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Banking Productivity and the European Productivity Gap:

A Comparative Analysis of U.S. and European Banks (2010–2024)

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Abstract

This thesis examines the profitability and productivity gap between U.S. and European banks over the period 2010–2024. While the European productivity slowdown has been extensively documented at the macroeconomic level, less attention has been devoted to whether persistent differences in banking sector performance may form part of this broader divergence.

The study analyses a sample of eighteen large publicly listed banks from both regions using financial data obtained through WRDS (Compustat North America and Compustat Global). Key performance indicators include return on equity (ROE), return on assets (ROA), and the revenue-to-assets ratio as a proxy for banking productivity. The empirical framework combines descriptive analysis with panel regressions that control for bank size, capitalisation, and operational efficiency.

The results show a persistent and statistically significant performance gap. On average, U.S. banks exhibit ROA of 0.94% compared to 0.33% for European banks, and ROE of 10.9% versus 5.5%. These differences remain robust after controlling for observable bank characteristics, with the U.S. dummy positive and significant across all specifications ($p<0.01$). The findings suggest that the gap reflects structural and institutional differences between the two financial systems rather than bank-level characteristics alone.

A partial convergence in ROE is observed from 2022 onwards, coinciding with the normalisation of monetary policy after the prolonged low-rate environment. This pattern is consistent with the view that macroeconomic conditions interact with structural constraints in shaping cross-regional differences in bank performance.

Keywords:

Bank profitability, banking productivity, European productivity gap, financial integration, panel data analysis, ROA, ROE.

Contents

1 Introduction

1.1 Research Motivation

Over the past two decades, economists and policymakers have paid increasing attention to the persistent productivity gap between Europe and the United States. While both regions registered strong productivity gains during the late 1990s and early 2000s, their trajectories began to diverge following the Global Financial Crisis of 2008. Since then, productivity growth in the United States has remained comparatively resilient, while many European economies have experienced a prolonged period of stagnation or only modest recovery. This divergence has emerged as one of the most pressing structural challenges facing the European economy, given that productivity growth is a fundamental driver of long-term economic prosperity, real wage increases, and international competitiveness.

Various explanations have been advanced to account for Europe's weaker productivity performance. These include differences in the pace of technological adoption and digitalization, the structure of labor markets, the ability of high-growth firms to scale, and the broader institutional environment. However, one dimension that has received comparatively less attention in the academic literature is the role of the banking sector. Financial institutions occupy a central position in modern market economies: they allocate capital, facilitate investment, and determine the extent to which productive firms can access the financing they need to grow. If banks operate with structural inefficiencies, or if the financial system as a whole fails to allocate capital effectively, the consequences for economic productivity can be significant.

The performance of European banks since the Global Financial Crisis provides a compelling case study for this type of analysis. European banks have consistently underperformed their U.S. counterparts in terms of profitability, operational efficiency, and revenue generation relative to assets. This divergence is not simply a cyclical phenomenon tied to the post-crisis recovery period; it has persisted through multiple economic cycles and reflects deeper structural differences between the two financial systems. Large U.S. banks have generally achieved higher returns on equity, stronger revenue generation, and more stable profitability levels, while many European institutions have struggled to maintain adequate financial performance in a challenging environment characterized by low interest rates, regulatory pressures, and structural fragmentation.

The potential explanations for this divergence are multiple and interrelated. The European financial system is characterized by a higher degree of fragmentation: banks continue to operate within distinct national regulatory and legal frameworks, cross-border consolidation remains limited, and capital markets are smaller relative to GDP than in the United States. This contrasts sharply with the U.S. financial system, where banks operate across a highly integrated domestic market, benefit from deeper and more liquid capital markets, and are able to exploit economies of scale across a unified customer base. In addition, the ECB's prolonged period of low or negative interest rates, while necessary to support economic recovery, placed additional pressure on European bank profitability by compressing net interest margins. These structural and macroeconomic differences may help explain why European banks have consistently lagged behind their U.S. counterparts in terms of key performance indicators.

Understanding whether differences in banking sector performance are part of the European productivity story is therefore a relevant and timely research question. This thesis approaches the topic from a comparative, empirical perspective, examining a sample of large publicly listed banks from both regions over the period 2010–2024.

1.2 Research Question and Contribution

This thesis addresses the following research question:

What explains the persistent profitability and productivity gap between U.S. and European banks over the period 2010–2024, and to what extent does this gap reflect structural and institutional differences between the two financial systems?

To address this question, the study draws on empirical banking literature as well as recent policy debates on European competitiveness. The analysis focuses on three performance indicators: ROA, ROE, and the revenue-to-assets ratio, and examines whether regional differences persist after controlling for bank size, capitalization, and operational efficiency. The main contribution of the thesis lies in connecting bank-level evidence with the broader structural debate on the European productivity gap, offering a granular perspective on how financial sector performance may relate to wider economic dynamics.

It is important to note from the outset that the thesis does not seek to argue that U.S. banks are "better managed" or inherently superior. Rather, the aim is to document a persistent performance

difference and explore the structural and institutional factors that may help explain it. The analysis therefore situates individual bank performance within the broader context of financial system design, regulatory environment, and macroeconomic conditions.

1.3 Structure of the thesis

The remainder of this thesis is structured as follows. Section 2 reviews the relevant literature on the European productivity gap, bank profitability, and financial system efficiency, and develops the main empirical hypotheses. Section 3 describes the dataset, the sample selection criteria, and the empirical methodology. Section 4 presents the main results, including descriptive statistics and regression estimates. Section 5 discusses the findings considering the literature and considers limitations and policy implications. Section 6 concludes.

2 Literature Review

2.1 The European Productivity Gap

The persistent productivity divergence between Europe and the United States is one of the most extensively studied topics in international macroeconomics. Following the productivity convergence observed during much of the postwar period, European economies began to fall behind the United States in terms of total factor productivity growth from the mid-1990s onwards. This reversal was particularly pronounced in the technology-intensive sectors of the economy and has been attributed to a range of structural and institutional factors.

A significant strand of the literature emphasizes the role of the digital economy. Gordon (2016) and Brynjolfsson and McAfee (2014) argue that the United States derived larger productivity gains from the ICT revolution of the 1990s, partly because American firms were better positioned to adopt and scale new technologies. European firms, by contrast, faced structural barriers to adoption including more rigid labor markets, lower levels of managerial capital, and weaker competition in product markets. These differences in technological diffusion have been identified as a key driver of the productivity gap.

More recent institutional analyses have broadened the scope of the debate. The European Commission's report on European competitiveness (Draghi, 2024) offers a comprehensive diagnosis of structural weaknesses, arguing that Europe suffers from fragmented markets, insufficient investment in research and development, and an inability to scale innovative firms to global size. Crucially, the report identifies financial fragmentation as a central structural weakness, emphasizing that European capital markets remain underdeveloped relative to their U.S. counterparts and that the Banking Union remains incomplete. These financial system characteristics may limit the ability of European firms to access patient capital and scale efficiently.

The role of finance in shaping productivity outcomes is well documented in the theoretical and empirical literature. Beck, Levine, and Loayza (2000) show that financial development is positively associated with economic growth and that the efficiency of financial intermediation matters for resource allocation across sectors. In a similar vein, Levine (2005) reviews the evidence and concludes that financial systems that allocate capital more efficiently tend to support stronger long-run productivity growth. From this perspective, differences in banking sector performance

between the United States and Europe may have broader implications for productivity dynamics that extend beyond the financial sector itself.

International organizations including the OECD (2022) and the IMF (2023) have also highlighted capital allocation, business dynamism, and structural efficiency as key determinants of cross-country productivity differences. The IMF's Global Financial Stability Report underscores the importance of a well-functioning banking system for maintaining investment and supporting economic recovery, particularly in the context of post-pandemic adjustment. The banking sector thus emerges as a relevant lens through which to study the European productivity gap. If European banks are structurally less efficient and less profitable than their U.S. counterparts, this may constrain their ability to finance investment, support the expansion of productive firms, and contribute to capital reallocation across the economy. The following section reviews the literature on bank profitability and financial system efficiency, which provides the direct theoretical grounding for the empirical analysis.

2.2 Bank Profitability and Financial System Efficiency

The literature on bank profitability identifies a range of factors that influence the ability of financial institutions to generate returns on their assets and equity. These factors can be broadly grouped into three categories: bank-specific characteristics, industry-level structure, and macroeconomic conditions.

At the bank level, capitalization is consistently found to be positively associated with profitability. Demirgüç-Kunt and Huizinga (1999) show, in one of the most widely cited cross-country studies, that well-capitalized banks tend to be more profitable, partly because they face lower funding costs and benefit from greater financial flexibility. Athanasoglou, Brissimis, and Delis (2008) confirm these findings using a panel of Greek banks and find that bank-specific factors including efficiency and capitalization are significant determinants of profitability, even after controlling for macroeconomic conditions. The equity ratio, as a measure of capitalization, is therefore an important control variable in any empirical analysis of bank profitability.

Bank size is another frequently studied determinant of performance. Larger banks may benefit from economies of scale, allowing them to spread fixed costs across a broader asset base, and from greater market power, which may translate into higher margins. However, the empirical evidence

on the size-profitability relationship is mixed. While some studies find that larger banks are more profitable, others identify diminishing returns or even a negative relationship at very high levels of size, reflecting organizational complexity and systemic risk concerns (Beck and Demirgüç-Kunt, 2009). This suggests that size is a necessary but not sufficient condition for superior performance.

Industry-level structure also plays a role. The degree of market concentration, typically measured through the Herfindahl-Hirschman Index (HHI), may affect profitability through its impact on pricing power and competitive dynamics. More concentrated markets may allow banks to charge higher fees and interest margins, potentially boosting profitability, although the relationship is nuanced and context-dependent. In the European context, fragmentation across national markets may reduce effective concentration at the system level while simultaneously limiting the ability of banks to achieve scale and compete across borders.

The macroeconomic environment is perhaps the most widely discussed structural factor in recent years. The prolonged period of very low or negative interest rates that characterized the euro area between 2014 and 2022 put sustained downward pressure on net interest margins, which represent the core revenue source for many European banks. The ECB (2022) documents that this environment significantly constrained the profitability of European banks, particularly those more dependent on traditional lending activities. By contrast, U.S. banks benefited from a somewhat shorter and less severe low-rate period, as well as from greater revenue diversification through capital markets and fee-based activities.

A central structural difference between the two financial systems concerns the degree of integration and the role of capital markets. The United States operates as a single, highly integrated financial market, with banks able to operate freely across state lines, access a deep and liquid domestic capital market, and serve a large and homogeneous customer base. This integration facilitates scale, risk diversification, and revenue diversification. In contrast, the European financial system remains fragmented along national lines despite significant progress toward integration through the Single Market and the Banking Union. Barriers to cross-border banking activity persist in the form of differences in national legal systems, taxation frameworks, and regulatory approaches, limiting the ability of European banks to achieve the same degree of operational efficiency as their U.S. counterparts.

The Draghi Report (European Commission, 2024) explicitly identifies this fragmentation as one of Europe's most significant structural weaknesses, arguing that the incomplete Capital Markets Union and the limited progress of the Banking Union constrain capital allocation and reduce the competitiveness of European financial institutions. This institutional diagnosis provides important context for interpreting the empirical results of the present study.

2.3 Measuring Bank Performance

The empirical banking literature uses a range of indicators to measure bank performance. The most widely used are return on equity (ROE) and return on assets (ROA), each capturing a different dimension of profitability.

ROE measures the return generated for shareholders relative to the book value of equity. It is a natural metric for evaluating the efficiency with which a bank deploys shareholder capital. However, ROE is sensitive to leverage: a bank can inflate its ROE by increasing financial leverage without necessarily improving its operational efficiency. For this reason, ROE comparisons across banks with different capital structures need to be interpreted with caution.

ROA captures the ability of a bank to generate profits relative to its total asset base. Because it abstracts from leverage, ROA is generally considered a more stable and comparable measure of operational performance. In banking, where high leverage is the norm, ROA provides a more reliable signal of how efficiently a bank transforms its assets into profits. The banking literature, including Athanasoglou et al. (2008) and the ECB's annual banking supervision reports, typically relies on ROA as the primary profitability measure in cross-institutional comparisons.

In addition to these profitability indicators, the revenue-to-assets ratio is used in this study as a proxy for banking productivity. This measure captures the amount of income generated per unit of assets and is particularly useful for comparing banks with different profitability profiles but similar asset bases. A bank with a higher revenue-to-assets ratio is more effective at transforming its balance sheet into income-generating activity, which can be interpreted as a form of operational productivity.

Finally, assets per employee is used as an indicator of operational efficiency. This measure captures the average volume of assets managed per member of staff and provides an indirect proxy for the degree to which banks have automated or streamlined their operations. Higher values may

reflect greater investment in technology, more efficient organizational structures, or a different mix of business activities.

2.4 Hypothesis Development

Drawing on the literature reviewed above, this section formulates the hypotheses that guide the empirical analysis. Four main hypotheses are proposed.

The first hypothesis follows from the descriptive evidence and prior studies documenting a persistent performance gap between U.S. and European banks:

H1: U.S. banks exhibit higher profitability and productivity than European banks across the full sample period.

The second hypothesis concerns the role of bank size, motivated by the economies of scale literature:

H2: Bank size, measured by the logarithm of total assets, is positively associated with profitability and productivity.

The third hypothesis relates to the role of capitalisation in supporting profitability:

H3: Higher capitalisation, measured through the equity ratio, is positively associated with bank profitability.

The fourth hypothesis addresses the structural and institutional dimension of the performance gap:

H4: A significant regional performance gap persists even after controlling for observable bank-level characteristics, consistent with the role of structural and institutional factors.

If H4 is supported, the coefficient on the U.S. dummy can be interpreted as capturing a broad set of unobservable structural differences between the two financial systems, including financial integration, regulatory environment, depth of capital markets, and business model diversity. These hypotheses are tested in Section 4 using the empirical framework described below.

Table 1. Structural Differences Between the U.S. and European Banking Systems

Dimension	United States	Europe
Financial system structure	Market-based	Bank-based
Market integration	Highly integrated (single domestic market)	Fragmented across national jurisdictions
Capital markets	Deep and liquid (NYSE, NASDAQ)	Smaller relative to GDP; varies by country
Regulatory framework	Single federal regulator (Fed/OCC)	Multi-layered: national + EU-level supervisors
Bank profitability (post-GFC)	Higher and more stable	Lower and more volatile
Interest rate environment	Faster policy normalisation	Prolonged negative/near-zero rates (ECB)
Cross-border consolidation	Common across states	Constrained by national barriers

Note: This table summarises stylized structural differences commonly highlighted in the literature on comparative financial systems. Sources: ECB (2022), Draghi (2024), BIS (2023), IMF (2023).

3 Data and Methodology

3.1 Data Sources and Sample Selection

This study uses financial data for large publicly listed banks in the United States and Europe over the period 2010–2024. Data are obtained from the Compustat database through WRDS (Wharton Research Data Services), which provides standardized annual financial statements for publicly listed firms and allows for consistent cross-country comparisons. U.S. bank data are extracted from Compustat North America, while European bank data are drawn from Compustat Global. All financial ratios are computed from the raw financial data to ensure consistency of construction across regions.

The sample covers large banks that play a significant role in financial intermediation in their respective regions. The selection is based on size and systemic relevance, focusing on institutions that are broadly representative of each country's financial system. The analysis is not restricted to European Union member states; the European sample includes banks headquartered in the United Kingdom and Switzerland alongside euro area institutions. This broader definition of "Europe" reflects the financial rather than strictly political geography of the region and is consistent with the practice of institutional reports that compare European and U.S. banking sectors.

The final sample consists of eighteen banks, nine from the United States and nine from Europe, observed annually over 2010–2024, yielding a balanced panel of 270 bank-year observations. A small number of institutions were excluded due to missing data or inconsistent reporting. Citigroup, for example, could not be retrieved consistently from the database, and ING was excluded to maintain compositional symmetry across regions. The resulting sample captures the core of both financial systems and includes institutions that account for a substantial share of total banking assets in their respective markets.

Table 2. Sample of Banks Included in the Analysis

U.S. Banks	HQ State	European Banks	Country
JPMorgan Chase	NY	BNP Paribas	France
Bank of America	NC	HSBC	UK
Wells Fargo	CA	Barclays	UK
Goldman Sachs	NY	Santander	Spain
Morgan Stanley	NY	Deutsche Bank	Germany
U.S. Bancorp	MN	BBVA	Spain
PNC Financial Services	PA	UniCredit	Italy
Truist Financial	NC	UBS	Switzerland
Charles Schwab	TX	Intesa Sanpaolo	Italy

Note: The European sample includes banks from both euro area and non-euro area countries (United Kingdom, Switzerland). The U.S. sample includes both money-centre banks and large regional institutions.

It is worth noting that European banks in the sample are on average larger than U.S. banks in terms of total assets, reflecting the composition of the sample rather than a systematic feature of both systems. This is because the European sample is more heavily concentrated in large globally systemic institutions, while the U.S. sample includes a broader mix of money-centre and regional banks. This asymmetry is addressed in the regression analysis through the inclusion of log(Assets) as a control variable.

Annual data are used throughout, which ensures comparability across regions with different reporting frequencies. More fundamentally, the use of annual observations is appropriate given the objective of the study: to document medium-term structural differences in bank performance rather than short-term or high-frequency fluctuations.

3.2 Variable Definition

The dependent variables in the analysis are three widely used measures of bank performance:

Return on Assets (ROA) is defined as net income divided by total assets. It measures how efficiently a bank generates profits from its asset base, abstracting from differences in financial leverage. Given the high and variable leverage ratios typical of banking institutions, ROA is

considered the most comparable cross-sectional profitability measure and serves as the primary dependent variable in the regression analysis.

Return on Equity (ROE) is defined as net income divided by total book equity. It captures the return generated for shareholders and reflects both operational performance and financial leverage. ROE is a natural metric from the perspective of investors, but its sensitivity to capital structure means that it needs to be interpreted alongside ROA to obtain a full picture of profitability.

The Revenue-to-Assets Ratio is defined as total revenues divided by total assets and is used as a proxy for banking productivity. This measure captures the intensity with which a bank's balance sheet is deployed to generate income, regardless of costs. A higher revenue-to-assets ratio indicates that the bank is more effective at converting its asset base into revenue-generating activity, which can be interpreted as a form of operational productivity consistent with the conceptual framework outlined in Section 2.

The independent variables are defined as follows. The U.S. dummy (US_i) takes the value of one for U.S. banks and zero for European banks in all years. This variable is the primary variable of interest and captures the average regional performance difference after controlling for other bank characteristics. $\text{Log}(\text{Assets}_{it})$ is the natural logarithm of total assets in millions of USD, computed using end-of-year values. The logarithmic transformation reduces the skewness of the asset distribution and allows the coefficient to be interpreted as reflecting proportional differences in size. The Equity Ratio is defined as total book equity divided by total assets and captures the degree of capitalisation. Higher values indicate a more conservatively financed institution. Assets per Employee is computed as total assets divided by the number of employees and is expressed in millions of USD. This variable serves as a proxy for operational efficiency and reflects the degree to which a bank's workforce manages a large volume of assets, potentially reflecting automation, technological investment, or scale advantages.

3.3 Empirical Strategy

The empirical analysis proceeds in two steps. The first step consists of a descriptive comparison of key performance indicators across regions, including tabular summaries of means and standard deviations, time-series comparisons of ROE and assets per employee, and a scatter analysis of the

relationship between efficiency and profitability. This exploratory analysis provides the empirical motivation for the regression framework.

The second step estimates a set of pooled OLS panel regressions in which bank performance is modelled as a function of both regional and bank-specific characteristics. The baseline specification is:

$$ROA_{it} = \beta_0(1) + \beta_1 US_i + \beta_2 \log(Assets_{it}) + \beta_3 EquityRatio_{it} + \beta_4 AssetsPerEmployee_{it} + \varepsilon_{it}$$

where ROA_{it} represents the dependent variable for bank i in year t. This specification is then replicated using ROE and the revenue-to-assets ratio as alternative dependent variables. All variables are measured at the bank-year level. Robust standard errors are used in all specifications to account for potential heteroskedasticity in the error term. Given the relatively small number of banks in the sample (18), cluster-robust standard errors are not applied, as they may substantially reduce statistical power. The analysis therefore follows a parsimonious approach commonly used in the empirical banking literature for samples of this size.

The U.S. dummy captures the average difference in performance between U.S. and European banks after conditioning on the control variables. If the coefficient on US_i remains positive and statistically significant, this indicates that the performance gap cannot be fully explained by observable bank characteristics, which would be consistent with H4 and with the view that structural and institutional differences play a role. The results are interpreted as evidence of statistical association rather than strict causality, in keeping with the observational nature of the data.

4 Empirical Results

4.1 Descriptive Statistics

Table 3 presents descriptive statistics for the main variables, reported separately for U.S. and European banks. The results provide strong initial support for H1: U.S. banks exhibit substantially higher average profitability and productivity across all three performance measures.

Table 3. Descriptive Statistics by Region (2010–2024)

Variable	Mean US	Mean EU	Diff.	SD US	SD EU	Obs.
ROA	0.0094	0.0033	0.0062***	0.0035	0.0044	269
ROE	0.1090	0.0551	0.0539***	0.0427	0.0754	269
Revenue/Assets	0.0500	0.0365	0.0135***	0.0104	0.0127	269
Log(Assets)	6.705	7.153	−0.448***	0.925	0.459	269
Equity Ratio	0.0890	0.0575	0.0314***	0.0166	0.0122	269
Assets/Employee ()	11.88	10.93	0.95	6.83	4.09	269

*Note: Means computed over the full sample period 2010–2024. *** denotes that the difference in means is statistically significant at the 1% level based on a two-sample t-test. Assets/Employee is expressed in millions of USD equivalent and has 269 observations.*

The differences are economically large as well as statistically significant. U.S. banks achieve an average ROA of *0.94%, compared to 0.33%* for European banks, a gap of 62 basis points. The ROE gap is even more pronounced: 10.9% for U.S. banks versus 5.5% for European banks, a difference of approximately 5.4 percentage points. The revenue-to-assets ratio tells a similar story: U.S. banks generate approximately 5.0 cents of revenue per dollar of assets, compared to 3.6 cents for European banks.

Notably, European banks are on average larger than U.S. banks in the sample, a difference confirmed by the log(Assets) variable in Table 3 (7.15 versus 6.71, expressed in logarithm of billions USD), which implies that the observed performance gap cannot be attributed to European banks being systematically smaller. This finding is already suggestive that size alone does not account for the profitability difference, and motivates the regression analysis in Section 4.4.

U.S. banks also exhibit higher equity ratios on average (8.9% versus 5.75%), reflecting higher capitalisation levels. Additionally, the assets-per-employee ratio is markedly higher for U.S. banks (USD 11.88 million per employee versus USD 10.93 million), pointing to greater operational efficiency or a more capital-intensive business model.

4.2 ROE and ROA Comparison

Figure 1 illustrates the evolution of average ROE for both groups over the sample period. The time-series comparison reveals a number of interesting patterns.

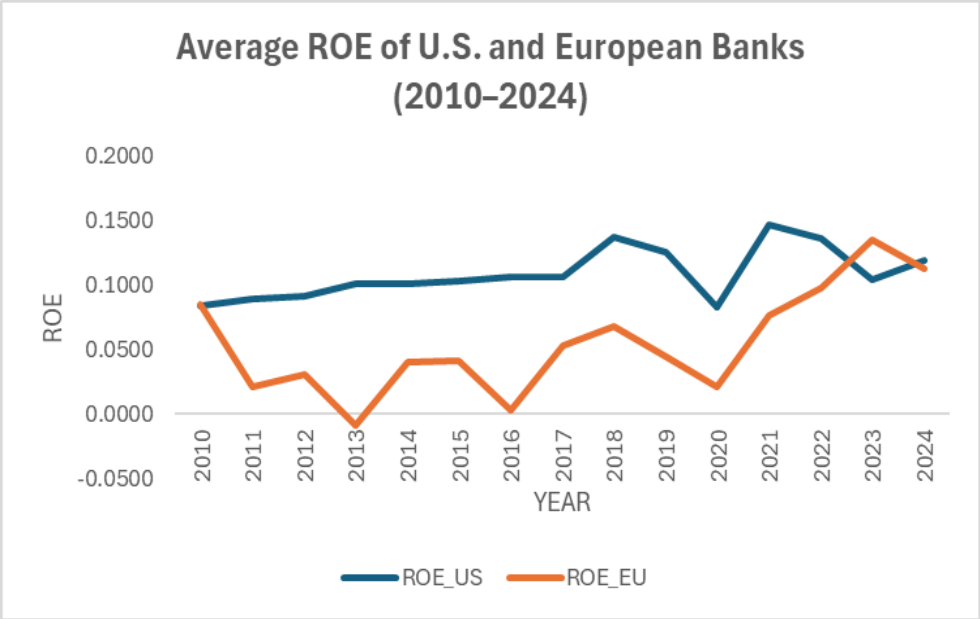

Figure 1: Average ROE — U.S. vs. European Banks (2010–2024)

First, U.S. banks maintain consistently higher ROE throughout most of the period. While there is some variability in both series, the gap is particularly pronounced between 2014 and 2021. During this period, U.S. banks benefited from a relatively supportive operating environment, including faster balance sheet restructuring following the financial crisis and a more dynamic capital markets environment. European banks, by contrast, were weighed down by legacy non-performing loans, a prolonged period of near-zero or negative interest rates imposed by the ECB, and the impact of the European sovereign debt crisis, which affected several countries in the sample.

Second, the period from 2022 onwards shows a marked convergence in ROE between the two groups. This narrowing coincides with the rapid normalisation of monetary policy globally,

including the ECB's decisive shift toward interest rate increases after years of accommodative policy. The increase in rates disproportionately benefited European banks that had been operating in a compressed net interest margin environment, and whose interest-sensitive income recovered strongly as rates rose. This pattern is consistent with the view that part of the performance gap observed during the low-rate period was cyclical in nature and related to the structure of monetary policy transmission in Europe.

However, even as ROE converges, U.S. banks maintain a modest advantage on average over the full sample period, and the regression analysis presented below suggests that structural factors continue to play a role beyond the interest rate environment.

4.3 Productivity and Operational Efficiency

Figure 2 displays the evolution of assets per employee over the sample period. U.S. banks consistently operate at higher levels of assets per employee throughout the period, and the gap between the two groups tends to widen over time rather than converge. This pattern suggests that U.S. banks have made greater progress in scaling their operations relative to their workforce, possibly through greater investment in technology, automation, and digital infrastructure.

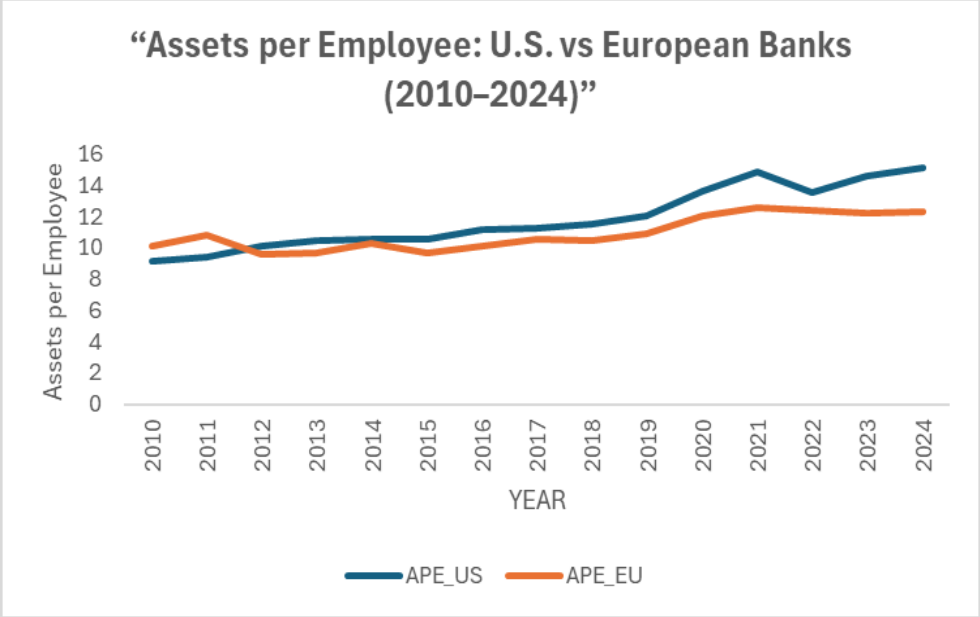

Figure 2: Assets per Employee — U.S. vs. European Banks (2010–2024), USD millions

The ECB (2024) documents that European banks have lagged behind in terms of digital investment and process automation, which may contribute to the persistent efficiency gap observed

in this metric. However, it is important to note that differences in assets per employee may also reflect differences in business model composition. U.S. banks with large capital markets and asset management operations may naturally manage more assets per employee than European banks with more traditional retail and corporate banking portfolios.

Figure 3 presents a scatter plot of assets per employee against ROA for individual bank-year observations. The plot reveals that while U.S. banks tend to cluster at higher values of both assets per employee and ROA, the relationship between the two variables is not strongly linear. Several European banks with moderate efficiency levels achieve ROA values comparable to lower-performing U.S. banks, and there is considerable dispersion within both groups. This suggests that operational efficiency, while correlated with performance, is not the primary driver of the cross-regional gap in profitability.

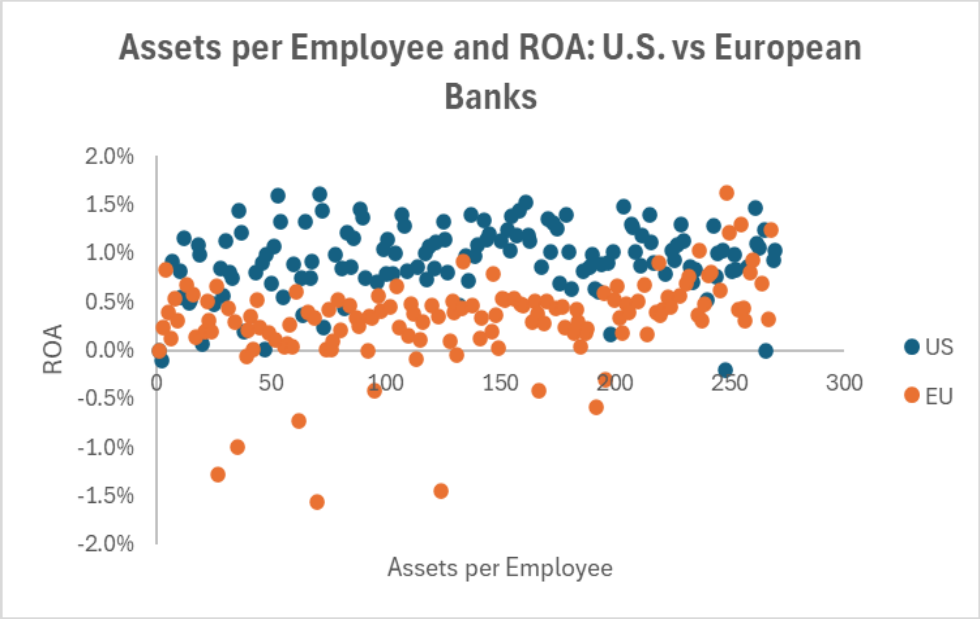

Figure 3: Assets per Employee vs. ROA — U.S. and European Banks (2010–2024)

Table 4 presents the average ROE ranking across banks in the sample, averaged over the full period. The ranking reveals that the majority of U.S. banks occupy the upper half of the distribution, while European banks dominate the lower half, with two notable exceptions like UBS (#7) and BBVA (#9). The top three performers are all U.S. institutions: U.S. Bancorp, Charles Schwab, and JPMorgan Chase and their consistency of performance across years is notably higher

than that of European counterparts. Within the European group, performance is more volatile and leadership varies across years, suggesting a more fragmented and less stable competitive structure.

Table 4. Average ROE Ranking by Bank (2010–2024)

Rank	Bank	Region	Avg. ROE	Consistency
1	U.S. Bancorp	United States	14.2%	High
2	Charles Schwab	United States	14.0%	High
3	JPMorgan Chase	United States	12.8%	High
4	Wells Fargo	United States	11.5%	Medium
5	Goldman Sachs	United States	11.0%	Medium
6	PNC Financial Services	United States	10.8%	Medium
7	UBS	Europe	10.6%	Medium
8	Morgan Stanley	United States	9.4%	Medium
9	BBVA	Europe	8.9%	Medium
10	HSBC	Europe	7.5%	Low-Medium
11	Truist Financial	United States	7.4%	Low-Medium
12	BNP Paribas	Europe	7.1%	Low-Medium
13	Bank of America	United States	7.0%	Low-Medium
14	Santander	Europe	6.9%	Low
15	Barclays	Europe	4.2%	Low
16	Intesa Sanpaolo	Europe	4.2%	Low
17	Deutsche Bank	Europe	1.4%	Very Low
18	UniCredit	Europe	−0.8%	Negative

Note: Shaded rows correspond to European banks. Average ROE computed over available bank-year observations in the sample period. "Consistency" reflects qualitative assessment of year-to-year stability in the top tercile of the sample distribution.

4.4 Regression Results

Table 5 presents the results of the regression analysis. Three specifications are estimated: the baseline model with ROA as the dependent variable (column 1), a replication using ROE (column 2) and a productivity specification using the revenue-to-assets ratio (column 3).

Table 5. Regression Results: Bank Performance on Regional and Bank-Level Characteristics

Variable	ROA (1)	ROE (2)	Revenue/Assets (3)
US Dummy	0.0044***	0.0597***	0.0095***
	(0.0008)	*(0.0127)*	*(0.0023)*
Log(Assets)	0.0001	0.0011	−0.0003
	(0.0003)	*(0.0054)*	*(0.0010)*
Equity Ratio	0.0556***	−0.1885	0.1340**
	(0.0198)	*(0.3101)*	*(0.0565)*
Assets/Employee	0.0000	0.0006	−0.0003**
	(0.0001)	*(0.0008)*	*(0.0001)*
Constant	−0.0003	0.0513	0.0344***
	(0.0029)	*(0.0454)*	*(0.0083)*
Year FE	No	No	No
Observations	269	269	269
R^2	0.403	0.171	0.320

*Note: Pooled OLS estimates. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. The dependent variable alternates between ROA (column 1), ROE (column 2), and the revenue-to-assets ratio (column 3). US Dummy equals one for U.S. banks and zero for European banks. Log(Assets) is the natural logarithm of total assets. Equity Ratio is total equity divided by total assets. Assets/Employee is total assets per employee in millions of USD. N = 269 in all specifications.*

The central finding is that the U.S. dummy is positive and statistically significant at the 1% level across all three specifications. This result is consistent with H4 and indicates that U.S. banks outperform European banks even after controlling for bank size, capitalisation, and operational efficiency. The coefficient on the U.S. dummy in the ROA specification (column 1) implies that

U.S. banks achieve a ROA approximately 44 basis points higher than European banks with similar observable characteristics. In the ROE specification (column 2), the estimated gap is approximately 5.97 percentage points, which is both statistically and economically large.

The equity ratio is positive and statistically significant in the ROA specifications (column 1), providing support for H3. This is consistent with the finding of Demirgüç-Kunt and Huizinga (1999) that better-capitalised banks tend to exhibit stronger profitability, potentially reflecting lower funding costs and greater operational stability. Interestingly, the equity ratio is not significant in the ROE specification, which is consistent with the mechanical relationship between higher equity and lower ROE through the leverage channel: more capitalised banks sacrifice return on equity for stability, even as their ROA improves.

Bank size (log of total assets) is not statistically significant in any specification, which is inconsistent with H2 and suggests that size, at this range of the asset distribution, does not translate into superior profitability. This finding is particularly notable given that European banks are on average larger within the sample. If size were the primary driver of performance, one would expect European banks to outperform, which is the opposite of what is observed. This reinforces the view that the performance gap reflects factors beyond scale.

Assets per employee is significant only in the revenue-to-assets specification (column 3), where it enters with a negative sign (-0.0003, $p<0.05$), but not in the ROA or ROE specifications. This finding aligns with the descriptive evidence from Figure 3: operational efficiency affects revenue generation but does not directly translate into higher profitability at the bank level. One possible interpretation is that higher assets per employee reduces per-unit revenue costs, but this benefit is partially offset by other cost components or by differences in the revenue mix across banks. The negative sign in the revenue-to-assets specification may reflect the composition of the sample: banks with very high assets per employee, such as large investment banks, tend to generate proportionally lower revenue relative to their asset base despite their operational scale

The R^2 values range from 17.1% (ROE) to 40.3% (ROA), reflecting the well-known difficulty of explaining profitability variation within banking using only a small number of accounting ratios. The relatively modest explanatory power of the models is itself informative: it underscores that a large portion of the performance gap remains unexplained by observable characteristics, consistent

with the view that structural and institutional differences which are not captured in the regression, play an important role.

5 Discussion

5.1 Interpretation of the Findings

The empirical results provide consistent and robust evidence of a persistent performance gap between U.S. and European banks over the sample period. This gap is observed across all three performance measures, survives the inclusion of controls for size, capitalisation, and efficiency, and is statistically significant at conventional levels. In this section, the findings are interpreted in light of the theoretical framework developed in Section 2 and placed in the context of the broader structural debate on European competitiveness.

The most important finding is not simply that U.S. banks outperform, but that this outperformance persists after controlling for observable bank characteristics. The coefficient on the U.S. dummy should therefore be interpreted as capturing a set of structural and institutional differences that are not directly observable in the data but that systematically differentiate the operating environment of U.S. and European banks. These may include the degree of financial market integration, the depth of domestic capital markets, the structure of the regulatory environment, the composition of revenue streams, and the broader macroeconomic context in which banks operate. The U.S. dummy is not capturing a "nationality premium"; it is capturing the cumulative effect of a financial system that is structurally more integrated, more market-oriented, and more conducive to generating stable profitability.

A second important finding concerns the role of bank size. European banks are on average larger than U.S. banks within the sample, yet they consistently underperform. This observation provides empirical support for the argument that size alone is not a sufficient condition for profitability. Larger balance sheets do not automatically translate into superior performance if the institutional environment limits the ability to achieve operational efficiencies, diversify revenue sources, or compete effectively across national boundaries. This finding has direct relevance for the ongoing debate about European banking consolidation: simply creating larger European banks through mergers is unlikely to close the performance gap unless it is accompanied by deeper structural reforms.

The descriptive evidence on the distribution of ROE across individual banks provides additional texture. The concentration of consistently high-performing institutions among U.S. banks, and the

absence of a similarly stable group of top performers in Europe, suggests that the U.S. banking sector benefits from a competitive structure that rewards efficient institutions over time. In Europe, performance leadership rotates more frequently across institutions, which may reflect a more fragmented competitive environment or greater sensitivity to idiosyncratic shocks at the national level.

Finally, the observed convergence in ROE from 2022 onwards is an important finding that merits careful interpretation. This convergence is consistent with the hypothesis that part of the performance gap observed during the low-rate period was cyclical: European banks, which had been disproportionately affected by the prolonged period of compressed net interest margins, benefited strongly from the normalisation of monetary policy. This does not imply, however, that the structural gap has disappeared. The regression results, which pool observations across the full period, confirm that the aggregate performance difference remains statistically significant after accounting for the recent improvement in European bank profitability.

5.2 Structural Explanations and the Literature

The findings are broadly consistent with the existing literature and with recent institutional analyses of European competitiveness. The ECB (2022) and the BIS (2023) both document the persistently lower profitability of European banks since the Global Financial Crisis and attribute this underperformance to a combination of structural and macroeconomic factors. The present study adds to this literature by demonstrating that the gap remains significant even after controlling for observable bank characteristics, suggesting that explanations rooted in structural differences are more compelling than those based solely on bank-level features.

The findings align closely with the diagnosis offered in the Draghi Report (European Commission, 2024). The report argues that financial fragmentation is one of Europe's central structural weaknesses, limiting the ability of financial institutions to achieve scale, diversify risk, and compete globally. The incomplete Banking Union, the persistence of national barriers to cross-border banking activity, and the underdevelopment of capital markets relative to the United States all constrain the performance of European banks. The empirical results of this study provide bank-level evidence that is consistent with this institutional narrative.

The role of monetary policy deserves particular attention. The ECB's implementation of large-scale asset purchase programmes, notably the Asset Purchase Programme (APP) and the Pandemic Emergency Purchase Programme (PEPP), alongside negative policy rates, created a particularly challenging environment for European bank profitability during the 2015–2022 period. The Bank of England similarly deployed quantitative easing through its Asset Purchase Facility. By contrast, the Federal Reserve, while also implementing unconventional monetary policy measures, operated in an environment with a shorter and less severe negative real rate period, and U.S. banks benefited from faster balance sheet deleveraging and earlier recovery in capital markets activity (Federal Reserve, 2022). The Swiss National Bank's approach, focused primarily on foreign exchange interventions, created an additional layer of complexity for Swiss institutions in the sample. These differences in monetary environment help contextualize the time-series patterns observed in Figure 1 and are relevant to the interpretation of the U.S. dummy in the regression.

The finding that assets per employee is significant for revenue generation but not for profitability is consistent with the view that operational efficiency affects how banks generate income but does not fully determine what they keep as profit. European banks may face higher compliance costs, greater fragmentation of back-office operations across jurisdictions, or higher provisions for credit losses that offset efficiency gains. This would imply that the cost structure of European banks, rather than the revenue side alone, is an important part of the story, a dimension that deserves further attention in future research.

5.3 Limitations

The results of this study should be interpreted in light of several important limitations.

The most significant limitation relates to sample composition. The dataset covers eighteen large publicly listed banks and may not be representative of the full diversity of banking systems in either region. In particular, the exclusion of smaller and mid-sized banks, cooperative institutions, and savings banks means that the results cannot be straightforwardly generalised to the entire banking sector. At the same time, the focus on large systemic institutions is appropriate given the objective of the study, which is to compare the core of each financial system rather than its periphery.

A second limitation concerns the empirical specification. The regression model includes only four explanatory variables and does not capture potentially important dimensions of bank performance, including business model diversity, asset quality, cost-to-income ratios, or revenue composition. The omission of these variables means that the U.S. dummy captures not only structural differences but also any systematic differences in business models or revenue mix that are not explicitly controlled for. This should be kept in mind when interpreting the coefficient as a reflection of institutional or structural factors.

Third, differences in accounting standards (US GAAP versus IFRS), reporting practices, and currency translation may introduce a degree of measurement error. While the use of ratio-based variables mitigates some of these concerns, residual comparability issues cannot be entirely ruled out. In particular, differences in how revenues and assets are recognised under the two accounting frameworks may affect the revenue-to-assets measure.

Finally, the analysis does not explicitly model the interest rate environment as a control variable. Given the substantial macroeconomic differences between the two regions over the sample period, including the ECB's prolonged negative rate policy, this omission may cause the U.S. dummy to capture part of the cyclical effect of monetary policy rather than purely structural differences. Including a measure of the domestic interest rate environment in future work could help disentangle these two channels.

5.4 Implications for Policy and Research

The findings of this study carry several implications for policymakers and for the future research agenda.

For policymakers, the most important message is that improving European bank performance requires addressing structural constraints rather than simply encouraging consolidation. The empirical evidence shows that size does not explain the performance gap, suggesting that policies aimed solely at creating larger European banks are unlikely to be sufficient. What appears to matter more is the institutional environment in which banks operate: the degree of financial integration, the consistency and efficiency of the regulatory framework, and the depth of domestic capital markets.

In this context, the case for completing the Banking Union and advancing the Capital Markets Union appears well-supported by the evidence. If the fragmentation of European financial markets is indeed a key driver of bank underperformance, then reducing barriers to cross-border banking activity, harmonising insolvency regimes, and facilitating the development of pan-European capital markets could contribute meaningfully to improving the competitiveness of European banks. This is broadly consistent with the recommendations of the Draghi Report and with the ECB's own institutional analysis.

The observed partial convergence in recent years also suggests that macroeconomic conditions, particularly the interest rate environment, interact with structural factors in shaping bank performance. This underscores the importance of understanding how monetary policy transmission differs across banking systems with different structural characteristics, which remains an active area of research.

6 Conclusion

This thesis has examined the profitability and productivity gap between U.S. and European banks over the period 2010–2024. Using a panel dataset of eighteen large publicly listed banks and financial data obtained through WRDS, it has compared key performance indicators (i.e., return on assets, return on equity, and the revenue-to-assets ratio) and assessed whether regional differences persist after controlling for observable bank characteristics.

The empirical evidence consistently points to a significant and robust performance advantage for U.S. banks. On average, U.S. banks achieve an ROA approximately 62 basis points higher than European banks, a ROE gap of approximately 5.4 percentage points, and generate meaningfully more revenue per unit of assets. These differences are statistically significant at the 1% level and remain robust across all regression specifications. Crucially, the performance gap cannot be explained by observable bank-level characteristics such as size, capitalisation, or operational efficiency: the U.S. dummy remains positive and significant in all models, indicating the presence of unobservable structural or institutional differences between the two financial systems.

The findings are consistent with the broader structural narrative on European competitiveness. The persistence of the gap, the concentration of high performers among U.S. institutions, and the absence of consistently top-performing European banks all point to a structural explanation rooted in financial fragmentation, regulatory complexity, and the incomplete integration of European financial markets. These findings provide bank-level empirical support for the institutional diagnoses offered by the Draghi Report, the ECB, and the BIS.

At the same time, the study documents an important pattern of partial convergence in ROE from 2022 onwards, associated with the normalisation of monetary policy. This convergence suggests that part of the gap observed during the preceding decade was related to the asymmetric impact of the low-rate environment on European banks. While this cyclical improvement is encouraging, it does not alter the structural picture: U.S. banks have maintained a performance advantage across the full sample period, and the regression results confirm that this advantage reflects factors beyond the interest rate environment.

The study contributes to the literature by linking bank-level performance data to the broader debate on the European productivity gap. If banks are less efficient at intermediating capital, less

able to fund high-growth firms, and less stable in their profitability, the implications for investment, resource allocation, and long-run economic performance extend well beyond the financial sector. Strengthening the European banking sector through deeper financial integration, more efficient regulation, and the development of capital markets, is therefore not only a matter of financial competitiveness but also a prerequisite for addressing the European productivity challenge more broadly.

This thesis is subject to limitations, including the restricted sample of large publicly listed banks, the relatively simple empirical specification, and the absence of explicit controls for the monetary policy environment. These limitations point to directions for future research, including expanded datasets, richer empirical frameworks, and a closer examination of the channels through which banking sector performance affects macroeconomic outcomes.

Overall, the results suggest that European banks appear to lag behind their U.S. counterparts in several profitability and productivity measures, and that this difference seems to persist beyond observable bank-level characteristics, potentially reflecting broader structural and institutional differences between the two financial systems. Addressing these structural gaps remains one of the central challenges facing European policymakers in the years ahead.

7 Annex

7.1 Declaration on the Use of Artificial Intelligence (AI)

I hereby, Nicolas Pou Corrales, student of the Bachelor's Degree in Business Administration and Management (E2-Bilingual) at Universidad Pontificia Comillas, upon submitting my Bachelor's Thesis titled " Banking Productivity and the European Productivity Gap: A Comparative Analysis of U.S. and European Banks (2010–2024)", declare that I have used the Generative Artificial Intelligence tool ChatGPT or other similar GAI tools solely within the context of the activities described below:

Brainstorming research ideas: Used to conceptualize and outline potential areas of research.

References: Used in conjunction with other tools to identify preliminary references that I subsequently cross-checked and validated.

Methodologist: To discover methods applicable to specific research problems.

Multidisciplinary studies: To understand perspectives from other communities on topics of a multidisciplinary nature.

Template builder: To design specific formats for sections of the thesis.

Literary style and language editor: To improve the linguistic and stylistic quality of the text.

Synthesizer of complex books: To summarize and comprehend complex literature.

Reviewer: To receive suggestions on how to improve and refine the work across different levels of rigor.

Translator: To translate texts from one language to another.

I affirm that all information and content presented in this work are the product of my individual research and effort, except where otherwise indicated and where corresponding credits have been given. I am aware of the academic and ethical implications of submitting unoriginal work and accept the consequences of any violation of this declaration.

Date: 01/06/2026

Signature: Nicolas Pou Corrales

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