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DISSERTATION

RETAIL TERM DEPOSIT BETA DYNAMICS IN MODERN EUROZONE

MARIANA FURTADO SIMÕES

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SUPERVISION:
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Para o meu Pai,

GLOSSARY

MRO - Main Refinancing Operations.

ALM - Asset-Liability Management.

ECB - European Central Bank.

EONIA - Euro Overnight Index Average.

ESTER - Euro Short-Term Rate.

HHI - Herfindahl-Hirschman Index.

LTRO - Long-Term Refinancing Operation.

CBPP - Covered Bond Purchase Programme.

ZLB - Zero Lower Bound.

NIRP - Negative Interest Rate Policies.

ABSTRACT, KEYWORDS AND JEL CODES

This dissertation investigates the pass-through of monetary policy to retail deposit rates across 20 euro area countries from 2005 to 2025, with a focus on the post-2022 tightening cycle. The aim is to estimate the short-run sensitivity of household term deposit rates, captured through deposit betas, to changes in short-term reference rates EONIA and Ester, and to identify structural factors behind cross-country heterogeneity.

The analysis uses country-level time-series regressions of monthly changes in 1-year household term deposit rates on changes in policy benchmarks. To account for shifts in the monetary environment, the sample is segmented into four sub-periods: pre-crisis, unconventional policy, negative rate regime, and post-pandemic tightening. Correlation analysis shows that pass-through was muted under negative rates but strengthened notably after 2022.

Beta estimates for 2022 - 2025 range from 0.15 to 0.78, indicating substantial cross-country variation. To explain this, the study examines structural indicators such as banking sector concentration (Herfindahl-Hirschman Index) and household term deposit share of the deposit liabilities balance sheet. While the Herfindahl-Hirschman index and deposit share results show no significant global relationship with deposit rate pass-through, the emergence of distinct country clusters suggests underlying structural heterogeneity that warrants further investigation using broader or more granular data.

These findings suggest that even under a unified monetary policy, transmission through the deposit channel remains uneven due to national structural differences. This heterogeneity has implications for the symmetry and effectiveness of monetary policy across member states and underscores the influence of banking structure on monetary transmission dynamics.

KEYWORDS: Term Deposits; Deposit Betas; Reference Rates; Monetary Policy Transmission; Retail Deposit Rates; Market Concentration.

JEL CODES: E43; E52; G21; C22

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RETAIL TERM DEPOSIT BETA DYNAMICS IN MODERN EUROZONE

BY MARIANA F. SIMÕES

This thesis examines how retail deposit rates across 20 euro area countries responded to monetary policy between 2005 and 2025, focusing on the post-2022 tightening cycle. Deposit betas are estimated through country-level regressions using short-term reference rates. Results show significant cross-country variation in pass-through strength. Structural factors, such as banking market concentration, help explain this heterogeneity, with more concentrated systems exhibiting weaker responsiveness. These findings highlight persistent fragmentation in the euro area's monetary transmission, despite a common policy framework.

1. INTRODUCTION

1.1 Monetary Policy and Interest Rates

1.1.1 The European Central Bank and its Monetary Policy Framework

The European Central Bank (ECB) is the euro area's central monetary authority, currently comprising 20 nations that adopted the euro as their common currency. Its primary goal is keeping inflation stable, which, following a 2021 strategy review, is defined as targeting a 2% inflation rate over the medium term. To meet this goal, the ECB formulates and conducts monetary policy using a range of reference interest rates and operating instruments that are intended to affect liquidity conditions and general financial markets. The ECB has an influence on short-term market conditions primarily through its reference interest rates, which serve as interbank liquidity anchors and broader financial benchmarks.

1.1.2 The Role of Reference Rates and Market Benchmarks

In implementing monetary policy, the ECB decides about a set of official interest rates, such as the Main Refinancing Operations (MRO) rate, the Deposit Facility Rate, and the Marginal Lending Facility Rate, that serve as the primary instruments for influencing short-term interest rates and overall liquidity in the euro-area. Among them, the Euro Overnight Index Average (EONIA) and, more recently, the Euro Short-Term Rate (Ester), reflect the prevailing conditions in the money market.

EONIA was historically the primary reference rate, measuring the weighted average interest rate on overnight unsecured lending transactions between euro area banks. However, in the aftermath of the global financial crisis, concerns emerged over the

reliability and transparency of interbank benchmarks, particularly due to the declining volume of underlying transactions and reliance on expert judgment. These issues prompted regulatory reform at the European and global levels, leading to the gradual phase-out of EONIA.

In October 2019, the Ester was introduced as its successor. Unlike EONIA, the Ester is based entirely on actual transactions reported by banks to the ECB each day. It captures the volume-weighted average interest rate on overnight unsecured borrowing by euro area banks from a broad range of counterparties, including non-bank financial institutions. As a result, it is considered more robust, representative, and compliant with international best practices, particularly the IOSCO principles for financial benchmarks (which emphasize transparency, data sufficiency, governance, and the use of observable transactions to ensure benchmark integrity).

From a monetary policy perspective, both EONIA and Ester function as proxies for the short-term cost of liquidity in the banking system. Changes in these rates reflect market expectations regarding current and future policy, and they serve as crucial benchmarks for pricing a variety of retail and wholesale financial instruments. For banks, movements in these rates influence their funding strategies and the rates they offer on deposits. Consequently, understanding how deposit rates respond to shifts in EONIA and Ester is essential for analysing the effectiveness of the deposit channel of monetary transmission, a topic this thesis addresses directly.

1.1.3 Monetary Policy Transmission Mechanisms

Monetary policy affects the broader economy through several interconnected transmission channels. By influencing short-term interest rates, central banks aim to steer aggregate demand, inflation, and financial conditions. Traditional mechanisms include the interest rate channel, which affects borrowing and saving decisions through changes in lending and deposit rates, and the bank lending channel, which operates via the availability of credit on bank balance sheets. In more recent research, attention has turned toward the deposit channel, particularly the responsiveness of retail deposit rates to policy shifts. This mechanism is especially important in environments of low or negative interest rates, where deposit rates often adjust sluggishly. The concept of the deposit beta, which

measures the sensitivity of deposit rates to reference rates, provides a useful way to quantify this aspect of monetary transmission. These channels interact and vary in effectiveness across time and jurisdictions. The next sections explore how such dynamics influence banks' funding strategies, with a particular focus on term deposits and their responsiveness to monetary policy changes.

1.1.4 The Challenges of Low and Negative Interest Rate Environments

Since the global financial crisis of 2008 and the subsequent euro area sovereign debt crisis, the ECB adopted a series of unconventional monetary policies, including negative interest rates and large-scale asset purchase programs. These measures were intended to support economic recovery and re-anchor inflation expectations when traditional policy rates had approached their effective lower bound.

However, the prolonged period of ultra-low and negative interest rates introduced notable complexities in the transmission of monetary policy, particularly through the deposit channel. In many cases, banks were reluctant to pass on negative rates to retail depositors due to concerns over customer dissatisfaction, reputational risks and the threat of deposit flight. As a result, retail deposit rates, especially for households, became increasingly "sticky" at or just above zero.

This reluctance to fully reprice deposits downward constrained the responsiveness of deposit rates to changes in policy rates, a phenomenon reflected in lower deposit betas during this period. While such "stickiness" helped banks preserve profitability in a low-margin environment, it also limited the effectiveness of monetary easing by weakening the pass-through to funding costs and, ultimately, to lending rates.

1.2 Asset-Liability Management and Bank Funding Strategies
1.2.1 Introduction to Asset-Liability Management

Asset-Liability Management (ALM) refers to how banks manage mismatches between the timing and pricing of their assets and liabilities. The main goal is to maintain liquidity, profitability, and solvency under changing market conditions. Banks typically face a maturity mismatch: loans and securities are long-term and illiquid, while liabilities,

especially retail deposits, can be short-term and volatile. ALM frameworks aim to monitor and mitigate the resulting interest rate and liquidity risks.

1.2.2 Interest Rate Risk and Maturity Mismatch

Interest rate risk arises when assets and liabilities reprice at different times. In the euro area, bank loans often carry floating rates indexed to market benchmarks like Euribor, while deposits, especially fixed-term products, adjust more slowly. When policy rates shift, this asymmetry can compress or expand net interest margins, depending on the cycle. Banks address this mismatch through strategies such as interest rate hedging and balance sheet structuring.

1.2.3 Deposit Funding and Strategic Pricing

Retail deposits, particularly term deposits, are a core funding source for euro area banks due to their relative stability and low cost. Term deposits offer defined maturities and are less sensitive to immediate market fluctuations, making them valuable for managing funding risk. However, pricing them is a strategic decision that depends on market competition, interest rate expectations, and depositor behavior. In tightening cycles, competitive pressure may force banks to raise deposit rates to retain funds, whereas in easing periods, deposit rates often adjust more slowly.

1.2.4 Liquidity Management and Regulatory Constraints

Following the financial crisis, regulatory reforms such as Basel III introduced liquidity requirements like the Liquidity Coverage Ratio (LCR) and the Net Stable Funding Ratio (NSFR). These rules encourage stable funding structures and have reinforced the importance of retail deposits in banks' funding mix. In this context, the responsiveness of deposit rates to policy changes has become increasingly relevant, not just for profitability, but for compliance and risk management.

1.3 The Role of Term Deposits

Term deposits serve a dual purpose in the financial system: they are a stable source of bank funding and a key transmission channel for monetary policy. Their fixed maturities and lower likelihood of early withdrawal make them especially useful for ALM, providing predictability in banks' liquidity planning. This stability allows banks to fund longer-term assets, such as mortgages and business loans, with greater confidence.

Although term deposits offer reliable funding, banks also maintain access to central bank facilities and financial markets as liquidity backstops. These include instruments like refinancing operations and securitization, which allow banks to manage shortfalls or reallocate liquidity.

On the policy side, term deposit rates are an important lever through which monetary signals reach households. When the ECB adjusts its policy rate, banks must decide whether, and how quickly, to reprice deposit products. This decision reflects funding needs, competitive dynamics, customer sensitivity, and the broader interest rate environment. Contrary to traditional assumptions of swift pass-through during tightening cycles, recent euro area experience has shown significant delays in deposit rate adjustment, especially for households.

This "stickiness" often reflects low competition, depositor inertia, or a strategic desire to protect net interest margins. During easing cycles, pass-through tends to be even weaker, particularly when policy rates approach zero or turn negative. In such cases, reputational and legal constraints can discourage banks from cutting deposit rates further.

The deposit beta, which measures the proportion of a policy rate change passed through to deposit rates, captures this responsiveness. A beta close to 1 implies full transmission; lower values indicate rigidity or delay. In the euro area, deposit betas vary significantly across countries and time, depending on structural and institutional factors.

In Portugal, for example, while demand deposits have become more prevalent, term deposits remain a significant funding source. They continue to show sensitivity to policy rates, especially during tightening cycles, making them a relevant focus for assessing the effectiveness of monetary transmission.

This variation in deposit rate behavior, particularly across interest rate regimes and national banking systems, motivates the empirical analysis of this thesis. Estimating deposit betas helps assess how effectively monetary policy is transmitted through the banking system's liability side, and highlights where frictions may undermine that process.

1.4 Deposit Beta: Definition, Measurement, and Importance
1.4.1 Concept and Theoretical Foundation

As briefly introduced in Section 1.1.3, the deposit beta quantifies the extent to which retail deposit rates adjust in response to changes in central bank policy rates or market-based benchmarks such as the Ester. It is typically expressed as the coefficient in a regression of changes in deposit rates on changes in reference rates, over the same time period.

A deposit beta of 1 implies full and immediate pass-through, while a beta of 0 indicates no responsiveness. In practice, deposit betas tend to fall well below one, particularly for household deposits, reflecting pricing frictions, customer inertia, and strategic bank behavior. This makes deposit beta an essential metric for understanding how monetary policy is transmitted through the banking system's funding side.

1.4.2 Empirical Measurement Approaches

Deposit betas are typically estimated using time-series regressions over macroeconomic or bank-level data. In this thesis, a basic specification is used that regresses the first differences of country-level average term deposit rates with agreed maturity up to one year month-on-month changes in the short-term reference rate - EONIA-Ester. The analysis is carried out separately for each of the 20 euro area countries individually, allowing for a country-specific estimation of the deposit beta that captures national variation in monetary policy transmission. Betas can be estimated for different maturities of deposits, such as sight deposits (despite their typically low or zero rates), short-term deposits, and longer-term maturities, to capture heterogeneity in interest rate

sensitivity, in this thesis we focused on short-term term deposits with maturities up to one year, more specifically.

More advanced models also incorporate lags to account for delayed adjustments and may allow for asymmetric pass-through depending on whether policy is tightening or loosening, which was deemed out of scope for this thesis.

1.4.3 Key Determinants of Term Deposit Beta

Several structural and strategic factors shape the size and variability of household term deposit betas:

- Market competition: More concentrated or less competitive banking sectors often display lower betas, as banks face fewer pressures to adjust rates.
- Customer stickiness: High switching costs or low-rate sensitivity among retail clients, namely due to a higher age average of investors, reduce the incentive to pass through changes.
- Funding structure: Banks that rely more heavily on term deposit funding may exhibit different pricing behavior depending on their strategic priorities. While some may delay deposit rate increases to preserve interest margins, others may reprice more quickly to maintain competitiveness and retain funding, especially in more contestable markets.
- Regulatory incentives: Liquidity requirements such as the LCR and NSFR assign favorable treatment to retail deposits due to their historically higher stability. This encourages banks to retain these funding sources, potentially through more competitive pricing. As a result, deposit betas may rise during tightening cycles but remain lower during easing, reflecting both regulatory incentives and strategic pricing behavior.
- Monetary regime: Low or negative policy rates have historically been associated with weaker deposit pass-through due to zero lower bound constraints and reputational risks.

These drivers explain not only cross-country variation but also the observed asymmetry in deposit repricing during tightening versus easing cycles. In this thesis we

assess the market competition influence as well as the funding structure reliance on household term deposits on the policy pass-through.

1.4.4 Relevance to Monetary Transmission and Bank Strategy

Deposit betas are key to understanding the transmission of monetary policy. A low beta implies that policy rate increases may not fully raise banks' cost of funds, allowing them to preserve margins, but also reducing the intended contractionary effect on credit conditions.

From a financial stability perspective, low deposit betas help banks maintain profitability during tightening cycles but may introduce allocation inefficiencies and weaken the responsiveness of savings behavior.

As this thesis will show, estimating and interpreting deposit betas across countries and over time provides valuable insight into how policy signals are filtered through the deposit channel, a mechanism still relatively under-explored compared to lending rate pass-through.

2. LITERATURE REVIEW

2.1 From Traditional to Deposit-Based Transmission Channels

Traditional literature on monetary policy transmission has long emphasized the role of banks, particularly through the credit and balance sheet channels. Foundational work by Bernanke and Blinder (1988), and later Bernanke and Gertler (1995), showed how policy rate changes affect the supply of credit by altering bank lending conditions. Kashyap and Stein (1995, 2000) further demonstrated how monetary shocks impact banks' liquidity and capital buffers, shaping credit availability.

In recent years, attention has shifted to the liability side of bank balance sheets. Drechsler et al. (2017) introduced the concept of the deposit channel, highlighting the stickiness of deposit rates and their incomplete adjustment to policy changes. This sluggish behavior, measured by the deposit beta, allows banks to perform maturity transformation while limiting interest rate risk. In follow-up work, Drechsler et al. (2021)

show how low deposit betas help banks preserve net interest margins during tightening cycles by slowing the pass-through to retail funding costs.

2.2 Evidence from Portugal and the Euro Area

A particularly relevant contribution comes from Bonfim and Queiró (2024), who analyze the Portuguese deposit market using the approach of Drechsler et al. (2017). Their panel data results show an average deposit beta of 0.65, with a notable divergence between firms (0.95) and households (0.59). Sight deposits were largely unresponsive, while short-term term deposits (under two years) showed the highest sensitivity.

These results reflect Portugal's prolonged low-rate environment and structural banking characteristics, such as high reliance on deposits and limited competition before 2022. Notably, they find that loan rate pass-through is similar or even weaker than deposit pass-through, a result explained by the dominance of variable-rate loans indexed to Euribor, which reprice automatically and reduce measured responsiveness.

This pattern echoes elsewhere in the euro area. Heider et al. (2019) document a widespread breakdown in deposit transmission during the negative interest rate period, showing that many banks avoided passing on negative rates to retail clients due to reputational concerns, depositor inertia, and legal barriers. This mirrors the Portuguese case.

Clerc et al. (2023) confirm that even after the ECB began raising rates in 2022, deposit rates have adjusted slowly across many euro area countries. Their evidence highlights how competition, customer behavior, and funding structure continue to influence the strength of the deposit channel.

Together, these studies show that deposit beta is shaped not just by interest rate cycles but also by national financial structures, reinforcing the need for country-level analysis even under a unified monetary policy.

2.3 Structural Segmentation and Policy Effectiveness

Structural segmentation within the euro area banking system further complicates monetary transmission. Ciccarelli et al. (2013) show how national differences in financial fragility and credit conditions generate divergent responses to a single monetary policy. Similarly, De Bondt (2005) identifies key institutional factors, such as market competition, financial development, and regulatory differences, that shape the degree and speed of interest rate pass-through across countries.

These factors directly influence the deposit beta. In countries with concentrated banking sectors, low depositor mobility, or weak competition, deposit rates tend to adjust more slowly, weakening the link between ECB policy rates and retail pricing behavior. This is particularly relevant during tightening cycles, when the speed and extent of deposit repricing affect both funding costs and household savings behavior.

Ultimately, deposit beta is more than a statistical estimate, it reflects institutional, behavioral, and structural differences across member states. This underscores the need for country-level analysis when assessing the strength and symmetry of monetary transmission in the euro area.

3. METHODOLOGY

This chapter outlines the empirical strategy used to estimate the sensitivity of household short-term term deposit rates to changes in short-term reference interest rates across the euro area. It describes the construction of a harmonized cross-country dataset, details the methodology for computing deposit betas, and introduces both the regression framework and supporting analyses, including sub-period segmentation and structural drivers of cross-country variation.

3.1 Data Sources and Construction

This section outlines the construction of the dataset used in this thesis, which brings together monthly data on short-term reference interest rates and retail deposit rates across 20 euro area countries. The dataset spans the period from 2005 to 2025, ensuring consistent temporal coverage for cross-country comparison. It includes new term deposit

with agreed maturities up to one year for households and non-financial corporations monthly rates, as well as a concatenated series of overnight reference monthly rates based on EONIA (used until October 2019) and Ester (used thereafter).

3.1.1 Reference Interest Rates

The benchmark short-term interest rates used in this thesis are sourced from the ECB and include:

- EONIA (Euro Overnight Index Average): Available from 1999 and officially discontinued on 3 January 2022.

- Ester (Euro Short-Term Rate): Introduced by the ECB on 2 October 2019 as a more robust, transaction-based benchmark for the euro area money market. It fully replaced EONIA as the overnight reference rate from that point forward.

- EONIA was recalibrated to track the Ester plus a fixed spread of 8.5 basis points. For the purposes of this analysis, the pre-recalibration EONIA (1999-October 2019) is used to represent the period during which it functioned as the primary overnight reference rate in the euro area.

To enable a continuous reference rate series, EONIA (1999-2019) and Ester (2019-2025) are concatenated into a single composite curve. This merged series (see Figure 1) facilitates a consistent analysis of the relationship between short-term reference rates and retail deposit rates over the study period.
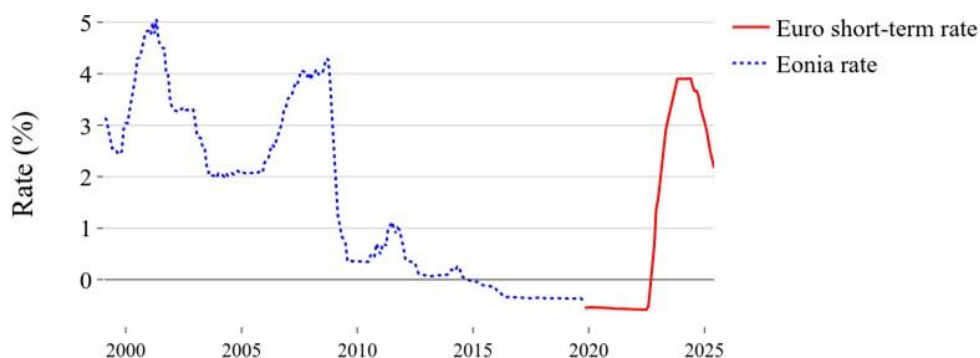
Figure 1 - Evolution of short-term benchmark rates in the euro area, showing the transition from EONIA (blue) to the Ester (red), highlighting periods of monetary easing and tightening from 1999 to 2025.

3.1.2 Retail Term Deposit Rates

Retail term deposit interest rates are sourced from the ECB's SDW. The data consist of monthly average interest rates on newly agreed retail term deposit contracts for households and non-financial corporations with agreed maturities up to one year.

The dataset covers 20 Euro area countries: Austria, Belgium, Croatia, Cyprus, Estonia, Finland, France, Germany, Greece, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Portugal, Slovakia, Slovenia, and Spain.

To ensure consistency across countries, the analysis focuses on the period from 2005 to 2025, which is the earliest point at which broadly comparable deposit rate data becomes available across the full country sample.

Although multiple maturity segments are reported in the original sources, the empirical analysis in this thesis uses only deposit rates with maturities below one year. The rationale for this selection is provided in Section 3.2.2.

However, not all countries have data available from 2005 onward. While the analysis window spans 2005-2025, the starting point varies by country due to differences in the reporting and Euro area accession dates. Specifically, Slovenia begins in May 2005, Malta in 2007, Lithuania in 2009, Croatia in 2011 and Ireland in 2017. The remaining 15 member states have data available for the full duration of the sample.

3.1.3 Data Transformation and Alignment

To analyze the pass-through from policy rates to term deposit rates, all interest rate series are used at their original monthly frequency, as reported by the ECB and national central banks. The time series are aligned on a common date index to ensure consistency across countries and maturities. The changes in deposit rates are regressed on the corresponding month-on-month changes in the overnight reference rate, represented by EONIA until 2019 and Ester thereafter.

For beta estimation, first differences (Δ) of interest rates are computed to capture month-to-month changes in both the independent variable (reference rate) and the dependent variables (term deposit rates).

The full dataset thus comprises a time-aligned panel of policy and deposit rate changes across the 20 Eurozone member states, broken down by maturity and suitable for both descriptive and regression analysis.

3.2. Methodology

This chapter outlines the strategy used to estimate how responsive short-term retail deposit rates are to monetary policy rates across 20 Eurozone countries. The central objective is to estimate country-level deposit betas (as defined in Section 1.4.1), which quantify the degree of pass-through from changes in short-term reference rates to household term deposit rates.

The empirical approach is based on first-difference regressions applied to monthly data during the 2022 to 2025 tightening cycle. To assess the timing and strength of co-movement, a correlation analysis is also conducted across different monetary regimes. Finally, a cross-sectional analysis investigates whether structural banking characteristics, specifically market concentration measured by the Herfindahl-Hirschman Index, and household term deposit funding dependence, help explain variation in estimated deposit betas across countries.

This combined framework enables a detailed assessment of both the magnitude and the structural drivers of monetary policy transmission through the retail term deposit channel in the euro area.

3.2.1. Model Specification and Estimation Strategy

The analysis begins with a set of linear regression models, each estimated separately for the banking system of each country in the sample, constructed in order to estimate the short-run sensitivity of deposit rates to changes in monetary policy. The model links deposit rate movements to movements in a short-term policy benchmark, capturing how retail pricing reacts to shifts in the central bank's stance. This is expressed formally as:

$$\Delta r_{i,t}^{dep} = \beta_i \cdot \Delta r_t^{ref} + \varepsilon_{i,t} \tag{1}$$

Where:

- $\Delta r_{i,t}^{dep}$ denotes the month-on-month change in the deposit rate of country i between month t and month $t\text{-}1$;

- Δr_t^{ref} represents the month-on-month change in the policy reference rate, which is constructed as a composite of EONIA and Ester between month t and month $t\text{-}1$;

- β_i is the deposit beta to be estimated, the parameter of interest, capturing the magnitude of the pass-through from monetary policy to deposit rates;

- $\varepsilon_{i,t}$ is the regression residual, representing unexplained variation in deposit rates not accounted for by the change in the policy rate.

The model assumes a linear relationship between the policy rate and deposit rates. The coefficient β_i can be interpreted as the marginal effect of a one basis point change in the policy benchmark on the deposit rate: for example, β_i of 0.5 implies that a 10 basis point increase in the reference rate leads to a 5 basis point increase in the deposit rate, on average, in the same month. This pass-through is rarely complete (i.e., $\beta_i < 1$) due to pricing frictions, market power, and deposit stickiness, phenomena extensively documented in the literature.

While a simple linear specification does not account for all potential heterogeneity, it provides a transparent and interpretable baseline for assessing the strength of the deposit channel.

3.2.2 Variable Construction and Maturity Focus

The variables used in the empirical estimation consist of monthly observations of deposit rates and reference interest rates across the 20 member countries of the Eurozone. These are constructed to align in frequency, timing, and transformation, ensuring comparability and suitability for the first-difference regression model outlined above.

The dependent variable in the model, $\Delta r_{i,t}^{dep}$, is defined as the monthly change in the average interest rate on new term deposit contracts with maturity up to one year offered

by banks offered to households in country i between month t and month $t-1$. This maturity segment is chosen based on both theoretical expectations and practical considerations, as outlined below.

From a theoretical perspective, deposits with shorter maturities are expected to exhibit greater responsiveness to changes in short-term monetary policy rates, given their frequent repricing and closer alignment in duration with overnight benchmarks such as EONIA or Ester. On the other hand, longer-maturity deposits tend to be more insulated from short-term policy fluctuations because their interest rates are typically fixed at the time of the agreement and are not subject to frequent renegotiation. Additionally, their pricing reflects banks' expectations of future interest rates over a longer horizon, rather than reacting to month-to-month changes in policy.

While deposit rates across maturities tend to co-move, those with maturities below one year typically respond more quickly and visibly to policy shifts, particularly during tightening episodes. In contrast, longer-term deposits tend to adjust more gradually, reflecting their contractual rigidity and lower repricing frequency. By focusing on this maturity band, the analysis isolates the segment of the deposit book most immediately influenced by short-term monetary policy signals, as suggested by both theoretical expectations and prior literature.

Although a formal test of maturity responsiveness lies beyond the scope of this thesis, the assumption aligns with the maturity-matching rationale in ALM (see Section 1.2.6) and is well supported by prior research on interest rate pass-through (e.g., Heider et al., 2019; Drechsler et al., 2021).

The independent variable, Δr_t^{ref}, represents the monthly change in the short-term reference interest rate used to signal monetary policy stance. As previously mentioned, in order to construct a continuous series that spans the full sample period, the analysis combines two key ECB benchmarks:

- From January 1999 to October 2019, the EONIA is used;

- From October 2019 onward, the Ester serves as the policy anchor, following its official adoption by the ECB and the discontinuation of EONIA.

These two rates are concatenated into a single series, with no additional transformation or calibration applied, since the regression is conducted on monthly changes rather than levels. This approach avoids complications associated with level discontinuities between the two benchmarks and permits a consistent estimation of deposit sensitivity across both monetary regimes.

3.2.3 Temporal Segmentation and Monetary Regimes

To examine whether the sensitivity of deposit rates to changes in reference interest rates varies over time, the empirical analysis is conducted both over the full sample and across four distinct sub-periods. These sub-periods were not pre-assigned based on institutional classifications or exogenous historical dates but rather identified through direct inspection of the time-series behavior of policy and deposit rates across countries.

Visual analysis of the data, in Figure 2, revealed clear inflection points in the dynamics of reference and term deposit rates, changes in volatility, slope, and co-movement patterns suggested structural breaks in the monetary transmission environment. These observations motivated the creation of four sub-periods, which were later linked to major changes in the euro area's monetary policy approach.
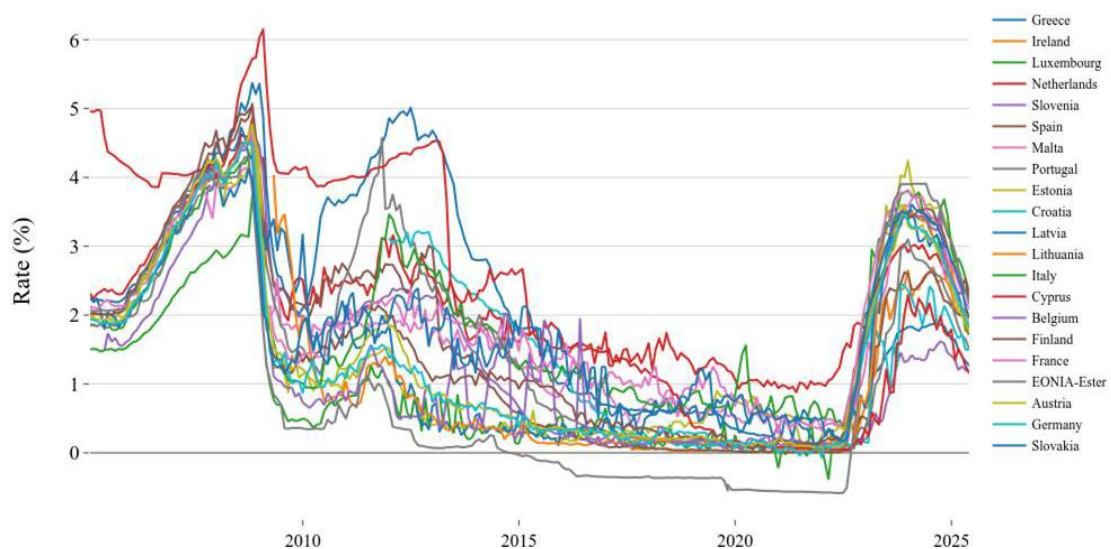
Figure 2 - Cross-country comparison of 1-year household deposit rates across the 20 Eurozone states from 2005 to 2025, plotted alongside the EONIA-Ester benchmark (gray).

The breakpoints correspond closely with major transitions in the ECB's monetary stance, including the adoption of unconventional instruments, the move to negative rates and the recent policy tightening phase. However, the segmentation was ultimately driven by visible changes in the reference rate curve, specifically points where the direction or pace of rate movements shifted clearly.

Notably:

- Around 2009, money market reference rates such as the EONIA experienced a rapid and sustained decline, falling below 1% as the financial crisis intensified.

- In 2010 to 2011, rates briefly recovered before falling again, consistent with the onset of the sovereign debt crisis.

- From 2015 to 2022, Ester and its predecessor EONIA remained negative, while deposit rates flattened at or near zero.

- In 2022, with the onset of the ECB's post-pandemic tightening cycle, both policy and deposit rates began to rise sharply.

Although policy rates entered negative territory in 2015, retail term deposit rates, particularly for households, remained clustered around zero. This persistent rigidity reflects a combination of structural, behavioral, and institutional factors that effectively impose a lower bound on retail deposit rate adjustments. One key constraint is the availability of physical cash, which offers a zero nominal return and thus serves as a natural floor: if deposit rates turn negative, depositors can simply convert their balances into cash to avoid losses, limiting the willingness of both individuals and firms to accept negative remuneration on bank deposits. In addition, banks face considerable reputational and political costs when attempting to pass through negative rates to retail clients. Charging customers for holding their savings is generally perceived as unfair or exploitative, particularly in low-income segments, and may provoke public criticism or regulatory scrutiny.

Legal and operational constraints also play a role. In some jurisdictions, regulations either prohibit or discourage the application of negative interest to retail accounts, while legacy banking systems may lack the infrastructure to implement such pricing structures efficiently. Even where no formal prohibition exists, banks may still hesitate to act

unilaterally, as doing so risks losing depositors to competitors who maintain zero or positive rates. This competitive pressure reinforces the stickiness of deposit rates near zero and helps explain the breakdown in the pass-through observed during the negative interest rate regime.

As a result, the pass-through of negative policy rates to retail depositors was substantially muted, especially in countries like Portugal where deposit-based funding plays a central role in the banking model.

Given this context, the four sub-periods used in the regression analysis are defined as follows:

- Pre-crisis period (2003 - 2009): a phase of conventional monetary policy, characterized by symmetric inflation targeting, normal market functioning, and relatively strong pass-through from policy rates to deposit pricing.

- Sovereign debt and unconventional policy phase (2009 - 2015): following the global financial crisis and euro area debt crisis, the ECB deployed a range of non-standard monetary policy tools (e.g., LTROs, CBPP, forward guidance), leading to altered liquidity conditions and potentially weakened transmission through the deposit channel.

- Negative interest rate regime (2015 - 2022): Defined by the ECB's sustained use of negative nominal interest rates and expanded asset purchase programs. Retail deposit rates exhibited significant downward rigidity during this period, especially for households, due to the structural and behavioral constraints noted above.

- Post-pandemic tightening cycle (August 2022 onward): Triggered by rapidly rising inflation, the ECB began a historically rapid tightening cycle. Deposit rates, which had been stagnant for years, began to rise once again, offering a valuable test case for upward pass-through dynamics.

Each sub-period is treated independently in the estimation. By calculating deposit betas separately for each regime, the methodology captures structural variation in the monetary transmission process, allowing for meaningful comparisons of pass-through strength and asymmetry across distinct monetary environments.

For clarity, these sub-periods are also visually represented in the time-series Figure 3 in Chapter 4.1, with shaded regions marking the regime boundaries.

3.2.4 Contemporaneous Correlation Assessment

To assess the strength of the relationship between policy rates and retail deposit rates, this thesis computes the Pearson correlation coefficient between monthly changes in household term deposit rates and the corresponding month-to-month changes in the composite short-term policy rate. The coefficient is defined as:

$$\rho_i = \frac{Cov\left(\Delta r_{i,t}^{dep}, \Delta r_{i,t}^{ref}\right)}{\sigma\left(\Delta r_{i,t}^{dep}\right) \cdot \sigma\left(\Delta r_{i,t}^{ref}\right)} \tag{2}$$

Where:

- $\Delta r_{i,t}^{dep}$: Monthly change in the term deposit rate of country i at time t;

- $\Delta r_{i,t}^{ref}$: Monthly change in reference interest rate;

- $Cov(\cdot,\cdot)$: Covariance of the two series;

- $\sigma(\cdot)$: Standard deviation of each series.

This approach allows for a regime-specific assessment of the co-movement between policy and deposit rates. In line with standard interpretations, values of $\rho > 0.60$ are considered strong, 0.30 to 0.60 moderate, and below 0.30 are classified as weak.

3.2.5 Cross-Sectional Analysis of Deposit Beta Determinants

In addition to estimating country-specific deposit betas, this thesis investigates potential structural drivers of heterogeneity in deposit rate responsiveness across euro area countries. Specifically, a cross-sectional analysis is conducted to examine whether variation in banking market structure and deposit funding dependence helps explain differences in estimated deposit betas during the post-2022 tightening cycle.

Two country-level explanatory variables are employed:

- Banking Sector Concentration: Measured using the Herfindahl-Hirschman Index (HHI), which reflects the concentration of banking activity within a country.

Specifically, the HHI is calculated based on the market shares of credit institutions in terms of total banking sector assets, not deposit volumes. The data used adheres to the definition and reporting standards outlined in the ECB Guideline on monetary and financial statistics (ECB/2014/15). The index is computed by summing the squares of each institution's market share of total assets within the national banking system:

$$HHI_i = \sum_{j=1}^{N_i} s_{ij}^2 \tag{3}$$

Where s_{ij} denotes the share of assets held by institution j in country i, and N_i is the number of credit institutions operating in that country.

A higher HHI indicates greater market concentration, with 1 reflecting monopoly and values approaching 0, indicating perfect competition.

- Household Term Deposit Share: This metric is defined as the average ratio of household term deposits (with agreed maturity up to one year) to the total deposit liabilities of the banking sector for a given country over the period 2022 - 2025. It reflects the degree to which banks rely on retail deposit funding, specifically from the household sector, relative to other funding sources such as corporate deposits, interbank borrowing, or wholesale market instruments. The metric is constructed as:

$$HTDS_i = \frac{1}{T} \sum_{t=2022}^{2025} \left(\frac{HouseholdTermDeposits_{i,t}}{TotalDeposits_{i,t}} \right) \tag{4}$$

Where T is the number of monthly observations from 2022 to 2025.

The estimated deposit betas from each country are regressed on these two explanatory variables. The goal is not to establish causal relationships, but rather to assess whether observable structural characteristics correlate with cross-country variation in interest rate pass-through.

This complementary cross-sectional analysis helps contextualize the time-series results and offers insights into how institutional features of national banking systems may shape the effectiveness of monetary transmission through the deposit channel.

4. Results

This chapter presents the findings on the sensitivity of retail deposit rates to changes in short-term monetary policy benchmarks across Euro area countries. Building on the methodology outlined in Chapter 3, the analysis begins with a descriptive overview of interest rate dynamics across the full sample and over selected sub-periods. The visual inspection of these trends supports the identification of distinct monetary policy regimes, which leads to the subsequent segmentation.

The core of the chapter is structured around two complementary components: (i) a time-series analysis of deposit betas, estimated country by country, using first-difference regressions over the post-2022 tightening cycle, and (ii) a cross-sectional analysis that explores how structural features of national banking systems, such as market concentration and reliance on term deposit funding, relate to the observed degree of pass-through.

Before presenting regression results, the chapter examines the strength of the link between reference rates and deposit rates using contemporaneous Pearson correlation coefficients. This exercise serves to validate the assumption of short-run co-movement and informs the choice of the primary estimation period. In particular, the analysis reveals that the pass-through relationship was markedly weaker during the negative rate environment but appears to have re-emerged more strongly in the current post-liftoff phase, making this recent period the most relevant for robust inference.

The remainder of the chapter is organized as follows: Section 4.1 presents a descriptive analysis of interest rate behavior and discusses the identification of structural breaks. Section 4.2 reports the correlation estimates between reference and term deposit rates. Section 4.3 introduces the main regression results on deposit betas across countries. Section 4.4 explores the role of banking sector concentration, and Section 4.5 investigates the influence of term deposit funding dependence. Together, these results provide a comprehensive view of the functioning and heterogeneity of the deposit channel in the Euro area's monetary transmission mechanism.

4.1 Monetary Policy Regimes and the Context for Deposit Rate Behavior

To understand how deposit rates respond to changes in monetary policy, it is essential to situate the analysis within the broader context of the euro area's evolving policy environment. Over the past twenty years, the ECB has transitioned across different monetary systems, each with distinct implications for the transmission of policy signals to retail deposit rates.

Figure 3[1] presents the four regimes identified, with shaded areas indicating the breakpoints discussed in Section 3.2.3. The plot displays the trajectories of short-term reference rates (EONIA-Ester) alongside representative national household term deposit short-term rates, illustrating how the relationship between policy signals and bank liability pricing behavior has evolved.

These regimes can be broadly characterized as follows:

- Pre-crisis period (2005 - 2009): Characterized by conventional monetary policy and relatively straightforward transmission. Short-term rates were positive, the yield curve was generally upward sloping, and banks adjusted deposit pricing in line with changes in policy rates. Pass-through was relatively strong and symmetric.

- Sovereign debt and unconventional policy phase (2009 - 2015): Following the global financial crisis and the escalation of sovereign risk in the euro area, the ECB introduced several unconventional measures that altered liquidity conditions and weakened the traditional interest rate channel. Term deposit rates became less sensitive to short-term benchmarks, as broader policy uncertainty and excess liquidity muted the incentive to reprice liabilities in countries less afflicted by the Government Debt Crisis, while increasing the competition for deposits in the remaining countries.

- Negative interest rate regime (2015 - 2022): This period was marked by sustained negative rates on ECB facilities and an expanded reliance on forward guidance and quantitative easing. Despite falling policy benchmarks, retail deposit rates, especially for households, remained clustered near zero. Downward stickiness,

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[1] For illustrative purposes only a sample of countries are represented in the graph.

driven by structural constraints such as the zero lower bound, reputational concerns, and competition from cash, became a defining feature of the deposit channel during this phase.

- Post-pandemic tightening cycle (2022 - 2025): With inflation surging across the euro area, the ECB launched a historically rapid tightening cycle. Policy rates rose sharply from negative territory and the relationship between reference rates and deposit pricing was reactivated. Banks faced renewed pressure to raise deposit rates to retain funding, re-establishing the link between policy signals and customer rates.

By structuring the analysis around these distinct periods, the results that follow can more effectively capture shifts in the strength, symmetry, and timing of deposit rate responses. In particular, the contrast between the negative interest rate regime and the post-2022 tightening phase offers a valuable test of how structural constraints give way when policy normalization resumes.
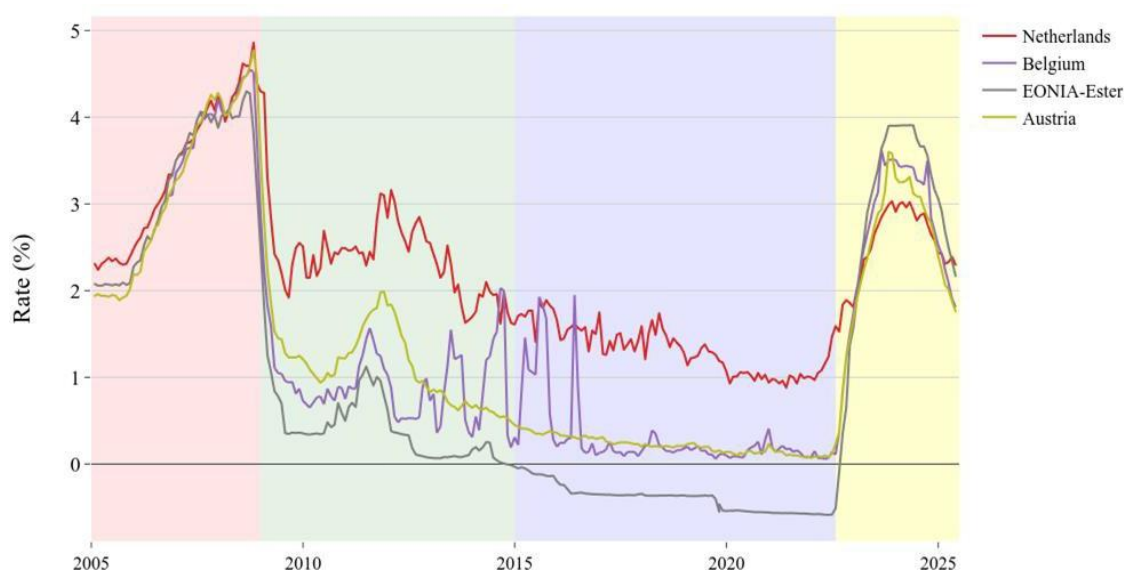
Figure 3 - Cross-country comparison of selected countries' household term deposit rates and reference rate with shaded regions marking distinct monetary policy phases: pre-crisis tightening (orange), post-crisis low-rate environment (green), negative rate regime (blue), and post-2022 tightening (yellow).

The next section begins by quantifying the strength of the relationship between short-term reference rates and household term deposit rates over time, using a contemporaneous

correlation analysis. This provides a foundation for the regression-based estimates of deposit betas presented later in the chapter.

4.2 Correlation Analysis: Deposit Rates and Short-Term Market Rates

This section's analysis focuses on month-on-month changes in up-to-1-year household term deposit rates across Eurozone countries, to determine their connection with monetary policy changes during different periods.

4.2.1. Pre-Crisis Period (2005 - 2009)

In the pre-crisis period, correlations were generally strong and positive. Countries with the strongest correlation, namely Belgium (0.81), Germany (0.79), Slovakia (0.78), and Luxembourg (0,76) stood out with near-contemporaneous correlations exceeding 0.75, as seen in Figure 4, suggesting efficient and timely transmission in those cases. These results are consistent with more competitive deposit markets and efficient transmission mechanisms.

Across all countries in this period, the average of correlations was approximately 0.5, indicating a moderately strong overall link between policy rates and deposit rates during the pre-crisis environment.

In contrast, several Southern and Eastern European countries, including Greece, Cyprus, and Estonia, exhibited weak or even negative correlations These patterns may reflect structural limitations in banking systems, lower competitions, or greater pricing inertia.

For Cyprus, the distinctly low correlation may also reflect the fact that the country only joined the Euro area in 2008, meaning it was not subject to the full monetary transmission of the ECB during much of this early sample window.
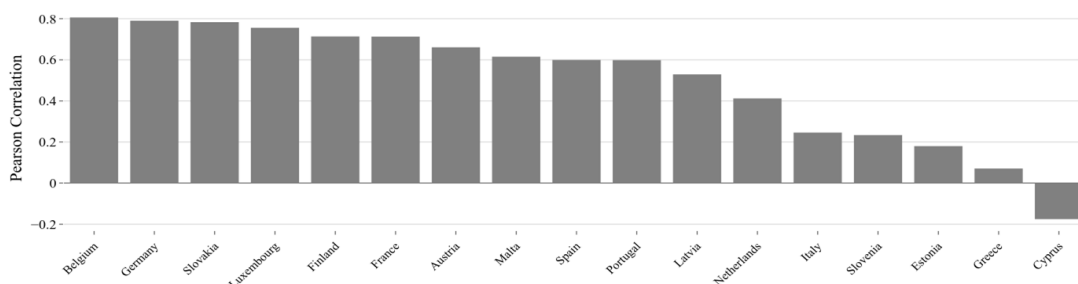
Figure 4 - Pearson correlation between EONIA-Ester and household term deposit rates' month-on-month changes across euro area countries in the same period. The average correlation is ~ 0.52.

4.2.2. Sovereign Debt Crisis and Unconventional Policy Phase (2009 - 2015)

During this period, the average peak correlation declined to around 0.42. This reflects a weakening of pass-through effectiveness, coinciding with the ECB's shift toward non-standard monetary policy measures, such as full allotment operations and longer-term refinancing operations (LTROs), which aimed to stabilize interbank markets but may have blurred the transmission to retail deposit pricing.

In addition, several peripheral economies that were affected by the sovereign debt crisis also faced heightened financial stability concerns, forcing banks in those countries to adopt more aggressive retail funding strategies. These domestic pressures likely weakened the conventional interest rate channel, leading to more idiosyncratic responses.

For instance, while Austria (0.79), Finland (0.75) and Estonia (0.70) continued to exhibit relatively strong and timely pass-through, several other countries, including Latvia (0.14), Lithuania (-0.04) and Croatia (-0.23) showed substantially lower or even negative contemporaneous correlations (see Figure 5). Notably, Lithuania and Croatia's anomalous correlations may be explained by their late euro adoption in 2015 and 2023, respectively, which limits the representativeness of earlier data.
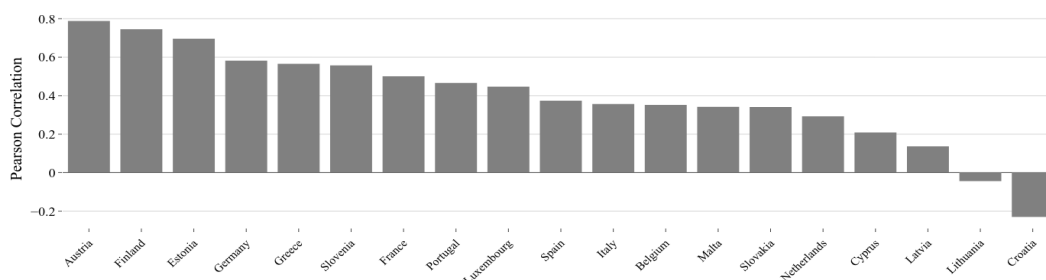
Figure 5 - Pearson correlation between EONIA-Ester and household term deposit rates' month-on-month change across euro area countries in the same period. The average correlation is ~ 0.42.

4.2.3. Negative Interest Rate Regime (2015 - 2022)

The correlation between deposit and benchmark rates reached its lowest during the negative rate period, with an average peak correlation of just 0.13, indicating very weak co-movement between policy rates and deposit rates across countries.

One particularly notable case is Latvia, which joined the euro area in 2014 and underwent substantial restructuring in its banking sector during the years that followed. The legacy of non-resident deposit inflows and subsequent regulatory tightening may have distorted the typical relationship between ECB policy rates and local deposit pricing, contributing to the strongly negative correlation observed.

This muted responsiveness is consistent with the presence of the effective lower bound on deposit rates. Banks, reluctant or unable to pass on negative rates to retail clients, kept deposit rates close to zero despite persistent policy loosening. Factors contributing to this rigidity include reputational risks, customer aversion to negative returns, and legal or operational constraints in implementing sub-zero pricing, namely in retail deposits.
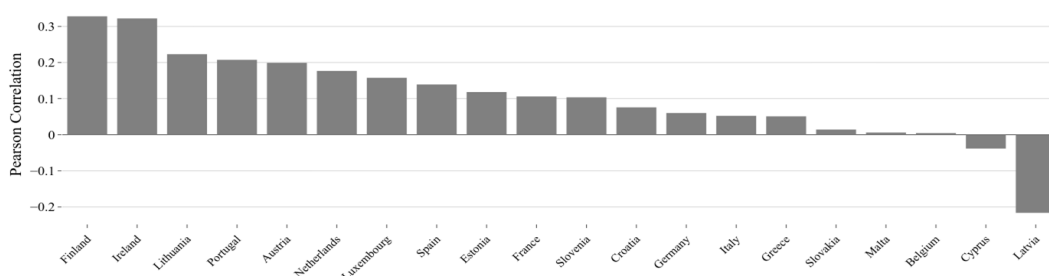

Figure 6 - Pearson correlation between EONIA-Ester and household term deposit rates' month-on-month across euro area countries in the same period. The average correlation is ~ 0.13.

4.2.4. Post-Liftoff Tightening Cycle (2022 - 2025)

With the ECB's exit from the ZLB environment, deposit-rate responsiveness improved significantly. The average peak correlation rose to 0.63.

France (0.92), Germany (0.90), Slovakia (0.89), and Luxembourg (0.85) demonstrated the strongest correlations (exceeding 0.85), consistent with quicker adjustment mechanisms or more competitive liability-side dynamics.
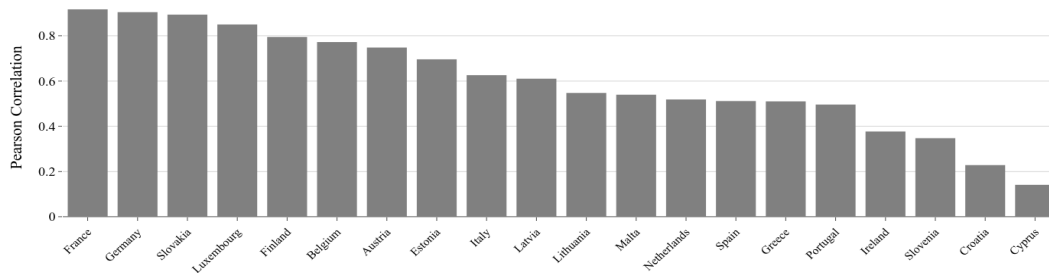

Figure 7 - Pearson correlation between EONIA-Ester and household term deposit rates' month-on-month change across euro area countries in the same period. The average correlation is ~ 0.63.

This correlation trajectory captures the evolving effectiveness of the monetary transmission mechanism in the Eurozone:

- During crisis and unconventional policy regimes, this link is weakened by financial fragmentation, policy uncertainty, and the diminishing informativeness of short-term benchmarks.

- Under the negative rate environment, transmission is severely impaired due to structural constraints and behavioral boundaries.

- Post-2022, correlations rebound as monetary tightening restores the role of interest rates as effective policy tools.

These results not only validate the periodization used throughout the thesis but also underscore the importance of regime-sensitive modeling in understanding deposit-rate dynamics.

4.3 Beta Estimation Results: Deposit Rate Sensitivity Post-2022

Following the correlation analysis, this section turns to the estimation of deposit betas during the most recent monetary tightening cycle, from August 2022 to July 2025. The analysis focuses on 1-year household term deposit rates' month-on-month changes, using month-on-month changes in the EONIA-Ester spread as the explanatory variable. These

regressions yield country-specific beta coefficients, reflecting the sensitivity of deposit rates to monetary policy changes, alongside corresponding R^2 values that capture model fit and P-values indicating statistical significance.

The results reveal a wide dispersion in estimated deposit betas across the Eurozone. As illustrated in Figure 8, which plots the variation in deposit rates against changes in the reference rate, the slope of the fitted lines already suggests cross-country heterogeneity in the strength of transmission.
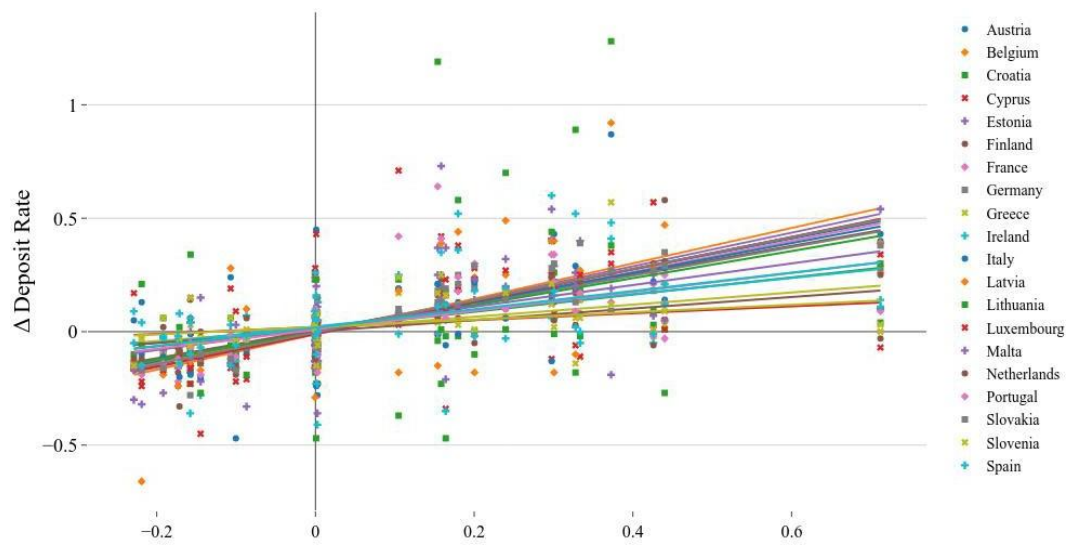

Figure 8 - Country-level scatter plots and trend lines illustrating the relationship between month-on-month changes in short-term reference rates and term deposit rates from August 2022 to July 2025.

Figure 9 presents the estimated betas sorted by country, showing values ranging from 0.78 in Belgium to just 0.15 in Cyprus.
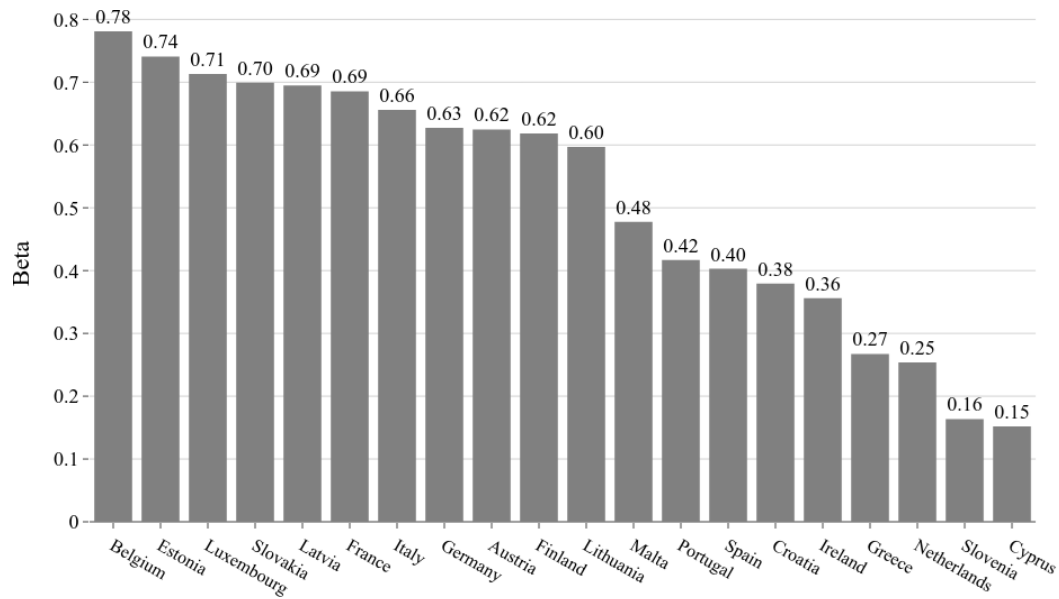
Figure 9 - Estimated deposit betas by country, measuring the pass-through of changes in the EONIA-Ester benchmark rate to 1-year deposit rates between August 2022 and July 2025.

4.3.1 High Beta Countries

At the top of the distribution are countries such as Belgium (β = 0.78, R^2 = 0.60, P-value = 9.11e-08), Estonia (β = 0.74, R^2 = 0.48, P-value = 4.93e-06), Luxembourg (β = 0.71, R^2 = 0.72, P-value = 2.02e-10), and Slovakia (β = 0.70, R^2 = 0.80, P-value =1.20e-12). These results are statistically significant and reflect strong monetary pass-through and efficient pricing adjustment. High beta values (defined here as those with betas greater than 0.5), combined with relatively high R^2 statistics and low P-values (statistically significant), suggest well-functioning deposit markets where policy signals are quickly internalized. A significant number of countries fall in the middle-to-high range of the distribution. For example, Germany (β = 0.63, R^2 = 0.82, P-value = 2.31e-13), Austria (β = 0.62, R^2 = 0.56, P-value = 3.73e-07), and Finland (β = 0.62, R^2 = 0.63, P-value = 1.98e-08) demonstrate moderate responsiveness, with strong explanatory power from the reference rate.

4.3.2 Low Beta Countries

Southern economies like Portugal ($\beta = 0.42$, $R^2 = 0.25$, P-value = 2.86e-03) and Spain ($\beta = 0.40$, $R^2 = 0.26$, P-value = 2.02e-03) show slower and less systematic deposit rate adjustments. In Portugal's case, the relatively low R^2 implies that policy changes are not consistently translated into deposit pricing, potentially due to legacy deposit bases, lower product switching, or dominant incumbents that can afford to delay adjustment. While not among the most responsive, Portugal's beta remains above the Eurozone median, indicating that ECB signals do matter, but operate more diffusely.

At the lower end of the spectrum, countries such as the Netherlands ($\beta = 0.25$, $R^2 = 0.27$, P-value = 1.69e-03), Slovenia ($\beta = 0.16$, $R^2 = 0.12$, P-value = 4.42e-02) and especially Cyprus ($\beta = 0.15$, $R^2 = 0.02$, P-value = 4.28e-01), display weak or insignificant pass-through. These low betas could reflect structural issues like oligopolistic banking sectors (as assessed in the following section), limited depositor mobility, or a stronger reliance on non-deposit funding sources. In the case of Cyprus, the estimated beta is not statistically significant (P-value = 0.428), reinforcing the interpretation that deposit rate adjustments are essentially disconnected from policy shifts. Similarly, Croatia ($\beta = 0.38$, $R^2 = 0.05$, P-value ≈ 0.19) and Slovenia ($\beta = 0.16$, $R^2 = 0.12$, P-value ≈ 0.04) reflect low explanatory power and weaker responsiveness. For these reasons, namely lack of statistical significance for beta, these countries will be excluded from the analysis that follows.

Taken together, these findings are in line with the perspective that, even in a regime of restored monetary transmission, national banking structures and depositor behavior continue to shape the extent of pass-through. This variation underscores the importance of analyzing deposit betas at country level. It also reinforces the need for tailored policy communication and regulatory awareness, especially in economies where sluggish deposit adjustment may weaken the effectiveness of rate-based monetary policy.

4.4 Market Concentration and Deposit Rate Responsiveness

To deepen the understanding of cross-country variation in deposit rate pass-through, this section explores the role of banking sector concentration. Specifically, it tests whether differences in competitive structure, measured using the average HHI of household term deposit share of total deposit balance sheet from 2022 to 2025, help explain the heterogeneity observed in deposit rate betas across Eurozone countries.

The theoretical expectation is straightforward: more concentrated banking systems (higher HHI) tend to be less competitive, enabling banks to adjust deposit rates less aggressively in response to changes in monetary policy. Conversely, in more fragmented systems (lower HHI), competitive pressures among banks typically enhance the responsiveness of deposit pricing.

Figure 10 below displays average HHIs across countries in the sample. Values range from as low as 0.03 in Germany and Luxembourg, indicating a highly competitive market structure, to over 0.25 in Cyprus, suggesting a much higher degree of concentration - less competition.
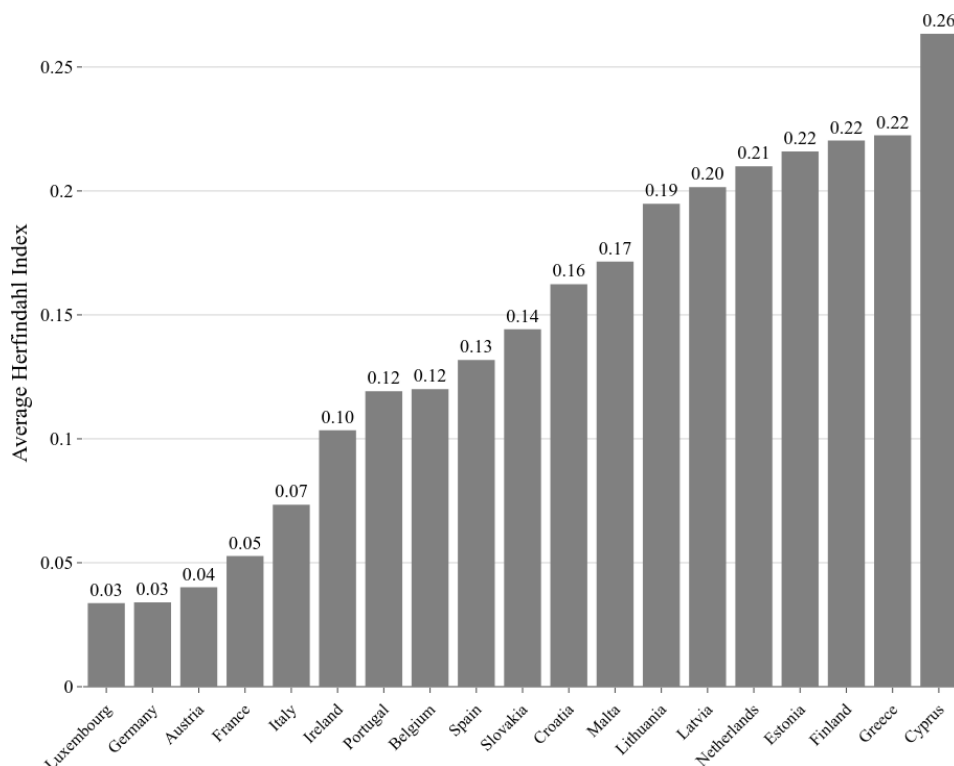
Figure 10 - Average Herfindahl-Hirschman Index (HHI) by country between 2022 and 2025, capturing the level of concentration in national banking sectors.

Theoretically, higher market competition, typically proxied by lower HHI values, is expected to enhance the transmission of monetary policy through retail interest rates. This relationship is grounded in the notion that in more competitive banking environments, banks face stronger incentives to adjust deposit rates in response to policy changes to retain and attract funding. Accordingly, one would anticipate an inverse relationship between term deposit betas and market concentration.
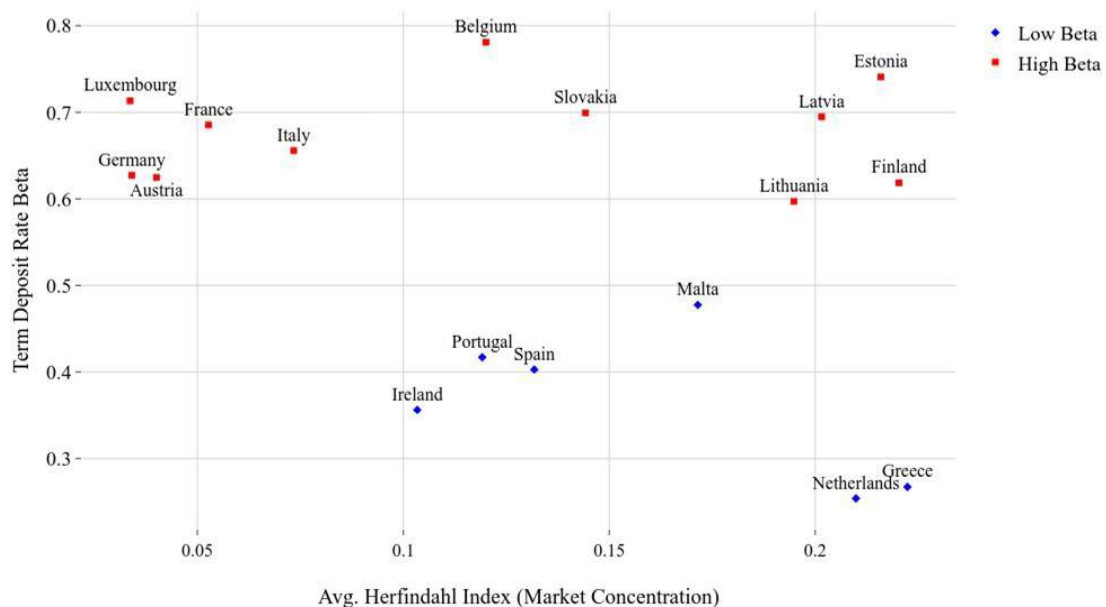
Figure 11 - Relationship between deposit rate betas and average Herfindahl-Hirschman Index (HHI) values across countries (2022–2025).

In this analysis, however, the results do not confirm a statistically significant or consistent inverse relationship between household term deposit rate betas and HHI indices across Eurozone countries. The relationship is non-linear, and with only 17 country-level observations available, the statistical power is inherently limited. Nonetheless, as seen in Figure 11, important behavioral distinctions emerge when categorizing countries into high and low beta groups, which may point toward underlying structural differences in how monetary policy is transmitted through the banking sector.

Among the high beta countries (defined here as those with betas greater than 0.5), the HHI ranges widely, from approximately (0.03) to (0.22), yet the deposit betas remain relatively clustered within a narrower band of beta values. This suggests that among countries with strong deposit rate responsiveness, market concentration is not a primary differentiating factor.

In contrast, within the low beta group (betas below 0.5), a more distinct pattern emerges. Countries with moderately low betas tend to exhibit lower HHI, around (0.12), indicating more competitive markets. However, as betas decline further, HHI rise, approaching levels near (0.21). This suggests a possible non-linear or threshold effect, where at some level of market concentration, the pass-through mechanism weakens more sharply. One exception is Malta, which, despite being in the low beta group, shows both a relatively higher beta within this cluster and an intermediate HHI of approximately (0.17), positioned between the low-concentration/low-beta and high-concentration/very-low-beta subgroups.

These findings imply that while market concentration alone does not linearly explain beta variation, it may interact with other structural or behavioral factors to shape country-level transmission dynamics. Moreover, the clear stratification observed between high and low beta groups, in terms of both betas and concentration levels, warrants further investigation.

4.5 Deposit Funding Dependence and Deposit Rate Responsiveness

To further investigate the structural drivers of variation in interest rate pass-through, this section examines whether differences in banks' reliance on household deposit funding help explain the heterogeneity in deposit betas observed during the post-liftoff tightening cycle (2022 - 2025).

The theoretical relationship between deposit reliance and pass-through is not clear-cut. On the one hand, banks with a higher share of household deposits in their liability

structure may be more sensitive to changes in policy rates due to their greater exposure to funding cost dynamics. In such cases, we would expect more responsive pricing of deposit products in order to retain retail funding as market rates rise. On the other hand, high deposit reliance could reflect customer stickiness or banks' market power over a relatively inelastic depositor base, which could reduce the urgency of adjusting deposit rates and lead to more sluggish pass-through.

Figure 12 below shows the average deposit share, defined as share of household term deposits (with agreed maturity up to 1 year) in relation to the total volume of deposits on financial institutions' balance sheets, across Eurozone countries between 2022 and 2025.

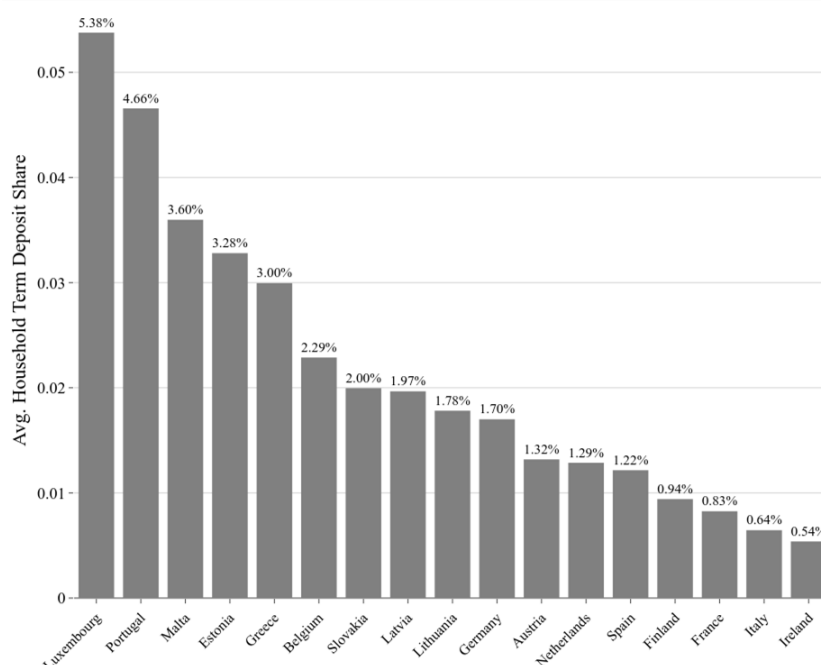Figure 12 - Average deposit share by country between 2022 and 2025, measured as the ratio of household term deposits to total bank deposits.

To test whether deposit funding dependence is systematically related to deposit rate responsiveness, a simple cross-sectional regression is estimated using deposit betas as the dependent variable and average deposit share as the explanatory variable. The results are presented in Figure 13.
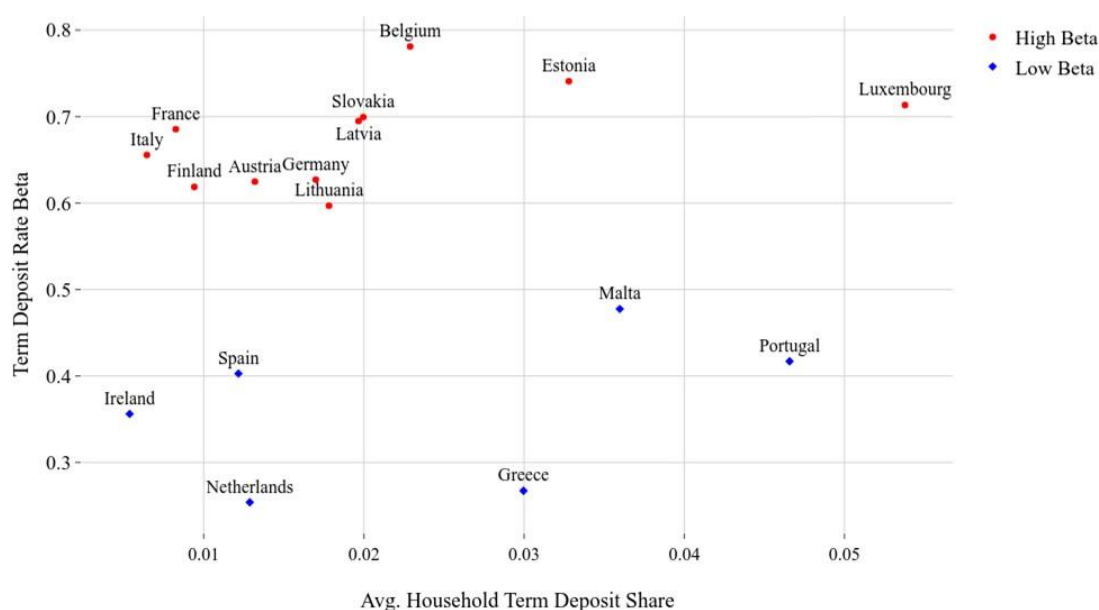
Figure 13 - Relationship between deposit rate betas and average household term deposit share of deposit balance across countries between 2022 and 2025.

In a complementary analysis, the share of household term deposits (with agreed maturity up to 1 year) in relation to the total volume of deposits on financial institutions' balance sheets was examined to assess whether it helps explain differences in term deposit rate betas across countries. Specifically, the average ratio of household term deposits to total deposit liabilities was computed for each country over the study period and compared against the previously estimated beta coefficients.

When plotting deposit share against deposit beta, a compelling pattern emerges: countries previously identified as high-beta and low-beta clusters appear once again to form distinct groups. However, in contrast to the analysis involving market concentration (HHI), here both clusters appear to exhibit internally consistent behavior, that is, within each group, there is a positive association between deposit share and beta. Countries with higher proportions of term deposits relative to their banking sector's balance sheets tend to exhibit higher transmission (i.e., higher beta values).

While the global relationship between deposit share and beta remains statistically weak due to the limited number of observations (N = 17), the internal coherence of each group suggests an underlying mechanism may be at play. Notably, within the low-beta cluster, the country with the highest deposit share, Portugal, also ranks among the highest in beta for that group. Similarly, the top deposit share country within the high-beta cluster, Luxembourg, also ranks toward the top in terms of beta, although the extremes between share and beta do not coincide exactly in either cluster.

This intra-group similarity in behavior could indicate that deposit share plays a role in shaping the sensitivity of deposit rates to policy rate changes, possibly by influencing how responsive banks need to be to monetary signals in order to attract or retain household funding. Both high- and low-beta countries exhibit this trend, but in separate and disjointed spaces of the beta spectrum, supports the notion that these clusters may be underpinned by structural, institutional, or behavioral factors not captured by simple linear models.

Given the relatively small number of data points in this study, we refrain from making strong statistical claims. However, the consistent patterns within clusters suggest that expanding the analysis to a larger set of countries, possibly including non-euro area members or countries outside the European Union, could provide more statistical power and reveal whether a global linear relationship might emerge when more variation is introduced.

This avenue could be a promising target for further research, particularly to test whether the observed cluster-dependent linearity persists across different monetary regimes, banking systems, or degrees of financial development.

5. CONCLUSION

This thesis has explored the dynamics of interest rate pass-through to retail deposit rates in the Euro Area, with a particular focus on the post-2022 tightening cycle. The analysis proceeds in three stages: correlation diagnostics across distinct monetary regimes, estimation of deposit betas at the country level, and structural regressions linking beta heterogeneity to banking market characteristics.

The initial correlation analysis confirms that the responsiveness of deposit rates is highly contingent on the prevailing monetary and financial regime. In conventional periods, deposit rates tend to co-move with policy rates, albeit with typical lags and asymmetries. However, in crisis periods, and especially under the constraints of the zero lower bound (ZLB) or negative interest rate policies (NIRP), this transmission weakens substantially. The effectiveness of the short-term rate as a policy signal erodes, particularly in retail banking markets where nominal rigidities and behavioral frictions are most pronounced.

Crucially, the analysis identifies the post-2022 monetary tightening cycle as the period of strongest interest rate correlation since 2005. This period is especially salient for two reasons. First, it occurs after a prolonged episode of unconventional monetary policy, marking a regime shift in both market expectations and institutional behavior. Second, unlike the pre-crisis years, it unfolds within the context of a matured regulatory and supervisory framework, including banking union components, macro-prudential instruments, and post-crisis capital and liquidity standards. These institutional distinctions make the post-2022 period the most relevant for evaluating current and forward-looking monetary transmission in the Euro Area.

On this basis, the thesis focuses its empirical analysis on the post-2022 period, estimating country-specific deposit betas to quantify interest rate pass-through. The findings confirm that while the average level of beta has risen compared to the ZLB period, significant cross-country heterogeneity persists. Countries such as Belgium, Estonia, Luxembourg, and Slovakia exhibit relatively high betas (above 0.70), suggesting a strong and immediate pass-through of ECB policy rates to deposit remuneration. In

contrast, countries like Cyprus, Slovenia, and the Netherlands display weak responsiveness, with betas well below 0.30. These differences underscore the uneven nature of monetary transmission across national banking systems, despite the uniformity of the ECB's policy stance.

For Portugal, the beta is estimated at 0.417, placing it in the lower half of the distribution. This is broadly in line with Spain (0.403) and consistent with regional patterns of deposit rate inertia and competitive dynamics. The finding reinforces the importance of institutional features such as market contestability, digitalization of banking services, and consumer mobility, all of which shape how policy signals filter through the financial system at the national level.

The final stage of analysis turns to structural factors potentially driving cross-country variation in deposit betas. Two candidate mechanisms are examined: banking market concentration - proxied by the average HHI - and the composition of bank funding, measured by the share of household term deposits in total bank deposit liabilities.

In contrast to theoretical expectations and prior empirical findings, the relationship between market concentration and deposit beta does not exhibit a clear or statistically significant pattern in this sample. Nevertheless, a visual inspection of the data reveals an interesting segmentation: low-beta countries tend to cluster into subgroups that differ in their HHI, while high-beta countries exhibit a wider spread in concentration levels despite relatively similar beta values. This divergence in internal structure suggests that concentration may still influence monetary transmission dynamics, but perhaps in non-linear or threshold-dependent ways that require more granular data to uncover.

Similarly, a parallel analysis using the share of household term deposits in banks' balance sheets, interpreted as a proxy for deposit funding reliance, also fails to produce a statistically significant linear relationship with deposit betas. However, this variable appears to separate high- and low-beta countries into internally consistent groups, each of which shows a positive intra-cluster association between deposit share and beta. Within both the high- and low-beta clusters, countries with greater deposit shares tend to exhibit higher betas, though the relationship is only visible when analyzed separately by group.

This suggests a potential mechanism through which deposit structure may influence rate responsiveness, albeit in a clustered or segmented fashion rather than uniformly across the full sample.

Taken together, HHI and term deposit share do not yield statistically significant global relationships, the emergence of behaviorally distinct clusters offers a promising direction for future work. These clusters may reflect deeper institutional or structural heterogeneity within the euro area banking systems - such as differences in competition policy, depositor behavior, or banking models - that modulate the transmission of monetary policy. Expanding the dataset to include more countries or transitioning to bank-level panel data could improve identification and help test whether these patterns persist with greater variation and statistical power.

Collectively, these findings contribute to a more nuanced understanding of how interest rate signals are transmitted through the Euro Area's banking system. They highlight that structural banking features, not just monetary policy stance, condition the strength and symmetry of policy pass-through. This has direct implications for the design of both monetary and regulatory policy, especially in a heterogeneous currency union.

For the ECB, the persistence of cross-country differences in deposit responsiveness challenges the presumption of uniform transmission and raises questions about potential distributional effects of policy. For national policymakers and supervisors, the results underscore the relevance of domestic financial structures, even in an integrated monetary framework.

Finally, this thesis suggests that future research and policymaking should move beyond simple averages and embrace disaggregated, structural approaches to monetary transmission, recognizing the microeconomic frictions that shape macroeconomic outcomes.

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