**Profitability in Mexican banks**

INTRODUCTION

Overall Mexican banking system characteristics

Bank profitability

This topic is relevant

Provides an insight on

the regulators know t

Health of the overall banking system

Resilience over bank specific and sector wide shocks

Confidence of depositors and

Know which factors determine the profitability,

may improve their sustainability

This article’s objective is to determine which are the key factors which influence key profitability indicators in the most significant banks.

1. LITERATURE REVIEW

Bank profitability, why is it important

Which conditions improve profitability in banks from around the world

**Papers de Mexico**

**Determinants of Commercial Bank Profitability in Mexico**

<https://www.scielo.org.mx/scielo.php?script=sci_arttext&pid=S1870-66222015000100097>

<https://www.eltrimestreeconomico.com.mx/index.php/te/article/view/481/521>

<https://www.scielo.org.mx/scielo.php?script=sci_arttext&pid=S2448-66552024000100099#B36>

<https://www.scielo.org.mx/scielo.php?pid=S0301-70362010000200007&script=sci_arttext>

Papers que se relacionen con

1. Macroeconomic variable

**Economic growth**

Output and the Consumer Price Index provide a comprehensive insight into the influence of the goods market in the loans market

Improves the financial conditions for borrowers, which can benefit the profitability of applying to a loan and paying it

**Inflation**

Two hypothesis can occur.

Inflation is linked to a stimulated economy, which in turn can attract consumers and businesses to apply to loans (papers that support the idea).

However, Ayaydin & Karakaya (2014),

have found that inflation and hypothesis that uncertainty

**Interest rates**

A general consensus in literature has suggested a positive effect of increases in interest rates to commercial bank profitability. Early work by Samuelson (1945) proposed that the individual banks benefit from increases in interest rate under general conditions, mainly profits are more sensitive to loan rates than deposit rates, which was empirically evaluated by Hancock (1985) for commercial banks in the United States.

Since, other articles have concurred with these findings.

In Mexico, Morales-Castro and Espinosa-Jiménez (2024) had previously found a 1% increase in interest rate increased ROE by 2.35% in a mix of 31 banks between 2011 and 2019. For these reasons, we expect short term interest rates also to positively affect profitability studied in this article.

1. Bank specific characteristics

**Bank size**

Modern financial intermediary theory suggests that larger banks can greatly benefit from economies of scale when compared to smaller banks, as they can spread and lower their operational costs (Mashamba, 2018). Chavarín-Rodríguez (2015) has previously found a positive and significant relationship between banks’ assets and profitability, supporting previous assumptions.

However, bank size has

Adelopo et Al. (2021) found a negative relationship between European banks and profitability, suggesting that bank size

size as a liability for big banks

[**https://www.jstor.org/stable/pdf/20857201.pdf?refreqid=fastly-default%3Af80d850b0655ccc17abc72d07fbe7e45&ab\_segments=&initiator=recommender&acceptTC=z**](https://www.jstor.org/stable/pdf/20857201.pdf?refreqid=fastly-default%3Af80d850b0655ccc17abc72d07fbe7e45&ab_segments=&initiator=recommender&acceptTC=z)

**Capitalization**

Traditional literature suggests that at higher capitalization ratio, profitability diminishes as a result of low levels of resources to lend. Recent articles that substantiate this view include Ayaydin and Karakaya (2014),

However, a positive relationship between capitalization and profitability may also signal favorable demand conditions for loans, which may also boost profits, as found by Molyneux, et Al. (1998).

* High capital adequacy

() found that

Is measured via the Capital Adequacy Ratio (CAR)

Recently, Esquivel found a negative relationship between capital and lending,

**Asset quality**

* **Credit/Total Assets**

**Liquidity**

Liquidity is defined as the

Contrary to conventional bank profitability literature, Mashamba (2018) found that liquidity positively affect bank profitability in banks operating in emerging countries. One explanation of such deviation is that some banks from inefficient emerging markets may prefer to invest to keep a conservative portfolio of liquid, low-risk government bonds, as supposed to lending to the private sector.

**Asset quality (morosity)**

Asset quality, that is the risk of non performance of loans.

Chavarín-Rodríguez (2015) previously found morosity not to be a significant factor driving profitability for Mexican commercial banks.

# Accessibility to services

# Ayaydin & Karakaya (2014) found that technology-based methods of service, such as the number of ATMs available and credit cards issued can improve bank profitability.

**Operational efficiency**

Efficience of asset management

Al-Homaidi et Al. (2018).

1. DATA

The data used for this article comprise a balanced panel of 2,470 observations from the ten largest commercial banks operating in Mexico, which include Banamex, BBVA México, Santander, HSBC, Inbursa, Scotiabank, Banorte, Banco del Bajío, Banregio, and Banco Azteca. As of June 2024, these banks captured % of total earnings and % of assets in the Mexican Banking system, therefore reflecting their overall dominance in the sector.

**Table 1. Statistical Summary of individual banks**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | ROE | GROWTH | INF | INT | LNAS | CAR | LIQ | IMORA | AM |
| **Bank: Banamex** |  |  |  |  |  |  |  |  |
| Mean | 11.805 | 1.698 | 4.447 | 6.166 | 13.870 | 15.593 | 20.992 | 5.903 | 0.979 |
| Std. Dev. | #N/D | #N/D | #N/D | #N/D | #N/D | #N/D | #N/D | #N/D | #N/D |
|  |  |  |  |  |  |  |  |  |  |
| **Bank: BBVA México** |  |  |  |  |  |  |  |  |
| Mean | 21.754 | 1.698 | 4.447 | 6.166 | 14.184 | 15.565 | 14.890 | 5.191 | 1.422 |
| Std. Dev. | #N/D | #N/D | #N/D | #N/D | #N/D | #N/D | #N/D | #N/D | #N/D |
|  |  |  |  |  |  |  |  |  |  |
| **Bank: Santander** |  |  |  |  |  |  |  |  |
| Mean | 16.902 | 1.698 | 4.447 | 6.166 | 13.743 | 15.682 | 16.422 | 4.840 | 0.955 |
| Std. Dev. | #N/D | #N/D | #N/D | #N/D | #N/D | #N/D | #N/D | #N/D | #N/D |
|  |  |  |  |  |  |  |  |  |  |
| **Bank: HSBC** |  |  |  |  |  |  |  |  |  |
| Mean | 9.476 | 1.698 | 4.447 | 6.166 | 13.155 | 14.132 | 23.091 | 6.956 | 0.519 |
| Std. Dev. | #N/D | #N/D | #N/D | #N/D | #N/D | #N/D | #N/D | #N/D | #N/D |
|  |  |  |  |  |  |  |  |  |  |
| **Bank: Inbursa** |  |  |  |  |  |  |  |  |
| Mean | 10.796 | 1.698 | 4.447 | 6.166 | 12.468 | 20.376 | 17.180 | 3.395 | 1.271 |
| Std. Dev. | #N/D | #N/D | #N/D | #N/D | #N/D | #N/D | #N/D | #N/D | #N/D |
|  |  |  |  |  |  |  |  |  |  |
| **Bank: Scotiabank** |  |  |  |  |  |  |  |  |
| Mean | 14.961 | 1.698 | 4.447 | 6.166 | 12.600 | 15.263 | 15.302 | 4.135 | 0.924 |
| Std. Dev. | #N/D | #N/D | #N/D | #N/D | #N/D | #N/D | #N/D | #N/D | #N/D |
|  |  |  |  |  |  |  |  |  |  |
| **Bank: Banorte** |  |  |  |  |  |  |  |  |
| Mean | 19.906 | 1.698 | 4.447 | 6.166 | 13.531 | 16.862 | 11.773 | 3.654 | 1.063 |
| Std. Dev. | #N/D | #N/D | #N/D | #N/D | #N/D | #N/D | #N/D | #N/D | #N/D |
|  |  |  |  |  |  |  |  |  |  |
| **Bank: Banco del Bajío** |  |  |  |  |  |  |  |  |
| Mean | 13.729 | 1.698 | 4.447 | 6.166 | 11.673 | 15.127 | 11.620 | 2.410 | 0.982 |
| Std. Dev. | #N/D | #N/D | #N/D | #N/D | #N/D | #N/D | #N/D | #N/D | #N/D |
|  |  |  |  |  |  |  |  |  |  |
| **Bank: Banregio** |  |  |  |  |  |  |  |  |
| Mean | 17.368 | 1.698 | 4.447 | 6.166 | 11.162 | 14.497 | 6.466 | 1.995 | 1.141 |
| Std. Dev. | #N/D | #N/D | #N/D | #N/D | #N/D | #N/D | #N/D | #N/D | #N/D |
|  |  |  |  |  |  |  |  |  |  |
| **Bank: Banco Azteca** |  |  |  |  |  |  |  |  |
| Mean | 13.433 | 1.698 | 4.447 | 6.166 | 11.495 | 14.340 | 33.820 | 11.334 | 0.749 |
| Std. Dev. | #N/D | #N/D | #N/D | #N/D | #N/D | #N/D | #N/D | #N/D | #N/D |

Own with data from CNBV, BANXICO, and INEGI.

Data is evaluated from December 2003 to June 2024, compiled in a monthly frequency. In total there were 2,470 observations.

Profitability is measured using a common variable in literature: the average return over equity.

**Arguments in favor and against ROE**

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Bank-specific indicators related to their financial situation and strength used in the model include the following variables:

1. Bank size (LNAS), measured as the natural logarithmic value of total assets.
2. Capital adequacy ratio (CAR), measured as the bank’s capital relative to their risk-weighted assets.
3. Liquidity (LIQ), measured as the ratio between total liquid assets and total assets.
4. Morosity (IMORA), calculated as Adjusted Deliquency Index, defined as the ratio of loans at Stage 3[[1]](#footnote-1) plus accumulated write-offs and debt forgiveness, to total credit portafolio at risk, including the aforementioned write-offs and debt forgiveness.
5. Operational efficiency (AM), calculated as the percentage of the operating profit divided by total assets.

Under the Credit Institutions Law, commercial banks are required to periodically publish their financial and operational information, which is made publicly available by the Comisión Nacional Bancaria y de Valores (CNBV) via their information portal. In Mexico, the CNBV acts as the regulatory body responsible for supervising and regulating financial institutions. In this article, we utilize this statistical data to construct the profitability indicators (ROA and ROE), as well as bank-specific characteristics (LNAS, LIQ, IMORA, AM).

Data for CAR is calculated and made publicly available by Bank of Mexico (Banxico).

Following common literature practices, we also make use of control variables to account for macroeconomic conditions and other factor that may influence the results. We include the following variables:

1. Economic growth (GROWTH), which is calculated with the log differences of year-by-year preliminary Gross Domestic Product figures.
2. Inflation rate (INF), which is calculated with the log differences of year-by-year Consumer Price Index.
3. Short term interest rate (INT), which captures monetary policy.

Data used to account for macroeconomic indicators include the Global Index of Economic Activity (IGAE) which provides a monthly measure of economic activity, and the Consumer Price Index (CPI) which measure the variation of prices of a basket of goods and services representative of household consumption in Mexico. The short-term interest rate used to capture monetary policy was the 28-day Federal Treasury Certificates (CETES 28).

Statistical data for IGAE and CPI are publicly released by the Instituto Nacional de Estadística y Geografía (INEGI), while CETES 28 data is published by the Banxico.

**Table 1. Statistical summary of variables used in the model**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  | .Obs | Mean | Std. Dev. | Min. | Max. |
| Endogenous variable: | |  |  |  |  |  |
|  | ROE | 2,470 | 15.013 | 7.724 | -23.953 | 55.474 |
| Macroeconomic controls: | |  |  |  |  |  |
|  | GROWTH | 2,470 | 1.698 | 4.469 | -26.522 | 24.464 |
|  | INF | 2,470 | 4.447 | 1.333 | 2.130 | 8.700 |
|  | INT | 2,470 | 6.166 | 2.307 | 2.670 | 11.320 |
| Bank-specific characteristics | | |  |  |  |  |
|  | LNAS | 2,470 | 12.788 | 1.174 | 9.255 | 14.924 |
|  | CAR | 2,470 | 15.744 | 2.736 | 9.710 | 29.260 |
|  | LIQ | 2,470 | 17.156 | 8.560 | 2.438 | 50.560 |
|  | IMORA | 2,470 | 4.981 | 3.383 | 0.205 | 24.168 |
|  | AM | 2,470 | 1.001 | 0.805 | -3.616 | 5.816 |

Own with data from CNBV, BANXICO, and INEGI.

1. METHODOLOGY

For our model, we produce a random effects panel regression with cluster-robust standard errors.

The first model provides insight into the effects of macroeconomic variables on bank profitability

The second model includes the previously mentioned bank-specific variables.

The third model and final model only include significant variables

Following ()() and other similar articles, we

Table of model all regressions with

Hausmann Test used to determine whether using fixed-effects or random-effects in the model would be appropriate in the panel data model.

All models showed autocorrelation and heteroskedasticity

1. RESULTS

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | Random effects panel regression with cluster-robust standard errors | | | GLS regression allowing for heteroskedasticity across panels | | |
|  |  | (1) | (2) | (3) | (1) | (2) | (3) |
| GROWTH |  | 0.176\* | 0.0531 | 0.0866\* | 0.102\*\*\* | 0.0928\*\*\* | 0.0587\*\* |
|  |  | (0.0908) | (0.0335) | (0.0492) | (0.0250) | (0.0235) | (0.0233) |
| INF |  | -0.779\*\*\* | -0.389\*\* | -0.723\*\*\* | -0.628\*\*\* | -0.536\*\*\* | -0.603\*\*\* |
|  |  | (0.289) | (0.192) | (0.268) | (0.0913) | (0.0863) | (0.0854) |
| INT |  | 1.231\*\*\* | 0.891\*\*\* | 0.868\*\*\* | 1.174\*\*\* | 1.002\*\*\* | 0.918\*\*\* |
|  |  | (0.312) | (0.234) | (0.286) | (0.0524) | (0.0526) | (0.0505) |
| LNAS |  |  | -2.486 |  |  | 0.689\*\*\* |  |
|  |  |  | (1.857) |  |  | (0.0944) |  |
| CAR |  |  | -0.172 |  |  | -0.366\*\*\* |  |
|  |  |  | (0.192) |  |  | (0.0425) |  |
| LIQ |  |  | -0.0695 |  |  | -0.172\*\*\* |  |
|  |  |  | (0.0859) |  |  | (0.0207) |  |
| IMORA |  |  | -0.427\*\*\* | -0.504\*\*\* |  | -0.256\*\*\* | -0.503\*\*\* |
|  |  |  | (0.103) | (0.104) |  | (0.0601) | (0.0428) |
| AM |  |  | 3.461\*\*\* | 3.110\*\*\* |  | 2.299\*\*\* | 2.450\*\*\* |
|  |  |  | (0.890) | (0.842) |  | (0.138) | (0.137) |
| Constant |  | 10.59\*\*\* | 45.51\*\* | 12.13\*\*\* | 10.88\*\*\* | 9.561\*\*\* | 11.80\*\*\* |
|  |  | (1.733) | (23.22) | (1.966) | (0.420) | (1.158) | (0.446) |
|  |  |  |  |  |  |  |  |
| Observations |  | 2,470 | 2,470 | 2,470 | 2,470 | 2,470 | 2,470 |
| Number of bank\_id |  | 10 | 10 | 10 | 10 | 10 | 10 |
| R-squared |  | 0.1219 | 0.2015 | 0.2796 |  |  |  |
| Robust standard errors in parentheses | | | | | | | | |  |  |  |  |  |
| \*\*\* p<0.01, \*\* p<0.05, \* p<0.1 | | | | | | | |  |  |  |  |  |  |

Robustness

1. CONCLUSIONS
2. BIBLIOGRAPHY

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1. General Provisions Applicable to Credit Institutions, Articule 110, Bis define Stage 3 Credit Risk as loans considered impaired, with significant credit deterioration or 90 days or more past due (CNBV, 2025). [↑](#footnote-ref-1)