

WORKING PAPER N° IDB-WP-1683

Competition and Market Power in the Latin American Banking Sector

Rodrigo Lluberas

Inter-American Development Bank
Department of Research and Chief Economist

February 2025



Competition and Market Power in the Latin American Banking Sector

Rodrigo Lluberas*

* Universidad ORT Uruguay

Inter-American Development Bank
Department of Research and Chief Economist

February 2025



**Cataloging-in-Publication data provided by the
Inter-American Development Bank
Felipe Herrera Library**

Lluberas, Rodrigo.

Competition and market power in the Latin American banking sector /

Rodrigo Lluberas.

p. cm. — (IDB Working Paper Series ; 1683)

Includes bibliographical references.

1. Banks and banking-Latin America. 2. Markup-Latin America. 3. Markdowns.

I. Inter-American Development Bank. Department of Research and Chief Economist. II. Title. III. Series.

IDB-WP-1683

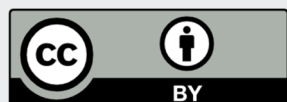
<http://www.iadb.org>

Copyright © 2025 Inter-American Development Bank ("IDB"). This work is subject to a Creative Commons license CC BY 3.0 IGO (<https://creativecommons.org/licenses/by/3.0/igo/legalcode>). The terms and conditions indicated in the URL link must be met and the respective recognition must be granted to the IDB.

Further to section 8 of the above license, any mediation relating to disputes arising under such license shall be conducted in accordance with the WIPO Mediation Rules. Any dispute related to the use of the works of the IDB that cannot be settled amicably shall be submitted to arbitration pursuant to the United Nations Commission on International Trade Law (UNCITRAL) rules. The use of the IDB's name for any purpose other than for attribution, and the use of IDB's logo shall be subject to a separate written license agreement between the IDB and the user and is not authorized as part of this license.

Note that the URL link includes terms and conditions that are an integral part of this license.

The opinions expressed in this work are those of the authors and do not necessarily reflect the views of the Inter-American Development Bank, its Board of Directors, or the countries they represent.



Abstract

The functioning of the banking sector is key for economic growth. In this paper, we first gather banks' balance sheet monthly regulatory information in a consistent manner for seven Latin American countries. Second, we estimate lending markups and deposits markdowns in each country over time. Third, with the estimated markups and markdowns in the different countries we study how they relate with banks' profitability, the cost of credit, credit risk and credit supply. Finally, we explore whether there are differences in markups on lending rates and markdowns on deposit rates between international and domestic banks.

JEL classifications: E44, L11, L16, G21

Keywords: Banking, Markups, Markdowns, Market concentration, Latin America

*Lluberas: Universidad ORT Uruguay, lluberas@ort.edu.uy. I am grateful to Jan de Loecker, Cezar Santos, Vanessa Alvarez, Javier Suarez, Tiago Cavalcanti, Nestor Gandelman, Cecilia Dassatti, Pablo Bazerque, Santiago Taroco and seminar participants in the IDB Research Network on Competition and Market Power in Latin America and the Caribbean for helpful comments and discussions. I thank Camila Amiasorho for excellent research assistance.

1 Introduction

The functioning of the banking sector is key for economic growth. Besides being key players in the operation of the payment system and in the transmission of monetary policy, as financial intermediaries, banks are in charge of channeling savings from households to firms through credit.

Previous literature has studied the effect of financial development on economic growth (Rajan and Zingales (1998), Levine and Zervos (1998), Beck and Levine (2004)), but less attention has been given to analyzing how the market structure of the banking sector affects the cost of credit and, ultimately, the allocation of resources in the economy.

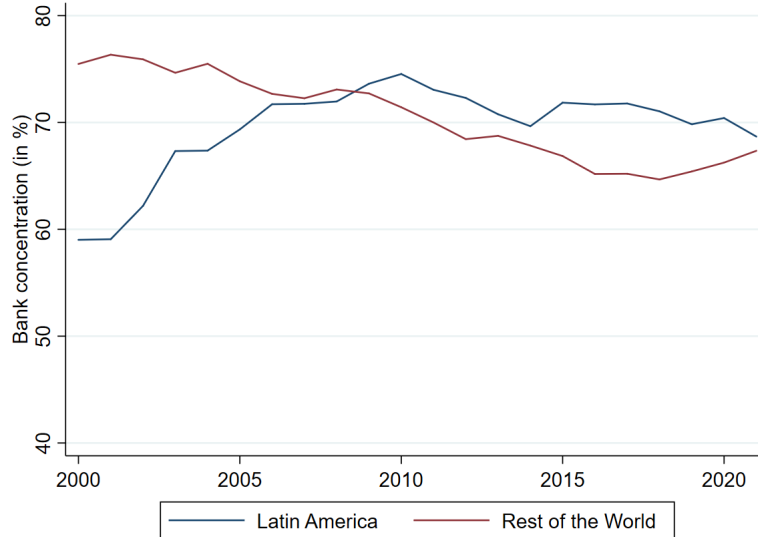
The aim of this paper is threefold. First, we gather banks' balance sheet monthly regulatory information in a consistent manner for seven Latin American countries: Brazil, Colombia, Chile, Ecuador, Mexico, Peru, and Uruguay. This micro-level information will allow us to document the recent evolution of the market structure of the banking system in the region.

Second, with the micro-level balance sheet information we can estimate lending markups and deposits markdowns in each country and the region as a whole and analyze the main factors explaining their evolution over time. Thus, following the *production approach* originally developed by De Loecker and Warzynski (2012) and applied to the banking sector by Pasqualini (2021), we are able to estimate markups and markdowns in the credit and deposit markets using banks' public balance sheet information.

Third, with the estimated markups and markdowns in the different countries we can study how they relate with banks' profitability, credit spreads and the type of bank, international or domestic.

Although there are differences across countries, bank concentration in the region has increased since 2000. Figure 1 shows the regional average assets of the three largest commercial banks as a share of total commercial banking assets between 2000 to 2021 compared to the rest of the world. While on average in the region the top three banks accounted for 59% of total assets in 2000, the figure increased to 69% by the year 2021. The rest of the world, on the other hand, experienced a decline in bank concentration.

Figure 1: Bank Concentration between 2000 and 2021 (in %)



Notes: The figure shows bank concentration measured as the assets of the three largest commercial banks as a share of total commercial banking assets. Source: *World Bank Global Financial Development Database*

But how does banking market structure relate with the cost of credit and credit supply? Table 1 shows exploratory empirical analysis of the correlation between market concentration, measured as the assets of the three largest commercial banks as a share of total commercial banking assets, and both the cost of credit, measured as the spread between lending and deposit interest rates, and credit supply, measured as the ratio of credit to deposits. Preliminary evidence suggests that market concentration is correlated with lower credit supply and a higher cost of credit, which might affect investment and the allocation of resources in the economy.

Table 1: Market Concentration, Cost of Credit and Credit Supply

	Credit spread	Credit/Deposits
Market concentration	0.047** (0.022)	-0.239*** (0.093)
Observations	1,786	1,712
R-squared	0.015	0.024

Notes: This table reports estimates of the following fixed effects panel data model: $Y_{it} = \alpha_i + \beta MC_{it} + \epsilon_{it}$ where i is country, t is year, Y_{it} is either credit spread or the credit to deposit ratio and MC_{it} is market concentration measured as the assets of the three largest commercial banks as a share of total commercial banking assets. Robust standard errors in parentheses, *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Estimating lending rates markups and deposits markdowns would allow us to study how they correlate with the banking sector market structure as well as with access to credit and banks' profitability in Latin America.

2 Literature Review

There are a few studies that document the market structure and concentration of the banking sector in Latin America, but the literature has given less attention to the relationship between banking market concentration and the cost of credit.

Yeyati and Micco (2007) analyze how foreign penetration and market concentration in the region’s banking sector during the 1990s affected competition behavior between banks and the financial stability of the sector. The authors find that increasing foreign penetration hindered competition and is associated with an increase in risk-taking by banks.

Chortareas, Garza-Garcia, and Girardone (2011) study the relationship between market structure, efficiency and bank profitability in nine Latin American countries during the period 1997-2005. Their results suggests that the increase in banks profitability during this period is explained by an increase in efficiency rather than by the increase in market concentration that took place.

More recently, Joaquim, Doornik, and Ornelas (2019) focus on the banking sector in Brazil to study how bank competition affects the cost of credit and economic activity in regions within Brazil. Looking at M&A activity, they find that an increase in concentration results in higher spreads between lending and deposit rates and a decline in credit that affects both the tradable and non-tradable sectors.

There is also evidence on how bank competition affects the cost of credit in Europe. Fungacova, Shamshur, and Weill (2017) study the relationship between bank competition and credit cost in 20 European countries over the period 2001-2011. They find that, in line with the information hypothesis, bank competition increases the cost of credit.

The paper closest to this study is Pasqualini (2021), which estimates markups on lending and markdowns on deposit rates in the United States following the *production approach* originally developed by De Loecker and Warzynski (2012). The author finds a decline in markups on lending rates between 1992 and 2019, and an important increase in markdowns on deposits after the 2008 global financial crisis. He also finds that markups and markdowns are weakly correlated with measures of market power and financial stability.

The empirical evidence on competition and risk taken is not conclusive. While Yeyati and Micco (2007) find a positive correlation between concentration and banks’ risk-taking in Latin America, Jiang, Levine, and Lin (2023) finds that competition increases banks’ risk-taking in the United States. They argue that, as competition lowers profits, banks end up taking more risk to boost profits.

There are also studies on banking sector market structure and access to finance. For example, Beck, Demirguc-Kunt, and Maksimovic (2004) studies bank competition and access to finance in 74 countries, including some from Latin America. They find that lack of competition affects access to finance, but only in countries with low economic development and poor institutions.

3 Data

Data on banks’ balance sheets are available from the national Central Banks or regulatory agencies of each country. Regulatory agencies in each country require banks to present monthly financial statements that are publicly available in the regulatory bodies’ websites. This paper makes use of these data.

Table 2 shows the available data and the corresponding links to each country’s regulatory body:

Table 2: Data Sources: Banks’ Balance Sheet and Income Statements

	Period	Link to download the data
Uruguay	January 2008 to December 2022	Banco Central del Uruguay
Chile	January 2008 to October 2023	Comision para el Mercado Financiero
Colombia	January 2016 to November 2023	Superintendencia Financiera
Peru	December 1993 to December 2019	Superintendencia de Banca, Seguros y AFP
Mexico	December 2000 to November 2023	Comisión Nacional Bancaria y de Valores
Brazil	March 2000 to June 2023	Banco Central do Brazil
Ecuador	January 2003 to January 2024	Superintendencia de Bancos

The balance sheet information included in the database comprises the following items: total assets, total liabilities, total equity, outstanding loans to the non-financial sector, deposits, expenditure on labor, equipment and premises (administrative costs), loan loss provisions, interest income (credit), interest costs (deposits), and net income. Additional items available in the banks’ balance sheet and income statements could be added in a later stage, but the items already are the ones we need to estimate markups on lending and markdowns on deposit rates following the *production approach* described in the methodology section.

Moreover, the granularity of the micro-level data allows us to measure market concentration on a variety of outcomes (with a particular focus on the credit market) and using different measures such as the concentration ratio (based on banks’ total assets or credit, for instance) and the Herfindahl-Hirschmann index (see exploratory analysis in Section 4).

On top of the bank-level balance sheet information in each country, for the descriptive statistics section and with the aim of showing aggregate trends in bank concentration and the cost of credit, I also use publicly available aggregate-level data available from the World Bank Global Financial Development Database that allow us to consider the region within a broader international benchmark.

4 The Banking Sector in Latin America

In this section we present descriptive statistics about the structure of the banking system in the seven Latin American countries included in this study: Brazil, Mexico, Colombia, Ecuador, Peru, Chile, and Uruguay.

For each country we present three figures aiming to capture market structure and concentration: the Herfindahl-Hirschmann index (HHI) for both the credit and the deposit markets, the share of total credit of the top five banks, and the share of total deposits of the top five banks.

Finally, we also include a graph aiming to show sources of fund for credit. This is measured by the credit-to-deposits ratio, i.e., the proportion of credit of which the source of fund is deposits.

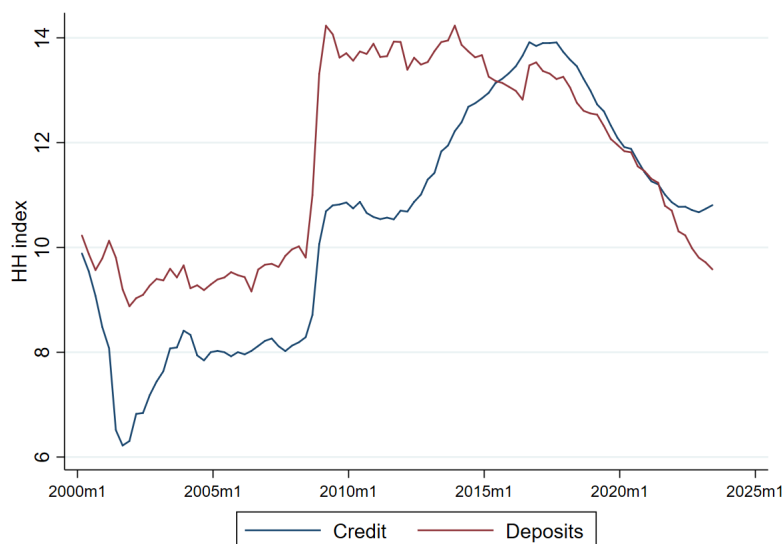
4.1 Brazil

There are more than 800 financial institutions receiving deposits and issuing credit in Brazil, but two-thirds of credits and deposits are concentrated in just five institutions: Santander, Bradesco, ItaÃº,

Prudencial and Caixa Economica Federal (see Figures 3 and 4).

Market concentration measured by the HHI increased by the end of 2008, particularly in the deposits market, after the merger of Santander with ABN Amro and of Ita^o with Unibanco.

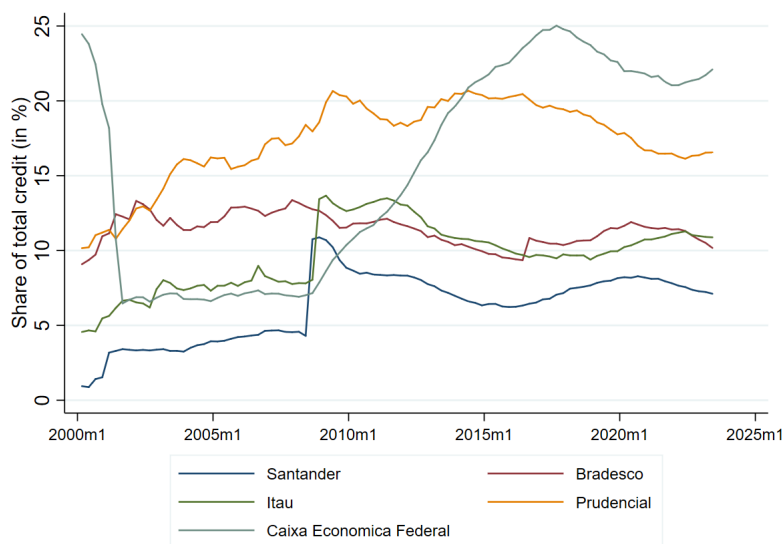
Figure 2: Herfindahl-Hirschmann Index: Credit and Deposits



Notes: The figure shows the Herfindahl-Hirschmann index for deposits and credit.

Source: *Balance sheet and income statements.*

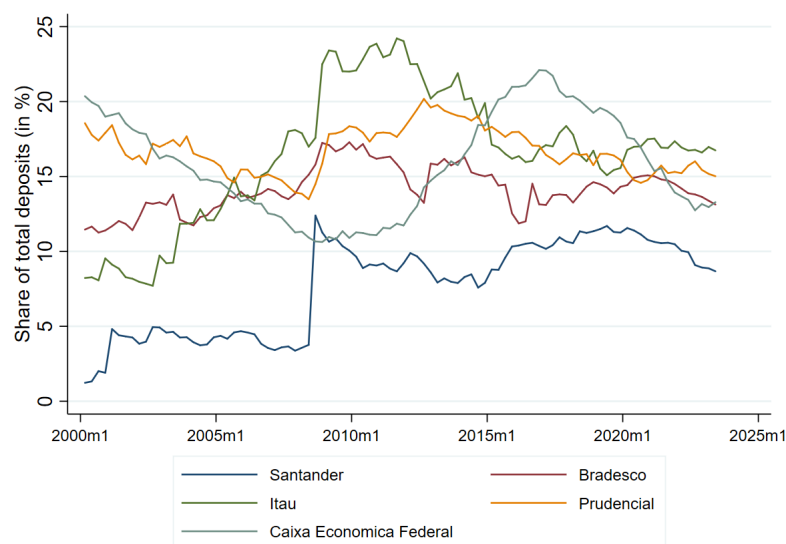
Figure 3: Share of Total Credit (in %, major banks)



Notes: The figure shows the share of total credit expressed in percent for the five major banks.

Source: *Balance sheet and income statements.*

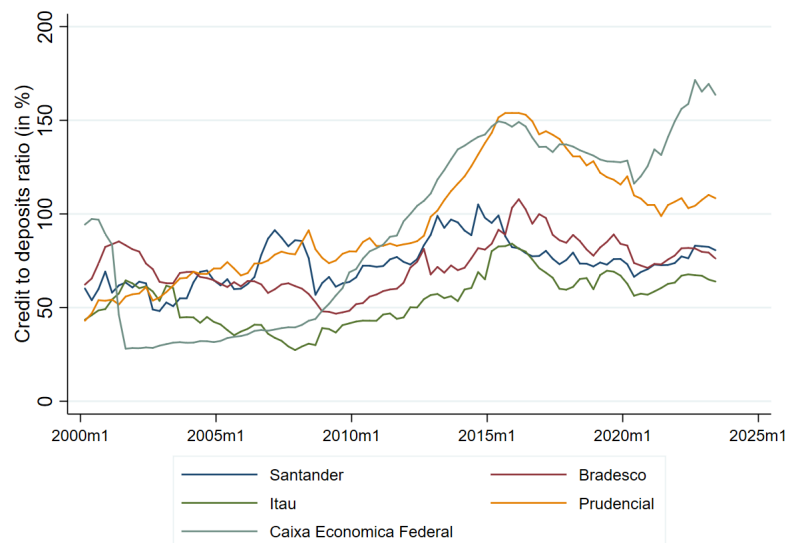
Figure 4: Share of Total Deposits (in %, major banks)



Notes: The figure shows the share of total deposits expressed in percent for the five major banks.
Source: *Balance sheet and income statements.*

Deposits as a source of funds for credits declined over time, particularly for Prudential and Caixa Econômica Federal, for which the credit to deposits ratio surpassed 100% by 2013.

Figure 5: Credit-to-Deposits Ratio (in %, major banks)

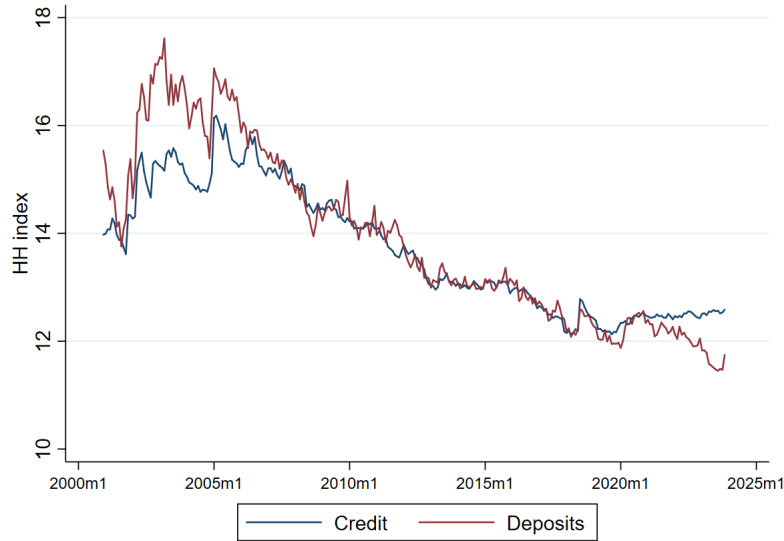


Notes: The figure shows the credit-to-deposits ratio expressed in percent for the five major banks. // Source: *Balance sheet and income statements.*

4.2 Mexico

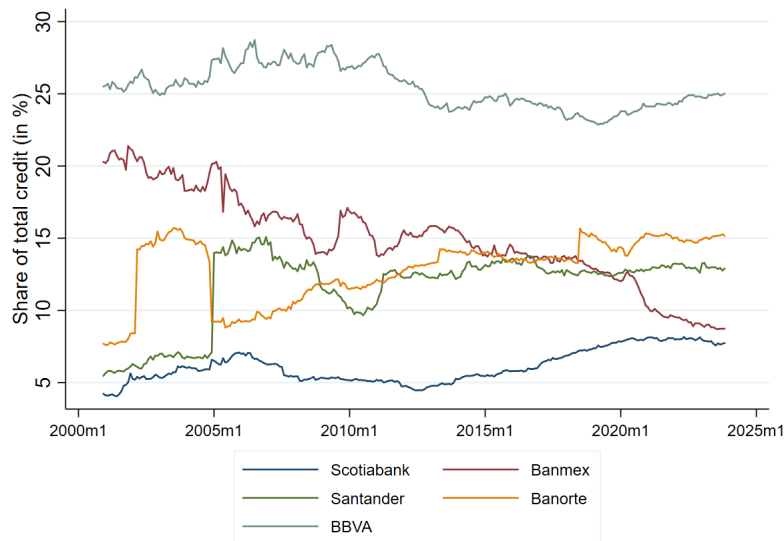
The Mexican banking system shows a declining market concentration, both in the credit and deposits markets, since year 2005. The HHI declined from about 16 in 2005 to 12 by the end of 2023 (Figure 6). Despite this decline in concentration, the top five banks account for 69% of the credit and 68% of the deposit market (Figures 7 and 8).

Figure 6: Herfindahl-Hirschmann Index: Credit and Deposits



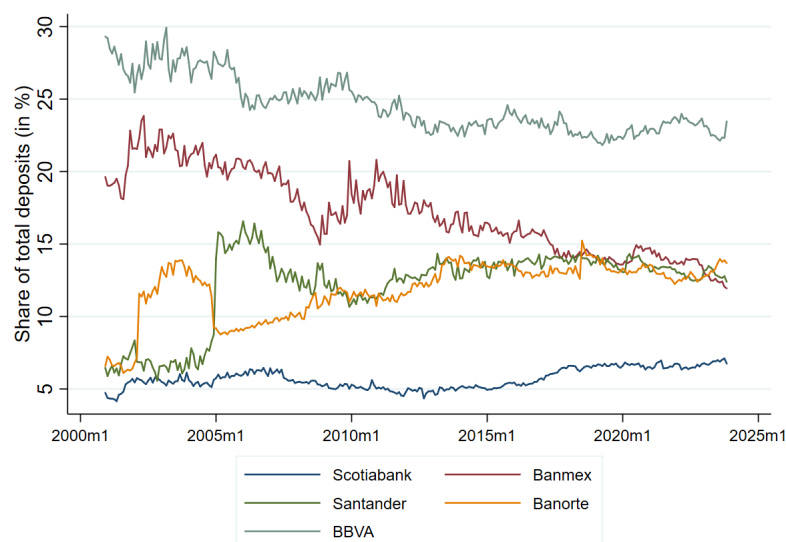
Notes: The figure shows the Herfindahl-Hirschmann index for deposits and credit.
Source: *Balance sheet and income statements.*

Figure 7: Share of Total Credit (in %, major banks)



Notes: The figure shows the share of total credit expressed in percent for the five major banks.
Source: *Balance sheet and income statements.*

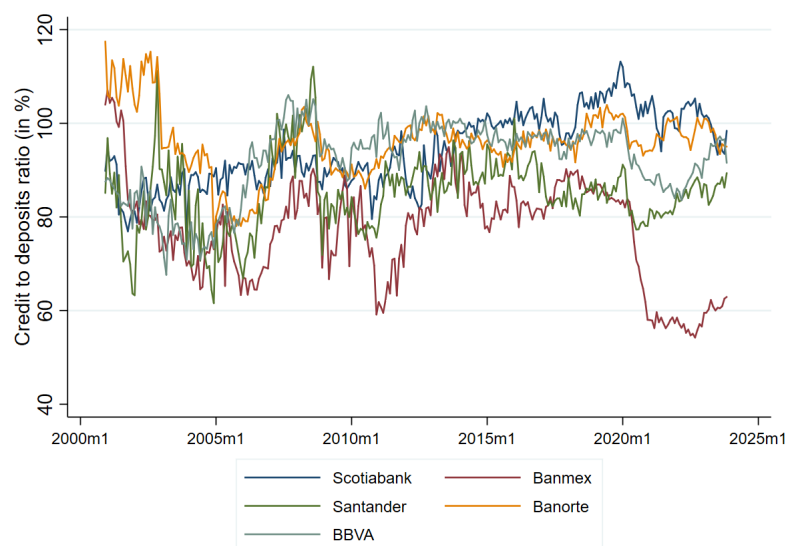
Figure 8: Share of Total Deposits (in %, major banks)



Notes: The figure shows the share of total deposits expressed in percent for the five major banks.
Source: *Balance sheet and income statements.*

For the top 5 banks in Mexico, the credit to deposits ratio fluctuated between 80 to 100%, suggesting that deposits are the main source of funds for loans issued in the Mexican banking system.

Figure 9: Credit-to-Deposits Ratio (in %, major banks)



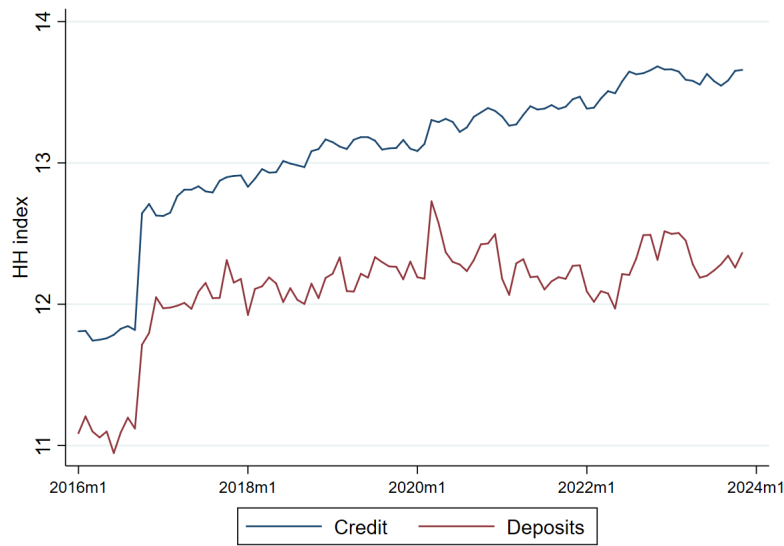
Notes: The figure shows the credit-to-deposits ratio expressed in percent for the five major banks. // Source: *Balance sheet and income statements.*

4.3 Colombia

While concentration in the deposit market stayed relatively constant after the increase in 2016 due to the merge between Bancolombia and Leasing Bancolombia, there was an steady increase in concentration in the credit market, with the HHI increasing from 12.6 in 2016 to 13.6 by the end of 2023 (Figure 10).

Bancolombia accounts for 25% of the deposits and 27% of the credit market in Colombia.

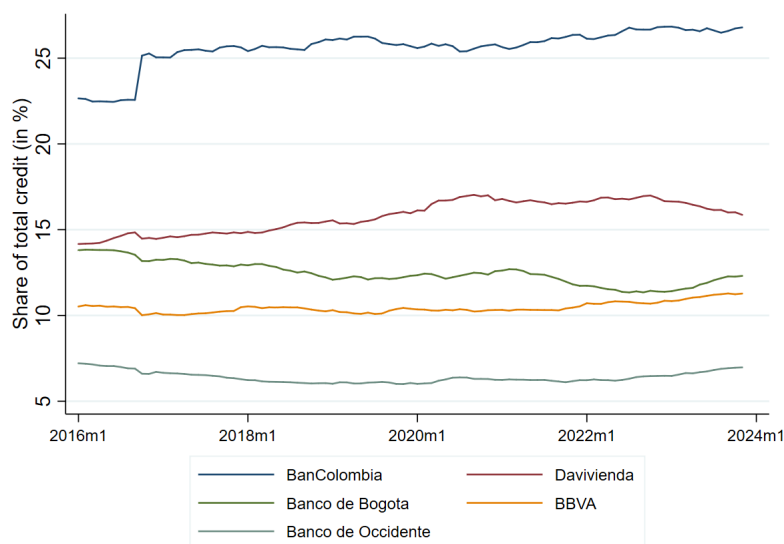
Figure 10: Herfindahl-Hirschmann Index: Credit and Deposits



Notes: The figure shows the Herfindahl-Hirschmann index for deposits and credit.

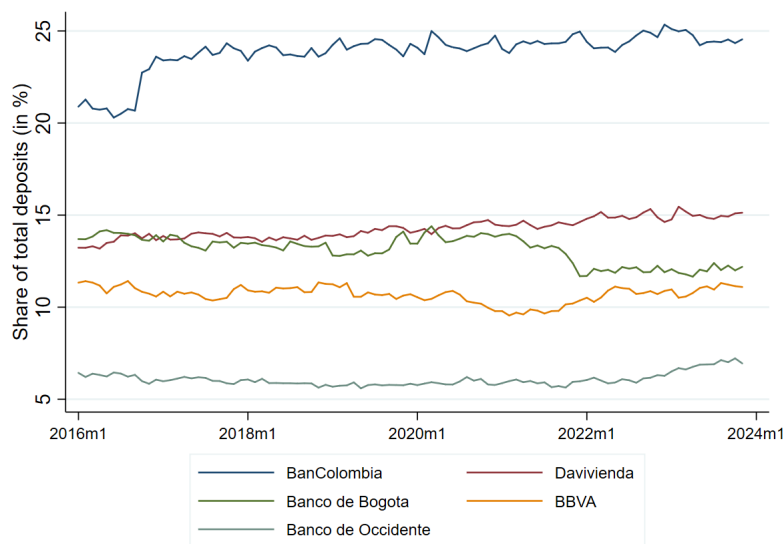
Source: *Balance sheet and income statements.*

Figure 11: Share of Total Credit (in %, major banks)



Notes: The figure shows the share of total credit expressed in percent for the five major banks.
Source: *Balance sheet and income statements*.

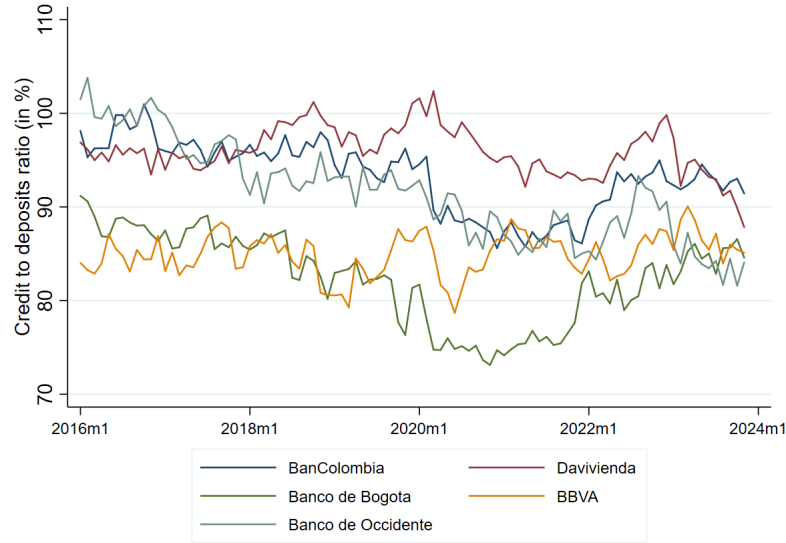
Figure 12: Share of Total Deposits (in %, major banks)



Notes: The figure shows the share of total deposits expressed in percent for the five major banks.
Source: *Balance sheet and income statements*.

The credit-to-deposits ratio declined over time for the top five banks but particularly Davivienda, Banco de Occidente and Bancolombia. The median credit-to-deposits ratio in the Colombian banking system is 92%.

Figure 13: Credit-to-Deposits Ratio (in %, major banks)



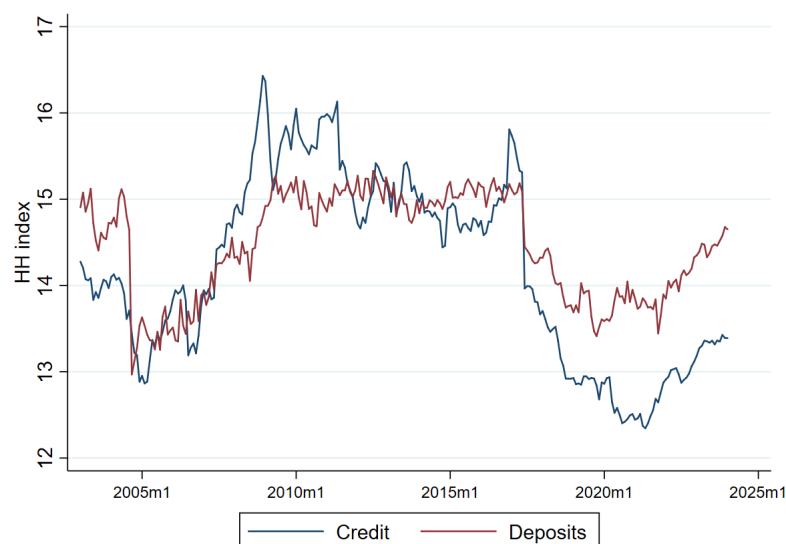
Notes: The figure shows the credit-to-deposits ratio expressed in percent for the five major banks. // Source: *Balance sheet and income statements.*

4.4 Ecuador

There are currently 24 financial institutions receiving deposits and offering credit in the banking system of Ecuador. Of those, Banco Pichincha accounts for 29% of the total deposits and 26% of total credit, while the following four banks account, altogether, for 45% of deposits and 46% of credits.

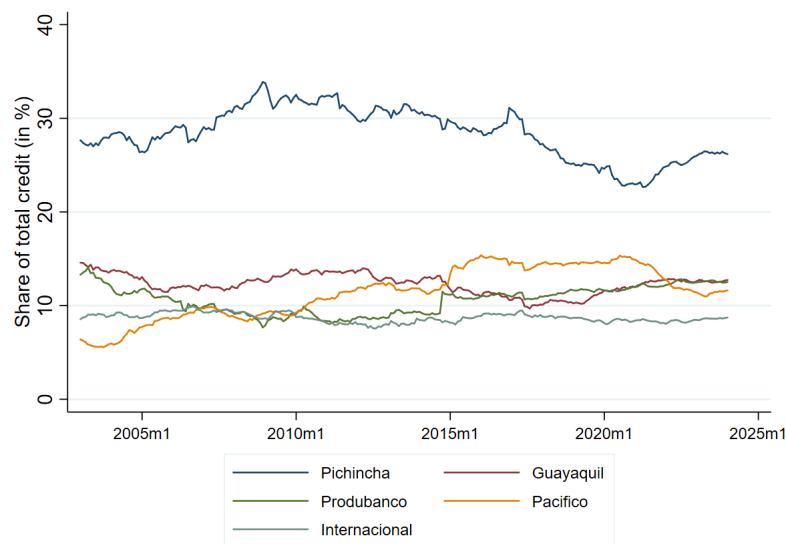
Market concentration, both for the credit and deposit markets, measured by the HHI increased between 2005 and 2010, remained relatively constant until 2017, and declined until the COVID-19 pandemic when it returned to 2005 levels. Currently the deposits market is slightly more concentrated than the credit market.

Figure 14: Herfindahl-Hirschmann Index: Credit and Deposits



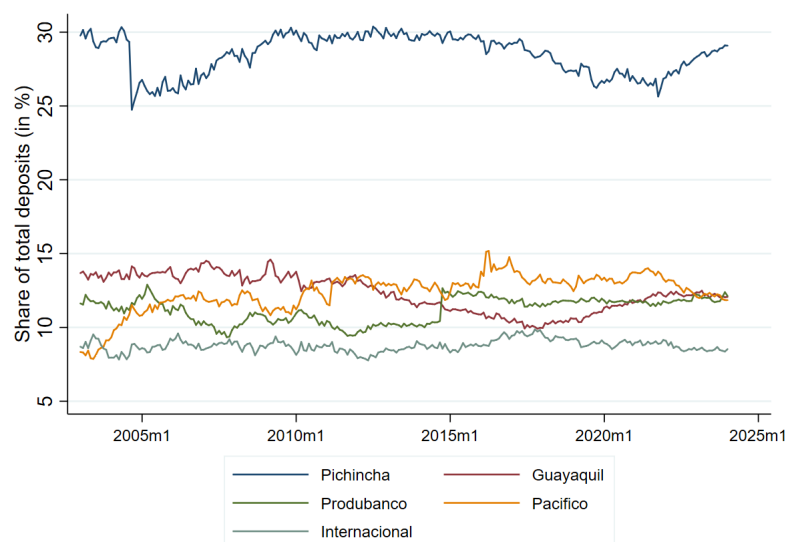
Notes: The figure shows the Herfindahl-Hirschmann index for deposits and credit.
Source: *Balance sheet and income statements.*

Figure 15: Share of Total Credit (in %, major banks)



Notes: The figure shows the share of total credit expressed in percent for the five major banks.
Source: *Balance sheet and income statements.*

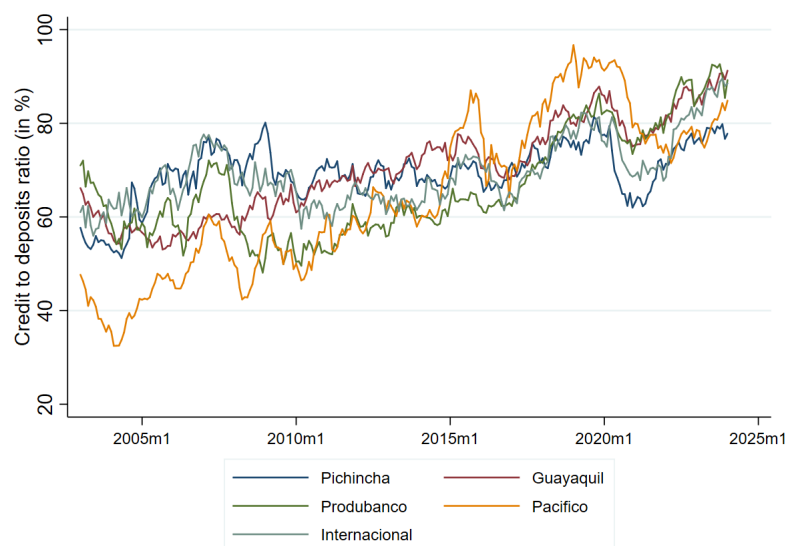
Figure 16: Share of Total Deposits (in %, major banks)



Notes: The figure shows the share of total deposits expressed in percent for the five major banks.
Source: *Balance sheet and income statements.*

As opposed to other countries in the region, in Ecuador deposits became the major source of funds for credits over time. While the average credit-to-deposits ratio for the five top banks was 61% in January 2003, it reached 86% in January 2024.

Figure 17: Credit-to-Deposits Ratio (in %, major banks)

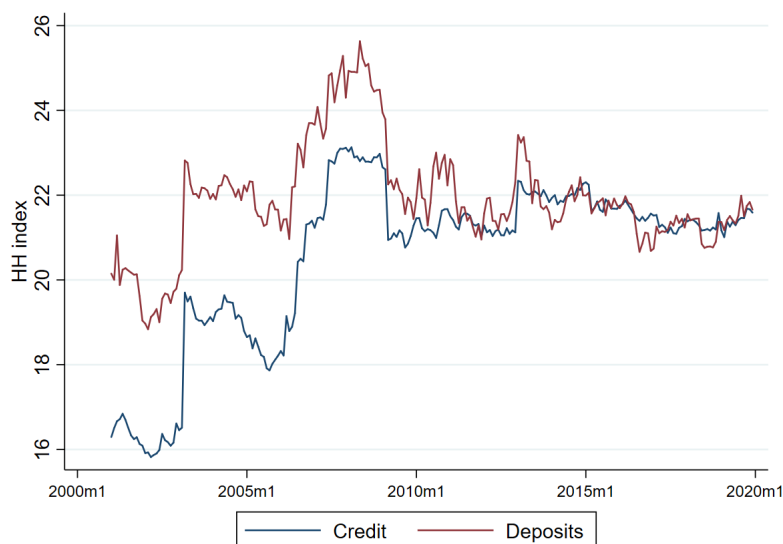


Notes: The figure shows the credit-to-deposits ratio expressed in percent for the five major banks. // Source: *Balance sheet and income statements.*

4.5 Peru

There have been many changes in the structure of the Peruvian banking system, both in terms of banks that stopped participating in the market and also in terms of mergers and acquisitions. As shown in Figure 18, there is a large concentration in both the credit and deposits market in Peru. Banco de Credito is a large participant in both markets, accounting for 35% of credits and of deposits. The top five banks in terms of assets account for 90% of both markets (see Figures 19 and 20).

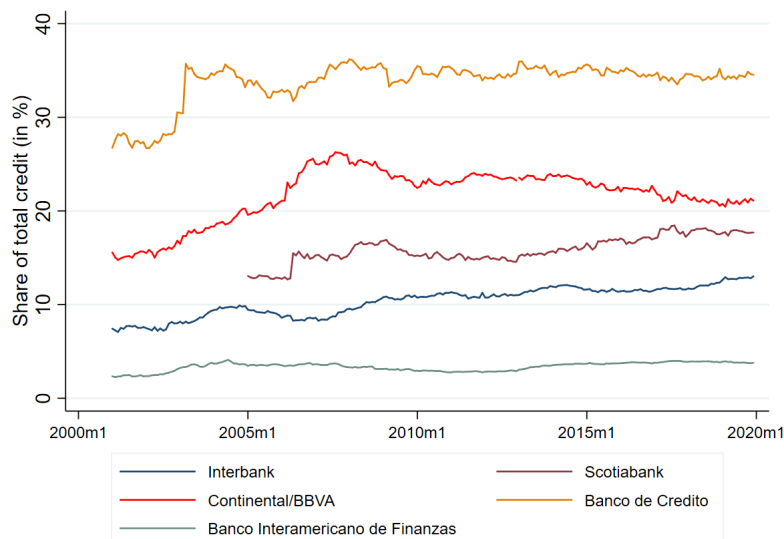
Figure 18: Herfindahl-Hirschmann Index: Credit and Deposits



Notes: The figure shows the Herfindahl-Hirschmann index for deposits and credit.

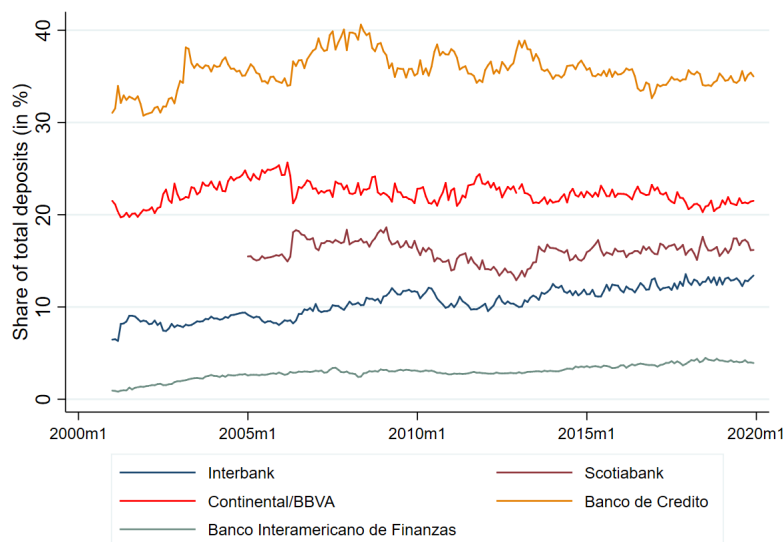
Source: *Balance sheet and income statements.*

Figure 19: Share of Total Credit (in %, major banks)



Notes: The figure shows the share of total credit expressed in percent for the five major banks.
Source: *Balance sheet and income statements.*

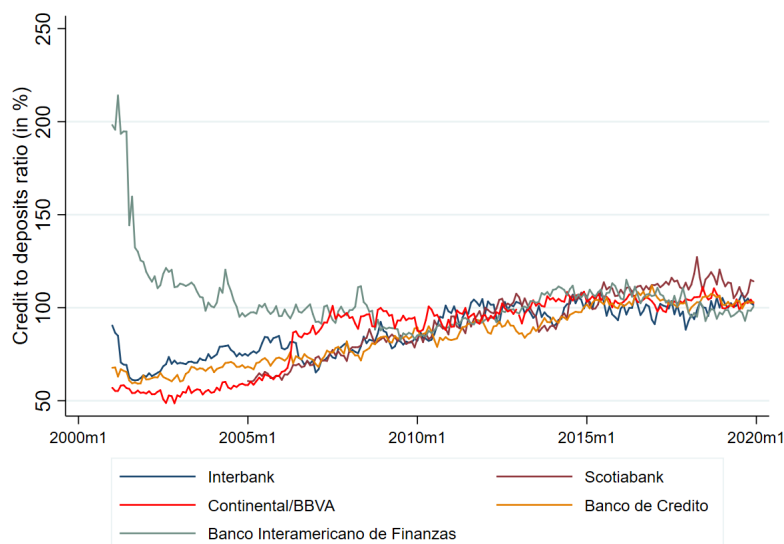
Figure 20: Share of Total Deposits (in %, major banks)



Notes: The figure shows the share of total deposits expressed in percent for the five major banks.
Source: *Balance sheet and income statements.*

With the exception of Banco Interamericano de Finanzas, the credit-to-deposits ratio increased in the top five banks of Peru, reaching in some cases more than 100%.

Figure 21: Credit-to-Deposits Ratio (in %, major banks)



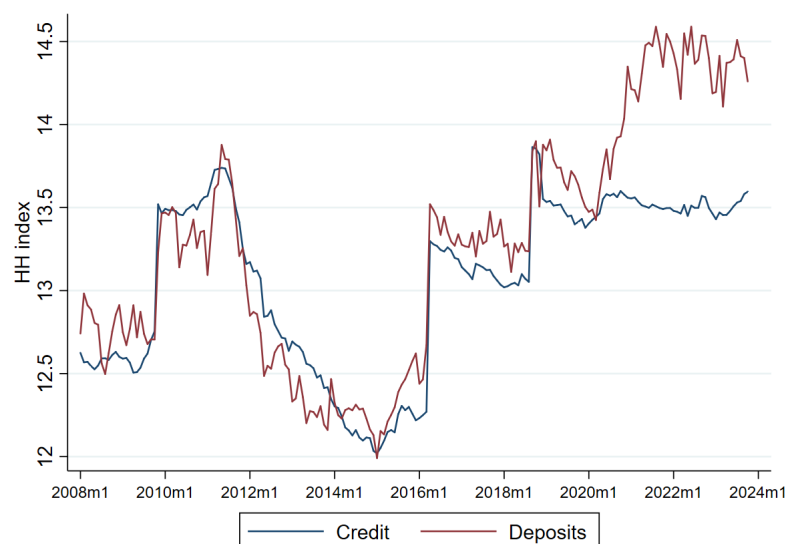
Notes: The figure shows the credit-to-deposits ratio expressed in percent for the five major banks. // Source: *Balance sheet and income statements.*

4.6 Chile

Due to a number of mergers and acquisitions, market concentration of the Chilean banking system, particularly for deposits, increased between 2008 and 2023 (22).

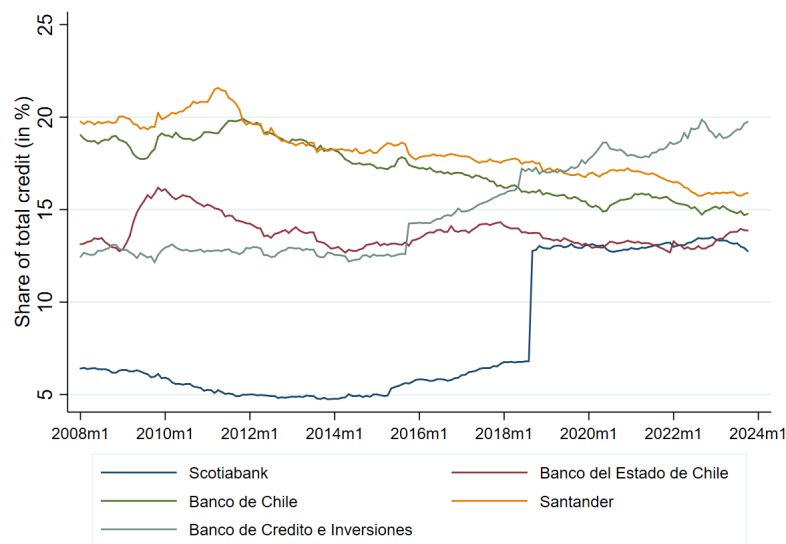
In particular, the acquisition of BBVA by Scotiabank in end-2018 resulted in an increase of 6 percentage points in the share of total credit and an increase in the concentration of credit among the top five banks.

Figure 22: Herfindahl-Hirschmann Index: Credit and Deposits



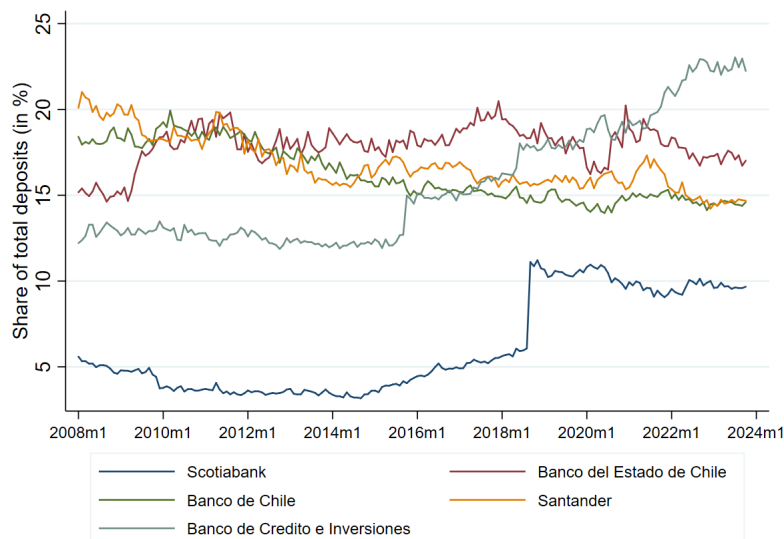
Notes: The figure shows the Herfindahl-Hirschmann index for deposits and credit.
Source: *Balance sheet and income statements.*

Figure 23: Share of Total Credit (in %, major banks)



Notes: The figure shows the share of total credit expressed in percent for the five major banks.
Source: *Balance sheet and income statements.*

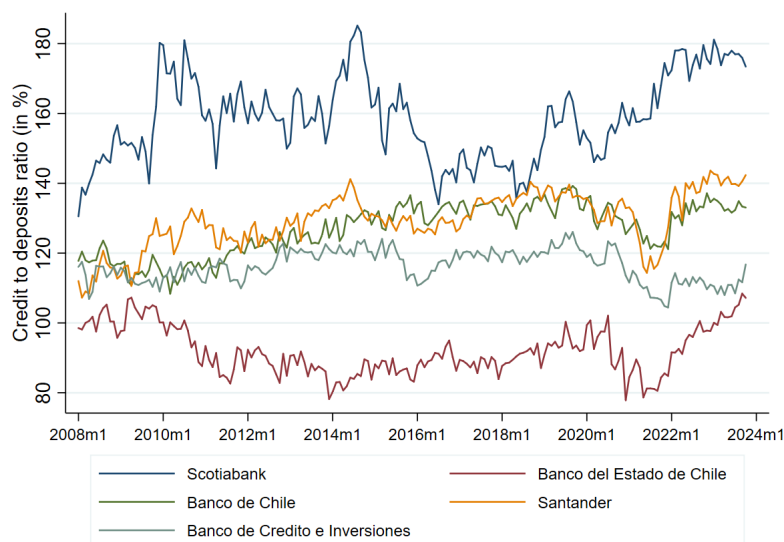
Figure 24: Share of Total Deposits (in %, major banks)



Notes: The figure shows the share of total deposits expressed in percent for the five major banks.
Source: *Balance sheet and income statements.*

For some of the major banks in Chile, the credit-to-deposits ratio was more than 100% during our sample period. This suggests that banks relied on other sources of funding, besides deposits, to issue loans.

Figure 25: Credit-to-Deposits Ratio (in %, major banks)



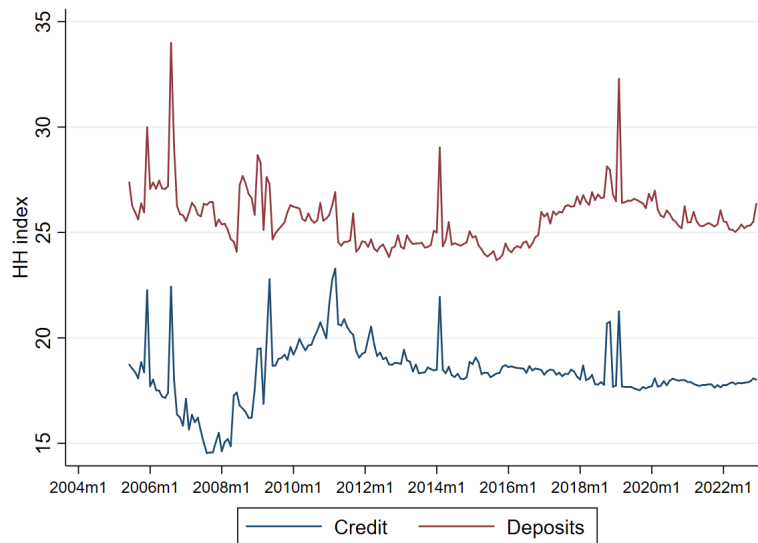
Notes: The figure shows the credit-to-deposits ratio expressed in percent for the five major banks. // Source: *Balance sheet and income statements.*

4.7 Uruguay

As in other countries, during the sample period, there are a few mergers and acquisitions between institutions in Uruguay. The exact dates are the following: April 2011, acquisition of Crédito Agrícola by BBVA; December 2012, merger of ABN AMRO with Santander; December 2013, acquisition of Lloyds Bank by Banque Heritage; November 2015, acquisition of Discount Bank by Scotiabank.

Figure 26 shows market competition in terms of credit and deposits measured by the Herfindahl-Hirschmann index. There is more competition in the credit market than in the deposits market, and that pattern has been even more pronounced during the last decade.

Figure 26: Herfindahl-Hirschmann Index: Credit and deposits



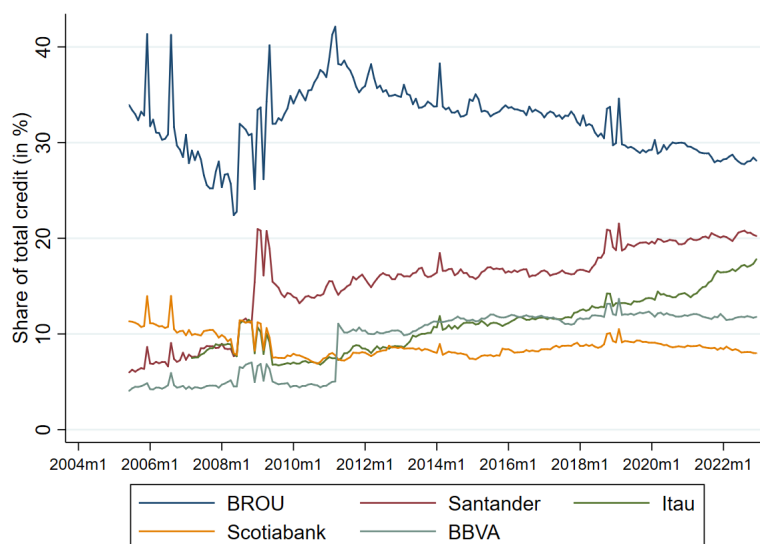
Notes: The figure shows the Herfindahl-Hirschmann index for deposits and credit.

Source: *Balance sheet and income statements.*

An alternative measure of the degree of market concentration is the share of total credit or deposits by bank. Figure 27 shows the share of total credit for the five major banks in the Uruguayan banking system, while 28 shows the share of total deposits for the same banks.

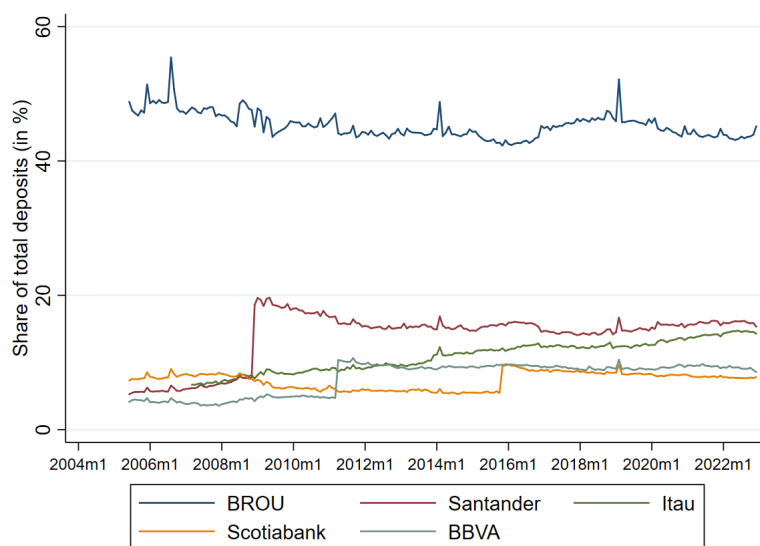
The state-owned bank, BROU, experienced a decline in its share of total credit after the peak in 2011. While by the beginning of 2011 BROU's credit represented more than 40% of the total credit issued by the banking system, it declined to less than 30% by the end of 2022. On the other hand, BROU accounts for more than 40% of total deposits followed by Santander and Ita^o with about 15%.

Figure 27: Share of Total Credit (in %, major banks)



Notes: The figure shows the share of total credit expressed in percent for the five major banks.
Source: *Balance sheet and income statements.*

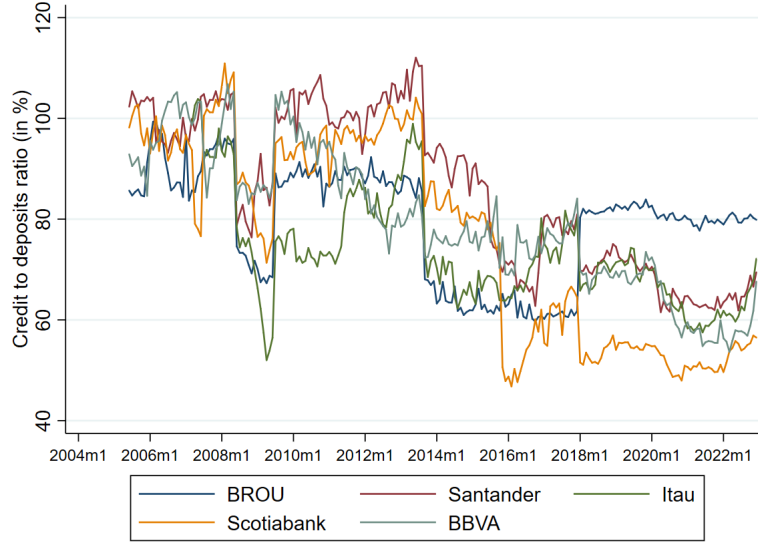
Figure 28: Share of Total Deposits (in %, major banks)



Notes: The figure shows the share of total deposits expressed in percent for the five major banks.
Source: *Balance sheet and income statements.*

As per the Herfindahl-Hirschmann indexes shown in Figure 26 and the previous figures with the share of deposits and credit, the market for deposits is much more concentrated than that for credits. Moreover, there is heterogeneity across banks in their funding and use of funds.

Figure 29: Credit-to-Deposits Ratio (in %, major banks)



Notes: The figure shows the credit-to-deposits ratio expressed in percent for the five major banks. // Source: *Balance sheet and income statements.*

These results suggest differences in behavior across banks that would be interesting to explore in more depth once we estimate markups on lending and markdowns on deposit rates.

4.8 Banks' Return on Assets and on Equity

Table 3 shows median return on assets (ROA) and median return on equity (ROE) for the seven countries included in our sample. ROA is measured as net income, before taxes, over total assets and ROE as net income, before taxes, over equity. Banks in Peru show higher ROA and ROE. On the other hand, banks in Mexico, where market concentration has been declining, or in Brazil, show lower ROA and ROE.

Table 3: Median ROA and ROE by Country (in %)

	ROA	ROE
Brazil	1.5	7.0
Chile	1.1	13.7
Colombia	1.0	9.1
Ecuador	1.5	13.5
Mexico	0.8	8.7
Peru	2.1	18.1
Uruguay	0.7	9.0

5 Methodology

The granularity of the micro-level data that we are gathering will allow us to measure market concentration in a variety of outcomes (with a particular focus on the credit market) and using different measures such as the concentration ratio (based on banks' total assets or credit) and the Herfindahl-Hirschmann index.

On top of descriptive measures of market concentration at the country or regional level, we aim to estimate markups on lending and markdowns on deposit rates following the *production approach* originally developed by De Loecker and Warzynski (2012) and applied to the banking sector by Pasqualini (2021).

Then, similarly to Pasqualini (2021), I assume that a bank collects funds through deposits and equity and uses these funds to grant loans. To perform their activities, banks need capital, labor and set aside loan loss provisions as inputs¹. Note that, as opposed to a manufacturing firm that only needs labor and capital to produce a tangible good, banks also need funds to grant loans. As the focus is on depository institutions, I am going to assume a single-product production function where the output is loans and consider only deposits and equity as the sources of funds.

Then, I assume that each bank i at time t , solves the following cost minimization problem by choosing the deposits (D_{it}), equity (E_{it}), loan loss provisions (P_{it}), labor (N_{it}), and capital (K_{it}):

$$\begin{aligned} \text{Min} \quad & C_{it} = r_{it}^D D_{it} + r_{it}^E E_{it} + r_{it}^P P_{it} + w_{it} N_{it} + r_{it}^K K_{it} \\ \text{s.t.} \quad & L_{it} = F(D_{it}, E_{it}, P_{it}, N_{it}, K_{it}) \end{aligned} \quad (1)$$

where w_{it} is the wage paid, r_{it}^D is the interest rate paid on deposits, r_{it}^E the return on equity, r_{it}^P is the return on loan loss provisions (opportunity cost), and r_{it}^K the return on capital and $L(\cdot)$ is the loan production function.

Assuming that labor is not subject to adjustment costs, Pasqualini (2021) shows that the gross markup on the lending rate can be expressed as the product of the elasticity of loan production to labor and the inverse of the expenditure share of labor relative to interest income on loans. From the first order condition of equation 1 with respect to labor costs, N_{it} , and after some computations, Pasqualini (2021) shows that markup on the interest rate on loans can be expressed as:

$$\mu_{it}^N = \frac{r_{it}^L}{\lambda_{it}} = \theta_{it}^N [\alpha_{it}^N]^{-1}$$

where μ_{it}^N is the markup on loans, $\theta_{it}^N = \frac{\partial F}{\partial N_{it}} \frac{N_{it}}{L_{it}}$, the elasticity of loan production with respect to labor and $\alpha_{it}^N = \frac{w_{it} N_{it}}{r_{it}^L L_{it}}$, the share of labor cost over interest income on loans.

It could also be assumed that loan loss provisions are not subject to adjustment costs and can also be used to recover markups. In particular, assume that banks are price takers in the financial market, so the opportunity cost of loan loss provisions (r_{it}^P) is given to them. Then, the first order condition of equation 1 with respect to loan loss provisions, P_{it} , is given by:

¹Pasqualini (2021) does not consider loan loss provisions as part of the loan production costs. As we are going to discuss, loan loss provisions are important in the Latin American banking system.

$$r_{it}^P - \lambda_{it} \frac{\partial F}{\partial P_{it}} = 0$$

which, after some computations, could be expressed as:

$$\mu_{it}^P = \frac{r_{it}^L}{\lambda_{it}} = \theta_{it}^P [\alpha_{it}^P]^{-1}$$

with μ_{it}^P being the markup on loans, $\theta_{it} = \frac{\partial F}{\partial P_{it}} \frac{P_{it}}{L_{it}}$, the elasticity of loan production with respect to loan loss production and $\alpha_{it}^P = \frac{r_{it}^P P_{it}}{r_{it}^L L_{it}}$, the share of loan loss provisions expenditure on loans income.

Then, the unobservable markup can be computed in two alternative ways. We can compute it with the inverse expenditure share, either of loan loss provisions or labor costs, available from banks' financial statements, and the loan production elasticity that can be estimated with panel data of banks' information.

Finally, if we assume that banks are not price takers in the market for deposits, we can recover the markdown component from the same variables as before plus a measure of markup, if we define the markdown as the wedge between the rate that banks pay for deposits relative to the rate they would pay if they were price takers on deposit markets. For that, consider the first order condition of equation 1 with respect to deposits and, after some computations (see Pasqualini (2021)):

$$\psi_{it} \cdot \mu_{it}^J = \theta_{it}^D [\alpha_{it}^D]^{-1}$$

where ψ_{it} is the inverse supply elasticity of deposits and could be interpreted as a markdown of the deposit rates banks pay compared to what they would pay if they were price takers in the market for deposits. Note that markdowns are a function of markups, either computed from labor or loan loss provisions ($J = P, N$). Then, markdowns can be obtained from:

$$\psi_{it} = \frac{\theta_{it}^D [\alpha_{it}^D]^{-1}}{\theta_{it}^J [\alpha_{it}^J]^{-1}}$$

In summary, according to Pasqualini (2021) the procedure to recover markups and markdowns consists of three steps. First, estimate the production function elasticity with respect to each input, either by estimating the loan production function or using factor shares. Second, compute the inverse expenditure share for each input good relative to interest income on loans. Third, choose two input goods, one for which there is no monopsonistic competition nor adjustment costs (labor and loan loss provisions), and another good not subject to adjustment costs (deposits).

Based on Pasqualini (2021) approach, we need information on net outstanding loans, domestic deposits, total equity, expenditure on labor, loan loss provisions, and the value of capital input, proxied by equipment and premises. All these variables are available from the banks' financial statements publicly available from the regulator.

5.1 Estimate Elasticities

The first step to recover markups and markdowns requires the estimation of output elasticities (in our case, loans) with respect to individual inputs used for loan production (deposits and loan loss provisions). According to De Loecker and Syverson (2021), there are two approaches regularly used in the literature to estimate output elasticities: production function estimation and factor shares.

In this version we follow the factor shares approach to estimate output elasticities. For that, we have to assume that output elasticity with respect to a given input is equal to the input's cost share times the scale elasticity. In practice, the scale elasticity is assumed to be equal to one, and thus output elasticity with respect to a given input J is defined as:

$$\frac{\partial L_{it}}{\partial J_{it}} \frac{J_{it}}{L_{it}} = \frac{r_{it}^J J_{it}}{TC_{it}}$$

where r_{it}^J is the price of input J , J is the quantity used in production and TC_{it} is total cost. In general, average across industries or producers over time is taken.

In our setting we need the elasticity of loan production with respect to labor and with respect to loan loss production. We can compute them as the share of labor and loan loss production cost to total cost. We are going to take the mean over time for each bank i , so:

$$\theta_i^J = \frac{\partial F}{\partial J_{it}} \frac{J_{it}}{L_{it}} = \sum_t \frac{r_{it}^J J_{it}}{TC_{it}}$$

Table 4 shows the median across banks estimates for the elasticity of loans with respect to labor (θ^N) and the elasticity of loans with respect to loan loss provisions (θ^P).

Table 4: Median Loan Production Elasticities

	θ^N	θ^P
Brazil	0.27	0.28
Chile	0.25	0.26
Colombia	0.22	0.44
Ecuador	0.49	0.26
Mexico	0.45	0.12
Peru	0.40	0.32
Uruguay	0.50	0.32

5.2 Expenditure Shares

With the output elasticities obtained following the factor share approach, we need the expenditure share of each input on interest income on loans to obtain our measures of markups.

Total expenditure is defined as the sum of expenditure on interest on deposits, loan loss production and remuneration to employees. Table 5 shows median expenditure shares for each country in our sample.

Table 5: Median Input Expenditure Share

	α^N	α^P
Brazil	0.31	0.32
Chile	0.23	0.27
Colombia	0.21	0.40
Ecuador	0.73	0.36
Mexico	0.49	0.15
Peru	0.43	0.29
Uruguay	0.68	0.40

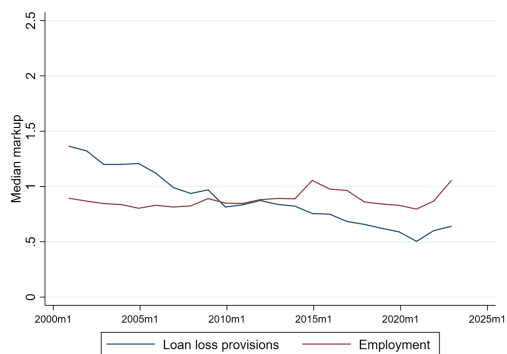
5.3 Markups and Markdowns

5.3.1 Markups

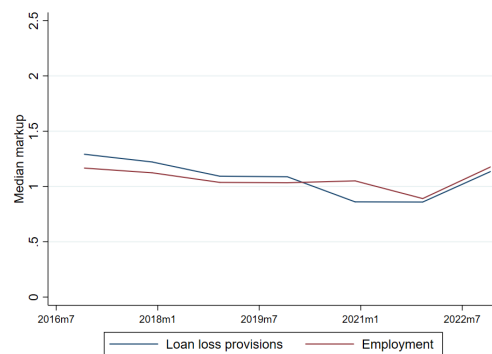
Figure 30 shows median markups overtime for the seven Latin American countries included in our sample. By considering two alternative inputs without cost adjustments, labor and loan loss provisions, we can check whether, besides the level of markups, their dynamics over time is qualitatively similar in the two inputs.

A markup above 1 means that banks are charging interest rates on loans above their marginal cost. Markups increased in Uruguay and Peru, the two countries with the largest market concentration in the region. On the other hand, they declined in Mexico, where market concentration, measured by the HHI, declined the most.

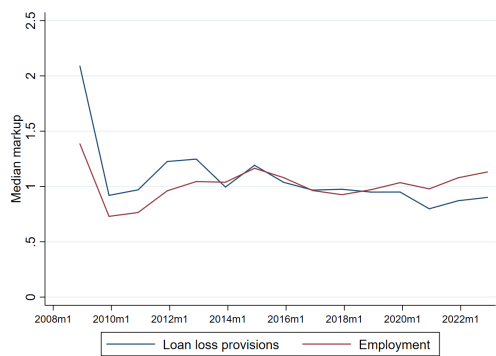
Figure 30: Median Markup by Country



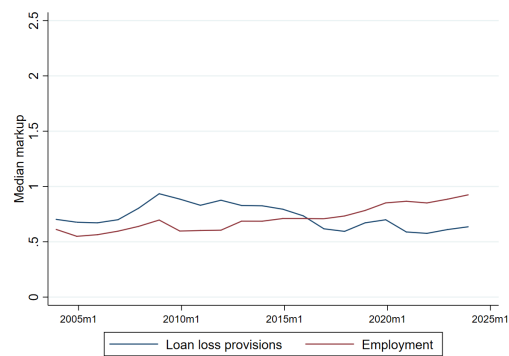
(a) Brazil



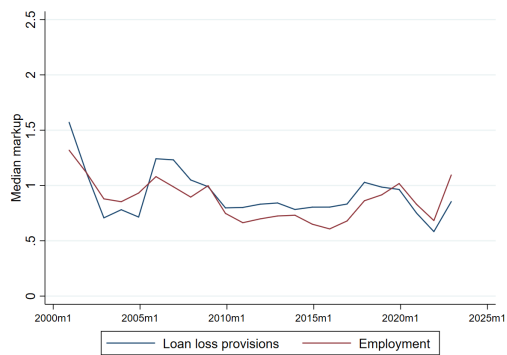
(b) Colombia



(c) Chile



(d) Ecuador



(e) Mexico



(f) Peru



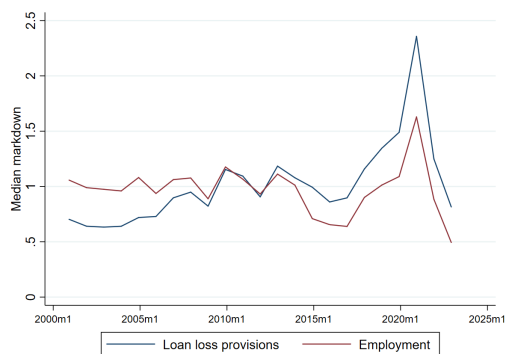
(g) Uruguay

5.3.2 Markdowns

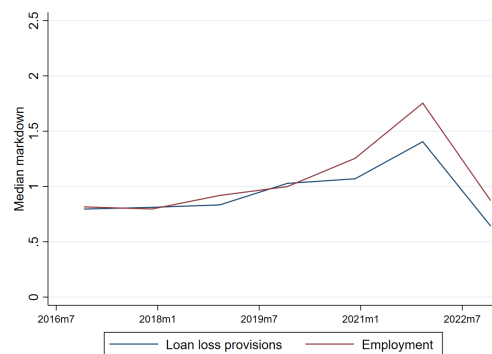
Figure 31 shows median markdowns overtime for the seven Latin American countries included in our sample. Note that markdowns are interpreted as the interest rate on deposits paid by banks relative to interest rates that banks would pay if they were price takers on deposit markets. Despite differences in levels, the dynamic over time for markdowns in each country is qualitatively similar if we consider loan loss provisions or employment as input.

Markdowns above 1 means that banks are paying lower interest rates on deposits compared to the competitive case. There is heterogeneity across countries and some exceptions but, in general, markdowns are close to 1.

Figure 31: Median Markdown by Country



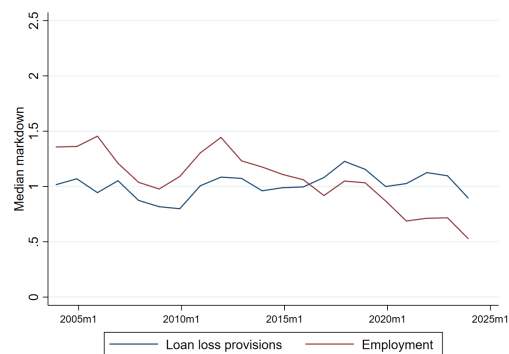
(a) Brazil



(b) Colombia



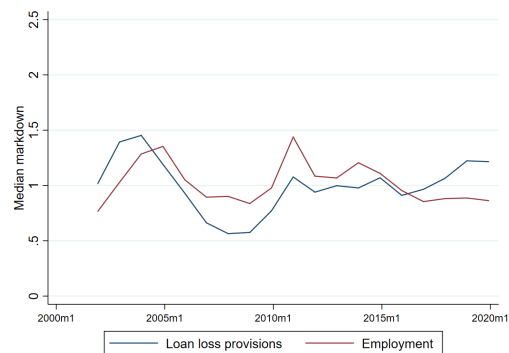
(c) Chile



(d) Ecuador



(e) Mexico



(f) Peru



(g) Uruguay

6 Markups, Markdowns and Banks' Characteristics

6.1 Banks' Profitability

Is there a relationship between banks' profitability and markups? And with respect to markdowns? In this section we run a simple OLS regression of banks' markups or markdowns and profitability measured by ROA or ROE. Then, for each country, we run the following regression:

$$Profitability_{it} = \gamma + \beta y_{it} + \epsilon_{it}$$

where y_{it} is either markup, μ_{it} , or markdown, ψ_{it} , for bank i at time t , and $Profitability_{it}$ is measured by either ROA or ROE.

Table 6 summarizes the results for the relationship between μ_{it}^N estimated previously and ROA for each country. Results suggest that there is a positive relationship between banks' markups and profitability. But there is heterogeneity across countries. While a 1 percentage point increase in markups is associated with a 1.2 percentage points increase in profitability in Chile, the figure is 2.4 for Mexico, 2.5 for Uruguay, 3.2 for Brazil, and 4.9 for Colombia and Peru.

Table 6: Markups and Banks' Profitability

	(1) Brazil	(2) Colombia	(3) Uruguay	(4) Peru	(5) Ecuador	(6) Mexico	(7) Chile
μ_{it}^N	2.271*** (0.051)	4.677*** (1.785)	2.547*** (0.472)	4.290*** (0.732)	1.459* (0.877)	1.945*** (0.311)	1.208*** (0.430)
Constant	-0.969*** (0.063)	-4.860** (2.150)	-1.104** (0.492)	-2.024*** (0.706)	0.355 (0.691)	-1.486*** (0.354)	-0.398 (0.513)
Observations	23,960	182	174	264	456	955	325
R-squared	0.113	0.114	0.112	0.287	0.018	0.069	0.052

Notes: This table reports estimates of the following OLS regression: $ROA_{it} = \gamma + \beta \mu_{it}^N + \epsilon_{it}$ where i is bank, t is time, μ_{it}^N is banks' markup, and ROA_{it} is the return on assets measured as net income over total assets. Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

Table 7 shows the results for the relationship between ψ_{it}^N and ROA for each country. As opposed to markups, there is no robust relationship found between markdowns and banks' profitability. With the exceptions of Peru and Ecuador, the coefficient on markup is always negative and statistically significant different from zero. On the other hand, an increase in markdown is associated with lower banks' profitability in Brazil.

6.2 Cost of Credit

Market concentration and increasing markups could lead to a rise in the cost of credit, affecting investment and long-term economic growth.

To analyze the relationship between markups and markdowns and the cost of credit we construct a

Table 7: Markdowns and Banks' Profitability

	(1) Brazil	(2) Colombia	(3) Uruguay	(4) Peru	(5) Ecuador	(6) Mexico	(7) Chile
ψ_{it}^N	0.209*** (0.032)	-1.943*** (0.362)	-0.401*** (0.102)	-0.040 (0.428)	-0.191 (0.281)	-0.730*** (0.139)	-0.454*** (0.167)
Constant	1.038*** (0.047)	2.356*** (0.496)	1.396*** (0.275)	2.261*** (0.452)	1.634*** (0.315)	1.416*** (0.187)	1.381*** (0.213)
Observations	23,744	182	174	264	456	937	324
R-squared	0.004	0.103	0.044	0.000	0.012	0.093	0.040

Notes: This table reports estimates of the following OLS regression: $ROA_{it} = \gamma + \beta \cdot \psi_{it}^N + \epsilon_{it}$ where i is bank, t is time, ψ_{it}^N is banks' markdown, and ROA_{it} is the return on assets measured as net income over total assets. Robust standard errors in parentheses, *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

proxy for credit spreads. Usually, credit spreads are measured by the difference between interest rates charged on loans minus interest rates paid on deposits. As we do not have information on interest rates at the bank level, we construct a proxy by exploiting information from banks' balance sheet and income statements. We have information on total credit, total deposits, interest income on loans, and interest expenses on deposits. With that information we construct a proxy for credit spread as:

$$s_{it} = \frac{IL_{it}}{L_{it}} - \frac{ID_{it}}{D_{it}}$$

where, for bank i at time t , YL_{it} is interest income from loans, ID_{it} is interest paid on deposits, L_{it} is total loans and D_{it} is total deposits.

A higher credit spread might be associated with a higher cost of credit. As for banks' profitability, we run the following regression to study the association between markups and markdowns with credit spread:

$$s_{it} = \omega + \delta y_{it} + \epsilon_{it}$$

where y_{it} is either banks' markup or markdown. Table 8 shows the results for markups. According to our results, markups are positively associated with credit spreads in Brazil, Colombia, Uruguay and Peru. This suggests that, for those countries, there is a positive correlation between markups and the cost of credit.

Results on the relationship between credit spreads and markdowns on deposits are shown in Table 9. As for banks' profitability, we do not find a robust association between credit spreads and banks' markdowns. The only statistically significant correlation is found for Uruguay, where credit spreads are negatively correlated with banks' markdowns, and Brazil, where we find a negative correlation between markdowns and credit spread. Recall that a higher markdown means a larger wedge between the interest paid on deposits and the interest rate banks would pay if they were price takers in the deposits market. Then, a high markdown should be associated with a lower interest rate on deposits that might result in lower interest rates charged on credits.

Table 8: Credit Spread and Markups

	(1) Brazil	(2) Colombia	(3) Uruguay	(4) Peru	(5) Ecuador	(6) Mexico	(7) Chile
μ_{it}^N	0.029*** (0.010)	0.193 (0.120)	0.042*** (0.008)	0.198*** (0.028)	-0.022 (0.030)	-0.116 (0.105)	0.037 (0.025)
Constant	-0.089*** (0.011)	-0.122 (0.150)	0.025*** (0.006)	-0.034 (0.026)	0.119*** (0.019)	0.125 (0.096)	0.027 (0.027)
Observations	23,907	181	174	257	455	845	298
R-squared	0.001	0.043	0.079	0.164	0.002	0.007	0.027

Notes: This table reports estimates of the following OLS regression: $s_{it} = \omega + \delta\mu_{it}^N + \epsilon_{it}$ where i is bank, t is time, μ_{it}^N is banks' markup, and s_{it} is credit spread. Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

Table 9: Credit Spread and Markdowns

	(1) Brazil	(2) Colombia	(3) Uruguay	(4) Peru	(5) Ecuador	(6) Mexico	(7) Chile
ψ_{it}^N	0.042*** (0.003)	-0.030 (0.026)	-0.011*** (0.002)	0.009 (0.019)	0.005 (0.004)	-0.012 (0.027)	0.014* (0.008)
Constant	-0.115*** (0.007)	0.120*** (0.018)	0.073*** (0.007)	0.146*** (0.022)	0.097*** (0.007)	0.031 (0.042)	0.050*** (0.010)
Observations	23,691	181	174	257	455	845	298
R-squared	0.006	0.006	0.081	0.002	0.004	0.001	0.023

Notes: This table reports estimates of the following OLS regression: $s_{it} = \omega + \delta\psi_{it}^N + \epsilon_{it}$ where i is bank, t is time, ψ_{it}^N is banks' markdown, and s_{it} is credit spread. Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

6.3 Credit Risk

On top of analyzing the association between markups and markdowns on banks' credit spread and profitability, we can exploit data on the amount of credit across the credit score in Uruguay and Colombia to analyze how markups and markdowns are related to banks' risk-taking. The focus is on credit to firms.

The amount of loans for each credit ranking is available from banks' balance sheet in Colombia. Borrowers are classified according to their credit scores in six categories, ranging from A to E. For commercial credit, good borrowers are classified as A or B, while borrowers with low payment capacity are classified as C, D or E. Category C is for loans with a delay in payment of between 3 to 6 months (90 to 180 days), category D is for loans with delays of 6 to 12 months (180 to 360 days), and category E is for non-performing loans.

For Uruguay, we are to obtain a measure of credit risk only for loans to firms. Credit rating takes seven categories: 1A, 1C, 2A, 2B, 3, 4, and 5. Loans classified as 1A are self-liquidated loans, covered by very liquid collateral. 1C loans have at most 10 days past due, 2A between 10 and 30 days, 2B between 30 and 60 days, 3 between 60 and 120 days, 4 between 120 and 180 days, and 5 are over 180 past due and are considered non-performing loans.

To make them comparable, we consider high risk loans as those classified as C, D or E in Colombia and those classified as 3, 4 or 5 in Uruguay.

Table 10 shows the results of estimating the following OLS regression for Colombia and Uruguay separately:

$$hr_{it} = \zeta + \eta x_{it}^N + \epsilon_{it}$$

where i is bank, t is time, x_{it}^N is either banks' markup (μ_{it}^N) or markdown (ψ_{it}^N), and hr_{it} is the proportion of loans to firms that are classified as high risk. For both Uruguay, higher markups are associated with higher credit risk. The coefficient is also positive for Colombia, but statistically not different from zero. A one standard deviation increase in markups is associated with an increase of 5 percentage points in the proportion of high-risk loans in Uruguay.

On the other hand, markdowns are associated with a lower proportion of high-risk loans in Uruguay. A standard deviation in markdowns is associated with reduction of 4 percentage points in the proportion of high-risk loans.

6.4 Credit Supply

Finally, we assess whether markups are associated with credit supply by estimating the following OLS regression for each country:

$$\ln(C_{it}) = \alpha + \beta_0 \mu_{it}^N + \beta_1 \ln(D_{it}) + \beta_2 \mu_{it}^N \times \ln(D_{it}) + \epsilon_{it}$$

where i is bank, t is time, μ_{it}^N is banks' markup, $\ln(C_{it})$ is the (log) of credit, and $\ln(D_{it})$ is the (log) of deposits. The coefficient β_1 captures how banks translate deposits into loans, and, if banks do not keep excess liquidity, is expected to be close to 1. Our coefficient of interest is β_2 , that captures the interaction of deposits, as source of funds, and markups. A positive coefficient would suggest that, given deposits, loans increase with markups, while a negative coefficient would suggest that, given

Table 10: Markups, Markdowns and Credit Risk

	(1) Uruguay	(2) Colombia	(3) Uruguay	(4) Colombia
μ^N	0.131*** (0.040)	0.020 (0.028)		
ψ^N			-0.028** (0.011)	0.011 (0.011)
Constant	0.240*** (0.032)	0.046 (0.030)	0.372*** (0.021)	0.056*** (0.013)
Observations	126	172	126	172
R-squared	0.081	0.014	0.080	0.007

Notes: This table reports estimates of the following OLS regression: $hr_{it} = \zeta + \eta x_{it}^N + \epsilon_{it}$ where i is bank, t is time, x_{it}^N is either banks' markup or markdown, and hr_{it} is the proportion of loans to firms that are classified as high risk. Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

deposits, loans decline with markups. Table 11 shows the results for each country.

First, as expected, β_1 is close to 1 for all the countries in the sample. Second, the coefficient capturing the interaction term between deposits and markups is negative, except for Peru. Only for Brazil, Uruguay and Peru is the coefficient statistically significant different from zero. Even though β_2 is negative, the economic magnitude is small, suggesting that markups does not seem to have a substantial effect on credit supply.

7 International Banks

The granularity of the data allows us to explore if there are any differences between international banks and local or regional banks in terms of markups and markdowns. We consider the following entities to be international banks: Santander, BBVA, Scotiabank JP Morgan, Citibank, HSBC, and Ita $\tilde{A}^o$.

To analyze whether international banks exhibit differences in markups and markdowns relative to local banks, we estimate a pooled (across countries) OLS regression with the following specification:

$$y_{ijt} = \alpha + \sum_h \delta_h I_h + \gamma_j + \omega_t + \epsilon_{it}$$

where y_{ijt} is either markup or markdown of bank i , operating in country j , at time t , I_h are dummy variables equal to 1 if bank j is an international bank and 0 otherwise, γ_j are country fixed effects and ω_t are time (yearly) fixed effects. Table 12 shows the results for the different measures of markups (columns 1 and 2) and markdowns (columns 3 and 4). With few exceptions, international banks operating in several countries have, on average, lower markups and lower markdowns compared to domestic or regional banks.

Table 11: Markups and Credit Supply

	(1) Brazil	(2) Colombia	(3) Uruguay	(4) Peru	(5) Ecuador	(6) Mexico	(7) Chile
μ_{it}^N	0.240*** (0.071)	6.950 (7.948)	2.025* (1.109)	-1.039 (0.892)	2.577* (1.453)	0.019 (0.214)	2.147* (1.245)
$\ln(D_{it})$	0.836*** (0.008)	1.115*** (0.288)	1.084*** (0.056)	0.867*** (0.059)	0.970*** (0.081)	0.737*** (0.048)	1.210*** (0.124)
$\mu_{it}^N \times \ln(D_{it})$	-0.022*** (0.006)	-0.229 (0.273)	-0.119* (0.061)	0.104* (0.059)	-0.169 (0.111)	-0.004 (0.034)	-0.169 (0.107)
Constant	1.573*** (0.086)	-3.690 (8.412)	-1.621* (0.963)	1.417 (0.869)	-0.154 (1.049)	2.500*** (0.416)	-2.696* (1.480)
Observations	23,960	181	174	257	455	853	298
R-squared	0.817	0.904	0.887	0.962	0.894	0.674	0.914

Notes: This table reports estimates of the following OLS regression: $\ln(C_{it}) = \alpha + \beta_0 \mu_{it}^N + \beta_1 \ln(D_{it}) + \beta_2 \mu_{it}^N \times \ln(D_{it}) + \epsilon_{it}$ where i is bank, t is time, μ_{it}^N is banks' markup, $\ln(C_{it})$ is the (log) of credit, and $\ln(D_{it})$ is the (log) of deposits. Robust standard errors in parentheses, *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

These results are consistent with Mertens and Mottironi (2023) and Gandelman and Casacuberta (2024), who find that larger firms have lower markups in 19 European countries and Uruguay, respectively.

8 Conclusion

The functioning of the banking sector is key for economic growth. Besides being key players in the operation of the payment system and in the transmission of monetary policy, as financial intermediaries, banks are in charge of channeling savings from households to firms through credit. Less attention has been given in the literature to analyze how the market structure of the banking sector affects the cost of credit.

In this paper, we first gather banks' balance sheet monthly regulatory information in a consistent manner in seven Latin American countries: Brazil, Colombia, Chile, Ecuador, Mexico, Peru and Uruguay.

Second, we estimate lending markups and deposits markdowns in each country. For that, we follow the *production approach* originally developed by De Loecker and Warzynski (2012) and applied to the banking sector by Pasqualini (2021). We show that there is heterogeneity in banks' markups and markdowns within and between countries.

Third, with the estimated markups and markdowns in the different countries, we study how they relate with banks' profitability. On one hand, our results suggest that there is a positive relationship between the estimated markups and banks' profitability measured by ROA and between markups and credit spreads. On the other hand, with the exception of Uruguay, we do not find a robust relationship between banks' markdowns and profitability and banks' markdowns and the cost of credit.

Table 12: Markups, Markdowns and International Banks

	(1) μ^P	(2) μ^N	(3) ψ^P	(4) ψ^N
Santander	-0.344*** (0.062)	-0.086* (0.045)	-0.201*** (0.068)	-0.279*** (0.061)
BBVA	-0.291*** (0.082)	0.064 (0.045)	-0.202*** (0.070)	-0.323*** (0.085)
Scotiabank	-0.295*** (0.062)	-0.076** (0.031)	-0.187** (0.075)	-0.220*** (0.079)
JP Morgan	0.886** (0.410)	-0.436*** (0.089)	0.160 (0.258)	-0.059 (0.122)
Citibank	-0.297*** (0.099)	-0.260*** (0.037)	0.705** (0.276)	0.685*** (0.261)
HSBC	-0.567*** (0.064)	-0.244*** (0.035)	-0.187*** (0.071)	-0.272*** (0.076)
Ita $\tilde{A}^o$	-0.502*** (0.073)	-0.209*** (0.054)	-0.169* (0.090)	-0.215*** (0.079)
Constant	2.499*** (0.086)	1.066*** (0.023)	0.982*** (0.039)	1.432*** (0.045)
Time FE	✓	✓	✓	✓
Country FE	✓	✓	✓	✓
Observations	25,643	26,313	25,545	26,078
R-squared	0.112	0.027	0.068	0.039

Notes: This table reports estimates of the following OLS regression: $y_{ijt} = \alpha + \sum_h \delta_h I_h + \gamma_j + \omega_t + \epsilon_{it}$ where y_{ijt} is either markup or markdown of bank i , operating in country j , at time t , I_h are dummy variables equal to 1 if bank j is an international bank and 0 otherwise, γ_j are country fixed effects and ω_t are time (yearly) fixed effects. Robust standard errors in parentheses, *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

References

- Beck, T., A. Demirguc-Kunt, and V. Maksimovic (2004). Bank competition and access to finance: International evidence. *Journal of Money, Credit and Banking* 36(3), 627–648.
- Beck, T. and R. Levine (2004). Stock markets, banks, and growth: Panel evidence. *Journal of Banking and Finance* 28(3), 423–442.
- Chortareas, G. E., J. G. Garza-Garcia, and C. Girardone (2011). Banking sector performance in latin america: Market power versus efficiency. *Review of Development Economics* 15(2), 307–325.
- De Loecker, J. and C. Syverson (2021). Chapter 3 - an industrial organization perspective on productivity. In K. Ho, A. Horta-Álves, and A. Lizzeri (Eds.), *Handbook of Industrial Organization, Volume 4*, Volume 4 of *Handbook of Industrial Organization*, pp. 141–223. Elsevier.
- De Loecker, J. and F. Warzynski (2012, May). Markups and firm-level export status. *American Economic Review* 102(6), 2437–71.
- Fungacova, Z., A. Shamshur, and L. Weill (2017). Does bank competition reduce cost of credit? cross-country evidence from europe. *Journal of Banking and Finance* 83, 104–120.
- Gandelman, N. and C. Casacuberta (2024). Mipymes en uruguay: distribucion de tamaños de las empresas y poder de mercado. *ANDE*.
- Jiang, L., R. Levine, and C. Lin (2023). Does competition affect bank risk? *Journal of Money, Credit and Banking* 55(5), 1043–1076.
- Joaquim, G., B. V. Doornik, and J. R. Ornelas (2019, October). Bank Competition, Cost of Credit and Economic Activity: evidence from Brazil. Working Papers Series 508.
- Levine, R. and S. Zervos (1998). Stock markets, banks, and economic growth. *American Economic Review*, 537–558.
- Mertens, M. and B. Mottironi (2023). Do larger firms exert more market power? Markups and markdowns along the size distribution. (1/2023).
- Pasqualini, A. (2021). Markups, markdowns and bankruptcy in the banking industry.
- Rajan, R. G. and L. Zingales (1998). Financial dependence and growth. *The American Economic Review* 88(3), 559–586.
- Yeyati, E. L. and A. Micco (2007). Concentration and foreign penetration in latin american banking sectors: Impact on competition and risk. *Journal of Banking and Finance* 31(6), 1633–1647.