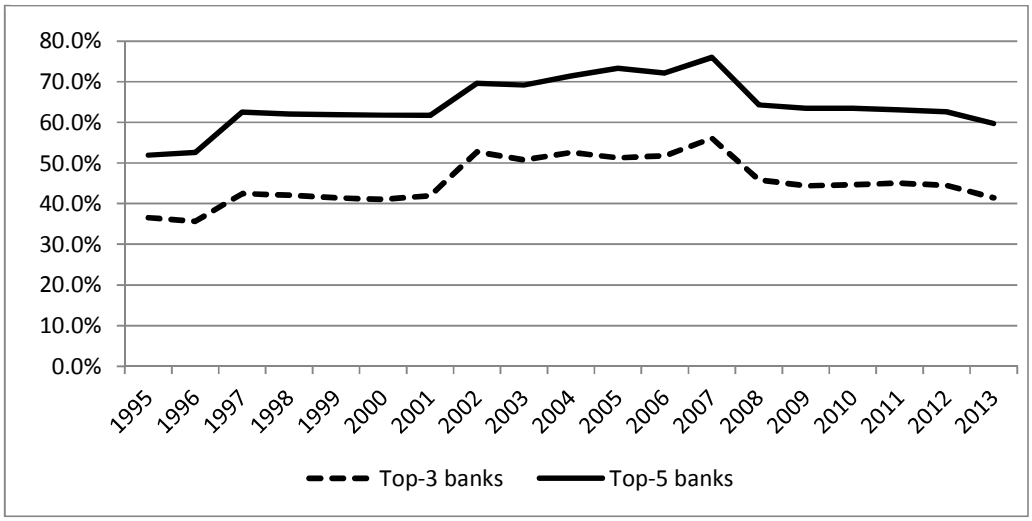

Figure 4. Concentration levels in the Chilean banking system.

(Share of loans for the top-3 and top-5 largest banks, in percentages)
Source: Author's calculations

Although, I believe that the 2008 world crisis may have had some effect on the number of loans decreasing from 2008; it may be possible that the new banking laws for establishing de novo banking operations in sectors of the economy that are highly concentrated, may have more to do with the number of loans decreasing from 2008. By selectively placing new banks in sectors of the economy that are highly concentrated, this increased competition allows for loans to be more evenly distributed across banks in those sectors, and thus allowing concentration in those sectors to decrease over time.

AFP's

In 1981, Chile switched from a pay-as-you-go to a fully funded defined contribution pension plan. The new pension plan was no longer managed by the government but managed by private pension fund administrative companies called (*Administradoras de Fondos de Pensiones*[8], or AFPs). AFP's offered one fund (referred to as fund C) in 1981 and were required by law[9] to invest employee contributions in low risk domestic assets such as time deposits and government bonds. This new defined contribution pension plan requires employees to contribute 10% of their monthly earnings plus administrative fees and premiums for disability and survivors' insurance to their individual accounts (OECD, 2011).

According to the Superintendence of Pensions[10] or SAFP (2010), the Chilean Pension System experienced high concentration through multiple mergers and acquisitions with the number of AFP's decreasing from fifteen in 1995 to only eight in 2000. Table 11, shows that during the 1995-2000 time periods, AFP fund assets grew from $32.8 billion to $51.7 billion making the pension system the second-largest contributor to the Chilean banking system behind banks. Assets as a percent of GDP grew from 36.5% in 1995 to 50.6% in 2000. Fund C returned an annual real rate of return of -2.5% in 1995 and an annual real rate of return of 16.2% in 1999. While net commissions paid by employees decreased slightly from 3.2% to 2.7% for this same time period, administrative costs rose from .03% to 1.17%. Also, bank term deposits in 1995 were 5.3% but grew rapidly to 18.7% by 2000.

[8]In 1981, Chile replaced its public pension with privately managed individual accounts. These private firms are called Administradoras de Fondos de Pensiones or (AFPs).
[9]Ahumada and Cetorelli (2003) discuss in their paper that Chilean pension funds are required by law to invest a fraction of their managed funds in bank deposits.
[10]Superintendence of Pensions (SAFP) is the Chilean Pensions Supervisor who regulates the Chilean Pension System. More information can be found at http://www.spensiones.cl/

Table 11. AFP Indicators 1995-2000

	1995	1996	1997	1998	1999	2000
Number of AFP's	15	12	12	9	8	8
AFP Term Deposits (%)	5.3	4.2	10.7	13.6	16.1	18.7
Average Real Rate of Return for Fund C (%)	-2.5	3.5	4.8	-1.1	16.3	4.4
Net Commission Paid by Employees (%)	3.1	3	3.0	2.7	2.6	2.5
Administrative Costs (% of fund)	0.03	0.21	0.18	0.25	0.47	1.17
Pension Fund Assets (billion US$)	32.8	34.9	38.2	39.6	48.1	51.7
Pension Assets (% of GDP)	36.5	37.4	39.0	40.2	49.1	50.6
HHI	13.1	13.4	13.9	16.9	20.8	20.7

Source: Superintendencia de Pensiones 2010
Central Bank of Chile

Ahumada and Cetorelli (2003) find that banks with a pension fund affiliation (ownership of the fund), offer higher deposits rates and charge higher loan rates than unaffiliated banks. Also, their interest rate spreads are higher than average. By 2001, the number of pension funds had been reduced to seven, with the four largest funds owned by foreign banks namely, Banco Santander, Citibank, Banco Penta, and BBVA. The author(s) find that affiliated banks can count on a more stable supply of deposits, which would support a more aggressive lending strategy. Taking on riskier investment projects could generate a higher rate of return on the lending portfolio, together with broader interest margins and higher profitability. Their research shows that from 1995-2001, affiliated banks enjoyed much higher AFP pension fund deposits than did non-affiliated banks.

In 2002, a new federal regulation was put in place that required AFP's to offer three additional funds, referred to as Funds B, C, D, and E which vary by different degrees of risk. AFP's may also offer Fund A, which has the highest degree of risk

with a maximum limit in equities of up to 80%. Fund E, has the lowest risk with zero equities. Fund C, continues to be the original fund that was established in 1981. The International Monetary Fund (2011) finds that the Chilean pension system has averaged a little over 9 percent average historic real rate of return since 1981. However, going forward, achieving long-term real returns in the 6 percent range may prove challenging.

In 2008, Chile's President Michelle Bachelet[11] (2006-2010) applied pressure to Congress to pass pension reform Law 20.255.[12] The new regulations were put in place to increase AFP competition and reduce high pension fund costs. Kritzer, Barbara E. (2008) finds that pension fees as a percentage of member contributions in 2008 was 14.6%, making Chile's pension fund administration fees the third highest in Latin America behind Argentina and Peru. The law mandates that:

- AFP's must eliminate their fixed monthly administration fees they charge to their members.
- AFP's must eliminate fees when members transfer their balances from another AFP.
- All AFP's must offer a single fee based on the percentage of member's earnings.
- All new members entering the pension system will be assigned to the AFP with the lowest fees for a 2 year period.
- New regulations allow AFP's to outsource most of their administrative functions to help improve efficiency.
- Insurance companies are now allowed to enter the market by setting up AFP subsidiaries.

Table 12, shows that from 2000-2013, the Chilean pension system concentrated further with the number of AFP's decreasing from seven to six. Pension fund assets grew from $51.7 billion to $163.9 billion while pension assets as a percent of GDP grew from 50.6% to 62.2%. During the 2008 world economic crisis, Fund C's average real rate of return was -18.9%, but bounced back in 2009 with a return of 12.6%. The fund's return in 2013 was .7%. Net commissions paid by employees decreased from 2.5% to 1.5%, while administrative costs increased from 1.16% to 1.25% over the same time period. Term deposits were 18.7% in 2000 but fell to 4.8% in 2013.

Table 12. AFP Indicators.

	2001	2003	2005	2007	2009	2011	2013
Number of AFP's	7	7	6	6	5	6	6
AFP Term Deposit's (%)	17.5	15.0	20.8	18.4	7.5	6.7	4.8
Average Real Rate of Return for Fund C (%)	6.7	10.6	4.6	5.0	12.6	-3.8	0.7
Net Commission Paid by Employees (%)	2.4	2.4	2.4	2.4	1.6	1.6	1.5
Administrative Costs (% of fund)	1.16	1.14	1.14	1.25	1.25	n.a.	n.a.
Pension Fund Assets (billion US$)	56.9	69.6	85.1	110.8	119	134.9	164
Pension Assets (% of GDP)	53.2	57.7	57.9	64.4	62.0	58.0	62.2
HHI	20.9	21.4	21.4	21.6	n.a.	n.a.	n.a.

Source: Superintendencia de Pensiones 2010
Central Bank of Chile
OECD Stat Extracts
Note: The complete table (includes even years) is available in the Appendix.

In 1995, the limit that pension funds could invest internationally was only 6 percent. In 2013, the limit has increased to 15 percent for Fund C. Although AFP's could invest more funds oversea during the 2000's, bank term deposits didn't decrease until after the 2008 world economic crisis. In 2009, AFP's reduced their term deposits from 20 percent to 7.7 percent. The International Monetary Fund

(2014) finds that banks reduced their dependence on institutional deposits from 2009–2011, while mutual funds have become the biggest institutional depositor during this same time period. Deposits from mutual funds have on average a shorter maturity than those from pension funds. At the end of 2011, AFP term deposits were just 6.7 percent while mutual funds deposits[13] accounted for 21 percent of total term deposits in the Chilean banking system.

Ahumada and Cetorelli (2003) find also, that the process of deregulation, which has made pensions funds less dependent on domestic sources of investment, seem to have reduced the importance for banks to tie themselves to a pension fund via common ownership. Shortly after Law 20.255 was passed in 2008, Banco Santander sold A.F.P. Bansander to the ING Group. Citibank sold its 40.23 percent indirect ownership in A.F.P. Habitat, Chile's 2nd largest pension fund to Sociedad de Inversiones y Servicios la Construcción, S.A. (Invesco) and Inversiones Provisionales S.A. (Inpresa) in 2010. Banco Penta sold A.F.P. Cuprum, Chile's 3rd largest pension fund to Principal Financial Group in 2012. Lastly, BBVA sold A.F.P. Provida, Chile's largest pension fund to MetLife in 2013.

Although Banco Santander, Citibank, Banco Penta, and BBVA are no longer affiliated with AFP's, I incorporated pension fund term deposits into my foreign bank model from 2001-2013, because of the significant influence term deposits had on foreign bank spreads from 1994-2001. My preliminary findings show that pension fund term deposits are no longer significant from 2001-2013.

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[11] Chile's President Michelle Bachelet served from 2006-2010.

[12]Chile's pension reform Law 20.255 was passed March 2008 was established to include more workers in Chile and to promote more competition among pension fund management companies.

[13]IMF: Chile selected issues, July 2014.

There may be many reasons to explain why Banco Santander, Citibank, Banco Penta, and BBVA sold their AFP pension fund businesses. It is certainly possible that Law 20.255 will increase AFP competition and reduce high pension fund costs over the long run. If this is the case however, then pension funds profitability will be reduced. Also, with stronger regulations regarding new members, if an AFP does not have the lowest fees at the beginning of every two-year window; the AFP is at risk of not growing its membership on a consistent basis. AFP's that do not consistently lead with the lowest fees will see their membership and assets decline over time.

Are Banks Finding it Easier to Enter the Chilean Banking System Since 1997 When Congress Passed the General Banking Act?

Karasulu (2007) finds that regulatory barriers to bank entry in Chile are among the lowest by international standards. However, the IMF (2005) finds that the Chilean banking system maintains capitalization levels well above the minimum regulatory requirements and also above those in most other countries. These high levels, which contribute to banks' financial stability, may also act as effective entry costs, particularly given the relatively small size of the Chilean banking system. On average, a one percent market share (in terms of non-risk weighted assets) in the Chilean banking system costs about 8 percent more in equity capital. When adjusted for banking risks, the premium for Chile is about 10 percent higher than on average in the other countries.

In the existing literature, Levine and Carkovic (2002) conduct a study of Chilean banks between 1976 and 1998 and find that while foreign banks could enter Chile, they were required to purchase a domestic bank to enter; they could not simply

apply and receive a new banking license. The new General Banking Act[14] passed in 1997 was designed to help loosen the tight restrictions on bank entry, improve competition, and lower concentration.

According to SBIF, eleven new foreign banks have entered the Chilean banking system since 2000. Although four foreign banks did purchase a domestic bank to enter the system, seven other banks entered the market as de novo operations. The seven banks that entered the market as de novo operations compete with local banks in niche markets such as investment banking, retail, and short-term company financing. It appears that many of these new banks have started to add additional products and services since inception. The niche market(s) that each bank set out to compete in continues to be their dominant line of business at least, for now. It is still unclear if Chile will allow a new de novo bank to open its doors as a full service commercial bank in the future.

Chile may not be experiencing concentration across all sectors of its economy. My research shows that only domestic banks are experiencing concentration; at least, for the top 5 largest domestic banks from 2001-2013. Foreign banks are not experiencing concentration for this same time period. Further research is needed to determine which sectors these domestic banks dominant. Chile can continue to place niche banks in highly concentrated sectors of the banking system to increase competition and lower concentration, but only in those sectors of the economy. Thus, the rest of the banking system would not be disrupted. I theorize that it is the establishment of niche banks placed in selectively concentrated sectors of the economy that has led to the decrease of concentration in those sectors of the economy and perhaps has led to lower concentration overall in the Chilean banking system.

Diversification of the banking system with the establishment of niche banks can lead to the reduction of bank concentration when placed in selectively highly concentrated sectors of the economy. Further, diversification allows for increased competition in those sectors without affecting the other sectors of the economy and the overall health of the banking system.

[14]See the Superintendency of Banks and Financial Institutions - Chile for more information about the General Banking Act of 1997.

CHAPTER III

CONCLUSIONS

This paper examines the determinants of bank interest rate spreads for both domestic and foreign Banks in the Chilean banking system from 2001-2013. Using the Backward and Forward Stepwise Selection method to construct my panel regressions, I compare my findings to those of Martinez Peria and Mody (2004) and other author(s) who have studied the impact that foreign banks have had on domestic bank spreads and concentration in the Chilean banking system, previously.

I find that non-performing loans for both domestic and foreign banks lead to higher bank spreads. I find also, that administrative costs are no longer significant for all banks from 2001-2013. Many research papers have theorized that foreign banks help domestic banking systems to become more efficient over time. It appears that domestic banks in Chile have become more efficient since 2000. It's certainly possible that the theory holds for the Chilean domestic banking system today.

Martinez Peria and Mody (2004) and others find that higher bank concentration raises spreads significantly for all banks in Chile from 1995-2000. Although, I find that bank concentration raises spreads significantly for domestic banks; I find also, that bank concentration does not raise spreads significantly for foreign banks in Chile from 2001-2013. Martinez Peria and Mody (2004) find also, that the top-5 banks with the largest share of loans is significant at the 1 percent level for domestic banks in Chile from 1995-2000. I find that the top-5 banks with the largest share of loans is significant at the 10 percent level for domestic banks from

2001-2013. It's possible that the establishment of niche banks has lead to the reduction of bank concentration in those sectors of the Chilean economy that were highly concentrated from 1995-2000. Thus, leading to a small reduction (significance went from 1 percent to 10 percent) in concentration overall, for domestic banks from 2001-2013. Further research is needed to determine if diversification is still working to reduce concentration over the next decade in the Chilean banking system.

APPENDIX

APPENDIX A

(Even years)

Table 1. Chile's Macroeconomic Indicators.

	2002	2004	2006	2008	2010	2012
Annual GDP Growth (%)	2.2	6.0	4.4	3.3	5.8	5.4
National Savings Rate (%)	21.9	22.8	25.3	22.3	24.1	21.4
Per Capita Income ($US)	4487	6224	9371	10686	12682	15246
Inflation (%)	4.2	7.5	12.8	0.5	8.8	1.3
Real Interest Rates (%)	3.4	-2.2	-4.3	12.7	-3.7	8.6

Source: World Bank

Table 2. Chile's Overall, Fiscal, Monetary, and Government Spending Scores.

	2002	2004	2006	2008	2010	2012
Fiscal	74	78.5	78.6	78.1	77.5	77.4
Gov't Spending	82.7	81.5	87.5	88.2	89.6	82.1
Monetary	82.7	84.2	86.9	78.8	73.0	85.6

Source: The Heritage Foundation

Table 3. Financial Soundness Indicators.

	2002	2004	2006	2008	2010	2012
Regulatory Capital to Risk-Weighted Assets	14.0	15.1	12.5	12.5	14.1	13.3
Tier 1 Capital	11.1	11.9	9.3	9.6	10.1	10.0
Non-Performing Loans	2.0	1.2	0.7	1.0	2.7	2.2
ROA	1.1	1.2	1.3	1.0	1.5	1.4
ROE	14.4	16.7	18.6	13.2	18.5	17.3
Liquidity	18.7	18.9	16.8	17.5	20.5	13.3

Source: IMF Chile: Financial system stability assessment 2004
IMF Chile: Financial system stability assessment 2011
IMF Chile: Country Report Chie No. 14/218. 2014
Central Bank of Chile
World Bank
Author's calculations

Table 4. Chile's Banking System.

	2002	2004	2006	2008	2010	2012
Total number of banks	24	26	25	24	24	23
Number of foreign banks	14	13	13	13	13	12
Foreign bank share of loans (%)	44.1	39.1	41.3	47.9	46.5	47.0
Top-3 bank share of loans (%)	52.8	52.6	51.8	45.9	44.7	44.5
Top-5 bank share of loans (%)	69.6	71.4	72.1	64.3	63.5	62.6

Source: Superintendence of Banks
Author's calculations
A foreign bank is defined to have at least 50 percent foreign ownership.
Note: The total number of foreign banks excludes Banco Estado, Chile's National Bank.

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