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THE IMPACT OF EUROPEAN CENTRAL BANK MONETARY POLICY ON EUROZONE STOCK MARKET PERFORMANCE

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Abstract

This work project assesses the impact of European Central Bank monetary policy on Eurozone stock markets from 2007 to 2024, focusing on differences between core and peripheral countries. Using panel data regressions, it explores the effects of conventional and unconventional measures during key crises, including the Global Financial Crisis, the Sovereign Debt Crisis, the COVID-19 pandemic, and the invasion of Russia in Ukraine. The analysis highlights how inflation, industrial production, economic sentiment, and financial volatility significantly mediate policy impacts. Findings reveal heterogeneous market responses, underscoring the need for tailored monetary interventions to ensure effective policy transmission in diverse economic contexts.

Keywords: European Central Bank, Monetary Policy, Expansionary Policies, Eurozone, Stock Market, Global Financial Crisis, Sovereign Debt Crisis, COVID-19 pandemic, invasion of Russia in Ukraine

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1 Introduction

Monetary policy is central to stabilizing the Eurozone economy, with the European Central Bank (ECB) playing a critical role in maintaining price stability and fostering sustainable growth. Since its establishment in 1999, the ECB has navigated significant and unexpected crises, including the Global Financial Crisis (GFC), the Sovereign Debt Crisis (SDC), the COVID-19 pandemic, and the invasion of Russia in Ukraine. These challenges have tested the limits of conventional monetary interventions, prompting the ECB to adjust its strategies and implement unconventional policies to address uncertainties. Unlike the GFC and SDC, which stemmed from systemic vulnerabilities within the economic system, the COVID-19 pandemic represented an exogenous shock outside the financial sector. This unprecedented event destabilized global economic activity through simultaneous supply and demand shocks. Lockdowns and health concerns curtailed production, disrupted supply chains, and limited workforce participation, while job losses and heightened uncertainty suppressed consumer spending and altered demand patterns. These disruptions were further aggravated by the inflationary pressures observed in the Eurozone, which peaked at 10.60% in October 2022 (Eurostat 2022). Initially driven by pandemic-induced supply chain bottlenecks, inflation was significantly exacerbated by Russia's invasion of Ukraine, which destabilized global energy and food markets, further straining economic recovery efforts. In response to these compounding crises, the ECB deployed targeted monetary measures, including interest rate adjustments, liquidity injections, and unconventional tools, to stabilize financial markets, curb inflation, and support the Eurozone's economic resilience. This complex economic landscape raises several critical questions: What does the empirical evidence reveal about how Eurozone stock markets have responded to ECB monetary policy interventions during these crises? Do these effects differ between core and peripheral countries, reflecting structural disparities within the Eurozone? To what extent have country-specific factors, such as inflation or industrial production, influenced

monetary policy transmission to financial markets? This work project addresses these questions by combining a thorough review of empirical findings with a panel regression analysis. Specifically, the study examines the interaction between ECB expansionary monetary policy and stock market performance, focusing on the structural differences across core and peripheral Eurozone economies. Using a panel regression model and data from 10 Eurozone countries spanning January 2007 to August 2024, the analysis incorporates 173 ECB monetary policy announcements and controls for country-specific macroeconomic variables such as inflation, industrial production, and economic sentiment. By covering a period marked by significant economic disruptions – including the crises discussed earlier – this research aims to provide valuable insights into the dynamics of monetary policy transmission and its implications for financial markets across the Eurozone. This study's main finding is that ECB expansionary monetary policy, conventional and unconventional, was more effective during the GFC and SDC than during the COVID-19 pandemic and the invasion of Russia in Ukraine for the Eurozone countries in analysis. Conventional tools proved less effective during the latter period due to persistently low interest rates during the pandemic and inflationary pressures during the invasion of Russia in Ukraine that required a sharp shift to contractionary policies. While crucial in mitigating financial distress, unconventional measures had mixed outcomes during this time, as stock markets often perceived them as inadequate responses rather than supportive solutions.

The study proceeds as follows. Section "Literature Review" explores the conventional and unconventional tools employed by the ECB over the past 2 decades and examines evidence from past empirical studies on the theoretical linkages between monetary policy and financial markets. Section "Empirical Approach" describes the data and methodology used in the analysis. Section "Results and Discussion" presents the main findings, followed by Section "Robustness Tests and Limitations", which evaluates the study's methodological constraints and potential

biases. Finally, Section "Summary and Conclusions" highlights the study's key results and broader implications and proposes avenues for future research.

2 Literature Review

2.1 Price Stability and Its Role in ECB Monetary Policy

The European Central Bank, the central bank for the 19 European Union countries that use the euro, prioritizes price stability as a cornerstone of long-term economic prosperity. According to the ECB (2024), "Price stability is the best contribution that monetary policy can make to economic growth". While the central bank cannot directly stimulate economic growth by manipulating the money supply or setting short-term interest rates in ways inconsistent with price stability, it plays a crucial role in indirectly fostering growth through its influence on inflation rates. At its establishment in 1999, the ECB Governing Council held policy meetings twice a month, while press conferences took place only once a month during the first meeting. However, beginning in November 2001, only 1 monthly session was designated as a policy meeting, scheduled for the first Thursday of each month and followed by a press conference. Since January 2015 and continuing to the present day, the frequency of monetary policy meetings has changed to a 6-week cycle (Altavilla et al. 2019). Hence, the Governing Council meets every 6 weeks to assess and determine the appropriate monetary policy stance[1]. Its goal is to maintain Eurozone inflation at a low, stable, and predictable rate, with a target of 2% in the medium term (ECB 2024). However, achieving this target becomes particularly challenging during severe economic downturns, which typically require substantial monetary policy accommodation through significant cuts in policy interest rates. These cuts often approach the zero lower bound (ZLB), at which nominal interest rates cannot be

[1] The Governing Council bases its decisions on an integrated analytical framework that includes all relevant factors, building on 2 interdependent analyses: the economic analysis and the monetary and financial analysis (ECB 2024).

further reduced. At the ZLB, central banks face limitations in their ability to stimulate lending and demand through traditional rate reductions, leading to potential distortions in financial markets (Altavilla et al. 2020). The ECB defines inflation as the broad increase in the prices of goods and services bought for consumption (ECB 2024). The Harmonised Index of Consumer Prices (HICP) plays a crucial role, providing a standardized inflation measure across the Eurozone. As Cecchetti and Wynne (2003) explain, the HICP represents the average price change consumers pay for a specific, regularly updated basket of goods and services over time. This index, compiled by Eurostat in collaboration with national statistical institutes from EU Member States, is based on prices[2] for a representative basket of goods and services that reflect the consumption patterns of private individuals in each country. Aggregating these national data produces an average inflation rate for the Eurozone, a critical factor in guiding monetary policy decisions. Indicators of inflation expectations are another essential component when determining the appropriate monetary policy stance. These expectations significantly influence the pricing of financial instruments, thereby affecting the transmission of monetary policy measures (Böninghausen et al. 2018). More importantly, inflation expectations are monitored to validate the Eurosystem's inflation projections, providing crucial reassurance about the accuracy of the ECB's forecasts and assessing public confidence in the ECB's ability to maintain long-term price stability. Anchoring these expectations is essential for preventing destabilizing wage-price spirals, particularly during significant economic shocks. The ECB's commitment to promoting economic stability is evident in its use of inflation-linked derivatives and its adoption of a data-driven approach that balances short-term fluctuations with long-term stability (Visco 2023; Gimeno and Ibáñez 2018). The central bank employs a symmetric inflation-targeting approach to avoid excessive inflation and

[2] Prices are collected from different places, like stores, restaurants and online shops, to get a broad overview of how prices evolve for different goods and services (ECB 2024).

deflation[3], addressing upward and downward deviations from the 2% target with equal importance. Deflation remains a concern, as it can be more damaging than inflation. To mitigate the risks of prolonged negative deviations, the ECB may allow inflation to temporarily exceed the 2% target (Grauwe and Ji 2024). This flexible strategy helps safeguard the euro's purchasing power, ensuring individuals can maintain their living standards over time. Additionally, well-balanced and communicated decisions foster confidence in the financial system by influencing borrowing costs, savings rates, and asset prices. This, in turn, supports informed financial decision-making regarding saving, spending, and investing, ultimately contributing to job creation and enhancing overall economic well-being (Filbien and Labondance 2013). A credible and robust monetary policy framework is crucial in reducing inflation persistence across the Eurozone, promoting long-term economic stability, and highlighting the importance of maintaining a reliable and proactive monetary authority (Skare et al. 2023).

2.2 ECB Monetary Policy Instruments

2.2.1 Conventional Monetary Policy

In the early 2000s, before the GFC and SDC, the ECB primarily relied on conventional monetary tools to stabilize the Eurozone economy (Drakos and Kouretas 2015). These tools revolved around 3 key interest rates: the Main Refinancing Operations Rate (MRO), the Marginal Lending Facility Rate (MLF), and the Deposit Facility Rate (DF). Among these, the MRO was particularly significant, representing the weekly borrowing rate for commercial banks to obtain funds from the ECB in exchange for sufficient collateral. Changes to the MRO rate influenced banks' borrowing costs, directly impacting credit availability for businesses and consumers, making it central to

[3] A broad-based and lasting decline in prices, with negative effects on economic growth (ECB 2014).

monetary policy. Specifically, when the ECB lowers the MRO rate – an expansionary conventional monetary policy – borrowing becomes cheaper, encouraging banks to lend more and stimulating economic activity while raising it – a contractionary conventional monetary policy – makes borrowing more expensive and helps control inflation by tightening credit conditions (Grauwe et al. 2024). The MLF rate, which applies to overnight loans from the ECB, serves as a backup for banks needing quick access to funds and establish the upper limit for overnight interbank market rates, thereby promoting stability (Grauwe et al. 2024). Conversely, the DF rate is applied to overnight deposits, and is the lower limit for interbank rates. A negative DF rate discouraged banks from holding idle reserves at the ECB, motivating them to lend excess funds instead. These 3 rates created an interest rate corridor, with the MRO rate as the central reference point. This corridor enabled the ECB to effectively steer monetary policy by managing the interplay between the DF and MLF rates[4] (Grauwe et al. 2024). In response to the challenges of the GFC and SDC during the late 2000s and early 2010s, the ECB implemented measures to enhance bank funding conditions, encourage business lending, and support overall financial stability – a key strategy in this effort involved reducing the MRO interest rate to historically low levels. The ECB's unwavering commitment to maintaining an accommodative monetary policy was particularly evident in the final quarter of 2008 when it progressively lowered the MRO rate from 4.25% to 1.00% in the second quarter of 2009 (see Figure 1). The low-interest rate environment persisted until July 2011, when the MRO rate gradually increased to 1.50% before dropping to the zero-bound level in subsequent years. This period marked the establishment of a prolonged low-interest rate environment. In 2020, the COVID-19 pandemic emerged as a global crisis, significantly impacting economies worldwide. While low interest rates, like those observed before the

[4] For instance, to reduce the money supply and curb inflation, the ECB would raise these rates, tightening liquidity conditions. Conversely, lowering the rates encouraged borrowing and economic activity, thereby stimulating the economy (Grauwe et al. 2024).

pandemic, can indirectly boost banking profits by promoting economic growth, increasing credit demand, consumer borrowing, and asset prices (Hack and Nicholls 2021), extended periods of such rates pose substantial risks to the financial sector. In early 2022, Russia's unexpected invasion of Ukraine exacerbated economic instability, causing inflationary pressures driven by surging energy prices and supply chain disruptions (Apostolakis and Giannellis 2024). Consequently, between 2020 and 2024, the ECB adapted its monetary policy to address the pandemic's dual challenges and Russia's invasion of Ukraine. Starting at the zero-bound level in early 2020, the ECB maintained the MRO rate during the pandemic to ensure liquidity, prevent a credit crunch, and support financial market stability and broader economic recovery (O'Donnell et al. 2024). However, as inflation surged well above the ECB's 2% target – peaking at 10.60% in October 2022 (Eurostat 2022) – the ECB shifted its strategy. Beginning in 2022, it raised the MRO rate aggressively to combat inflation, reaching 4.50% by the first quarter of 2024 (Figure 1). This strategic shift underscores the ECB's adaptability in balancing liquidity provision during crises with the need to address inflationary pressures in an unstable economic environment.

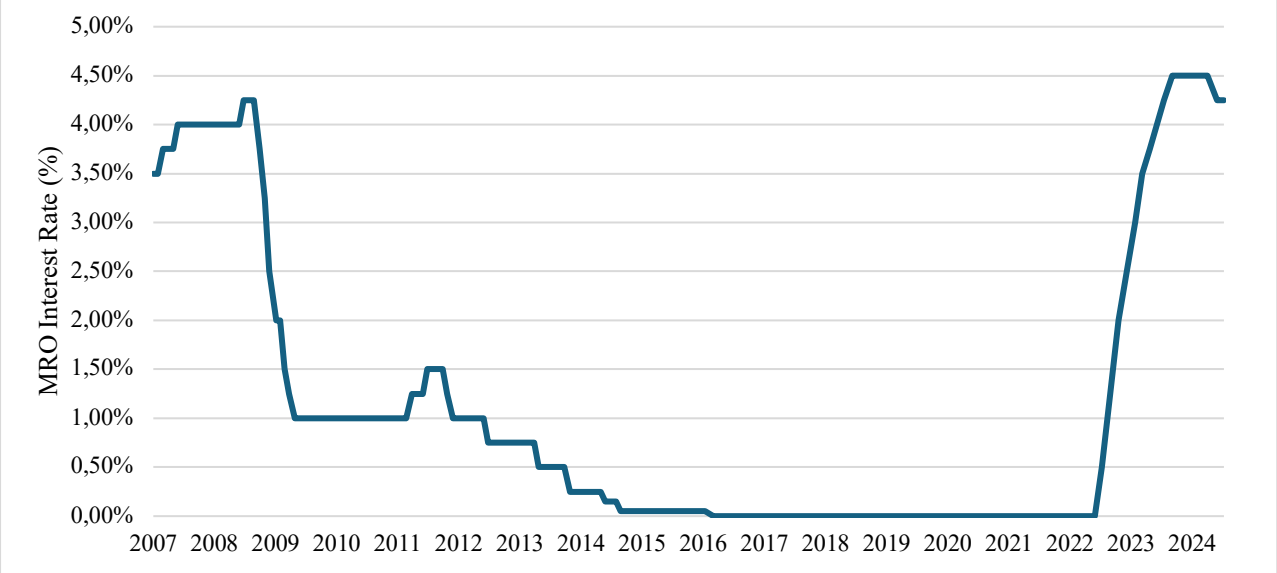

Figure 1. ECB's Main Refinancing Operations Interest Rate (2007–2024)

2.2.2 Unconventional Monetary Policy

The ECB also implemented unconventional monetary policy measures to address financial instability and market dysfunctions following the GFC and SDC. Key initiatives included adopting a full allotment fixed-rate tender procedure, which guaranteed that financial institutions could access as much liquidity as they needed at a fixed interest rate, provided they had sufficient eligible collateral (Altavilla et al. 2020). The ECB also expanded collateral eligibility, allowing a broader range of assets to be used as collateral in refinancing operations, thereby increasing access to central bank funding for banks facing liquidity constraints (Falagiarda et al. 2015). Additionally, the ECB extended refinancing operation maturities, introducing long-term facilities that provided liquidity for up to 3 years and addressed persistent funding challenges faced by Eurozone banks (Blot et al. 2024). To stabilize the euro's exchange rate and ensure access to US dollar funding, the ECB established currency swap agreements with the US Federal Reserve, allowing European banks to meet dollar-denominated obligations (Altavilla et al. 2019).

During the sovereign debt crisis, the ECB introduced the Securities Market Programme (SMP), which involved the purchase of public debt securities to stabilize bond markets in vulnerable peripheral countries such as Greece, Ireland, Portugal, Spain, and Italy (Blot et al. 2020). This program was particularly significant in addressing widening sovereign bond spreads and market fragmentation, which threatened the stability of the Eurozone. Complementary measures included the Covered Bond Purchase Programme (CBPP2) and 2 rounds of 3-year Very Long-Term Refinancing Operations (VLTROs) to bolster liquidity in the banking sector (Altavilla et al. 2019). In 2012, the ECB announced the Outright Monetary Transactions (OMT) program to stabilize secondary bond markets, though it was never activated (Blot et al. 2020). The ECB introduced forward guidance in 2013, a communication strategy that provided explicit indications about the future trajectory of monetary policy – this measure aimed to improve transparency and

shape market expectations, reducing uncertainty and volatility in financial markets (Rogers et al. 2014). A transformative step occurred in 2015 with the launch of Quantitative Easing (QE) under the Asset Purchase Programme (APP), where the ECB purchased public and private sector securities, significantly increasing bank reserves. This program established the DF rate as the effective lower bound for money market rates (Rogers et al. 2014). Between 2015 and 2022, the DF rate remained negative, encouraging banks to channel excess reserves into the real economy.

Building on its unconventional monetary policy framework, the ECB further adapted its measures to address the dual challenges of the COVID-19 pandemic and the invasion of Russia in Ukraine. These efforts prioritized liquidity support and credit provision through targeted lending operations (Petrakis et al. 2022). Baldwin and Weder di Mauro (2020) emphasize the scope of the ECB's quantitative easing during the pandemic, which included large-scale purchases of government bonds, commercial paper, and mortgage-backed securities. The Pandemic Emergency Purchase Programme (PEPP) was central to these measures, launched in 2020, to safeguard liquidity, prevent market fragmentation, and support economic recovery (Apostolakis and Giannellis 2024).

In addition to PEPP, the ECB deployed longer-term refinancing operations, including the Targeted Longer-Term Refinancing Operations (TLTRO) and the Pandemic Emergency Longer-Term Refinancing Operations (PELTRO), introduced in May 2021 (O'Donnell et al. 2024). These programs underscored the ECB's strategic focus on stability, as evidenced by the absence of shorter-term interventions such as overnight reverse repo operations (O'Donnell et al. 2024). In response to inflationary pressures fueled by rising energy prices and supply chain disruptions linked to the Russia-Ukraine conflict, the ECB introduced the Transmission Protection Instrument (TPI) in 2022. Designed to ensure the smooth transmission of monetary policy across all Eurozone member states, particularly during periods of market stress, the TPI reinforced the ECB's commitment to maintaining financial stability (Grauwe et al. 2024).

2.3 Financial Markets Responses to ECB Monetary Policy Decisions

Empirical studies extensively document how monetary policy influences financial markets and asset prices through various transmission channels. According to the semi-strong Efficient Markets Hypothesis, stock prices reflect all publicly available information, including central bank announcements (Filbien and Labondance 2013). As new information emerges, financial markets adjust asset prices to reflect changes in the macroeconomic environment (Bernanke and Kuttner 2005). Interest rate adjustments, a key tool of conventional monetary policy, affect equity prices by altering the present value of future cash flows. When interest rates are cut, the risk-free rate[5] for discounting future cash flows decreases, lowering the equity risk premium and enhancing expected cash flows (Bernanke and Kuttner 2005). Conversely, contractionary policies increase the discount rate, reducing equity valuations (Tobin 1978).

Empirical studies show that monetary policy has an immediate and significant impact on financial markets. During periods of economic strength, Eurozone stock markets react sharply to negative news, such as unexpected rate hikes, while during downturns, they respond more positively to indications of rate cuts (Filbien and Labondance 2013). Hau and Lai (2016) highlighted that lower accurate interest rates encourage a shift from money markets to riskier equity investments, resulting in notable price increases. This effect is particularly pronounced in countries with significant investment home bias[6], emphasizing the critical role of monetary policy in asset allocation and pricing. Aside from the interest rate channel, the ECB wields other mechanisms that enhance its influence on equity markets. The confidence channel, especially during crises, plays a vital role. Through asset purchase programs like SMP and the PSPP, the ECB reduced sovereign risk premiums in stressed Eurozone countries, restoring market confidence and encouraging capital

[5] The theoretical rate of return of an investment with no risk of financial loss (Investopedia 2024).
[6] A term used to describe the tendency of investors to invest in their domestic market (Investopedia 2024).

inflows (Fratzscher et al. 2014). These interventions reassured investors about the economic stability of stressed countries, contributing to the recovery of equity prices. The portfolio rebalancing channel also significantly impacts equity prices. When the ECB purchases government bonds, their yields decline, prompting investors to sell them and reinvest in higher-yielding securities like equities (Fratzscher et al. 2014). This effect was particularly evident during the APP, which had a global impact on enhancing equity prices (Georgiadis and Gräb 2016).

Another important channel is the direct pass-through and bank lending mechanism. TLTROs provided euro-area banks with long-term liquidity, reduced funding costs, and incentivized credit expansion to non-financial firms and households. This expansion of credit, combined with reduced liquidity risk[7], boosted equity prices by lowering risk premiums (Petrakis et al. 2022). From 2013 onwards, the ECB introduced forward guidance, indicating that key interest rates would remain low for an extended period. This signaling channel influenced investors' expectations regarding the future trajectory of monetary policy, reducing market uncertainty and volatility. This reduced risk premium spreads, supporting higher equity prices (Petrakis et al. 2022). The various monetary policy transmission channels are complementary and often work together to stabilize financial markets.

Finally, while unconventional monetary policies have effectively mitigated financial distress by stabilizing financial markets and supporting equity prices (Haitsma et al. 2016), their implementation demands careful calibration to avoid unintended consequences. Despite their success, studies such as Bohl, Siklos, and Sondermann (2008) highlight negative market reactions caused by misaligned expectations or adverse spillovers. As a result, the precise execution of these

[7] The risk that an asset cannot be sold on short notice without incurring a loss (Investopedia 2024).

policies, paired with clear and strategic communication, is essential to align market expectations and achieve their intended outcomes.

3 Empirical Approach

This section outlines the data and methodology used to provide a thorough perspective on the research question introduced in the study: "The impact of European Central Bank monetary policy on Eurozone stock market performance." All analyses and computations were conducted using Stata.

3.1 Sample

The analysis covers the period from January 2007 to August 2024, comprising 212 monthly observations across 10 Eurozone countries. These countries are divided into 2 groups: core countries, which include Austria, Belgium, France, Germany, and the Netherlands, and peripheral countries, which consist of Italy, Spain, Portugal, Greece, and Ireland. The sampling period is segmented into 2 distinct periods. The Period 1, from 2007 to 2017, encompasses the GFC, the SDC, and the subsequent post-crisis recovery years. The Period 2, 2020 to 2024, reflects the economic challenges posed by the COVID-19 pandemic and the invasion of Russia in Ukraine. These periods were selected to capture different economic conditions and policy responses, expected to influence the relationship under investigation. Additional details on these periods are provided in Table 1 in the Appendix.

3.2 Measuring Stock Market Performance

Stock markets were selected as the focal point of this study due to their high liquidity and significant role in the Eurozone's financial system. Monthly stock returns, denoted as

Monthly_Returns, are the dependent variable of this analysis and were calculated using the first differences of each country's natural logarithm of closing stock prices. The closing stock prices were sourced from each country's stock market index, with the specific indices detailed in Tables 2 and 3 in the Appendix. This method closely approximates percentage changes in stock prices and is expressed as:

$$\text{Monthly\_Returns}_{i,t} = ln\left(\frac{P_{i,t}}{P_{i,t-1}}\right) \quad (1)$$

where $\text{Monthly\_Returns}_{i,t}$ represents the monthly return for country i at time t, and $P_{i,t}$ is the closing stock price.

3.3 Key Determinants and Control Factors

3.3.1 Monetary Policy Indicators

The study includes 2 dummy variables to capture the effects of expansionary conventional and unconventional monetary policy measures. The MRO rate serves as a proxy for conventional measures, with the dummy variable MRO_decrease assigned a value of 1 in months when the ECB reduced the MRO rate and 0 otherwise. During the sample period, the ECB reduced the MRO rate 16 times, as detailed in Table 4 in the Appendix. The second dummy variable, Unconventional Monetary Policies (UMP), captures expansionary unconventional monetary measures, taking 1 in months when such interventions occurred and 0 otherwise. A total of 46 unconventional monetary policy interventions were recorded during the sample period, as outlined in Table 5 in the Appendix. MRO_decrease and UMP are constant across all Eurozone countries and vary over time. These variables were constructed using data from 173 ECB announcements in the Governing Council press releases published on the ECB website, covering the period from January 2007 to August 2024. Consistent with the literature, the 2 dummy variables are applied with a 2-month lag

after the announcement to account for the delayed impact of monetary policy measures (Petrakis et al. 2022).

3.3.2 Control Variables

To ensure the robustness of the analysis, three macroeconomic control variables[8] – the Industrial Production Index (Ind_Prod), the Harmonized Index of Consumer Prices (HICP), and the Economic Sentiment Indicator (ESI) – were included, following the approach outlined by Petrakis et al. (2022). Given the lack of monthly gross domestic product data, Ind_Prod was used as a proxy for economic output. Monthly growth in industrial production was calculated using the first differences of the natural logarithm to approximate percentage changes and ensure stationarity. The inflation rate was measured using the HICP, expressed as the 12-month percentage change. Stationarity tests confirmed that the HICP series was stationary, ensuring its suitability for econometric analysis. The ESI, constructed by the European Commission, reflects confidence levels across 5 sectors: industry, services, retail trade, construction, and consumers. To address potential non-stationarity, the first difference of the ESI was used to measure month-to-month changes in sentiment, capturing whether sentiment improved or worsened compared to the previous month.

3.4 Methodology

A panel data regression analysis was conducted to examine the impact of the ECB's expansionary monetary policies on eurozone market returns, controlling for the aforementioned macroeconomic factors. The study used 3 commonly applied approaches: Random Effects (RE), Fixed Effects (FE),

[8] Data for the Industrial Production Index, the Harmonized Index of Consumer Prices, and the Economic Sentiment Indicator were sourced from Eurostat to ensure harmonization and comparability across Eurozone countries.

and Pooled Ordinary Least Squares (Pooled OLS). The goal was to identify the most appropriate model, ensuring robustness and accounting for cross-sectional heterogeneity. The empirical model is specified as follows:

$$\text{Monthly\_Returns}_{i,t} = \alpha_0 + \beta_1 \text{MRO\_Decrease}_t + \beta_2 \text{UMP}_t + \beta_i \text{Control}_{i,t} + \delta_i + \varepsilon_{i,t} \quad (2)$$

where δ_i represents cross-country specific effects, capturing unobserved heterogeneity, and $\varepsilon_{i,t}$ denotes the idiosyncratic error term, accounting for random disturbances specific to each country and period. Before estimating the model, pairwise cross-correlation analyses were conducted for the independent variables across core and peripheral countries during the analysis periods. The results revealed relatively low correlations, suggesting no significant multicollinearity issues among the independent variables. A Hausman test was then performed to evaluate the suitability of the RE model against the FE model. The test results favored the RE model as the most appropriate, with differences in coefficient estimates between the 2 models found to be statistically insignificant. Consequently, the RE model is emphasized in the interpretation and discussion of the results. This approach assumes that the unobserved individual effects (δ_i) are uncorrelated with the independent variables, ensuring more efficient and consistent coefficient estimates under this assumption.

4 Results and Discussion

4.1 Descriptive Statistics

To provide context for the analysis, descriptive statistics for the variables – monthly returns, inflation rate, industrial production index, and economic sentiment indicator – are summarized in Tables 6–11 in the Appendix. For Periods 1 and 2, as shown in Tables 6 and 7, mean monthly returns increased from -0.25% to 0.50%, reflecting improved stock market performance. Inflation

rates rose significantly, averaging 1.44% in Period 1 and 3.88% in Period 2. The Industrial Production Index grew from a mean value of 91.61 to 98.69, while economic sentiment, measured by the ESI, showed a modest increase from 97.36 to 98.79.

4.2 Regression Analysis

4.2.1 Period 1

Tables 12, 13, and 14 in the Appendix present the comprehensive empirical findings for Period 1, corresponding respectively to the core countries, peripheral countries, and the combined sample of all countries.

4.2.1.1 Monetary Policy Indicators

During Period 1 (2007 to 2017), which encompasses the GFC, the SDC, and the subsequent post-crisis recovery years, reductions in the MRO rate consistently positively impacted stock market performance in core and peripheral Eurozone countries. In core countries, MRO rate cuts were associated with an average monthly increase in stock returns of 1.45 percentage points, observed 2 months after the policy change. Peripheral countries demonstrated an even stronger response, with an average monthly increase of 1.72 percentage points. These results underscore the effectiveness of expansionary conventional monetary policy in stimulating stock markets during this period. The findings align with the literature on the transmission mechanisms of monetary policy. Lowering the MRO rate reduces the appeal of low-risk assets by decreasing the money market rate, deposit rates, and other short-term interest rates. This shift prompts investors to reallocate capital into higher-yielding and riskier securities, such as equities, thereby increasing demand for these assets. As equity demand rises, the equity risk premium decreases, signaling reduced market uncertainty

and greater confidence in the stability of equity investments (Bernanke and Kuttner 2005; Petrakis et al. 2022).

Moreover, the 2-month lag reflects the time financial agents need to adapt their strategies and reassess asset valuations following policy changes. This lagged effect is consistent with previous studies, highlighting the gradual adjustment of equity markets to monetary policy as financial agents recalibrate their strategies and expectations (Hau and Lai 2016; Filbien and Labondance 2013). The more robust response observed in peripheral countries compared to core countries may reflect higher sensitivity to monetary policy interventions in economies with more significant structural vulnerabilities. Peripheral countries often face higher borrowing costs, weaker financial systems, and increased economic uncertainty, making their equity markets more responsive to reductions in interest rates (Petrakis et al. 2022). Expansionary unconventional monetary policy measures have had significant but uneven effects on stock markets across the Eurozone. In core countries, these policies led to an average monthly increase of 1.19 percentage points in stock returns, reflecting the robust transmission of monetary interventions in these economies.

In contrast, peripheral countries saw a more modest increase of 0.65 percentage points, highlighting structural constraints that limit the effectiveness of such measures. As Petrakis et al. (2022) noted, peripheral economies are burdened by high sovereign risks, a larger share of non-performing loans, and weaker bank capitalization, all of which impede policy transmission and heighten investor concerns about their stability and recovery prospects. The 2-month lag in equity market responses further underscores the complexities of implementing unconventional measures, as banks require time to assess borrower creditworthiness and investors adjust their portfolios to evolving market conditions.

4.2.1.2 Control Variables

Due to structural differences in how these economies respond to inflationary pressures, inflation affects stock returns differently in core and peripheral Eurozone countries. In core countries, inflation has a statistically insignificant impact on equity returns. This is mainly due to the stability of these countries' financial systems and economic conditions, which provide a secure environment for financial decisions, even amid inflationary pressures. In contrast, peripheral countries experience a significant decline in equity returns, with a 1-percentage point increase in the inflation rate associated with a 0.47 percentage point reduction in monthly stock market returns. The more pronounced impact in peripheral countries is a cause for concern, resulting from weaker economic fundamentals, higher inflation rates, and structural vulnerabilities that exacerbate the adverse effects of rising prices. High inflation reduces corporate profitability by increasing input costs and diminishing consumer purchasing power (Petrakis et al. 2022). Industrial production affects stock market performance differently between core and peripheral Eurozone countries. In core countries, a 1% monthly increase in industrial production growth is associated with a 0.21 percentage point rise in equity returns. This positive correlation reflects the more substantial industrial base, better access to credit, and more stable economic fundamentals in these regions.

Conversely, peripheral countries show a negative, though statistically insignificant, relationship, with a coefficient of -0.03. Economic sentiment significantly influences stock returns across the Eurozone, with notable differences between core and peripheral countries. A 1-point increase in month-to-month change of the ESI in core economies corresponds to a 0.70 percentage-point rise in monthly stock returns. This impact is even more pronounced in peripheral economies, where a 1-point increase in the ESI results in a 0.76 percentage-point increase in equity returns. The Economic Sentiment Indicator gauges firms' and consumers' confidence in their country's economic outlook. When optimism about future economic conditions and personal welfare grows,

firms and consumers are more likely to increase their consumption, production, and investment activities. This increased confidence drives stock markets to respond to these positive expectations. These findings are consistent with those of Petrakis et al. (2022), highlighting the crucial role of economic sentiment as a critical driver of market performance.

4.2.2 Period 2

Tables 15, 16, and 17 in the Appendix present the comprehensive empirical findings for Period 2, corresponding respectively to the core countries, peripheral countries, and the combined sample of all countries.

4.2.2.1 Monetary Policy Indicators

The second period under analysis spans 2 distinct phases. The first phase, during the COVID-19 pandemic (January 2020 to December 2021), was characterized by the ECB maintaining persistently low interest rates to ensure liquidity and support economic recovery. During this time, financial markets were driven more by unprecedented fiscal support and crisis-response measures than traditional monetary policy. Borio and Hofmann (2017) suggest that monetary policy is less effective in such environments, as the interest rate channel becomes constrained by low rates, and unconventional tools dominate. This helps explain the limited impact observed during this period, particularly in the context of subdued investment activity and heightened economic uncertainty. The second phase began with the invasion of Russia in Ukraine in February 2022, marking a sharp shift in the ECB's monetary strategy. Inflationary pressures, driven by surging energy prices and supply chain disruptions, prompted the ECB to transition from its pandemic-era expansionary policies to a contractionary approach. This shift involved aggressive interest rate hikes aimed at stabilizing the Eurozone economy. Over the entire period from January 2020 to August 2024, the

ECB only reduced the MRO rate once in June 2024. As a result, the MRO_Decrease dummy variable assumes a value of 1 only for this month, severely limiting its variation. This lack of variation contributes to the statistically insignificant effect observed for MRO rate cuts on stock market returns in core and peripheral countries. These findings are consistent with O'Donnell et al. (2024), who emphasize the diminishing role of interest rate adjustments when rates approach the ZLB or during periods of increased uncertainty.

During the analysis period, the ECB also used unconventional monetary tools, including the PEPP and the TPI, which were pivotal in addressing market fragmentation and stabilizing financial conditions. However, their impact on stock markets was notably mixed. In core countries, the interventions were associated with a statistically significant coefficient of -0.02, reflecting investor perceptions of these measures as reactive responses to deepening economic instability rather than preventive strategies. This perception likely dampened investor confidence and contributed to reduced stock returns.

Peripheral countries exhibited a slightly less negative response, with a coefficient of -0.01. While unconventional measures successfully mitigated financial distress, their implementation requires careful calibration to avoid unintended consequences. As Bohl et al. (2008) note, occasional negative market reactions can arise from misaligned expectations, adverse spillovers, or delayed policy adjustments. For instance, investor skepticism about the long-term effectiveness of measures like the PEPP and TPI may have exacerbated the negative responses in equity markets. Thus, the precise execution of monetary tools and clear strategic communication are essential to align market expectations and achieve policy objectives effectively.

4.2.2.2 Control Variables

Inflation did not have a statistically significant impact on equity returns in either core or peripheral countries during this period, indicating that its influence was muted during the period of analysis. This lack of significance suggests that other macroeconomic factors may have played a more prominent role in shaping market dynamics. For instance, industrial production growth showed a positive and statistically significant effect on equity markets in core countries, with a coefficient of 0.11. Conversely, peripheral countries did not exhibit significant effects. Furthermore, economic sentiment, as measured by the ESI, also failed to influence equity returns significantly during this volatile period. This underscores the adaptability and resilience of investors, who focused on immediate economic and geopolitical developments rather than sentiment indicators when navigating elevated uncertainty.

5 Robustness Tests and Limitations

The empirical results presented in this study are unlikely to suffer from reverse causality. The GFC, SDC, the COVID-19 pandemic, and the invasion of Russia in Ukraine represent unexpected shocks that disrupted the economic system.

The variables used to measure monetary policy interventions, namely MRO_Decrease and UMP, are assigned a value of 1 on days when expansionary monetary policy announcements occurred and 0 otherwise. These variables are assumed to be exogenous, as their determination is independent of monthly Eurozone stock market returns. This exogeneity strengthens the credibility of the study's methodology. Although reverse causality could theoretically arise in the long run – where economic conditions influence government responses to crises – this issue is less pertinent to the short-term analysis undertaken here. For example, while the state of the economy may have influenced the timing and scope of lockdowns during the pandemic, such feedback effects are

unlikely to distort the immediate relationship between monetary policy interventions and stock market performance.Consequently, potential long-term reverse causality effects are unlikely to bias the findings.

Nevertheless, this study acknowledges limitations that may impact the interpretation of its results. A primary concern lies in the potential for contemporaneous correlations in error terms across countries. While panel-corrected standard errors (PCSE) offer a method to address this issue, their implementation in this study encountered challenges, as the coefficients derived using PCSE were not statistically significant. This outcome may suggest that the PCSE method is overly conservative in adjusting standard errors or that the model specification may not fully capture the complex relationship between monetary policy and stock market returns. As a result, the possibility of correlated disturbances across countries, which could bias standard errors, remains a concern. Additionally, the use of low-frequency monthly data introduces potential endogeneity concerns. Stock markets typically react immediately to monetary policy announcements. While including control variables and applying country- and time-fixed effects help mitigate omitted variable bias, these measures cannot fully account for high-frequency interactions within shorter time frames. This limitation highlights the trade-off between data availability and analytical precision, as high-frequency data could provide deeper insights into the immediate effects of policy interventions. Despite these limitations, the robustness checks and econometric approaches employed in this analysis provide a substantial degree of confidence in the validity of the findings. The study offers meaningful insights into the effects of ECB monetary policy on Eurozone equity markets, contributing to a deeper understanding of the relationship between monetary interventions and market dynamics during periods of crisis and recovery.

6 Summary and Conclusions

This research presents significant findings on the impact of ECB monetary policy on Eurozone stock markets, analyzed across 2 distinct periods. The GFC, the SDC, and the subsequent post-crisis recovery years characterized Period 1 (2007–2017). MRO rate cuts had a pronounced positive effect on stock markets, particularly in peripheral countries. The stronger response in peripheral economies reflects their heightened sensitivity to monetary interventions stemming from structural vulnerabilities such as higher borrowing costs and weaker financial systems. Unconventional measures also positively impacted stock markets in core and peripheral countries, with the effect being more substantial in core economies. Economic sentiment emerged as a strong positive driver of stock returns across all countries. At the same time, inflation negatively influenced peripheral economies, and industrial production growth contributed positively to equity markets in core countries. In Period 2 (2020–2024), encompassing the COVID-19 pandemic and the invasion of Russia in Ukraine, the effectiveness of expansionary monetary policy was notably weaker. Conventional tools proved less effective in a prolonged low-interest-rate environment. Unconventional measures, such as the PEPP and TPI, were crucial in mitigating financial distress but had mixed effects on stock markets. Core and peripheral countries reacted negatively, perceiving these measures as reactive instead of proactive. During this period, inflation and economic sentiment had muted effects as markets prioritized immediate economic and geopolitical shocks over longer-term indicators.

Monetary policy has been a cornerstone of cyclical policymaking over the past 2 decades, pivotal during significant economic and geopolitical uncertainty periods. While much research has focused on US monetary policy, the financial market effects of ECB policies remain less thoroughly examined. This analysis addresses this gap by analyzing how ECB monetary policy influenced Eurozone stock markets during significant economic and geopolitical uncertainty periods. A key

contribution of this research is its focus on the COVID-19 pandemic and the invasion of Russia in Ukraine – periods characterized by surging inflation, supply chain disruptions, and geopolitical instability – where few studies have investigated the Eurozone stock market's response to monetary policy. By conducting a comparative analysis of these recent crises alongside the GFC and SDC, this study underscores the structural differences in policy transmission between core and peripheral Eurozone countries, offering a nuanced understanding of ECB interventions in diverse economic contexts. Despite its contributions, this investigation has limitations. It does not consider spillover effects from other central banks' policies or the influence of fiscal measures, which could impact Eurozone stock markets. Additionally, relying on monthly data limits the ability to capture immediate market reactions to monetary policy announcements.

This research demonstrates the critical role of ECB monetary policy in stabilizing Eurozone stock markets during crises. Period 1 highlights the effectiveness of conventional tools, while Period 2 reveals their limitations and the importance of unconventional measures in addressing overlapping crises. By comparing responses across core and peripheral countries and focusing on less-studied periods, such as the COVID-19 pandemic and the invasion of Russia in Ukraine, this research provides valuable insights for policymakers and investors navigating complex economic landscapes.

Future research could address these limitations by incorporating high-frequency data, particularly for the COVID-19 pandemic and the invasion of Russia in Ukraine, where such studies remain scarce compared to the extensive high-frequency analyses conducted during GFC and SDC.

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Appendix

Table 1. Periods of analysis

		Start Date	End Date
Period 1	Encompasses the GFC, the SDC, and the subsequent post-crisis recovery years.	January 2007	December 2017
Period 2	Emcompasses the COVID-19 pandemic and the invasion of Russia in Ukraine.	January 2020	August 2024*
* Ongoing Crisis (Analysis includes data up to August 2024).			

Table 2. Market indices for core countries

Stock Index	Country
ATX	Austria
BEL 20	Belgium
CAC 40	France
DAX 30	Germany
AEX	Netherlands
Stock closing prices for each country were sourced from Refinitiv.	

Table 3. Market indices for peripheral countries

Stock Index	Country
FTSE MIB	Italy
ASE Comp	Greece
PSI 20	Portugal
ISEQ 20	Ireland
IBEX 35	Spain
Stock closing prices for each country were sourced from Refinitiv.	

Table 4. MRO Rate decrease announcement dates

Date	MRO Rate Decrease
8 October 2008	-0,005
6 November 2008	-0,005
4 December 2008	-0,0075
15 January 2009	-0,005
5 March 2009	-0,005
2 April 2009	-0,0025
7 May 2009	-0,0025
3 November 2011	-0,0025
8 December 2011	-0,0025
5 July 2012	-0,0025
2 May 2013	-0,0025
7 November 2013	-0,0025
5 June 2014	-0,001
4 September 2014	-0,001
10 March 2016	-0,005
6 June 2024	-0,0025
Source: ECB's press conferences and press releases. This table lists the months during which the ECB announced reductions in the Main Refinancing Operations (MRO) interest rate.	

Table 5. Announcement dates of ECB's non-standard expansionary measures.

Date	Description
22 August 2007	Supplementary LTROs
28 March 2008	6-Month Supplementary LTROs
7 May 2009	One-year LTROs and Covered Bond Purchases
4 June 2009	CBPP1 Implementation Details
3 December 2009	Enhancements to LTROs Framework
4 March 2010	LTROs Framework Adjustments
10 May 2010	SMP and Additional Liquidity Measures
3 March 2011	Fixed-rate Full-Allotment Procedure for MROs and LTROs
4 August 2011	6-Month Supplementary LTROs with Fixed-Rate Full-Allotment and Additional Measures
6 October 2011	Launch of CBPP2 and 12-Month Supplementary LTROs
8 December 2011	Introduction of Two 3-Year LTROs and Additional Policy Measures
9 February 2012	Approval of Criteria for National Credit Claims
26 July 2012	Draghi's "Whatever It Takes" Speech
2 August 2012	OMT Program Initiated
6 September 2012	Amendments to Collateral Rules
22 March 2013	Launch of T-LTROs and Related Measures
5 June 2014	Details on the First Series of T-LTROs
3 July 2014	Specifications for the Initial Series of T-LTROs
4 September 2014	CBPP3 and ABSPP
22 January 2015	Expanded APP and Accompanying Measures
5 March 2015	PSPP Details

23 September 2015	Adjustments to the ABSPP Purchase Process
9 November 2015	Increase in PSPP Share Limits
3 December 2015	Extension of the APP through March 2017
10 March 2016	ECB Decision to Expand Monthly Purchases Under the APP and Launch Second Series of T-LTROs and CSPP
21 April 2016	Specifications for the CSPP
3 May 2016	Legal Framework for the Second Series of T-LTROs
2 June 2016	Eurosystem Commences Purchases Under CSPP
8 December 2016	ECB’s decision to continue net asset purchases at a monthly pace of €60 billion until the end of December 2017, starting from April 2017
26 October 2017	ECB’s decision to continue net asset purchases at a monthly pace of €30 billion until the end of September 2018, starting from January 2018
14 June 2018	ECB's decision to decrease net asset purchases at a monthly pace to €15 billion until the end of December 2018, starting from October 2018
13 December 2018	The ECB decided to stop the net purchases under the Asset Purchase Programme (APP) by the end of December 2018. The ECB committed to fully reinvesting the principal payments from maturing securities purchased under the APP for an extended period, even after the end of net purchases. The reinvestment of maturing securities will continue for as long as necessary to maintain favorable liquidity conditions and an ample degree of monetary accommodation.
7 March 2019	Announced TLTRO III, starting in September 2019 and ending in March 2021, each with a maturity of two years
6 June 2019	Details for TLTRO III
25 July 2019	The ECB will continue reinvesting principal payments from maturing securities under the Asset Purchase Programme (APP) to maintain liquidity and support financial conditions. The ECB is prepared to adjust its policy instruments, including new asset purchases, to ensure inflation moves towards its target. The ECB is exploring a tiered reserve remuneration system to alleviate the impact of negative rates on banks, supporting financial stability and lending.
12 September 2019	ECB's decision to restarted net purchases under APP at a monthly pace to €20 billion, starting from November 2019. Change in TLTRO III Introduction of a two-tier system for reserve remuneration
12 March 2020	Additional longer-term refinancing operations (LTROs) will be conducted carried out through a fixed rate tender procedure with full allotment. In TLTRO III, considerably more favorable terms will be applied during the period from June 2020 to June 2021 to all TLTRO III operations outstanding during that same time.

	A temporary envelope of additional net asset purchases of €120 billion will be added until the end of the year
18 March 2020	Launch of the Pandemic Emergency Purchase Programme (PEPP) with a €750 billion envelope to counter risks from COVID-19, including all asset categories under the existing APP, with purchases until the end of 2020.
30 April 2020	Increased the PEPP by €600 billion to €1.35 trillion and extended its timeline to at least June 2021, with reinvestment extended until 2022. Eased conditions on TLTRO III, reducing the interest rate to 50 basis points below the average interest rate on the Euro system's main refinancing operations from June 2020 to June 2021. Introduced a new series of non-targeted Pandemic Emergency Longer-Term Refinancing Operations (PELTROs).
4 june 2020	Increased the PEPP envelope by €600 billion to a total of €1.35 trillion. Extended the horizon for net purchases under the PEPP to at least the end of June 2021. Reinvested the maturing principal payments from PEPP securities until at least the end of 2022.
10 December 2020	Increased the PEPP envelope by €500 billion to a total of €1.85 trillion and extended the horizon for net purchases until at least March 2022. Extended the reinvestment of principal payments from PEPP securities until at least the end of 2023. Recalibrated the conditions for TLTRO III and extended the duration of collateral easing measures until June 2022. Introduced four additional PELTROs in 2021 to provide continued liquidity support.
16 December 2021	Extended the reinvestment horizon for PEPP until at least the end of 2024. Set monthly net purchases under the APP at €40 billion for Q2, €30 billion for Q3, and €20 billion from October 2022 onwards, to maintain accommodative policy
10 March 2022	Monthly net purchases under the APP: €40 billion in April, €30 billion in May, and €20 billion in June. Extended the Eurosystem repo facility (EUREP) for central banks until 15 January 2023.
9 June 2022	The ECB confirmed that net purchases under the APP would end by 1 July 2022, marking a step in its policy normalization process.
21 July 2022	The ECB introduced the Transmission Protection Instrument (TPI), a new tool designed to address market fragmentation and ensure the effective transmission of monetary policy across the Eurozone.
27 October 2022	The Governing Council decided to adjust the terms and conditions of the third series of targeted longer-term refinancing operations (TLTRO III)

This table lists the months during which the ECB announced expansionary unconventional monetary policy interventions.
Source: ECB press conferences, press releases, and key speeches; cross-referenced with previous research (Petrakis et al. 2022).

Table 6. Descriptive statistics for Period 1

Country	Mean	Median	Max	Min	Std
Monthly_Returns	-0.0025	0.0044	0.1985	-0.3267	0.0630
HICP	0.0144	0.0140	0.0590	-0.0290	0.0145
Ind_Prod	91.61	98.20	133.20	34.70	19.75
ESI	97.36	99.30	119.80	66.60	10.12

This table presents the descriptive statistics for **Monthly_Returns**, **HICP**, **Ind_Prod**, and **ESI** across Eurozone countries during **Period 1** (2007–2017).

Table 7. Descriptive statistics for Period 2

Country	Mean	Median	Max	Min	Std
Monthly_Returns	0.0050	0.0092	0.2577	-0.3312	0.0612
HICP	0.0388	0.0310	0.1710	-0.0240	0.0361
Ind_Prod	98.69	99.90	143.60	55.60	8.97
ESI	98.79	99.60	123.60	57.20	10.67

This table presents the descriptive statistics for **Monthly_Returns**, **HICP**, **Ind_Prod**, and **ESI** across Eurozone countries during **Period 2** (2020–2024).

Table 8. Descriptive statistics for Full Period

Country	Mean	Median	Max	Min	Std
Monthly_Returns	-0.0001	0.0062	0.2577	-0.3312	0.0607
HICP	0.0207	0.0160	0.1710	-0.0290	0.0245
Ind_Prod	93.95	99.30	143.60	34.70	17.10
ESI	98.72	100.61	123.60	57.00	10.15

This table presents the descriptive statistics for **Monthly_Returns**, **HICP**, **Ind_Prod**, and **ESI** across Eurozone countries during **Full Period** (2007–2024).

Table 9. Descriptive statistics for monthly returns by country - Period 1

Country	Mean	Median	Max	Min	Std
Austria	-0.002017	0.005041	0.135468	-0.325417	0.068006
Belgium	-0.0007443	0.004290	0.110650	-0.240879	0.049924
France	-0.00032	0.002045	0.118287	-0.145225	0.049781
Germany	0.0050908	0.012827	0.154968	-0.213096	0.055184
Netherlands	0.000718	0.010110	0.105922	-0.219583	0.053296
Italy	-0.0048466	0.003831	0.188949	-0.178006	0.063753
Greece	-0.0128822	-0.003996	0.198539	-0.326730	0.098066
Portugal	-0.0055414	-0.003481	0.100720	-0.235478	0.057074
Ireland	-0.0021986	0.003243	0.178252	0.235228	0.061335
Spain	-0.0025947	0.002704	0.153789	-0.186727	0.059266
All	-0.0025	0.0044	0.198539	-0.326730	0.062997

This table presents the descriptive statistics for **Monthly_Returns** across Eurozone countries during **Period 1** (2007 – 2017).

Table 10. Descriptive statistics for monthly returns by country - Period 2

Country	Mean	Median	Max	Min	Std
Austria	0.002809	0.009288	0.217318	-0.331158	0.075593
Belgium	0.001003	0.006657	0.186455	-0.184245	0.053336
France	0.004360	0.008415	0.183311	-0.188851	0.055837
Germany	0.006350	0.015034	0.139853	-0.179579	0.056616
Netherlands	0.007471	0.008740	0.126742	-0.109493	0.046956
Italy	0.006786	0.009053	0.206604	-0.254119	0.064834
Greece	0.007956	0.016148	0.257721	-0.254841	0.079479
Portugal	0.004637	0.007862	0.154603	-0.157918	0.050843
Ireland	0.005508	0.016308	0.111336	-0.216182	0.062928
Spain	0.003167	0.000262	0.224587	-0.251213	0.062455
All	0.0050	0.0092	0.257721	-0.331158	0.061199

This table presents the descriptive statistics for **Monthly_Returns** across Eurozone countries during **Period 2** (2020– 2024).

Table 11. Descriptive statistics for monthly returns by country – Full Period

Country	Mean	Median	Max	Min	Std
Austria	-0.000847	0.006341	0.217318	-0.331159	0.067926
Belgium	-0.000225	0.008924	0.186455	-0.240879	0.049895
France	0.001509	0.006439	0.183311	-0.188851	0.050927
Germany	0.004966	0.010683	0.154968	-0.213096	0.053916
Netherlands	0.002913	0.010111	0.126742	-0.219583	0.049931
Italy	-0.000881	0.004244	0.206604	-0.254119	0.062861
Greece	-0.005291	0.002653	0.257721	-0.326730	0.089968
Portugal	-0.002380	0.002765	0.154603	-0.233478	0.053761
Ireland	0.000182	0.006526	0.178253	-0.235228	0.059471
Spain	-0.001017	0.001705	0.224587	-0.251213	0.057970
All	-0.0001	0.0062	0.257721	-0.331159	0.060684

This table presents the descriptive statistics for **Monthly_Returns** across Eurozone countries during **Full Period** (2007– 2024).

Table 12. Results for core countries – Period 1

Dependent Variable Monthly_Returns			
	FE	**RE**	**Pooled OLS**
Independent Variables			
MRO_Decrease_L2	0.0138**	0.0145***	0.0145**
	(0.00317)	(0.00332)	(0.00657)
UMP_L2	0.0116***	0.0119***	0.0119**
	(0.00116)	(0.00118)	(0.00492)
HICP	-0.525*	-0.306	-0.306*
	(0.236)	(0.292)	(0.177)
d_log_Ind_Prod	0.206**	0.207***	0.207*
	(0.0571)	(0.0590)	(0.106)
d_ESI	0.00668***	0.00695***	0.00695***
	(0.000675)	(0.000700)	(0.000891)
Constant	0.00262	-0.000204	-0.000204
	(0.00324)	(0.00551)	(0.00332)
R-squared	0.137		0.133

This table presents the regression results for **Fixed Effects** (FE), **Random Effects** (RE), **and Pooled Ordinary Least Squares** (OLS) models based on Equation (2). The t-statistics are given in parentheses and ***, **,** and *** describe the significance at the **10%, 5%**, and **1%** levels, respectively.

Table 13. Results for peripheral countries – Period 1

Dependent Variable Monthly_Returns			
	FE	**RE**	**Pooled OLS**
Independent Variables			
MRO_Decrease_L2	0.0172*	0.0172**	0.0172**
	(0.00691)	(0.00685)	(0.00749)
UMP_L2	0.00650	0.00653*	0.00653
	(0.00358)	(0.00357)	(0.00600)
HICP	-0.474***	-0.468***	-0.468**
	(0.0799)	(0.0801)	(0.181)
d_log_Ind_Prod	-0.0295	-0.0282	-0.0282
	(0.0372)	(0.0354)	(0.0601)
d_ESI	0.00753**	0.00756***	0.00756***
	(0.00217)	(0.00216)	(0.00145)
Constant	-0.00341*	-0.00350	-0.00350
	(0.00146)	(0.00290)	(0.00416)
R-squared	0.102		0.102

This table presents the regression results for **Fixed Effects** (FE), **Random Effects** (RE), and **Pooled Ordinary Least Squares** (OLS) models based on Equation **(2)**. The t-statistics are given in parentheses and *, **, and *** describe the significance at the **10%, 5%,** and **1%** levels, respectively.

Table 14. Results for all countries – Period 1

Dependent Variable Monthly_Returns			
	FE	**RE**	**Pooled OLS**
Independent Variables			
MRO_Decrease_L2	0.0150***	0.0154***	0.0154***
	(0.00353)	(0.00350)	(0.00350)
UMP_L2	0.00925***	0.00940***	0.00940***
	(0.00187)	(0.00192)	(0.00192)
HICP	-0.486***	-0.416***	-0.416***
	(0.0867)	(0.0844)	(0.0844)
d_log_Ind_Prod	0.0171	0.0213	0.0213
	(0.0438)	(0.0446)	(0.0446)
d_ESI	0.00719***	0.00729***	0.00729***
	(0.00107)	(0.00106)	(0.00106)
Constant	-0.000470	-0.00143	-0.00143
	(0.00122)	(0.00238)	(0.00238)
R-squared	0.113		0.111

This table presents the regression results for **Fixed Effects** (FE), **Random Effects** (RE), and **Pooled Ordinary Least Squares** (OLS) models based on Equation **(2)**. The t-statistics are given in parentheses and ***, ****, and *** describe the significance at the **10%, 5%,** and **1%** levels, respectively.

Table 15. Results for core countries – Period 2

Dependent Variable Monthly_Returns			
	FE	**RE**	**Pooled OLS**
Independent Variables			
MRO_Decrease_L2	-0.00201	-0.00169	-0.00169
	(0.00492)	(0.00483)	(0.00510)
UMP_L2	-0.0189**	-0.0194***	-0.0194**
	(0.00430)	(0.00446)	(0.00768)
HICP	-0.103**	-0.0661	-0.0661
	(0.0259)	(0.0415)	(0.105)
d_log_Ind_Prod	0.110	0.106*	0.106
	(0.0556)	(0.0564)	(0.134)
d_ESI	0.000167	0.000209	0.000209
	(0.000282)	(0.000295)	(0.000780)
Constant	0.0135***	0.0123***	0.0123**
	(0.000972)	(0.00231)	(0.00576)
R-squared	0.025		0.024

This table presents the regression results for **Fixed Effects** (FE), **Random Effects** (RE), and **Pooled Ordinary Least Squares** (OLS) models based on Equation **(2)**. The t-statistics are given in parentheses and ***, **,** and *** describe the significance at the **10%, 5%,** and **1%** levels, respectively.

Table 16. Results for peripheral countries – Period 2

Dependent Variable Monthly_Returns			
	FE	**RE**	**Pooled OLS**
Independent Variables			
MRO_Decrease_L2	-0.00447	-0.00451	-0.00451
	(0.0119)	(0.0119)	(0.0105)
UMP_L2	-0.0136**	-0.0136***	-0.0136*
	(0.00393)	(0.00393)	(0.00759)
HICP	-0.0679	-0.0701	-0.0701
	(0.0428)	(0.0434)	(0.125)
d_log_Ind_Prod	0.0437	0.0440	0.0440
	(0.0533)	(0.0535)	(0.0549)
d_ESI	0.000489	0.000483	0.000483
	(0.000608)	(0.000612)	(0.000988)
Constant	0.0128***	0.0128***	0.0128*
	(0.00144)	(0.00225)	(0.00695)
R-squared	0.015		0.015

This table presents the regression results for **Fixed Effects** (FE), **Random Effects** (RE), and **Pooled Ordinary Least Squares** (OLS) models based on Equation **(2)**. The t-statistics are given in parentheses and ***, **,** and *** describe the significance at the **10%, 5%,** and **1%** levels, respectively.

Table 17. Results for all countries - Period 2

Dependent Variable Monthly_Returns			
	FE	**RE**	**Pooled OLS**
Independent Variables			
MRO_Decrease_L2	-0.00299	-0.00282	-0.00282
	(0.00591)	(0.00593)	(0.00593)
UMP_L2	-0.0162***	-0.0164***	-0.0164***
	(0.00291)	(0.00300)	(0.00300)
HICP	-0.0817**	-0.0667**	-0.0667*
	(0.0273)	(0.0298)	(0.0298)
d_log_Ind_Prod	0.0522	0.0523	0.0523
	(0.0489)	(0.0488)	(0.0488)
d_ESI	0.000413	0.000423	0.000423
	(0.000303)	(0.000303)	(0.000303)
Constant	0.0130***	0.0125***	0.0125***
	(0.000899)	(0.00154)	(0.00154)
R-squared	0.019		0.018

This table presents the regression results for **Fixed Effects** (FE), **Random Effects** (RE), and **Pooled Ordinary Least Squares** (OLS) models based on Equation **(2)**. The t-statistics are given in parentheses and ***, **,** and *** describe the significance at the **10%, 5%,** and **1%** levels, respectively.