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MASTER´S FINAL WORK

DISSERTATION

DETERMINANTS OF BANK PROFITABILITY AND VALUATION ACROSS MONETARY REGIMES: US AND EURO AREA EVIDENCE (2020-2024)

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SUPERVISION:
DR. JOSÉ ALVES

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GLOSSARY

CDS – Credit Default Swap

EA – Euro Area

ECB – European Central Bank

FE – Fixed Effects

Fed – Federal Reserve System

FOMC – Federal Open Market Committee

GFC – Global Financial Crisis

Monetary Tightening – Increase in Policy Interest Rates

NIM – Net Interest Margin

NPL – Non-Performing Loan

P/B Ratio – Price-to-Book Ratio

Policy Rate – Central Bank Policy Interest Rate

ROA – Return on Assets

ROE – Return on Equity

Tier 1 Capital Ratio – Regulatory Capital / Risk-Weighted Assets

US – United States

Yield Curve – Interest Rates Across Maturities

Yield Curve Slope – 10-Year Yield Minus 3-Month Yield

ZLB – Zero Lower Bound

ABSTRACT

This dissertation examines whether monetary regime shifts alter determinants of bank profitability in the United States and the Euro Area. The analysis covers the transition from the 2020–2021 Zero Lower Bound environment to the 2022–2024 monetary tightening cycle, one of the most rapid interest rates increases in recent decades. Using an unbalanced panel of the 50 largest listed commercial banks, Fixed Effects regressions with interaction terms are employed to examine whether the effects of bank-specific characteristics vary across monetary regimes impacting accounting profitability and market valuations. The results reveal strong heterogeneity across regions. Rising rates widened NIM universally, but whether higher margins translate into accounting profitability depended on banks' balance-sheet characteristics. Capitalisation emerged as a particular advantage during the tightening cycle, especially for EA banks, while weaker asset quality became a constraint on profitability, particularly with stronger effect in the US. The findings indicated that monetary regime transitions reshape the role of bank-specific characteristics, implying that the effect of monetary policy depends on banks' balance-sheet structures. Overall, the thesis demonstrates that the determinants of bank profitability are not constant across monetary regimes.

KEYWORDS: Bank Profitability; Bank Valuation; Monetary Policy; Bank's Balance Sheet Structure; Euro Area; United States.

JEL CODES: C23; E43; E52; G21; G32.

RESUMO

Esta dissertação analisa se as mudanças de regime monetário alteram os determinantes da rentabilidade bancária nos Estados Unidos e na Área do Euro. A análise abrange a transição do ambiente de Taxa de Juro no Limite Inferior Zero (Zero Lower Bound) de 2020–2021 para o ciclo de aperto monetário de 2022–2024, um dos períodos de aumento das taxas de juro mais rápidos das últimas décadas. Utilizando um painel não balanceado dos 50 maiores bancos comerciais cotados, são aplicadas regressões de Efeitos Fixos com termos de interação para examinar se os efeitos das características específicas dos bancos variam entre regimes monetários. Os resultados revelam uma forte heterogeneidade entre regiões. O aumento das taxas de juro alargou universalmente a margem financeira líquida (NIM), mas a sua transmissão para a rentabilidade depende das características dos balanços bancários. A capitalização revelou-se uma vantagem durante o ciclo de aperto monetário, sobretudo para os bancos da Área do Euro, enquanto uma menor qualidade dos ativos limitou a rentabilidade, com um efeito mais pronunciado nos Estados Unidos. Os resultados sugerem que os efeitos da política monetária dependem da estrutura dos balanços dos bancos e que os determinantes da rentabilidade bancária não permanecem constantes ao longo de diferentes regimes monetários.

PALAVRAS-CHAVE: Rentabilidade Bancária; Valorização Bancária; Política Monetária; Estrutura Balanço do Banco; Área do Euro; Estados Unidos.

CÓDIGOS JEL**:** C23; E43; E52; G21; G32.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

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1. INTRODUCTION

The 2020–2024 period confronted banks in advanced economies with an unprecedented monetary environment: policy rates pinned at or below zero, extraordinary fiscal support suppressing credit risk transmission, and then the most rapid tightening cycle in four decades. Even within the same macroeconomic environment, banks differ substantially in their returns, a heterogeneity consistently linked to capitalisation, asset quality and other bank characteristics. When the monetary environment itself shifts dramatically, these differences may amplify, making the 2020–2024 regime transition a demanding test of whether bank-specific characteristics operate differently across monetary regimes.

Building on the evidence reviewed in chapter 2 and seeking to extend the empirical frontier, this thesis identifies three gaps in the literature. First, existing studies are largely limited to the pre-2020 period, leaving both the zero lower bound (ZLB) phase of 2020–2021 and the 2022–2024 tightening cycle unexamined within a unified framework. Second, some authors assume bank-specific determinants operate with constant coefficients across monetary environments, leaving untested whether the roles of capitalisation, funding structure, or credit quality shift as the regime changes – a concern reinforced by Altavilla et al. (2017). Third, market valuation remains underexplored in panel studies covering this period. This thesis examines how the shift between monetary regimes alters bank profitability – measured through return on assets, return on equity, and net interest margin – and market valuation – captured through the price-to-book ratio – across the two largest advanced-economy banking systems.

The central research question of the thesis is following "Do monetary regime shifts between the COVID ZLB period of 2020–2021 and the subsequent tightening cycle of 2022–2024 alter the role of bank-specific characteristics in shaping bank profitability and market valuation in the United States and the Euro Area?". The answer carries direct implications for how policy makers, investors, and bank managers think about balance sheet positioning across monetary cycles.

The thesis uses a panel Fixed Effects regression framework with a regime-interaction design following Altavilla et al. (2017), applied to an unbalanced panel of the 50 largest US and EA banks over Q1 2020 to Q4 2024. Bank-specific variables – capitalisation, asset quality, deposit funding, loan intensity, and size – are interacted with the policy rate to test whether their effects vary across monetary regimes. US and EA subsamples of 25 banks are examined separately to identify cross-regional heterogeneity.

The remainder is structured as follows. Chapter 2 reviews the literature on bank-specific determinants and the monetary policy environment. Chapter 3 describes the data and methodology. Chapter 4 presents the empirical results across all four dependent variables and both subsamples. Chapter 5 summarises the findings and discusses limitations and directions for further inquiry.

2. LITERATURE REVIEW

The determinants of bank profitability have attracted scholarly attention since Short (1979) and Bourke (1989), whose cross-country analyses set the agenda pursued by Molyneux and Thornton (1992), Demirgüç-Kunt and Huizinga (1999), and Goddard, Molyneux, and Wilson (2004), among others. The literature converges on two broad categories: bank-specific factors and macroeconomic conditions. Within the first, capitalisation emerges as the most consistently positive determinant, while asset quality is the most robustly identified negative determinant, with non-performing loan (NPL) ratios compressing earnings through provisioning costs and balance sheet rigidity (Klein, 2013; Sousa and Almeida, 2025). Funding structure, loan composition, and operational efficiency round out the bank-specific determinants (Dietrich and Wanzenried, 2014). At the macroeconomic level, GDP growth, inflation, and unemployment have received attention, broadly confirming pro-cyclical profitability dynamics with cross-country heterogeneity (Athanasoglou et al., 2008; Albertazzi and Gambacorta, 2009).

The link between monetary policy and bank profitability has emerged as a prominent research strand since the Global Financial Crisis (GFC). Borio, Gambacorta, and Hofmann (2017) establish that both the level of short-term rates and the yield curve slope are positively associated with return on assets, with the relationship non-linear and asymmetric across regimes. Related work confirms that prolonged accommodation compresses margins and elevates risk-taking, with heterogeneous effects depending on banking system structure (Claessens et al., 2018; Altavilla et al., 2017). English et al. (2018) add the market valuation dimension, showing via high-frequency identification that unexpected rate increases generate large negative bank stock reactions varying with core deposit reliance and maturity mismatch. Thus, complemented by Altavilla et al. (2017), whose event-study evidence shows ECB unconventional policy announcements raised bank stock prices and compressed Credit Default Swap (CDS) spreads.

The following sections review each determinant category. Section 2.1 examines bank-specific characteristics; Section 2.2 covers macroeconomic conditions; Sections 2.3 and 2.4 turn to monetary policy transmission and market valuation evidence, which motivate the regime-interaction design.

2.1. Bank-Specific Determinants

Empirical research identifies bank-level characteristics as primary drivers of profitability heterogeneity. Sousa and Almeida (2025), in a bibliometric review of 634 studies from 1969–2023, confirm that internal determinants including capitalisation, credit quality and size – constitute the core of the profitability literature. This section reviews the evidence on size, capitalisation, funding structure, asset composition, and credit quality, and the mechanisms through which each influences profitability.

The effect of **bank size** on profitability is theoretically ambiguous and empirically inconsistent. Larger banks may benefit from scale economies and implicit too-big-to-fail guarantees (Boyd and Runkle, 1993; Short, 1979), while beyond a certain threshold, managerial diseconomies and complexity can offset these advantages. Athanasoglou et al. (2008) find size insignificant for Greek banks, interpreting this as evidence that growing banks sacrifice short-run profitability to expand market share. Dietrich and Wanzenried (2014) as well find no consistent size advantage across 118 countries. García-Herrero et al. (2009) even document negative results for Chinese state-owned banks. Taken together, the evidence offers no universal size–profitability relationship, but a context-dependent one.

The relationship between **capitalisation** and profitability is among the most consistently documented in the literature. Well-capitalised banks are more profitable, as higher equity buffers reduce bankruptcy costs, lower funding costs through market discipline, and enable lending without distress (Bourke, 1989; Berger, 1995). O'Connell (2023) finds a positive, highly significant effect of capital on ROAA for UK domestic banks. Critically, Berger and Bouwman (2013) show the benefits are not time-invariant as for medium and large banks, capital enhances profitability primarily during banking crises, implying pooled estimates may understate the importance of capital during systemic stress.

The **deposit funding share** is about how much of its funding comes from customer deposits versus wholesale market borrowing – has attracted attention since 2008 crisis, which exposed the dangers of wholesale reliance. Customer deposits are stable and insured, whereas wholesale funding can dry up rapidly under stress. Demirgüç-Kunt and Huizinga (2010) provide the most rigorous international evidence that banks reliant on non-deposit funding are more fragile and generate lower risk-adjusted returns. Their IV estimates indicate that shifting the non-deposit share from zero to 0.5 reduces insolvency distance by roughly two-thirds. Dietrich and Wanzenried (2014) show funding cost differentials are pronounced across income groups. García-Herrero et al. (2009) offer a Chinese case where deposits are the cheapest funding source and directly contributes to raising banks profitability's. While the **loan-to-assets** ratio conditions interest income directly as higher loan intensity raises interest income but credit risk as well. Kohlscheen et al. (2018) find loan growth consistently associated with higher profitability, while Demirgüç-Kunt and Huizinga (2010) show over-diversification into non-interest activities raises risk without proportionally improving returns. Dietrich and Wanzenried (2014) confirm the optimal interest and non-interest balance varies across environments.

Credit quality, measured through the **NPL ratio**, operates through the credit risk channel as rising NPLs force higher provisioning, compress net income, and constrain new lending. Dietrich and Wanzenried (2014) find loan-loss provisions reduce ROAA significantly across all income groups. Klein (2013), examining sixteen Central, Eastern and South-Eastern European (CESEE) economies over 1998–2011, documents strong NPL persistence (lagged coefficients 0.6–0.93) and shows NPL dynamics respond significantly to unemployment, GDP growth, and exchange rates. This persistence implies asset quality shocks have prolonged effects beyond the initial deterioration. Sousa and Almeida (2025) confirm asset quality remains one of the most robustly identified determinants, making the NPL ratio a necessary control.

2.2 Macro Determinants

Macroeconomic conditions are an important external determinant of bank profitability, affecting both credit demand and loan portfolio quality. GDP growth is the most consistently examined variable: stronger economic conditions raise borrower incomes, reduce defaults, and stimulate loan demand, producing pro-cyclical bank returns. Dietrich and Wanzenried (2014) confirm a positive, significant relationship between GDP growth and profitability in middle- and high-income countries, though insignificant in low-income economies. Klein (2013) shows a one percentage point increase in real GDP growth produces a cumulative 0.6 percentage point decline in NPLs across CESEE economies, and that the relationship runs in both directions. Athanasoglou et al. (2008) show this cyclical effect is asymmetric – profitability rises only when output exceeds trend – suggesting banks can partially insulate performance during contractions.

Inflation has a theoretically ambiguous relationship with profitability. Banks that anticipate inflation can adjust lending rates and improve margins; unanticipated inflation can raise costs faster than revenues. Athanasoglou et al. (2008) document a positive inflation effect for Greek banks, attributing it to managers' ability to adjust rates ahead of depositors' expectations.

Unemployment is an important intermediary between macro conditions and credit risk: rising joblessness weakens household debt-servicing capacity, raising defaults and provisioning costs. Klein (2013) finds unemployment a significant determinant of NPLs across CESEE systems before and after 2008. Joaqui-Barandica et al. (2022), in a dynamic factor analysis of US banks, identify household income and employment as one of three common factors explaining 63–68% of profitability variation, underscoring that labour market dynamics shape bank performance through both credit quality and loan demand.

2.3 Monetary policy regimes

Prior to analysis on how interest rate changes shape bank earnings, the mechanisms through which monetary policy transmits to bank balance sheets must be established.

The theoretical foundation lies in banks' intermediation function - transforming short-term liabilities into longer-term assets. Samuelson (1945) showed that because banks hold more rate-sensitive assets than liabilities, rising short-term rates raise net interest income in the short run as asset yields adjust faster than funding costs. Ho and Saunders (1981) formalised this, showing that **net interest margin** (NIM) reflect a risk premium determined by interest rate volatility, market structure, and maturity mismatch. NIM compression is the primary channel through which monetary policy affects bank profitability; when rates decline, asset yields on floating-rate and maturing fixed-rate instruments fall quickly, while retail deposit rates face a de facto floor as banks resist passing negative rates to customers for fear of losing core deposit relationships and triggering cash substitution (Claessens et al., 2018). **Yield curve slope** is a second, distinct channel as banks borrow short and lend long, a steeper curve widens the margin from maturity transformation, while a flat or inverted curve compresses it regardless of policy rate level (English, 2002; Landier et al., 2013). Loan loss provisions form a third channel and implies that rate easing reduces borrower debt service, supports asset prices, and lowers default probabilities, allowing provision releases that partially offset NIM compression at the overall profitability level (Altavilla et al., 2017; Albertazzi and Gambacorta, 2009).

2.3.1. Empirical Evidence: Low Rates, Non-Linearity, and the Low-For-Long Effect

The empirical literature has converged on three findings directly relevant to the present thesis. The rate-profitability relationship is non-linear, adverse effects accumulate over time, and the net impact on overall profitability is more ambiguous than the NIM evidence alone suggests once macroeconomic endogeneity is addressed.

Non-linearity in the rate-NIM relationship was established by Borio et al. (2017), who find across 109 large international banks in 14 advanced economies that short-term rates and yield curve slope are positively associated with ROA, but with diminishing marginal returns – the profitability gain from a given rate increase is substantially larger near zero. Claessens et al. (2018) extend this across 3,385 banks in 47 countries, showing that a one percentage point rate decline lowers NIM by eight basis points on average, but by twenty in already low-rate environments. The mechanism is that banks pass cuts to borrowers faster than they reduce deposit rates, and the deposit floor bites hardest when rates are lowest. They further find that small banks are more severely affected than large banks, as larger institutions possess greater capacity to hedge interest rate risk and diversify into non-interest income (Claessens et al., 2018; Bikker and Vervliet, 2018).

The low-for-long effect is a temporal dimension that compounds these effects. Claessens et al. (2018) find that each additional year in a low-rate environment reduces NIM by a further eight to nine basis points, while Altavilla et al. (2017) confirm this for

EA banks, finding ROA declines by approximately two basis points per additional year of low rates, with the cumulative effect reaching 25 percent of median ROA after five years – implying that EA banks entering the 2020–2021 ZLB period after more than a decade of post-GFC accommodation carried deeply embedded low-for-long damage before the sample period begins.

The endogeneity debate is the main methodological fault line in this literature. Because central banks cut rates when economic conditions worsen, and the weak economy – not the cut itself, that may primarily reduce bank profitability via higher provisions and weaker loan demand. Altavilla et al. (2017) demonstrate this as once forward-looking macro conditions, particularly expected GDP growth, are controlled for, the short-term rate coefficient becomes insignificant for ROA. NIM compression remains, but it is offset by reduced provisioning as macroeconomic environment improves – partially at odds with Claessens et al. (2018) and Borio et al. (2017), though those papers focus on NIM rather than ROA. This motivates the inclusion of both NIM and ROA in the present thesis to see if the endogeneity argument holds, NIM and ROA effects should diverge in the expected direction, with margin compression not fully translating into profitability deterioration once macro conditions are controlled.

2.3.2. The COVID-19 Shock and the ZLB Environment (2020–2021)

The COVID-19 pandemic produced the most compressed monetary policy episode in modern financial history, creating the ultra-accommodative regime used here as the low-rate benchmark against which the later tightening cycle is applied. This thesis does not study the COVID-19 shock itself. Rather, 2020–2021 is treated as a characterised monetary regime defined by ZLB or even negative rates, extraordinary fiscal and regulatory support, and suppressed credit risk transmission.

The Fed returned to the ZLB while the ECB held its deposit facility rate at −0.50% and expanded asset purchases aggressively. Fiscal support, loan moratoria, and government guarantees simultaneously altered the credit risk environment: transfers sustained household and corporate incomes, moratoria let borrowers defer payments without triggering NPL classification, and guarantee schemes shifted credit risk from bank to sovereign balance sheets (Demirgüç-Kunt et al., 2021). The consequence was paradoxical, despite the sharpest peacetime GDP contractions on record, NPL ratios did not rise dramatically, and provisions stayed far below historical predictions. While market valuations told a different story as Demirgüç-Kunt et al. (2021) examining 896 banks across 52 countries, find sharp equity valuation declines varying with bank-specific characteristics, indicating that investors priced forward-looking credit risk that accounting measures had not yet reflected.

The 2020–2021 period is thus characterised by effective lower bound rates, suppressed credit risk transmission, and compressed NIMs – the configuration against which the 2022–2024 tightening cycle must be understood.

2.3.3. The Tightening Cycle and Monetary Regime Transition (2022–2024)

The 2022 monetary tightening was the most rapid and synchronised policy rate increase in four decades. The Fed raised the Fed Funds Rate from 0.25% to 5.50% in sixteen months, and the ECB moved from −0.50% to 4.00% in just over a year. This transition created a monetary environment fundamentally different from anything the existing empirical literature had examined within a unified framework.

Policy rate increases do not benefit all banks uniformly, and tightening dynamics are more complex than a simple reversal of low-rate compression. English et al. (2018), using high-frequency identification around FOMC announcements for 355 US bank holding companies from 1997 to 2007, find that unexpected rate increases generate average bank stock price declines of 2–2.5% for a 25-basis point surprise. Their local projections show that tightening initially raises NIM and ROA for approximately four to six quarters through the Samuelson repricing effect, before reversing as funding structures adjust and core deposit outflows accelerate.

Yield curve dynamics during 2022–2024 added complexity as central banks raised short rates aggressively, long-term yields rose more slowly, producing sustained US inversion from mid-2022. For banks doing maturity transformation, level and slope effects worked in opposite directions simultaneously as rising policy rates raised floating-rate asset yields while the inverted curve compressed margins on new fixed-rate lending.

Bank heterogeneity in tightening transmission is the central motivation for this thesis's interaction design. The same policy impulse generates heterogeneous profitability responses depending on balance sheet structure. English et al. (2018) find that core-deposit-reliant banks are more sensitive to level and slope surprises, as rising rates erode below-market deposit funding franchise value. Claessens et al. (2018) show that asset maturity conditions the speed of income repricing. Altavilla et al. (2017) demonstrate that capitalisation, asset quality, and efficiency all condition the profitability response – more efficient banks benefit more from easing, banks with higher NPL ratios face disproportionate pressure as borrower distress amplifies, a mechanism that extends naturally to the tightening environment examined in this thesis. Calomiris and Nissim (2014) show that rate changes alter the market-to-book value of bank equity through core deposit franchise revaluation, varying with deposit relationship depth. Together, this evidence establishes that the roles of bank-specific characteristics are not stable across monetary regimes but vary systematically with the rate environment, motivating the regime-interaction panel design used in the thesis.

2.4. Bank's Valuation

Whereas ROA and NIM capture realised profitability, the price-to-book ratio reflects forward-looking investor expectations about future earnings capacity, franchise value, and risk. Its relevance became clear after the GFC, when the average market-to-book ratio of US bank holding companies fell from above 2.4 before the crisis to around 1.2 in the post-crisis period and remained persistently depressed well after accounting losses had been recognised — suggesting the destruction of intangible franchise value across lending relationships, core deposit franchises, and fee-generating activities rather than temporary loss recognition (Calomiris and Nissim, 2014).

Bernanke and Kuttner (2005) establish the theoretical foundation for why monetary policy moves equity prices, showing in a high-frequency event study that a 25-basis point surprise rate cut raises broad US indexes by about one percent on the announcement day. Their VAR decomposition attributes roughly 42% to expected dividend revisions, 53% to a lower equity risk premium, and less than 1% to the direct real interest rate channel. For banks specifically, monetary policy therefore affects market valuation not only through discount rates but through expectations about future earnings and perceived risk.

The monetary policy and bank equity valuation relationship is more complex than for non-financial firms and changes sign with the rate environment. Ampudia and Van den Heuvel (2022), studying 56 listed EA banks across 245 ECB policy dates (1999–2017), find that a 100-basis point surprise cut raised bank stock prices by about 3.9 percent on average, but at the ZLB the same cut destroyed roughly 2% of bank equity value. The reversal coincides with the deposit facility rate reaching zero, identifying the deposit floor as the trigger, with the high–low deposit-ratio differential reaching about 7.7 percentage points for a 100-basis point cut in the low-rate period. Calomiris and Nissim (2014) show that deposit franchise value tracks rates with a lag, falling sharply as ZLB rates compressed the spread between market borrowing costs and below-market deposit rates. They as well document a post-crisis reversal in the capitalisation-valuation relationship as pre-crisis higher leverage was associated with higher P/B, while post-crisis higher capitalisation became positively associated with market value as default risks were repriced.

The transition from the 2020–2021 ZLB regime to the 2022–2024 tightening cycle thus generates testable predictions about how markets price bank-specific characteristics across regimes – whether capitalisation premiums recover, deposit franchise values are restored, and credit risk repricing diverges across US and EA institutions. These questions are examined through the price-to-book ratio alongside accounting profitability measures, completing the empirical framework.

3. DATA AND METHODOLOGY

The first part of this chapter will present the data including its sources alongside defining variables for analysis. The second part introduces the regression model used to investigate the effects of monetary policy and bank-specific characteristics on bank profitability and market valuation, alongside a list of hypotheses.

3.1. Data

The data consists of three main blocks of variables which are bank-specific variables, monetary and macro variables (control) for United States (US) and Euro Area (EA) countries. The sample was chosen based on the top-25 banks by size from each region determined by the total asset variable in the Bloomberg platform on the 31st December 2019. This is the last date prior to the analysis span of the paper from the beginning of 2020 to the end of 2024 with quarterly frequency. This period was selected to capture both the ZLB environment of 2020–2021, followed by the extreme monetary tightening of 2022–2024.

TABLE I. DEFINITION OF VARIABLES

Variables	Description	Expected effect
Dependent		
ROA	Net profits over average total assets (in %)	
ROE	Net profits over average total equity (in %)	
Net interest margin	Net interest income/ avg. interest-earning asset (in %)	
Price-to-Book	Market price per share over book value per share	
Independent		
Bank-specific characteristics		
Capital ratio	Tier 1 capital over risk-weighted assets (in %)	+
NPL ratio	Non-performing loans over total loans (in %)	–
Deposit ratio	Customer deposits over total assets (in %)	?
Loan intensity	Total loans over total assets (in %)	+
Bank size	Natural logarithm of total assets	?
Monetary variables		

Policy rate	Fed Funds Rate / ECB deposit facility rate (in %)	+
Yield curve slope	Spread between 10-year and 3-month sovereign bond yield, country-level (in %)	+
Macroeconomic controls		
GDP growth	Quarterly real GDP growth rate, seasonally adjusted annual rate (in %)	+
Unemployment rate	Quarterly unemployment rate, country-level (in %)	−
Inflation	Year-over-year CPI / HICP inflation rate, country-level (in %)	?
Interaction terms		
Capital ratio × Policy rate	Tests if capitalisation premium is amplified during tightening cycle	+
NPL ratio × Policy rate	Tests whether asset quality penalty is amplified when rates rise	–
Deposit ratio × Policy rate	Tests whether deposit-funded banks gain endowment advantage during tightening	?
Loan intensity × Policy rate	Tests if loan-heavy banks benefit more from asset repricing during rate rises	?
Bank Size × Policy rate	Tests whether sizes of banks matters during monetary tightening	?

Notes: Expected effect refers to the anticipated sign of the coefficient on profitability (ROA, ROE, NIM). ? denotes theoretical ambiguity.

Moving to the data sources, all bank-specific financial data for all 50 institutions in the sample are sourced from the Bloomberg terminal, which provides standardised quarterly financial statements across both US and EA banks. The variables retrieved include return on assets, return on equity, net interest margin, price-to-book ratio, Tier 1 capital ratio, non-performing loan ratio, deposit ratio, loan intensity, and total assets.

Macroeconomic variables are sourced at the country level to show the institutional reality of banks operating within the EA that share a common monetary policy but face heterogeneous real economic conditions across member states. For the US, GDP growth, unemployment rate, and CPI inflation are obtained from the Federal Reserve Economic Data (FRED) and International Monetary Fund Database. For EA countries, the equivalent variables are sourced from Eurostat database. Monetary policy variables were collected for each region respectively, the Federal Funds Rate for US and the ECB deposit facility rate for EA are both sourced from FRED. The yield curve slope is constructed as the spread between the ten-year and three-month sovereign bond yield for each bank's home country. The US yields data was collected from FRED while EA yields are sourced from Bloomberg terminal. In case of EA allowing the yield curve variable to capture country-level differences in term structure that an aggregate EA measure would obscure.

It is important to note that central banks, pure investment banks, national development banks, other public financial institutions were excluded from the sample, even where their total asset size would have placed them within the top 25 for their respective region. Pure investment banks, despite their significant balance sheet size, derive their revenues primarily from capital markets, trading, and advisory activities rather than traditional deposit-taking and lending – making their NIM, deposit ratios, and overall profitability dynamics fundamentally incomparable to commercial banks. Similarly, central banks and national development banks operate under public mandates and regulatory frameworks that bear no meaningful resemblance to commercial banking economics. Additionally, only publicly listed banks are included in the sample, as the price-to-book ratio – one of the four dependent variables requires market price data that is unavailable for non-listed institutions.

For the EA, the sample is drawn across multiple member states, reflecting the distribution of the largest commercial banks across the currency union. The sample covers institutions headquartered in France, Germany, Spain, Netherlands, Italy, Austria, Belgium, and Portugal, which together account for the largest share of EA banking assets.

The panel is unbalanced as a result of 6 US banks and 3 EA banks that were either acquired, merged, or failed at different points during the 2020–2024 sample period. These institutions are retained in the analysis up to their last available quarterly observation rather than being excluded entirely. This approach is preferable because dropping these banks retrospectively would introduce survivorship bias by systematically removing institutions that underperformed or faced distress during the tightening cycle, which is precisely the period of analytical interest. Retaining them until the point of their exit ensures the sample reflects the actual cross-section of banks that were active during different phases of the monetary regime, including those most severely affected by the 2022–2024 tightening. The unbalanced nature of the panel is accommodated by the Fixed Effects estimator, which does not require a balanced structure to produce consistent estimates.

TABLE II. DESCRIPTIVE STATISTICS

Variables	Full Sample					US Subsample					EA Subsample				
	N	Mean	SD	Min	Max	N	Mean	SD	Min	Max	N	Mean	SD	Min	Max
Dependent Variables															
ROA	905	0,718	0,560	-3,223	3,213	437	0,977	0,519	-3,220	3,210	468	0,477	0,485	-2,720	2,190
ROE	905	9,324	6,979	-43,36	33,060	437	10,647	6,258	-39,56	33,060	468	8,087	7,385	-43,36	28,090
NIM	905	2,308	0,908	0,270	9,270	437	2,906	0,712	1,610	9,270	468	1,750	0,690	0,270	3,500
P/B	890	0,882	0,495	0,000	3,160	437	1,191	0,478	0,180	3,160	453	0,583	0,284	0,000	1,470
Bank-Specific Variables															
Size (log)	905	26,594	1,227	24,551	29,068	437	26,245	1,321	24,551	29,068	468	26,920	1,032	25,199	28,785
Capital Ratio	905	13,710	2,316	8,710	20,200	437	11,956	1,384	9,510	16,800	468	15,349	1,740	8,710	20,200
Deposit Ratio	905	64,313	17,501	4,960	90,370	437	76,705	8,997	44,850	90,370	468	52,741	15,474	4,960	83,840
Loan Ratio	905	54,438	14,456	12,030	79,010	437	58,772	13,889	27,140	79,010	468	50,392	13,799	12,030	73,860
NPL Ratio	905	2,085	1,864	0,060	14,140	437	0,616	0,445	0,060	3,780	468	3,456	1,624	1,430	14,140
Macroeconomic and Monetary Variables															
Policy Rate	1.000	1,841	2,224	-0,500	5,330	500	2,461	2,313	0,060	5,330	500	1,222	1,946	-0,500	4,000
Yield Curve	1.000	0,502	1,112	-1,520	3,730	500	0,198	1,067	-1,480	1,850	500	0,805	1,074	-1,520	3,730
GDP Growth	1.000	0,504	3,689	-17,80	15,900	500	0,619	2,571	-7,880	7,760	500	0,389	4,540	-17,80	15,900
Unemployment	1.000	6,602	3,378	3,000	16,500	500	4,945	2,295	3,500	13,000	500	8,259	3,474	3,000	16,500
Inflation	1.000	3,964	2,948	-0,770	14,130	500	4,204	2,451	0,360	8,640	500	3,724	3,358	-0,770	14,130

Table 2 presents descriptive statistics for the full sample and the US and EA subsamples separately. Across the full sample of 905 bank-quarter observations for bank-specific variables (890 for P/B ratio) and 1,000 for macroeconomic and monetary variables, the data exhibit substantial variation in both profitability and balance sheet characteristics, reflecting the heterogeneity of institutions. The mean ROA of 0.719% and mean ROE of 9.324% are positive on average despite including the COVID-affected quarters of 2020, indicating that fiscal support and provision releases broadly sustained bank earnings through the crisis. The mean price-to-book ratio of 0.882 is below unity and consistent with the post-GFC pattern documented by Calomiris and Nissim (2014), as depressed market valuations reflect the erosion of franchise value under prolonged low interest rates. The full-sample mean inflation of 3.964% and mean policy rate of 1.841%

reflect the arithmetic average across both the near-zero rate environment of 2020–2021 and the sharp tightening of 2022–2024.

The cross-regional differences appear in profitability, asset quality, and funding structure despite having similar log sizes on average (26.245 for US and 26.920 for EA banks). US banks are substantially more profitable than EA counterparts across all accounting measures, mean ROA of 0.977% vs 0.477% and mean NIM of 2.906% versus 1.750% are consistent with the structural advantages of US banks including higher reliance on fee and trading income, greater operational efficiency and in general more competitive deposit market. The difference in market valuation followed same pattern as accounting variables. US banks trade at a mean P/B of 1.191, more than double the EA mean of 0.583 suggesting equity markets assign substantially higher franchise value to US institutions. Asset quality diverges sharply as the mean NPL ratio for EA banks stands at 3.456%, nearly six times the US mean of 0.616%, this could be reflection legacy of the European sovereign debt crisis and slower NPL resolution mechanisms across several EA jurisdictions. Funding structure also differs as US banks fund 76.705% of their balance sheet through customer deposits on average, compared to 52.741% for EA banks, indicating greater US reliance on stable retail funding.

The monetary environment also differs meaningfully between regions. The average US policy rate of 2.461% exceeds the EA equivalent of 1.222%, reflecting the Federal Reserve's more aggressive tightening trajectory and the ECB's negative rate starting point of -0.50%, depressing the sample average despite ultimately reaching 4.00%. The EA mean yield curve slope of 0.805% exceeds the US mean of 0.198%, consistent with the more pronounced yield curve inversion experienced in the US from mid-2022 as the Fed tightened faster than long-term yields adjusted. Labour market conditions diverge structurally – EA unemployment averaged 8.259% versus 4.945% in the US – while GDP growth was broadly similar across regions, though the EA exhibits substantially higher macroeconomic volatility as captured by a larger GDP standard deviation of 4.540 versus 2.571. These cross-regional differences in banking system structure and macroeconomic conditions motivate the separate subsample analysis reported throughout the empirical results.

3.2 Methodology

3.2.1 Model Specification

The empirical strategy adopts a Fixed Effects panel regression framework, following the specifications of Altavilla et al. (2017) and partially Dietrich and Wanzenried (2014). The baseline model takes the following form:

$$(1) \quad \mathbf{Y}_{it} = \alpha_i + \beta_1 \mathbf{X}_{it-1} + \beta_2 \mathbf{M}_{jt} + \beta_3 \mathbf{R}_{jt} + \beta_4 \mathbf{D}_t + \varepsilon_{it}$$

where $\mathbf{Y}_{it}$ denotes one of four dependent variables – ROA, ROE, NIM, P/B ratio for bank i in quarter t. The vector $\mathbf{X}_{it-1}$ contains bank-specific characteristics lagged one quarter, $\mathbf{M}_{jt}$ contains macroeconomic controls for country j at time t, $\mathbf{R}_{jt}$ contains monetary policy variables, $\mathbf{D}_t$ is a COVID-19 dummy variable, α_i represents bank fixed effects absorbing all time-invariant bank-level heterogeneity, and ε_{it} is the idiosyncratic error term.

The main empirical contribution extends the baseline by introducing interaction terms between the policy rate and each bank-specific characteristic following Altavilla et al., (2017):

$$(2) \quad \mathbf{Y}_{it} = \alpha_i + \beta_1 \mathbf{X}_{it-1} + \beta_2 \mathbf{M}_{jt} + \beta_3 \mathbf{R}_{jt} + \beta_4 \mathbf{D}_t + \beta_5 (\mathbf{X}_{c,it-1} \times \mathbf{R}_{jt}) + \varepsilon_{it}$$

where $\mathbf{X}_{c,it-1}$ denotes mean-centred bank-specific variables and β_5 captures whether the sensitivity of bank profitability and market valuation to bank-specific characteristics changes systematically with the monetary policy rate only, directly addressing the research question. Bank-specific variables are mean-centred prior to constructing interaction terms to reduce multicollinearity and to ensure the main effect of the policy rate is interpretable as the effect for a bank with average characteristics. The interaction term coefficients are invariant to mean-centring. A positive and significant coefficient on Capital Ratio × Policy Rate, for example, would indicate that the profitability premium associated with higher capitalisation is amplified during the tightening cycle, providing direct evidence of regime-dependent determinant effects.

The model is estimated using the Fixed Effects within estimator, which eliminates time-invariant bank-specific heterogeneity including management quality, institutional culture etc. through a demeaning transformation, producing consistent estimates when unobserved bank characteristics are correlated with the regressors (Wooldridge, 2010).

Time fixed effects are deliberately excluded from the specification, following Altavilla et al. (2017) and Borio et al. (2017). In a two-way fixed effects framework, period dummies would absorb the common interest rate environment faced by all banks within each quarter, rendering the policy rate and yield curve slope collinear with the time dummies and preventing identification of the monetary transmission channel which is the central variable of interest in this thesis. Instead, time-varying conditions are partially controlled for through contemporaneous country-level GDP growth, following Altavilla et al. (2017) and additionally, unemployment, and inflation levels. This approach acknowledges a potential endogeneity concern, central banks lower rates precisely when economic conditions deteriorate, creating a possible spurious correlation between low rates and weak bank profitability. Contemporaneous macro controls are therefore employed as an alternative, and results should be interpreted as conditional associations rather than strict causal estimates.

To capture the acute disruption of the COVID-19 pandemic which simultaneously depressed economic activity, triggered fiscal interventions, and suppressed normal credit risk transmission, a dummy variable for Q1, Q2, and Q3 of 2020 is included in all specifications. The three-quarter window encompasses both the initial shock and the mechanical rebound quarter, during which loan moratoria, government guarantees, and fiscal transfers continued to distort normal bank profitability dynamics, consistent with the evidence in Demirgüç-Kunt et al., (2021).

All bank-specific variables are lagged one quarter to mitigate reverse causality as higher profitability may allow banks to build capital through retained earnings or reduce NPL ratios through write-offs, following Altavilla et al. (2017), Dietrich and Wanzenried (2014) and Athanasoglou et al. (2008). Bank size is entered as the natural logarithm of total assets throughout to compress the large variation in absolute balance sheet size across the sample. The analysis is conducted on the full sample of 50 banks and on US and EA subsamples separately, allowing direct cross-regional comparison of how the monetary regime transition differentially affects bank performance across the two regions.

3.2.2 Diagnostic Tests

Prior to estimation a comprehensive set of diagnostic tests was conducted to validate the model specification and address econometric concerns. The Hausman test was applied to all four dependent variable specifications to determine the appropriate estimator. The null hypothesis of Random Effects consistency was rejected for ROA, ROE, and P/B at the 1% significance level, and for NIM at the 10% level, confirming that Fixed Effects is the appropriate estimator across all models. For NIM the borderline result is consistent with the weaker within-bank variation in NIM once bank and time variation are separated. Therefore, in appendices as robustness check, NIM is also presented on Random Effects model. However, for main results section, Fixed Effects is retained following literature, and for consistency across specifications.

Multicollinearity was assessed using Variance Inflation Factors. All variables returned values below 6, with the highest being the yield curve slope at 5.4 reflecting its natural correlation with the policy rate, still well below the conventional threshold of 10. Stationarity of all variables was confirmed using the Augmented Dickey-Fuller test, with all fourteen variables rejecting the null hypothesis of a unit root at the 1% significance level.

Three further violations were identified and addressed simultaneously through the choice of standard errors. The Wooldridge test strongly confirmed serial correlation within bank observations across all four models, consistent with the literature on persistence of bank profitability over time. The Breusch-Pagan test confirmed heteroskedasticity across all specifications, consistent with substantial size heterogeneity across the sample. The Pesaran cross-sectional dependence test confirmed significant dependence across bank residuals in all specifications, reflecting the common monetary policy and macroeconomic environment shared by banks within each region. Standard errors clustered at the bank level are employed throughout all specifications, following Altavilla et al. (2017), providing robust inference under heteroskedasticity and serial correlation within bank observations. Cross-sectional dependence is only partially mitigated through the inclusion of macro controls, which absorb common within-country shocks, and the COVID-19 dummy, which captures the most acute common crisis of the sample period. Finally, Ramsey RESET test, applied to the OLS specification as the test does not support Fixed Effects models, confirmed the presence of nonlinear relationships in the ROE and P/B specifications and a borderline result for NIM, providing additional motivation for the interaction term design adopted in the main specification. The complete diagnostic results are summarised in Table 3 below.

TABLE III. DIAGNOSTIC TEST RESULTS

Test	ROA	ROE	NIM[1]	P/B	Conclusion
Hausman	p<0.001	p<0.001	p=0.092	p<0.001	FE confirmed
VIF max	5.4	5.4	5.4	5.4	No multicollinearity
ADF	p<0.01	p<0.01	p<0.01	p<0.01	All stationary
Wooldridge	p<0.001	p<0.001	p<0.001	p<0.001	Clustered SE applied
Breusch-Pagan	p<0.001	p<0.001	p=0.007	p<0.001	Clustered SE applied
Pesaran CD	p<0.001	p<0.001	p<0.001	p<0.001	Macro controls applied
Ramsey RESET	p=0.409	p=0.011	p=0.060	p<0.001	Motivates interactions

3.2.3 Hypotheses

Drawing on the theoretical mechanisms and empirical evidence reviewed in chapter 2, the following hypotheses guide the empirical analysis. The first group establishes expected baseline relationships consistent with the existing literature. The second group constitutes the testing whether these relationships are altered by the monetary regime.

Baseline Hypotheses

H1: Bank capitalisation is positively associated with profitability and market valuation. Well-capitalised banks face lower bankruptcy costs and signal creditworthiness to markets, supporting higher returns. Consistent with Bourke (1989) Berger (1995), Dietrich and Wanzenried (2014).

H2: Asset quality is negatively associated with profitability and market valuation. Higher NPL ratios force elevated provisioning, compress net income, and signal balance sheet weakness to markets. Consistent with Athanasoglou et al. (2008) and Klein (2013).

H3: The policy rate and yield curve slope are positively associated with bank profitability, particularly net interest margin. Rising rates and a steeper yield curve widen the spread between asset yields and funding costs through the Samuelson (1945) repricing and maturity transformation channels. Consistent with Borio et al. (2017) and Claessens et al. (2018)

H4: The COVID-19 period significantly reduced bank profitability and market valuation. The pandemic triggered acute uncertainty about bank earnings and credit losses while

[1] NIM robustness check in Appendix A

forcing banks into a countercyclical lending role, compounded by the extraordinary fiscal and monetary interventions that distorted normal credit risk transmission. Consistent with Demirgüç-Kunt et al. (2021).

H5: Bank size has a neutral effect (statistically insignificant) on profitability among the largest systemically important institutions. In the case of the largest banks, the structural complexities and regulatory constraints are expected to counterbalance any traditional scale efficiencies. Consistent with Goddard et al. (2004), and Athanasoglou et al. (2008).

Interaction Term Hypotheses

H6: The positive effect of capitalisation on profitability is amplified during the monetary tightening cycle. Equity-funded assets reprice upward when rates rise without a corresponding increase in equity costs, earning a larger premium during tightening, with the effect stronger in the EA given its negative rate starting point. Consistent with Altavilla et al. (2017).

*H7: The negative effect of asset quality on profitability is amplified during the tightening cycle***.** Rising rates increase borrower debt service burdens, compounding the income drag for banks with pre-existing weak loan portfolios through the credit risk channel. Consistent with English et al. (2018).

H8: The effect of deposit funding on profitability changes with the monetary regime, with the sign remaining theoretically ambiguous. Rising rates initially expand the markdown between market rates and deposit rates boosting NIM, but trigger core deposit outflows over the medium term that compress margins. Consistent with Borio et al. (2017), Claessens et al. (2018), and English et al. (2018).

H9: Loan-intensive banks benefit more in the short-run from the asset repricing channel during tightening. Variable-rate loan portfolios reprice upward immediately when rates rise while funding costs adjust more slowly, generating a temporary NIM and ROA windfall for loan-heavy banks. Consistent with Samuelson (1945), Borio et al. (2017).

H10: The sensitivity of bank profitability and market valuation to monetary regime changes differs systematically between US and EA banks. Structural differences in interest income dependence, deposit funding, NPL ratios, and the ECB's more extreme tightening starting point imply heterogeneous transmission of the similar monetary impulse.

4. RESEARCH RESULTS

The following section presents and discusses the empirical findings. Results are organised into two analytical dimensions. The first examines the accounting dimension of bank performance – ROA as the primary profitability measure, ROE as a consistency check, and NIM to capture the monetary policy transmission mechanism. The second turns to the market valuation dimension through the price-to-book ratio, assessing whether accounting profitability patterns are reflected in forward-looking investor expectations. Within each block, baseline specifications are discussed first, followed by the interaction models that constitute the primary contribution, and subsample results are presented to examine cross-regional heterogeneity as well as geographical robustness check. Results are discussed in relation to the hypotheses established in Section 3.2.3 and the theoretical mechanisms reviewed in Chapter 2.

4.1.1 ROA

The baseline ROA results in column 1 of Table 4 below confirm several relationships established in the existing literature. A one percentage point increase in the Tier 1 capital ratio is associated with a 0.085 percentage point increase in ROA, a positive and statistically significant relationship, confirming H1. Asset quality emerges as the most robust determinant as the NPL ratio carries a coefficient of −0.165, significant at the 1% level, confirming H2. A bank moving from the sample mean NPL ratio of 2.1% to the 75th percentile would experience a ROA reduction of approximately 0.23 percentage points, equivalent to roughly one third of the full sample mean ROA of 0.72%, consistent with the strong NPL persistence documented by Klein (2013). The deposit ratio enters positively at 0.012, significant at the 5% level, consistent with H8’s expectation that deposit-funded banks benefit from cheaper and more stable funding sources in normal rate environments, aligning with Demirgüç-Kunt and Huizinga (2010). However, the deposit ratio loses significance in the interaction specification, suggesting its direct effect is partially absorbed by the monetary regime interaction terms. Bank size enters with a large negative coefficient of −0.857, significant at the 1% level, partially rejecting H5, which anticipated size neutrality. Instead, the evidence suggests that for the largest systemically important institutions, regulatory burden actively dominates any scale advantage, producing a consistently negative within-bank size effect consistent with García-Herrero et al. (2009).

TABLE IV. PANEL REGRESSION RESULTS – RETURN ON ASSETS (ROA)

	m_roa	m_roa_int	us_roa_int	ea_roa_int
	Full Baseline	Full Interactions	US Interactions	EA Interactions
Dependent Var.:	ROA	ROA	ROA	ROA
Capital_Ratio_lag	0.0850** (0.0361)	0.0486 (0.0300)	-0.0016 (0.0561)	0.0565** (0.0246)
NPL_Ratio_lag	-0.1649*** (0.0426)	-0.1322** (0.0593)	-0.6312*** (0.1620)	-0.0604* (0.0346)
Deposit_Ratio_lag	0.0117** (0.0056)	-0.0041 (0.0081)	-0.0083 (0.0191)	-0.0014 (0.0054)
Loan_Ratio_lag	-0.0017 (0.0048)	0.0037 (0.0066)	-0.0239 (0.0183)	0.0086 (0.0062)
Size_log_lag	-0.8570*** (0.2439)	-0.6081** (0.2770)	-0.4472 (0.3727)	-0.4224* (0.2086)
Policy_rate	-0.0374 (0.0379)	-0.0550 (0.0402)	-0.2005 (0.1174)	-0.0492 (0.0514)
Yield_curve	-0.0693 (0.0631)	-0.1136* (0.0582)	-0.1622 (0.1045)	-0.0021 (0.0326)
GDP_growth	-0.0045* (0.0024)	-0.0032 (0.0023)	-0.0016 (0.0131)	0.0024 (0.0026)
Unemployment_rate	-0.0526*** (0.0186)	-0.0656*** (0.0152)	-0.0266 (0.0362)	-0.0982*** (0.0265)
CPI_Inflation	0.0160 (0.0109)	0.0253** (0.0103)	0.0186 (0.0252)	0.0033 (0.0108)
covid_dummy	-0.0051 (0.0627)	-0.0317 (0.0609)	-0.2100 (0.1870)	-0.0779 (0.0892)
Cap_X_Rate		0.0194*** (0.0059)	0.0117 (0.0103)	0.0279*** (0.0099)
NPL_X_Rate		0.0114 (0.0280)	-0.0475 (0.0487)	0.0447 (0.0296)
Dep_X_Rate		6.19e-5 (0.0008)	0.0027 (0.0023)	0.0009 (0.0007)
Loan_X_Rate		0.0021* (0.0011)	0.0027 (0.0028)	0.0002 (0.0009)
Size_X_Rate		0.0107 (0.0103)	0.0240 (0.0263)	0.0123 (0.0096)
Fixed-Effects:				
bank_id	Yes	Yes	Yes	Yes
S.E.: Clustered	by: bank_id	by: bank_id	by: bank_id	by: bank_id
Observations	855	855	412	443
R2	0.58121	0.60477	0.45631	0.73813
Within R2	0.25495	0.29687	0.28551	0.57807

Signif. codes: 0 '***' 0.01 '**' 0.05 '*' 0.1 ' ' 1

Proceeding with macroeconomic controls, unemployment enters negatively at −0.053, confirming that weaker labour markets depress profitability via credit risk channel. GDP growth enters negatively at −0.005, marginally significant in the full baseline but insignificant in the interaction and subsamples, suggesting this result is not robust and should be interpreted carefully. The negative sign likely reflects 2020–2024 dynamics as fiscal transfers, moratoria, and guarantees insulated profitability during the 2020 contraction, while subsequent tightening pressured margins during moderate-growth quarters, severing the normal positive link between output and bank earnings within the panel. Additionally, the COVID dummy insignificance for ROA contributes to previous point and again could indicate that fiscal support and loan moratoria insulated accounting profitability from the pandemic shock, partially rejecting H4, which anticipated profitability deterioration. The policy rate is insignificant in the full sample baseline, consistent with Altavilla et al. (2017), who showed that once macro conditions are properly controlled, monetary policy has no significant average effect on overall profitability.

The interaction specification in column 2 is the primary contribution of this thesis, improving within R^2 from 0.255 to 0.297. Cap_X_Rate at 0.019 significant at the 1% level, confirms H6 - indicating that the profitability effect of capitalisation increases by 0.019 percentage points for each one percentage point rise in the policy rate. As an example of the economic magnitude, across the cycle (≈0% ZLB to ≈4.5% peak), this implies the capitalisation premium widened by about 0.087pp (0.019 × 4.5) for the average bank, representing a meaningful amplification of the role of capital during the monetary regime transition. This aligns with English et al. (2018), who show that well-capitalised banks hold more equity-funded assets that reprice upward during tightening without matching liability cost increases. Loan_X_Rate at 0.002 is marginal in the full sample but insignificant in both subsamples, giving only weak, regionally non-robust support for H9 – consistent with short-run Samuelson repricing for loan-heavy banks, but not a systematic feature of either banking system. The yield curve slope enters negatively at −0.114 (marginal) in the full interaction model which is a counterintuitive finding given that a steeper curve should benefit banks through maturity transformation. This negative sign likely reflects the persistent yield curve inversion from mid-2022, as short rates rose faster than long rates during the most aggressive tightening phase. Borio et al. (2017) document a positive slope effect on profitability, but this presupposes a normally upward-sloping curve, a condition that did not hold for a substantial portion of the sample period. H7 is not confirmed for ROA in the full sample as NPL_X_Rate is statistically zero. Deposit ratio and size interaction terms are insignificant as well, suggesting endowment effects and rising deposit betas broadly cancelled out during 2022–2024 tightening, consistent with the ambiguous expectation in H8.

The subsamples reveal dramatic regional differences in NPL sensitivity. The US NPL coefficient reaches −0.631 in the interaction – more than ten times of the EA equivalent of −0.060 – indicating far greater US sensitivity to asset quality deterioration. This likely reflects differences in provisioning speed and NPL resolution mechanisms as US banks tend to recognise and write off non-performing assets more rapidly, creating a more immediate and concentrated impact on quarterly earnings, while EA banks historically carried NPLs for longer periods with slower provisioning cycles. The capital interaction effect is entirely EA-concentrated as EA Cap_X_Rate is 0.028 (1% significant), while the US coefficient is statistically zero, confirming H10. One of the reasons could be that EA banks entered the tightening cycle from deeply negative ECB rates that had severely compressed margins, so as rates normalised through the 450bp 2022–2023 tightening, well-capitalised EA banks were better positioned to capture the repricing benefit as equity-funded assets adjusted upward while liability costs lagged. US banks, starting from a less extreme point in a more diversified banking system, showed no equivalent capital amplification.

The substantial difference in model fit where EA within R^2 of 0.578 vs US within R^2 of 0.286 in the interaction specification is itself informative. The empirical design of this thesis draws closely on Altavilla et al. (2017), whose panel specification was developed for and applied exclusively to EA banks. The stronger EA fit reflects that this specification is better suited to bank-based systems with unified monetary policy, where common conditions absorb more within-bank variation. US banks exhibit greater idiosyncratic variation beyond the model's systematic factors, a limitation that warrants caution when drawing conclusions from the US subsample results specifically.

4.1.2 ROE

Return on equity results in Table 5 broadly confirm the ROA findings while adding detail. In the baseline specification, capital ratio enters positively at 0.969, marginally significant at the 10% level, and NPL ratio carries a large negative coefficient of −2.334, significant at the 1% level — confirming H1 and H2 respectively and consistent with the ROA evidence. The capital coefficient is larger than the ROA equivalent of 0.085 because ROE amplifies asset-level effects via leverage (ROE = ROA × Assets/Equity), but its significance is weaker, likely because ROE is also driven by leverage decisions unrelated to capitalisation, adding noise. Bank size enters at −10.79 (1% significant) – the largest accounting coefficient in absolute terms, again rejecting H5 – but loses significance in both subsamples, indicating the effect is partly driven by cross-regional variation rather than a pure within-region phenomenon. Unemployment enters negatively at −0.634 and inflation positively at 0.291, both significant. The positive inflation coefficient is consistent with Athanasoglou et al. (2008), who find that bank managers can partially anticipate inflation and adjust lending rates, accordingly, converting higher nominal revenues into improved equity returns before deposit costs fully adjust.

TABLE V. PANEL REGRESSION RESULTS – RETURN ON EQUITY (ROE)

	m_roe	m_roe_int	us_roe_int	ea_roe_int
	Full Baseline	Full Interactions	US Interactions	EA Interactions
Dependent Var.:	ROE	ROE	ROE	ROE
Capital_Ratio_lag	0.9685* (0.5201)	0.5404 (0.4509)	-0.1695 (0.5345)	0.7933* (0.4188)
NPL_Ratio_lag	-2.334*** (0.6663)	-1.983** (0.8023)	-6.793*** (1.612)	-1.219* (0.6528)
Deposit_Ratio_lag	0.1457* (0.0775)	-0.0247 (0.1054)	-0.1629 (0.2078)	-0.0352 (0.0877)
Loan_Ratio_lag	-0.0131 (0.0660)	0.0318 (0.0844)	-0.2814 (0.2019)	0.1471 (0.0997)
Size_log_lag	-10.79*** (2.942)	-8.651*** (3.167)	-5.351 (3.973)	-6.492 (3.954)
Policy_rate	-0.1797 (0.4707)	-0.3445 (0.4924)	-2.719** (1.296)	-0.2057 (0.7964)
Yield_curve	-0.8399 (0.8099)	-1.318* (0.7579)	-1.537 (1.193)	0.1936 (0.6482)
GDP_growth	-0.0624* (0.0332)	-0.0475 (0.0329)	-0.1119 (0.1464)	0.0111 (0.0377)
Unemployment_rate	-0.6341** (0.2483)	-0.7478*** (0.2209)	-0.7465* (0.3953)	-1.024*** (0.3570)
CPI_Inflation	0.2908** (0.1446)	0.3946*** (0.1367)	0.1324 (0.2776)	0.1190 (0.1584)
covid_dummy	-0.3593 (0.9816)	-0.7508 (0.9660)	-1.040 (2.086)	-1.339 (1.386)
Cap_X_Rate		0.2137*** (0.0764)	-0.0265 (0.1250)	0.3686** (0.1506)
NPL_X_Rate		0.1557 (0.3304)	-0.8193* (0.4765)	0.4954 (0.4410)
Dep_X_Rate		0.0103 (0.0114)	0.0391 (0.0308)	0.0238** (0.0104)
Loan_X_Rate		0.0194 (0.0146)	0.0061 (0.0336)	-0.0034 (0.0158)
Size_X_Rate		0.0887 (0.1150)	0.1309 (0.2972)	0.1911 (0.1594)
Fixed-Effects:				
bank_id	Yes	Yes	Yes	Yes
S.E.: Clustered	by: bank_id	by: bank_id	by: bank_id	by: bank_id
Observations	855	855	412	443
R2	0.55007	0.56860	0.53251	0.68989
Within R2	0.31197	0.34032	0.33389	0.52676

Signif. codes: 0 '***' 0.01 '**' 0.05 '*' 0.1 ' ' 1

The interaction specification confirms the capital amplification from ROA. Cap_X_Rate at 0.214 (1% significant) is the largest interaction coefficient across all accounting variables, confirming H6 and showing the capitalisation premium on equity returns rises substantially during tightening. The capital interaction is again entirely EA-driven. The EA Cap_X_Rate is 0.369 is significant at the 5% level while the US is statistically zero. In contrast, the US subsample produces the only statistically supported evidence of H7 across all specifications as NPL_X_Rate enters negatively at −0.819, marginally significant. Thus, confirming that rising rates amplify the NPL penalty on US bank equity returns as higher borrower debt service burdens accelerate provisioning requirements, compressing net income relative to the equity base, a dynamic entirely absent for EA banks. This effect appears in ROE but not ROA reflects the leverage channel as the provisioning drag is large enough to compress shareholder returns but insufficient to reach statistical significance at the asset level, where it is diluted across a larger base. The two subsamples therefore reveal a structural symmetry, capitalisation acts as a positive regime-dependent amplifier for EA banks, while asset quality acts as a negative amplifier for US banks. An additional EA finding emerges from Dep_X_Rate coefficient at 0.024, partially confirming H8, indicating more deposit-funded EA banks earned higher equity returns as rates rose via the endowment channel − a liability-side advantage that translated directly into higher equity returns.

The policy rate enters negatively and significantly for US banks at −2.719, suggesting the Fed tightening compressed US equity returns on average, likely reflecting the same balance sheet dynamics through which rising rates eventually erode profitability after the initial repricing benefit fades. Within R^2 improves from 0.312 in the baseline to 0.340 with interactions for the full sample, with EA again showing substantially stronger fit, further confirming H10.

4.1.3 Net Interest Margin

The NIM results in Table 3 offer the most direct evidence of monetary policy transmission through bank balance sheets, capturing how rate changes translate into the interest income spread underlying profitability. Unlike ROA and ROE, which reflect the net outcome of multiple offsetting channels, NIM isolates the pricing channel as the spread between what banks earn on assets and what they pay on liabilities. Thus, making it the natural lens through which to examine H3 and the theoretical mechanisms.

TABLE VI. PANEL REGRESSION RESULTS – NET INTEREST MARGIN (NIM)

	m_nim	m_nim_int	us_nim_int	ea_nim_int
	Full Baseline	Full Interactions	US Interactions	EA Interactions
Dependent Var.:	NIM	NIM	NIM	NIM
Capital_Ratio_lag	0.0206 (0.0447)	-0.0078 (0.0456)	-0.2589 (0.2051)	0.0538*** (0.0172)
NPL_Ratio_lag	-0.0956*** (0.0249)	-0.0658** (0.0294)	-0.1214 (0.1677)	-0.0442 (0.0306)
Deposit_Ratio_lag	0.0064 (0.0078)	-0.0043 (0.0097)	9.33e-5 (0.0197)	5.27e-5 (0.0054)
Loan_Ratio_lag	0.0083 (0.0152)	0.0129 (0.0129)	0.0007 (0.0324)	0.0014 (0.0096)
Size_log_lag	-0.4175 (0.4741)	-0.3036 (0.4187)	-0.2248 (0.5605)	-0.4851* (0.2605)
Policy_rate	0.1037*** (0.0220)	0.1077*** (0.0222)	0.1064** (0.0402)	0.0909*** (0.0310)
Yield_curve	0.0093 (0.0268)	-0.0106 (0.0268)	-0.0409 (0.0700)	-0.0039 (0.0234)
GDP_growth	-0.0015 (0.0013)	-0.0005 (0.0014)	-0.0067 (0.0132)	0.0024 (0.0018)
Unemployment_rate	0.0252 (0.0291)	0.0196 (0.0267)	-0.0407 (0.0449)	-0.0618* (0.0325)
CPI_Inflation	-0.0145 (0.0103)	-0.0112 (0.0109)	-0.0718* (0.0351)	-0.0062 (0.0062)
covid_dummy	0.1031 (0.0637)	0.0637 (0.0640)	0.1213 (0.2044)	0.0756 (0.0446)
Cap_X_Rate		0.0032 (0.0069)	0.0148 (0.0207)	0.0071 (0.0058)
NPL_X_Rate		0.0341** (0.0140)	0.0324 (0.0469)	0.0109 (0.0185)
Dep_X_Rate		0.0028 (0.0018)	0.0020 (0.0030)	0.0019** (0.0008)
Loan_X_Rate		-0.0011 (0.0020)	-0.0025 (0.0031)	-0.0009 (0.0012)
Size_X_Rate		-0.0007 (0.0138)	-0.0068 (0.0254)	-0.0306** (0.0126)
Fixed-Effects:				
bank_id	Yes	Yes	Yes	Yes
S.E.: Clustered	by: bank_id	by: bank_id	by: bank_id	by: bank_id
Observations	855	855	412	443
R2	0.83557	0.84158	0.61149	0.93500
Within R2	0.29897	0.32462	0.26932	0.73059

Signif. codes: 0 '***' 0.01 '**' 0.05 '*' 0.1 ' ' 1

The key baseline finding for H3 is the policy rate coefficient of 0.104 (1% significant) in the full sample, 0.106 in US and 0.091 in EA, both significant. This is the cleanest and most consistent monetary policy result across the analysis. A one percentage point rate rise is associated with a 0.104pp NIM widening, confirming H3. To put this in concrete terms, the US policy rate ranged from 0.06% at its lowest point in Q2 2020 to 5.33% at its peak in Q2 2024, a 5.27 percentage point swing. Applying the US subsample coefficient of 0.106, this implies an associated NIM widening of roughly 0.56pp across the period, about 19% of the US subsample mean NIM of 2.91%. This is directly consistent with the Samuelson (1945) asset repricing effect, whereby banks earn higher yields on floating-rate and maturing fixed-rate assets faster than their funding costs adjust upward. Borio et al. (2017) establish the theoretical foundation for this finding as their non-linear rate-profitability relationship operates primarily through the net interest income channel. Crucially, the effect is significant and comparable across US and EA, confirming H3 as a universal feature of bank intermediation, consistent with Claessens et al. (2018), who document this relationship across 47 countries.

The NPL ratio enters at −0.096 (1% significant) in the full sample, confirming H2. However, it loses significance in both US and EA interaction subsamples, suggesting the credit quality channel on NIM is better captured at the aggregate level once interactions are added. The negative relationship operates through two channels simultaneously. First directly, as NPLs generate no interest income while still consuming funding costs; and indirectly, as high-NPL banks hold larger low-yield liquidity buffers that compress the margin. Claessens et al. (2018) document this dual compression – asset quality deterioration reduces interest income faster than funding costs. Capital ratio is insignificant in the full sample and US subsample, entering positively at 0.054 only in the EA interaction, reflecting that better-capitalised EA banks hold more interest-earning equity-funded assets, widening NIM during tightening and partially confirming H1 for EA. This EA-specific finding is consistent with Altavilla et al. (2017).

The NIM interactions tell a nuanced story. NPL_X_Rate enters positively at 0.034 (5% significant) in the full sample, providing a sign reversal from the negative main effect that needs careful interpretation. The positive interaction does not mean higher-NPL banks benefit more from rate rises in overall profitability; it means their margin widens more as rates rise. The mechanism reflects risk-repricing as higher-NPL banks hold riskier, higher-yielding portfolios that reprice up more aggressively when rates rise, temporarily boosting gross interest income faster than for cleaner banks with lower contractual rates. Claessens et al. (2018) document this asymmetry in their decomposition as banks with shorter asset maturities and riskier portfolios show near-complete pass-through of rate changes to interest income, with coefficients approaching 0.94 in the low-rate environment, while cleaner banks show substantially lower pass-through. The tension between the negative main effect and positive interaction thus reflects two horizons: the static drag of carrying NPLs, and the dynamic short-run income benefit from holding higher-yielding assets during tightening. This does not confirm H7 conventionally, as the NIM channel creates a perverse short-run income advantage for higher-risk banks that does not translate into

ROA once provisioning is recognised. The interaction disappears in both subsamples, confirming it is not regionally robust.

The Dep_X_Rate enters positively at 0.002 for EA only, additional EA-specific evidence of the deposit endowment effect through the margin channel. As the ECB tightened, EA banks with larger deposit bases benefited from the widening spread between rising asset yields and sticky deposit rates, partially confirming H8 for EA via NIM and complementing the ROE deposit interaction finding. The Size_X_Rate is negative and significant for EA at −0.03, meaning larger EA banks see margins squeezed more as rates rise. This finding connects to the liability structure of large EA banks, which rely more on wholesale and market-based funding that reprices immediately when rates rise, in comparison to more deposit-funded institutions that benefit from sticky retail deposit pricing as in US case.

Within R^2 improves from 0.299 to 0.325 in the full sample and reaches 0.731 for EA subsample – by far the strongest within-bank fit across all dependent variables and specifications, reflecting that NIM is particularly well-suited to the Altavilla et al. (2017) panel design and is the primary channel through which ECB policy affects EA bank profitability.

4.2.1 Price-to-Book Ratio

The price-to-book ratio results in Table 4 shift the analysis from realised bank earnings to forward-looking market valuations, capturing how investors price bank franchise value, future earnings capacity, and risk across the monetary regime transition.

The results tell a distinctly different story from the accounting measures, as interaction terms are largely insignificant, suggesting markets do not systematically price the regime-dependent bank characteristic effects, while baseline bank and monetary variables drive the valuation narrative more cleanly.

Capital ratio enters positively at 0.028 in the baseline (5% significant) and strengthens to 0.030 for EA in the interaction, confirming H1 for market valuation. A 1pp increase in the Tier 1 ratio is associated with a 0.028 P/B rise, roughly 3% relative to the baseline mean, consistent with Calomiris and Nissim (2014) on the post-crisis repricing of default risk. The deposit ratio is the most robust bank-specific determinant of market valuation, entering positively across all specifications at 0.023 in the baseline, 0.024 for US banks, and 0.010 for EA banks, all significant, reflecting the franchise value of stable retail funding relationships. Loan ratio enters negatively at −0.020 in the baseline and −0.026 for US, losing significance for EA, as markets discount credit-risk concentration. Bank size is −0.547 in the baseline and −0.655 for US, but insignificant for EA. This partially rejects H5 which anticipated size neutrality. For US banks the regulatory burden of systemic importance actively depresses market valuations, suggesting investors price the compliance and resolution costs of large US institutions as a valuation discount rather than merely offsetting scale advantages. NPL is insignificant in the baseline and EA interaction, with the only significant effect being −0.377 for US in the interaction specification. Thus, matching the accounting results and implying that asset quality risk is primarily priced by US equity markets.

TABLE VII. PANEL REGRESSION RESULTS – PRICE-TO-BOOK RATIO (PB)

	m_pb	m_pb_int	us_pb_int	ea_pb_int
	Full Baseline	Full Interactions	US Interactions	EA Interactions
Dependent Var.:	PB	PB	PB	PB
Capital_Ratio_lag	0.0278** (0.0115)	0.0149 (0.0132)	-0.0034 (0.0321)	0.0295*** (0.0090)
NPL_Ratio_lag	-0.0207 (0.0181)	-0.0039 (0.0187)	-0.3765** (0.1797)	-0.0144 (0.0153)
Deposit_Ratio_lag	0.0229*** (0.0039)	0.0162*** (0.0043)	0.0242*** (0.0059)	0.0098* (0.0048)
Loan_Ratio_lag	-0.0196*** (0.0053)	-0.0155** (0.0058)	-0.0264** (0.0108)	-0.0054 (0.0039)
Size_log_lag	-0.5471*** (0.1427)	-0.4036*** (0.1408)	-0.6545*** (0.1674)	-0.1079 (0.1149)
Policy_rate	0.0122 (0.0110)	0.0088 (0.0127)	0.1678** (0.0781)	0.0091 (0.0167)
Yield_curve	0.0611** (0.0231)	0.0474** (0.0223)	0.2131*** (0.0405)	-0.0160 (0.0158)
GDP_growth	-0.0035*** (0.0013)	-0.0030** (0.0014)	-0.0081 (0.0057)	0.0019 (0.0012)
Unemployment_rate	-0.0329*** (0.0068)	-0.0403*** (0.0070)	-0.0107 (0.0202)	-0.0622*** (0.0131)
CPI_Inflation	-0.0230*** (0.0055)	-0.0209*** (0.0058)	-0.0319* (0.0174)	-0.0118*** (0.0038)
covid_dummy	-0.1965*** (0.0317)	-0.2049*** (0.0308)	-0.3260*** (0.0930)	-0.1280*** (0.0246)
Cap_X_Rate		0.0034 (0.0043)	-0.0037 (0.0092)	-0.0004 (0.0052)
NPL_X_Rate		0.0108* (0.0060)	0.0546 (0.0386)	-0.0047 (0.0051)
Dep_X_Rate		-9.87e-5 (0.0008)	-0.0014 (0.0022)	7.08e-5 (0.0006)
Loan_X_Rate		0.0002 (0.0018)	-0.0006 (0.0032)	0.0004 (0.0009)
Size_X_Rate		0.0018 (0.0140)	-0.0124 (0.0286)	0.0030 (0.0081)
Fixed-Effects:				
bank_id	Yes	Yes	Yes	Yes
S.E.: Clustered	by: bank_id	by: bank_id	by: bank_id	by: bank_id
Observations	840	840	412	428
R2	0.85866	0.86282	0.77971	0.89049
Within R2	0.40033	0.41795	0.46107	0.66342

Signif. codes: 0 '***' 0.01 '**' 0.05 '*' 0.1 ' ' 1

A clear cross-regional pattern emerges. US valuations respond significantly to nearly all balance sheet dimensions – deposit ratio, loan ratio, size, NPL ratio – suggesting US markets price the full spectrum of bank risk. EA valuations are driven primarily by the capital ratio. This divergence likely reflects the structural differences in regulatory emphasis between the two regions, where EA banks face stricter Basel III and ECB capital requirements, making capitalisation the dominant signal for EA investors to assess bank health, while US investors in a more market-based system price a broader set of characteristics simultaneously.

Turning to macroeconomic and monetary variables, inflation is negative and significant across all specs, as higher inflation erodes real earnings and raises credit uncertainty. GDP growth also enters negatively and significant in the baseline at −0.004, suggesting that during 2020–2024 markets did not price economic activity as a valuation positive, consistent with the atypical GDP dynamics in the accounting measures. The COVID dummy provides the clearest confirmation of H4 across the analysis, entering negatively at −0.197 in the baseline, −0.274 for US banks, and −0.132 for EA banks, all significant at the 1% level. Unlike ROA and NIM, where fiscal support insulated accounting profitability, markets priced forward-looking credit risk and earnings uncertainty immediately. The larger US coefficient likely reflects sharper initial uncertainty and higher starting valuations providing more room to fall, consistent with Demirgüç-Kunt et al. (2021) who document that bank equity valuations fell sharply at the onset of the COVID shock with magnitude varying significantly by bank characteristics, consistent with the cross-regional asymmetry observed here.

The cross-regional contrast in monetary policy transmission concerns market pricing of rate changes. For US banks, both the policy rate at 0.168 and yield curve slope at 0.213 are significant and positive in the interaction. A 1pp Fed Funds increase is associated with a 0.168 P/B rise – about 14% relative to the US mean of 1.191. Markets appear to anticipate that rising rates will widen future NIM and earnings before negative funding effects materialise, matching Bernanke and Kuttner (2005), where dividend revisions account for roughly 42% of equity price responses to policy surprises. For EA, neither monetary variable is significant, suggesting EA markets did not systematically price the tightening as a valuation positive, likely reflecting lingering concerns about legacy NPL and sovereign risk concerns that have kept EA P/B persistently below unity throughout the sample period.

Finally, all interaction terms are insignificant except NPL_X_Rate, which is marginal at 0.011 in the full interaction but disappears in both subsamples, confirming it is not regionally robust. The absence of significant interactions suggests equity markets do not differentially price the regime-dependent capitalisation or funding effects identified in the accounting regressions, pointing to a disconnect between how monetary regime transitions affect bank earnings and how markets price these dynamics forward. Within R^2 improves from 0.400 to 0.418, with EA substantially stronger at 0.663 than US at 0.461, consistent with the pattern across all dependent variables.

5. CONCLUSION

This thesis examines whether the regime transition between the 2020–2021 ZLB and the 2022–2024 tightening cycle altered the role of bank-specific characteristics in shaping profitability and market valuation across fifty of the largest US and EA banks. The results confirm several established relationships while revealing meaningful regime-dependent heterogeneity.

Across the accounting dimension, asset quality and capitalisation emerge as the two defining determinants of profitability - but with fundamentally different roles. The NPL ratio compresses earnings consistently and significantly across ROA and ROE regardless of the rate environment. In case of ROE even amplifying the negative effect of NPL ratio during tightening. Thus, credit quality is a baseline constraint that no rate cycle can offset. Capitalisation, by contrast, is not merely a stable positive determinant but a regime-dependent amplifier; its profitability premium expands significantly as rates rise, concentrated entirely in EA. This reflects EA banks' bank-based system, greater interest-income dependence, stricter Basel III/ECB capital requirements, and entry into the tightening cycle from negative rates that had severely compressed margins – conditions under which capitalisation determined which banks captured the repricing benefit. US banks, operating in a more market-based and institutionally diversified system starting from a less extreme point, showed no equivalent capital amplification. To conclude, asset quality is a story of constraint; capitalisation is a story of opportunity; the monetary regime determined which banks could seize it.

The NIM results reveal the mechanism behind the accounting story. Rising rates universally widened margins across both regions, confirming Samuelson asset repricing as a fundamental feature of bank intermediation. As the US rate rose from 0.06% to 5.33%, the model implies a NIM widening of about 0.56pp for the average US bank. For EA institutions with larger deposit bases, this dynamic was amplified even further generating additional margin expansion through the endowment channel. However, wider margins do not automatically translate into higher profitability. Banks carrying higher NPL ratios temporarily benefit through even faster asset repricing as their riskier portfolios adjust upward most aggressively during tightening, widening NIM, but this short-run margin gain is absorbed at the ROA and ROE level by the provisioning costs that the same risky portfolios demand. Therefore, the margin channel is real, universal, and quantifiable, but whether it reaches the bottom line depends on asset quality – thus connecting the monetary transmission mechanism back to the asset-quality and capitalisation and other bank-specific dynamics documented in the results.

The market valuation dimension completes the picture by revealing how investors priced these dynamics forward. The COVID dummy, largely invisible in accounting profitability due to fiscal support and moratoria, generated sharp valuation declines - confirming markets priced forward-looking credit risk that earnings had not yet reflected. Deposit and loan ratios are priced in opposite directions as stable funding attracts a consistent premium and loan intensity a consistent discount, holding in sign across both regions (the loan penalty loses significance in EA but never reverses direction). The cross-regional monetary contrast is equally striking as US markets rewarded rising rates and a steeper curve with higher P/B, anticipating future margin improvement, while EA markets showed no equivalent response – a forward-looking judgment consistent with EA banks carrying NPL ratios nearly six times higher than US peers. As a result, markets appear to have anticipated what the accounting results confirm, that for NPL-burdened institutions, the margin widening from rising rates is absorbed by provisioning costs rather than reaching the profitability line as for US banks. How markets price bank characteristics also diverges sharply a US equity markets price the full spectrum of balance sheet simultaneously, while EA markets assign valuation significance almost exclusively to the capital ratio, reflecting the dominance of regulatory capital signals in EA. Neither region shows significant and robust interaction effects in market valuations, pointing to a disconnect between how monetary regime transitions alter realised earnings and how markets price these dynamics forward - a finding that itself invites further inquiry.

The findings presented above advance understanding of how monetary regime transitions shape bank performance. However, three limitations warrant acknowledgment. The endogeneity of monetary policy is only partially addressed through contemporaneous macro controls, so results should be interpreted as conditional associations rather than causal estimates. The sample of fifty largest institutions limits generalisation to smaller banking entities whose balance sheet dynamics may differ. Also, 2020–2024 period is structurally unusual in ways that may not replicate in future monetary cycles. These constraints notwithstanding, the findings collectively suggest that monetary regime transitions do not merely shift the level of profitability but reshape the competitive landscape - rewarding banks whose balance sheets align with the new rate environment and penalising those whose legacy burdens prevent them from converting margin opportunities into earnings. Future research extending the framework to longer time series, incorporating dynamic panel estimators capturing earnings persistence, or disaggregating by bank business model would further illuminate how the bank-specific components studied in this thesis interact with monetary regimes - and whether their relative importance shifts as rate cycles evolve.

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APPENDICES

Appendix A. NIM Robustness Check on Random Effects Estimator

TABLE VIII-A. PANEL REGRESSION RESULTS. NIM, RANDOM EFFECTS

	re_nim	re_nim_int
Dependent Var.:	RE Baseline	RE Interactions
	NIM	NIM
Capital_Ratio_lag	0.0100 (0.0148)	-0.0186 (0.0174)
NPL_Ratio_lag	-0.1122*** (0.0165)	-0.0897*** (0.0177)
Deposit_Ratio_lag	0.0107** (0.0039)	0.0045 (0.0041)
Loan_Ratio_lag	0.0109* (0.0049)	0.0148** (0.0051)
Size_log_lag	-0.1764* (0.0753)	-0.1532 (0.0786)
Policy_rate	0.0976*** (0.0167)	0.0995*** (0.0169)
Yield_curve	0.0058 (0.0345)	-0.0150 (0.0348)
GDP_growth	-0.0018 (0.0034)	-0.0009 (0.0034)
Unemployment_rate	0.0233* (0.0114)	0.0165 (0.0119)
CPI_Inflation	-0.0166* (0.0071)	-0.0145* (0.0071)
covid_dummy	0.1314* (0.0581)	0.0966 (0.0578)
Cap_X_Rate		0.0032 (0.0041)
NPL_X_Rate		0.0301*** (0.0072)
Dep_X_Rate		0.0029*** (0.0007)
Loan_X_Rate		-0.0016 (0.0010)
Size_X_Rate		-0.0019 (0.0090)
R2	0.329	0.348
Observations	855	855
Estimator	Random Effects	Random Effects

Notes: Random Effects estimated using Amemiya variance component estimator. Significance: * p<0.05, ** p<0.01, *** p<0.001.

Table A1 reports Random Effect estimates for NIM as a robustness check against the FE baseline. Although the Hausman test for NIM produced a borderline result, FE is retained in the main analysis for consistency and theoretical reasons. The core findings remain stable under RE: the policy rate coefficient stays positive and highly significant at approximately 0.098 across both specifications, close to the FE estimate of 0.104. The NPL_X_Rate interaction also remains positive and significant at 0.030, confirming the sign reversal identified in the main results. Additionally, the deposit ratio interaction becomes positive and significant in the full sample RE interaction model, providing further support for the deposit endowment mechanism discussed in the main analysis.

Appendix B. Banks and their initial rankings used in empirical analysis.

TABLE IX-B. TOP 25 US AND EA BANKS BY ASSETS AS OF 31/12/2019

N	Bank	Country	Total Assets ($)	Cutoff period	Reason
1	JPMORGAN CHASE	US	2.76T		
2	BANK OF AMERICA	US	2.43T		
3	CITIGROUP INC	US	2.01T		
4	WELLS FARGO & CO	US	1.94T		
5	US BANCORP	US	487.67B		
6	PNC FINANCIAL SE	US	408.92B		
7	TRUIST FINANCIAL	US	236.75B		
8	FIFTH THIRD BANC	US	171.08B		
9	CITIZENS FINANCI	US	164.36B		
10	KEYCORP	US	146.69B		
11	REGIONS FINANCIA	US	128.15B		
12	M&T BANK CORP	US	125.50B		
13	FIRST REPUBLIC B	US	111.03B	Q2 2023	Failed
14	HUNTINGTON BANC	US	108.74B		
15	COMERICA INC	US	72.85B		
16	ZIONS BANCORP NA	US	70.36B		
17	SVB FINANCIAL GR	US	68.23B	Q1 2023	Failed
18	FLAGSTAR BANK NA	US	52.54B		
19	PEOPLE'S UNITED	US	52.07B	Q1 2022	Merged
20	CIT GROUP INC	US	51.40B	Q4 2021	Acquired
21	SIGNATURE BANK	US	49.41B	Q1 2023	Failed
22	SYNOVUS FINL	US	47.66B		
23	TCF FINANCIAL CO	US	45.69B	Q2 2021	Merged
24	FIRST HORIZON CO	US	43.72B		
25	EAST WEST BNCRP	US	43.27B		
1	BNP PARIBAS	FR	2.74T		
2	CREDIT AGRICOLE	FR	1.94T		
3	BANCO SANTANDER	ES	1.65T		
4	DEUTSCHE BANK-RG	DE	1.64T		
5	SOC GENERALE SA	FR	1.54T		
6	ING GROEP NV	NL	1.01T		
7	UNICREDIT SPA	IT	940.98B		
8	INTESA SANPAOLO	IT	925.36B		
9	BBVA	ES	773.04B		
10	NATIXIS	FR	586.91B	Q2 2021	Privatized*
11	COMMERZBANK	DE	559.70B		
12	CAIXABANK SA	ES	450.47B		
13	ABN AMRO BANK-CV	NL	436.29B		
14	KBC GROUP	BE	321.45B		
15	ERSTE GROUP BANK	AT	274.87B		
16	BANCO SABADELL	ES	242.93B		
17	BANKIA SA	ES	226.13B	Q1 2021	Merged
18	BANCO BPM SPA	IT	185.75B		
19	RAIFFEISEN BANK	AT	164.42B		
20	BANCA MONTE DEI	IT	145.96B		
21	UBI BANCA SPA	IT	142.20B	Q1 2021	Acquired
22	BANKINTER	ES	91.85B		
23	MEDIOBANCA	IT	89.40B		
24	BANCO COM PORT-R	PT	88.71B		
25	BPER BANCA SPA	IT	87.98B		

Notes: Banks without a cutoff period remained active throughout the sample until 2024 Q4. Privatized* reason only effects the P/B ratio reporting as entity is not anymore publicly listed.

Appendix C. Bloomberg Variable Codes

TABLE X-C. BLOOMBERG CODES AND DATA SOURCES

Variable / Series	Bloomberg Code
ROA	RETURN_ON_AVERAGE_ASSETS
ROE	RETURN_ON_AVERAGE_EQUITY
Net Interest Margin	NET_INT_MARGIN
Price-to-Book Ratio	PX_TO_BOOK_RATIO
Tier 1 Capital Ratio	TIER1_CAPITAL_RATIO
NPL Ratio	NON_PERFORMING_LOANS_RATIO
Deposit Ratio	CUSTOMER_DEPOSITS_TO_TOTAL_ASSETS
Loan Ratio	TOTAL_LOANS_TO_TOTAL_ASSETS
Total Assets	BS_TOT_ASSET
EA 3-Month Sovereign Yield Codes	
Germany 3M	GTDEM3MO Govt
Belgium 3M	GTBEL3MO Govt
Italy 3M	GTITL3MO Govt
Portugal 3M	GTPRT3MO Govt
Netherlands 3M	GTNTH3MO Govt
Austria 3M	GTAUS3MO Govt
Spain 3M	GTESP3MO Govt
France 3M	GTFRF3MO Govt
EA 10-Year Sovereign Yield Codes	
Germany 10Y	GDBR10 Index
Belgium 10Y	GBGB10YR Index
Italy 10Y	GBTPGR10 Index
Portugal 10Y	GSPT10YR Index
Netherlands 10Y	GNTH10YR Index
Austria 10Y	GAGB10YR Index
Spain 10Y	GSPG10YR Index
France 10Y	GTFRF10YR

Notes: Bloomberg codes correspond to the series used for quarterly panel construction. EA yield curve variables were constructed as the spread between 10-year and 3-month sovereign bond yields.

Appendix D. Monetary Policy Rates and Yield Curves movements

FIGURE 1-D. Monetary Policy Rate Paths: Fed vs ECB

(Quarterly averages in percentage points, 2020-24)

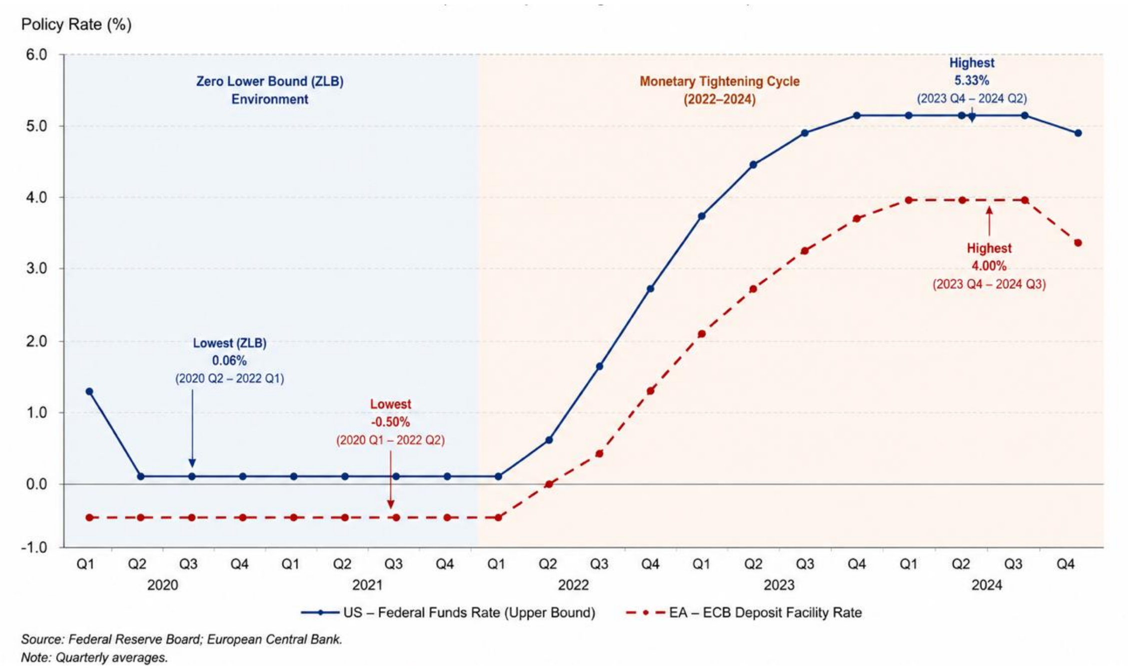
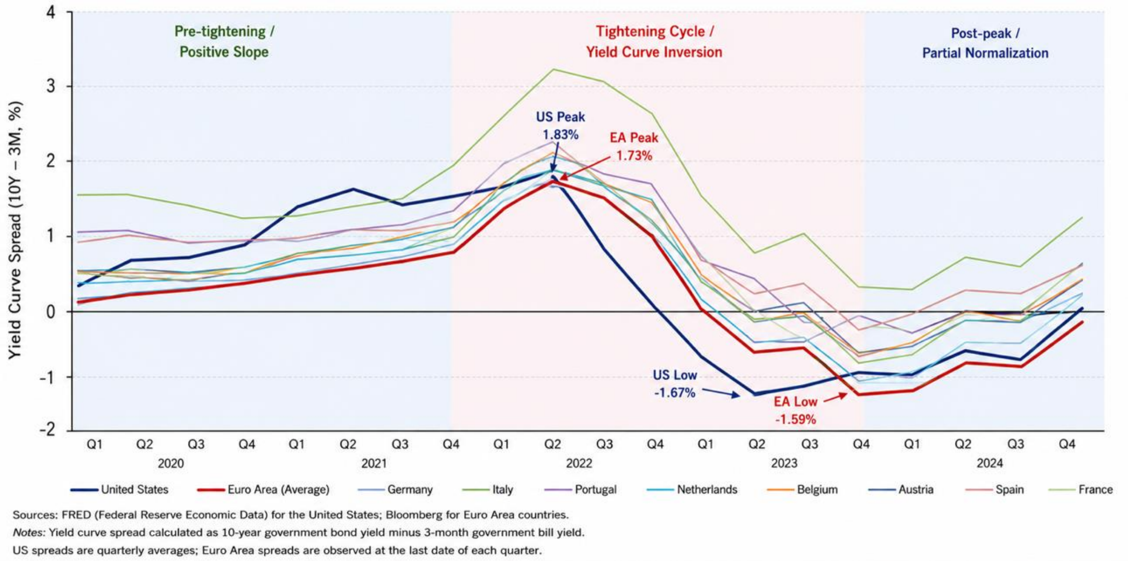


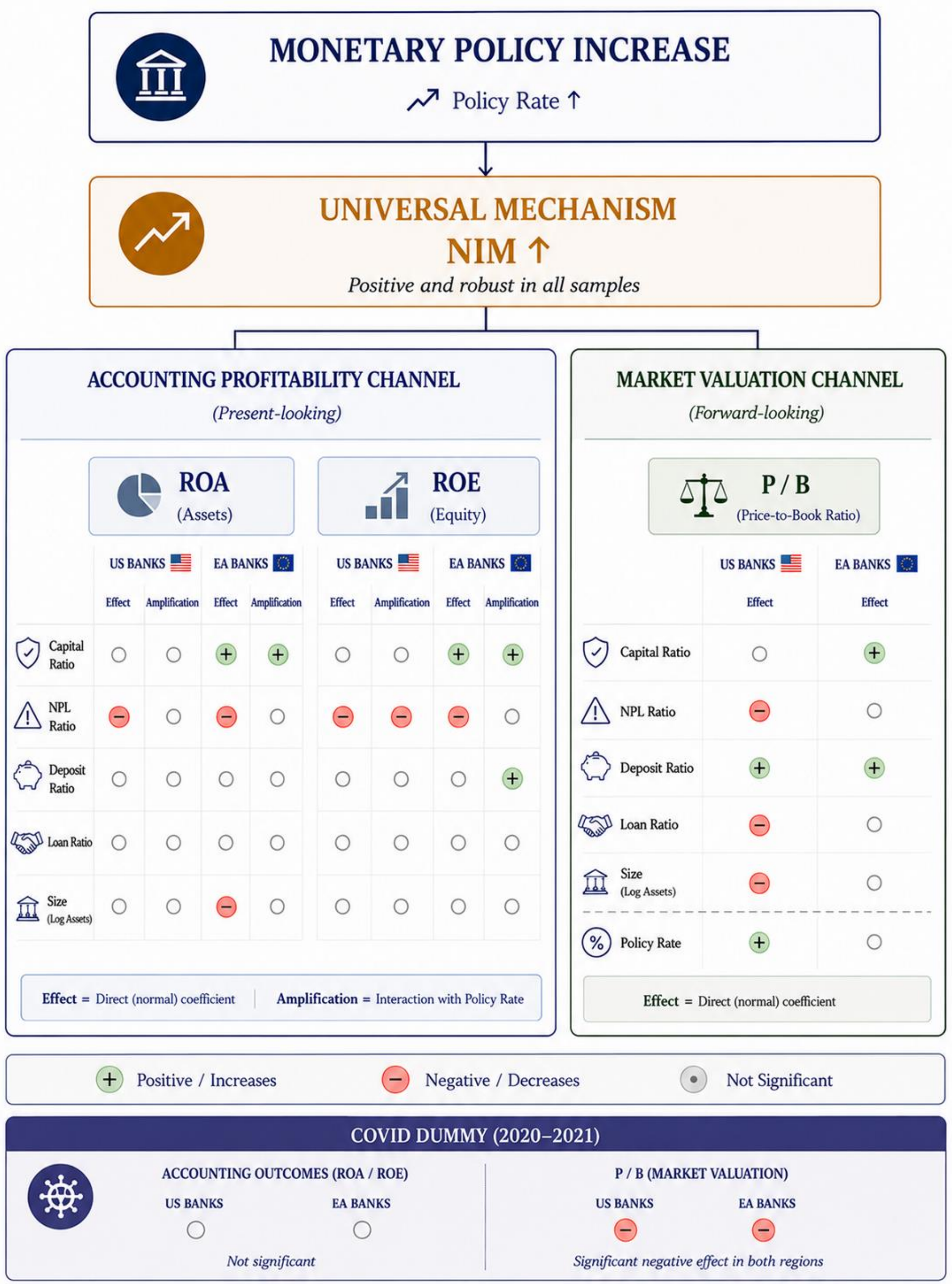
FIGURE 2-D. Sovereign Yield Curves Spreads (10Y-3M): US vs EA countries

(In percentage points)



Appendix E. Conceptual Synthesis of Empirical Findings

FIGURE 3-E. Conceptual framework of the empirical findings in subsamples



Appendix F. Artificial Intelligence Use Disclaimer

Artificial Intelligence (AI) tools were used during the preparation of this dissertation in a supplementary capacity. Specifically, OpenAI's ChatGPT (GPT-5.5) and Anthropic's Claude (Claude Sonnet 4.6 and subsequent versions) were used to assist with language editing, proofreading, data extraction, table formatting, figure development, reference formatting checks aligned with APA 7 citation style, and the refinement of written explanations and visual presentations to improve academic style and clarity.

AI tools were also used to assist in the generation of Excel-based code, formulas, and technical scripts for retrieving bank balance sheet data directly from Bloomberg Terminals at ISEG. In addition, AI-assisted coding support from Claude Sonnet 4.6 was used to advise on and refine code scripts in R, the primary statistical software used in the analysis, for data processing, panel regression runs, diagnostic testing, and robustness checks. These tools served solely as technical support for data collection and statistical implementation.

AI assistance was limited to supportive tasks. No AI tool was used to independently generate the research questions, academic arguments, literature review, empirical analysis, interpretation of results, or conclusions of this dissertation. All research design decisions, literature selection, data collection, variable construction, econometric modelling, statistical analysis, interpretation of findings, and final conclusions were conducted, reviewed, and validated by the author.

The author reviewed all AI-assisted outputs and assumes full responsibility for the accuracy and academic integrity of the work presented in this dissertation.