

# **The Role of Risk Coverage, Liquidity and Uncertainty in the Profitability of Commercial Mexican Banks**

## **Abstract**

This paper investigates the impact of bank-specific, macroeconomic variables, and economic policy uncertainty (EPU) on bank profitability in commercial Mexican banks. The analysis is based on empirical data from data over the period from 2011 to 2024. We conclude that EPU does not exert a statistically significant influence on bank profitability, whereas economic growth trends and interest rates do. Furthermore, operational efficiency, capital risk coverage, and liquidity are important bank-specific factors that significantly affect bank performance.

**Keywords:** Bank profitability, Mexico, economic policy uncertainty, liquidity, risk coverage

## **Introduction**

Over the past decades, the profitability among Mexican commercial banks has generally tandem with prevailing economic conditions. This is particularly evident in the most recent economic shock (Alcaraz et al., 2024), with deteriorated credit conditions and the reduction in credit supply. As illustrated in Figure 1, a consistent overall common trend can be observed across institutions where, profitability is represented as the average return over equity (ROE), experiencing a brief decline corresponding to the recent episode of economic contraction and expansion, along with the associated decrease and subsequent increase in interest rates.

However, the extensive literature related to bank profitability worldwide, with recent additions by Al-Homaidi et al. (2018), Adelopo et al. (2021), Elekdag et al. (2020), Chaudron (2018), has shown that returns may be influenced by strategic decisions taken by individual institutions, not only by macroeconomic factors. This heterogeneous characteristics among banks, such as assets size, capitalization, liquidity, non-performing loans, operational efficiency, etc. may influence significantly bank profitability, as these affect their risk-taking attitude, operational costs, lending capabilities sources of income, and resilience to external shocks.

Uncertainty has been getting special attention as it reflects the sentiment of decision

Covid paper

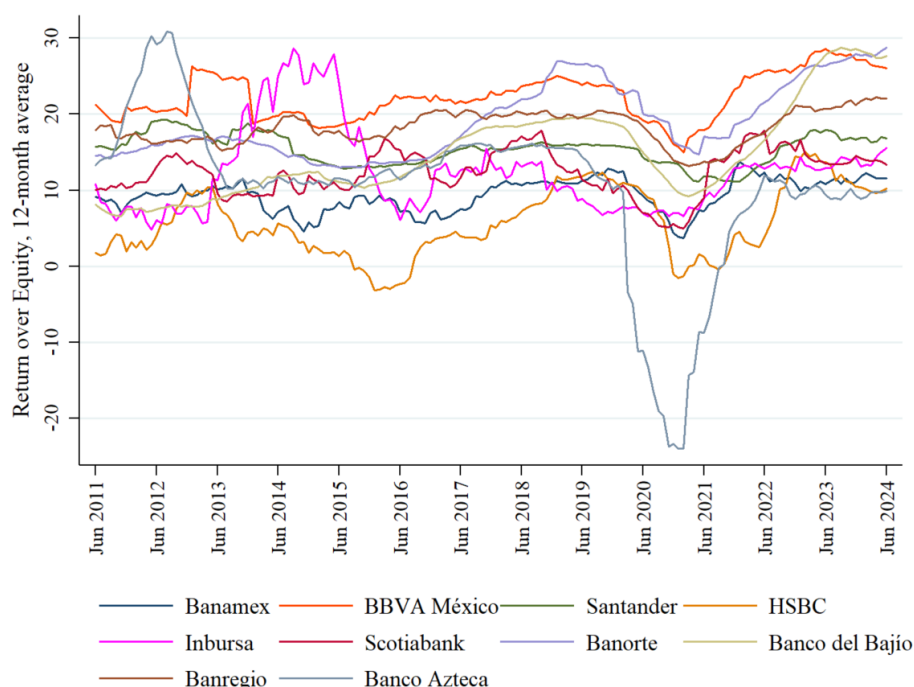
Overlooked

This objective of this article is to identify the key factors that influence profitability indicators in the Mexican banking system. This analysis is particularly relevant as it offers insightful information into bank operations, helping institutions identify the factors that influence and strengthen overall returns. By highlighting the significant variables, decisionmakers can prioritize their focus on

strategies and allocate resources more efficiently, thereby enhancing efficiency and overall profitability.

This analysis is specially of interest to regulators, as it may provide insights into the health and resilience of the banking system to both bank-specific, sector wide shocks and economic outlook of policy. We aim to identify how the banking system reacts to economic policy and the uncertainty surrounding it.

**Figure 1: Average Return on Equity, Ten Largest Mexican Commercial Banks**



Data shows the 12-month average of Return on Equity from Banamex, BBVA México, Santander, HSBC, Inbursa, Scotiabank, Banorte, Banco del Bajío, Banregio, and Banco Azteca, from June 2011 to June 2024. Own elaboration with data from CNBV.

# Incluir el ROE promedio de los bancos

Confidence of depositors and

Know which factors determine the profitability,

External factors such as interest rates and growth have consistently been found to increase bank profitability

may improve their sustainability

what innovation does this article has

Extended period of data incorporate recent economic shocks, such as the pandemic

The analysis of economic policy uncertainty in bank profitability in Mexico

Which to our knowledge has never been done

## **I. Literature review**

There has been a growing body of research examining the determinants of profitability Mexican commercial banks, providing evidence on key contributing factors.

In relation to market power theories, Chortareas et al. (2009) found that, for commercial banks operating between 1997 and 2004, efficiency and capital ratios played an important role in the pursue of profits. Guerrero-Mora & Villalpando-Benítez (2009) suggested that, based on a similar sample, market concentration and financial resilience positively influence profitability.

Additionally, asset concentration and quality have been a recurrent topic of interest. Chavarrín-Rodríguez (2015) aimed to capture the effect of morosity on profitability after global financial crisis in 2008, but could not find significant relationship. Morales Castro & Espinosa Jiménez (2024), who found that morosity and the size of non-performing loans to negatively affected profitability prior to the pandemic, but reported no significant effects in the post-pandemic period. However, Martínez-Vázquez et al. (2025) had recently found bank profitability to be negative affected by morosity of consumer loans when using an extended period of data and correlation estimation methods, suggesting that morosity may indeed play a more significant role than previously assumed.

Risk coverage factors have likewise emerged as areas of inquiry in the study of bank profitability in Mexico, as banks with higher liquidity and capitalization exhibit greater resilience to economic shocks (Chiguil-Rojas et al., 2024). Capital ratios have been associated to increments in profitability, as a consequence of banks expecting greater profitability and transmitting such information to the public via increases in capital, as well as higher incentives for shareholders to monitor management and efficiency (Chavarrín, 2014; Chortareas et al., 2009; Guerrero & Villalpando, 2009).

Theoretical models generally showcase how both internal factors and the overall economic environment impact profitability (Ozili, 2017). Following standard practices, we formulate our hypotheses on the interactions between macroeconomic, and bank-specific variables based on the reviewed literature.

### **i. Economic growth and bank profitability**

Economic growth is commonly used in literature as a control variable, as it provides a comprehensive insight into the influence business cycles in profitability (Bikker & Vervliet, 2018).

Bank profitability has been found to be procyclical, with a greater Gross Domestic Product (GDP) improving the financial conditions for borrowers, which enhances credit portfolio quality and lending activity (Albertazzi & Gambacorta, 2009). Empirical evidence indicates that GDP growth positively influences banks profitability, as shown by Al-Homaidi et al. (2018) for commercial Indian banks, and Adelopo et al. (2021); Elekdag et al. (2020) for the largest banks in the European Union, among others.

In Mexico, economic activity has been found to increase credit supply (Chiguil-Rojas et al., 2024), which in turn may increase profitability, as credit supply shocks positively correlate profitability Alcaraz et al. (2024). However, Chavarín-Rodríguez (2015), and Morales Castro & Espinosa Jiménez (2024) did not find statistically significant results confirming that economic activity is associated to bank profitability, although the relationship was positive. With a different measure to identify economic growth tendencies, we anticipate a positive association.

## **ii. Inflation and bank profitability**

Inflation also provides valuable insights into the broader economic environment, although literature offers mixed evidence on its effect on bank profitability. Several articles have found evidence of a positive relationship (Bikker & Vervliet, 2018), while other identify a negative relationship (Ayaydin & Karakaya, 2014; Sajid Saeed, 2014) between inflation and profitability.

Adelopo et al. (2021) highlights that the accurate prediction of change in inflation rates is crucial, as banks modify their interest rates based on their predictions the rate. Ayaydin & Karakaya (2014) explain this relationship in Turkish commercial banks, suggesting that a negative relationship arises from the slow adjustment of interest rates relative to inflation rate, which may increase bank costs faster than revenues. In Mexico, evidence is mixed and inconclusive.

## **iii. Interest rates and bank profitability**

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. Bikker & Vervliet (2018) found that in the United States, falling interest rates impairs bank performance as net interest margins compress. In Mexico, Morales Castro & Espinosa Jiménez (2024) had previously found a 1% increase in interest

rate increased ROE by 2.3 units 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.

**iv. Bank size and bank profitability**

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). In México, Chavarín-Rodríguez (2015) previously found a positive and significant relationship between banks' assets and profitability, supporting previous assumptions. For this reason, we expect bank size to positively impact bank profitability.

However, recent studies identified a negative relationship between size and profitability in banks. Such is the case of European commercial banks, as identified by Adelopo et al. (2021), suggesting that size may act a liability for big banks.

**v. Capital risk coverage and bank profitability**

Capital risk coverage reflects the institution's resilience when absorbing potential losses. Traditional literature suggests that at higher capitalization ratio, profitability diminishes as a result of low levels of resources to lend. Papers that substantiate this view include Ayaydin & Karakaya (2014). Additionally, Chiguil-Rojas et al. (2024) recently documented a negative relationship between capital levels and credit supply, support this idea.

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) and Adelopo et al. (2021). Chortareas et al. (2009), Chavarín (2014) who provide supporting evidence for Mexican commercial banks.

**vi. Liquidity and bank profitability**

Liquidity is defined as the capacity of banks to meet their short-term financial obligations. Common bank profitability literature suggests that liquidity and bank profitability have an inverse relationship, with empirical evidence in Nepalese commercial banks (Pradhan & Shrestha, 2017),

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 (Chiguil-Rojas et al., 2024).

**vii. Asset quality and bank profitability**

Asset quality, that is the risk of nonperformance of loans having a significant portion of total credit portfolio. Chavarín-Rodríguez (2015) previously found morosity not to be a significant determinant driving profitability for Mexican commercial banks when using a period of data between 2007 to 2013. However, a recent study by Martínez-Vázquez et al. (2025), which examined an extended period from 2011 to 2023 and employed correlation analysis via Copulas, identified a negative correlation, which may indicate that asset quality does in fact affect profitability.

**viii. Operational efficiency and bank profitability**

Efficiency of asset management has been shown to contribute to bank performance, as the reduction of costs improve productivity (Al-Homaidi et al., 2018).

Chortareas et al. (2009) had previously found supportive evidence of the Efficient Structure (ES) hypothesis in the Mexican banking system from 1997 to 2004, using alternative measures of profitability such as interest rate spreads and return over assets. The ES hypothesis posits that efficiency plays a crucial role in determining profitability and, ultimately contribute to growth. Additional evidence from Chavarín-Rodríguez (2015) substantiate this view.

**ix. Diversification and bank profitability**

Specialization refers to the extent in which interest income from the issuance of credit dominate total operational income relative to other sources of income, such as fees and commissions. Chavarín-Rodríguez (2015) had previously found non-interest revenue to contribute to overall profitability, although coefficients were small.

**x. Economic policy uncertainty and bank profitability**

The inclusion of economic policy uncertainty is recent and scares. However, supporting evidence suggests that it credit supply and asset quality are affected. Using data for Chinese commercial banks from 2007 to 2014, Chi & Li (2017) found that economic policy uncertainty can affect lending decisions, by increasing non-performing loans and

Recently, Nasim et al. (2025)

Decisions incorporate uncertainty so that it does not affect profitability

## II. Data

The data used for this article comprise a balanced panel of 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 88.069% of total earnings and 81.122% of assets in the Mexican Banking system, therefore reflecting their overall dominance in the sector. Data is evaluated from June 2011 to June 2024, compiled in a monthly frequency. In total there were 1570 observations.

**Table 1. Descriptive Statistics of Variables, Individual Banks**

	ROE	ECG	INF	INT	LNAS	CAR	LIQ	MOR	AM
<b>Bank: Banamex</b>									
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
<b>Bank: BBVA México</b>									
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
<b>Bank: Santander</b>									
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
<b>Bank: HSBC</b>									
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
<b>Bank: Inbursa</b>									
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
<b>Bank: Scotiabank</b>									
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
<b>Bank: Banorte</b>									
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
<b>Bank: Banco del Bajío</b>									
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
<b>Bank: Banregio</b>									
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
<b>Bank: Banco Azteca</b>									
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

Data is comprised of a balanced panel from Banamex, BBVA México, Santander, HSBC, Inbursa, Scotiabank, Banorte, Banco del Bajío, Banregio, and Banco Azteca, from April 2011 to June 2024. Own elaboration with data from CNBV, BANXICO, and INEGI.

In line with bank profitability literature, we use the average return over equity (ROE) as our dependent variable, calculated as the total net income accumulated over 12 months divided by average equity over 12 months. ROE reflects how efficiently banks generate returns to their shareholders.

Bank-specific indicators related to their financial situation, resilience, and efficiency we employ in the model include the following variables:

- Operational efficiency (AM), calculated as the percentage of the operating profit divided by total assets.
- Capital adequacy ratio (CAR), measured as the bank's capital relative to their risk-weighted assets.
- Liquidity (LIQ), measured as the ratio between total liquid assets and total assets.
- Morosity (MOR), calculated as Adjusted Delinquency Index, defined as the ratio of loans at Stage 3<sup>1</sup> plus accumulated write-offs and debt forgiveness, to total credit portfolio at risk, including the aforementioned write-offs and debt forgiveness.
- Diversification (NIR), calculated as the ratio of commissions, fees and other non-interest rate incomes, to total operative income.
- Bank size (LNAS), measured as the natural logarithmic value of 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 indicator (ROE), as well as bank-specific characteristics (AM, LIQ, MOR, LNAS, NIR). Data for CAR is calculated and made publicly available by Bank of Mexico (Banxico). We opt to use this capital ratio as to provide a comprehensive assessment of a bank's financial strength, as using the commonly used leverage ratio does not account for the market risk of assets.

Additionally, following Nasim et al. (2025), we account for economic policy uncertainty using the Economic Policy Uncertainty index for Mexico, estimated using the methodology used by Baker et al. (2016).

- Economic Policy Uncertainty (EPU), estimated by counting the number of articles that contain terms related to economics, regulation, and uncertainty.

The EPU index is estimated using digital text archives of locally newspapers coverage. For a detailed description on the methodology employed in its calculation, see Economic Policy Uncertainty (2012).

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<sup>1</sup> General Provisions Applicable to Credit Institutions, Article 110, Bis define Stage 3 Credit Risk as loans considered impaired, with significant credit deterioration or 90 days or more past due (CNBV, 2025).



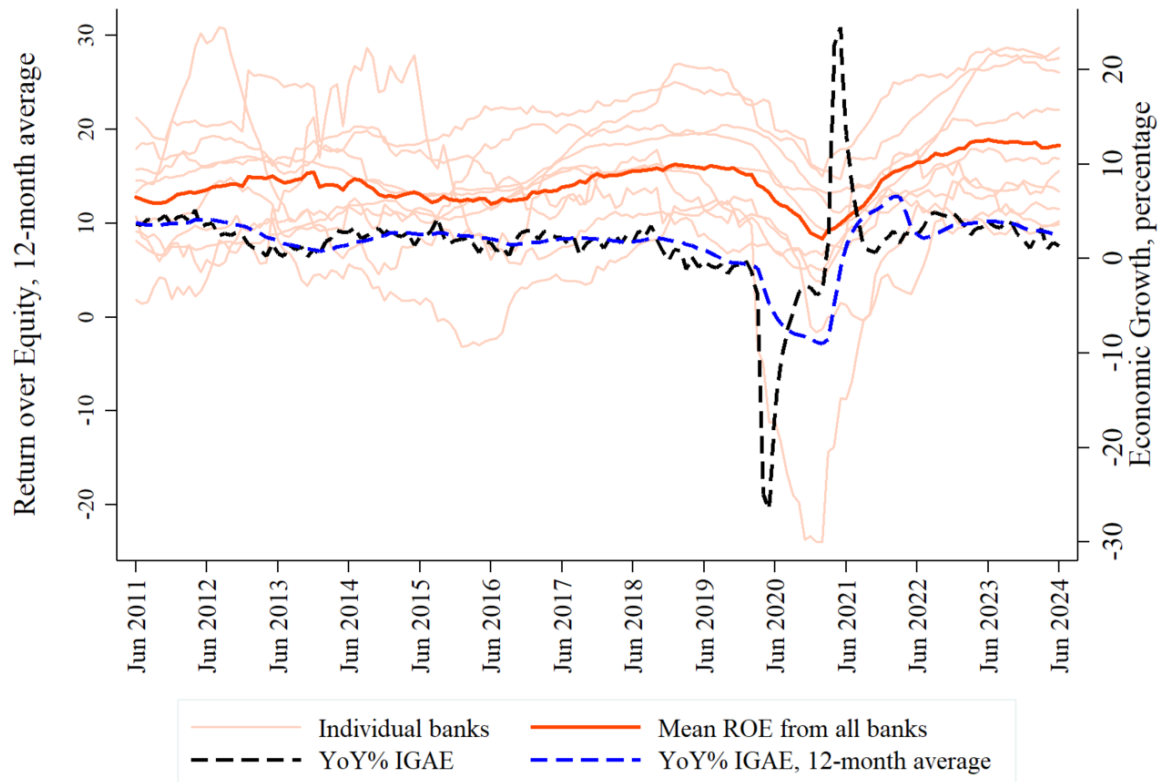
**Figure 3. Economic Policy Uncertainty Index for Mexico**

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:

- Economic growth trend (GROWTH), which is calculated with the log differences of year-by-year of preliminary the last 12-month average GDP figures, which captures the underlying trend.
- Inflation rate (INF), which is calculated with the log differences of year-by-year Consumer Price Index.
- Short term interest rate (INT), which captures monetary policy.

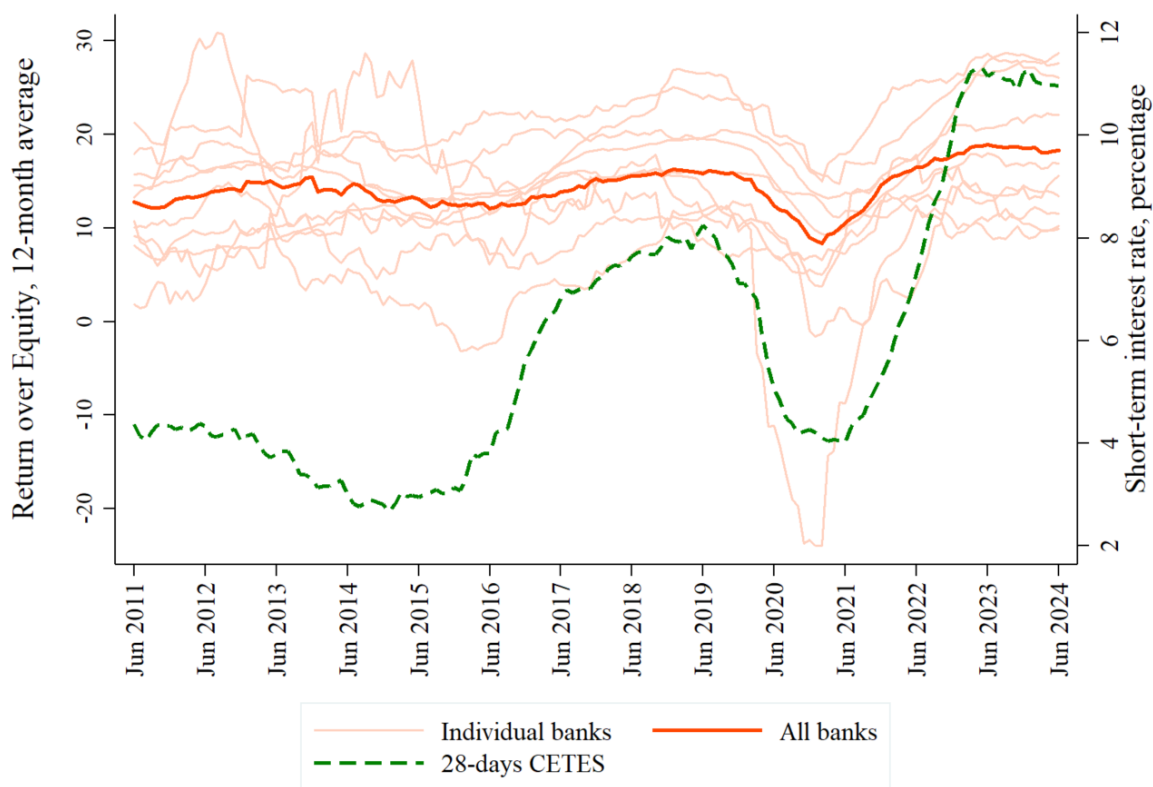
The data we use to account for macroeconomic indicators include the Global Index of Economic Activity (IGAE) which provides a monthly measure of GDP, and the Consumer Price Index (CPI) which measure the variation of prices of a basket of goods and services representative of household consumption in Mexico. To account for large fluctuations derived from economic shocks and capture the gradual effect on bank profitability, we apply a moving average. This approach smooths short-term volatility and highlights the underlying trend. Figure 4 presents a comparison between year-on-year GDP growth and moving average.

**Figure 3. Economic growth trend and ROE from all banks**



The short-term interest rate is often used to capture monetary policy was the 28-day Federal Treasury Certificates (CETES), which closely reflect the stance of the central bank. Figure 2 shows the how CETES and the central bank's target rate evolve similarly over time. Statistical data for IGAE and CPI are publicly released by the Instituto Nacional de Estadística y Geografía (INEGI), while CETES data is published by the Banxico.

**Figure 4. Short-term interest rate and ROE from all banks**



Data shows the 12-month average of Return on Equity from Banamex, BBVA México, Santander, HSBC, Inbursa, Scotiabank, Banorte, Banco del Bajío, Banregio, and Banco Azteca, and the mean from all banks, from June 2011 to June 2024. Own elaboration with bank-specific data from CNBV. All banks include the meand ...

**Table 1. Descriptive Statistics of Variables, All Banks**

	.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
MOR	2,470	4.981	3.383	0.205	24.168
AM	2,470	1.001	0.805	-3.616	5.816

Data is comprised from observations of all banks (Banamex, BBVA México, Santander, HSBC, Inbursa, Scotiabank, Banorte, Banco del Bajío, Banregio, and Banco Azteca), from December 2003 to June 2024. Own elaboration with data from CNBV, BANXICO, and INEGI.

### III. METHODOLOGY

In line with bank-profitability literature, we include in our models all variables that been shown to be relevant in empirical studies from other countries. For our model, we estimate a panel regression with cluster-robust standard errors, often used to accounts for autocorrelation and heteroskedasticity. Following Sajid Saeed (2014), the Hausmann Test is used to determine whether fixed-effects or random-effects are appropriate for the panel data model.

Our model includes variables that have been previously found significant in other countries. The equation to be estimated is as follows:

$$ROE_{i,t} = \beta_1 GROWTH_t + \beta_2 INF_t + \beta_3 INT_t + \alpha_1 LNAS_{i,t} + \alpha_2 CAR_{i,t} + \alpha_3 LIQ_{i,t} + \alpha_4 MOR_{i,t} + \alpha_5 AM_{i,t} + \alpha_6 NIR_{i,t} + \gamma_1 EPU_t + \epsilon_i + u_{i,t}$$

We evaluate the robustness of our models by also estimating the models by using generalized least squares (GLS), which also accounts for autocorrelation and heteroskedasticity issues in the models. GLS has been found to be efficient, as it incorporates these issues directly (Bai et al., 2020).

### IV. Results

The first model includes all the variables mentioned before, as shown in Table 4. The Wooldridge test and the Modified Wald test for groupwise heteroskedasticity indicate that all models have both autocorrelation and heteroskedasticity issues.

**Table 4. Panel estimation of bank performance (ROE), Jun 2011 to Jun 2024**

	Random effects panel regression with cluster-robust standard errors			GLS regression allowing for heteroskedasticity across panels		
	(1)	(2)	(3)	(1)	(2)	(3)
AM	2.290** (0.721)	2.328*** (0.773)	2.332*** (0.763)	2.316*** (0.135)	2.187*** (0.131)	2.189*** (0.131)
CAR	0.424** (0.186)	0.368** (0.165)	0.367** (0.165)	0.426*** (0.049)	0.493*** (0.045)	0.492*** (0.045)
LIQ	-0.283** (0.099)	-0.295*** (0.110)	-0.296*** (0.110)	-0.424*** (0.023)	-0.406*** (0.016)	-0.406*** (0.016)
NIR	0.00258** (0.001)			-0.00444* (0.002)		
EPU	-0.002 (0.007)	-0.002 (0.007)		-0.002 (0.004)	-0.001 (0.004)	
LNAS	-3.185 (2.937)			0.508*** (0.125)		
MOR	-0.031 (0.180)			0.025 (0.072)		
GROWTH	0.201* (0.108)	0.331* (0.184)	0.335* (0.174)	0.227*** (0.037)	0.201*** (0.036)	0.205*** (0.034)
INF	-0.182 (0.160)	-0.331 (0.230)	-0.331 (0.230)	-0.291*** (0.077)	-0.287*** (0.075)	-0.287*** (0.075)
INT	0.807*** (0.212)	0.554** (0.221)	0.548** (0.217)	0.534*** (0.049)	0.574*** (0.047)	0.569*** (0.044)
Constant	47.160 (34.790)	8.233*** (2.677)	8.179*** (2.627)	2.681* (1.387)	7.855*** (0.642)	7.809*** (0.627)
Pesaran's test	0.000	0.000	0.000	0.000	0.000	0.000
Haussmann test	0.000	0.377	0.378	0.000	0.377	0.378
Wooldridge test	0.000	0.000	0.000	0.000	0.000	0.000
Modified Wald test	0.000	0.000	0.000	0.000	0.000	0.000
Effects (R/F)	F	R	R	-	-	-
Observations	1570	1570	1570	1570	1570	1570
Number of bank_id	10	10	10	10	10	10
R-squared	0.452	0.497	0.497	0.707	0.701	0.701

**Table 4. Panel estimation of bank performance (ROE), Jun 2011 to Jun 2024**

	Random effects panel regression with cluster-robust standard errors				GLS regression allowing for heteroskedasticity across panels			
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
LIQ	-0.331**	-0.296***	-0.295***	-0.283**	-0.495***	-0.406***	-0.406***	-0.424***
	-0.139	-0.110	-0.110	-0.099	-0.017	-0.016	-0.016	-0.023
CAR	0.462**	0.367**	0.368**	0.424**	0.580***	0.492***	0.493***	0.426***
	-0.226	-0.165	-0.165	-0.186	-0.046	-0.045	-0.045	-0.049
AM		2.332***	2.328***	2.290**		2.189***	2.187***	2.316***
		-0.763	-0.773	-0.721		-0.131	-0.131	-0.135
NIR				0.00258**				-0.00444*
				-0.001				-0.002
UNCERTAIN			-0.002	-0.002			-0.001	-0.002
			-0.007	-0.007			-0.004	-0.004
LNAS				-3.185				0.508***
				-2.937				-0.125
MOR				-0.031				0.025
				-0.180				-0.072
GROWTH	0.412*	0.335*	0.331*	0.201*	0.193***	0.205***	0.201***	0.227***
	-0.244	-0.174	-0.184	-0.108	-0.035	-0.034	-0.036	-0.037
INF	-0.305	-0.331	-0.331	-0.182	-0.278***	-0.287***	-0.287***	-0.291***
	-0.240	-0.230	-0.230	-0.160	-0.078	-0.075	-0.075	-0.077
INT	0.674***	0.548**	0.554**	0.807***	0.754***	0.569***	0.574***	0.534***
	-0.226	-0.217	-0.221	-0.212	-0.045	-0.044	-0.047	-0.049
Constant	8.762***	8.179***	8.233***	47.160	9.114***	7.809***	7.855***	2.681*
	-3.131	-2.627	-2.677	-34.790	-0.629	-0.627	-0.642	-1.387
Hausmann test	0.6634	0.3781	0.3768	0.000	0.6634	0.3781	0.3768	0
Wooldridge test	0.000	0.000	0.000	0.000	0	0.000	0.000	0
Modified Wald test	0.000	0.000	0.000	0.000	0	0.000	0.000	0
Effects (R/F)	R	R	R	F	-	-	-	-
Observations	1570	1570	1570	1570	1570	1570	1570	1570
Number of banks	10	10	10	10	10	10	10	10
R-squared	0.3795	0.4972	0.4971	0.452	0.6145	0.7011	0.7011	0.707

Robust standard errors in parentheses. Dependent variable is the average return over equity (ROE), calculated as the total net income accumulated over 12 months divided by average equity over 12 months. Columns one to four were estimated using a panel regression with cluster-robust standard errors. Columns five to eight were estimated using generalized least squares (GLS) regression allowing for heteroskedasticity across panels. Diagnostics section include p-values of tests. Overall  $R^2$  is reported for panel regression, while Pseudo- $R^2$  is reported for GLS. Asterisks denote significance at the 10% (\*), 5% (\*\*), and 1% (\*\*\*) levels.

The coefficient  $\beta_1$  remains consistently positive in all regressions, suggesting that the economic growth trend does exert a meaningful effect on bank profitability as previously expected.

The coefficient  $\beta_2$  shows that inflation is negative related to profitability, in line with previous studies, but results were statistically insignificant. Results of both variables are equally not significant when using GLS, which confirms that inflation does not contribute to our model.

Short term interest rates are shown to having an impactful and significant effect on profitability. Regression 3 suggest that a percentage increase in interest rates,

# Robustecer el modelo y conclusiones

# Tabla 2, checar si los coefficients que salieron significativos siguen con s mismo signo y significancia quitando controles, y con algunos contrles y otros

# Tabla 3.

Results suggest that an 1 percentage increase in short term interest rates increase profitability to a .078 percentage points increase in ROE.

Morales Castro & Espinosa Jiménez (2024) explain that reduction on profitability was due to a contraction in economic growth. However, our results yield different results. When using an extended by data period, significance in economic growth fades in favor of interest rate

conclude that economic growth was not the driving affecting profitability but rather the subsequent decline in interest rates

### Table 5. Profitability and bank-specific variables

Robust standard errors in parentheses. Dependent variable is the average return over equity (ROE), calculated as the total net income accumulated over 12 months divided by average equity over 12 months. Columns one to three were estimated using a panel regression with cluster-robust standard errors. Columns four to six were estimated using generalized least squares (GLS) regression allowing for heteroskedasticity across panels. Diagnostics section include p-values of tests. Asterisks denote significance at the 10% (\*), 5% (\*\*), and 1% (\*\*\*) levels.



Robustness

## **V. Conclusions**

This paper presents empirical

Ddddd

Propose policy actions that should be taken to improve bank profitability

Further research can be conducted by investigating the effects of other type of news on the outlook of bank profitability

How uncertainty derived from economic policy may affect smaller banks

Alternative measurements of bank profitability

All panel regression were estimated using random effects as there are no unobservable bank-specific effects, given that macroeconomic variables influence the whole banking system.

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# Finally, recent interest on financial inclusion has sparked a new line of research examining the impact of accessibility and financial services on bank performance. A recent contribution by Magallón González et al. (2023) included financial innovation indicators, such as automatic teller machines (ATMs). However, results had weak influence on overall profits.

As with ATM, transaction on mobile may help banks keep concentration on their banking system share and not increment their profitability directly

Labour productivity = Gross revenue/number of employees

Use of net capital over risk weighted assets, as using standard capital over total assets

In order as tier ii capitalization reflects true risk and potential losses of riskier positions.

Tier ii capitalization discourages capital arbitrages, that is having a high-risk asset portfolio over the required minimum capitalization