MASTERS' IN

MONETARY AND FINANCIAL ECONOMICS

MASTERS' FINAL PROJECT

DISSERTATION

FROM "WHATEVER THE COST" TO "WHATEVER IT TAKES":
THE PARADIGM SHIFT WITHIN THE ECB IN 2011 AND ITS IMPACT ON THE MONETARY UNION

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Abstract

This paper provides a brief historical account of the financial crisis years and the way their impact has led to a paradigmatical change at the ECB level of monetary policy decisions. Several speeches from prominent actors inside the ECB institutional direction were analyzed and discussed. From this historiographical endeavor, I created a model seeking to analyze and explain the effects of the changes in communication stance of the ECB on the interest rate spreads for sovereign debt bonds in the euro area. To provide and empirical analysis of my hypothesis, I used the speech given by Mr. Mario Draghi on July 26th, 2012, as a proxy for this paradigm shift, as well as gathered data on real economic variables - inflation, unemployment, and financial risk measures - and direct monetary policy effects – the ECB standing facility rates. With this empirical model, I found that a dummy variable for the speech of Mr. Mario Draghi provides a strong statistical significance for the regression of the dependent variable of the interest rate spreads between Germany and euro area periphery countries – Greece, Ireland, Italy, Portugal, and Spain - sovereign debt bonds.

Keywords JEL

B26 - Financial Economics, C32 – Time Series Models, E43 – Interest Rates, E52 – Monetary Policy, E58 – Central Banks and their Policies, E68 – Particular Policy Episodes

"It was just some old
convention like the horse
before the cart"
-Leonard Cohen, in Happens to the Heart (2019)

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1.Introduction

As an institution, the ECB is among the most peculiar ones operating in modernity, if one considers its historical and foundational value, as well as its operational guidelines and internal workings. As all other institutions, the ECB does not and could never operate in a vacuum: for all its efforts, as well as that of academics, in looking outward to economic and financial conditions, there is an equally relevant effort of looking inward into the very dynamics and workings of the ECB as an institution. More relevant even, given its condition as a European Institution.

In this work, I intend to shed some light into how the actions of the ECB have shaped the single currency and how it has improved (or perhaps failed to do so, at times) the economic, social and cultural lives of millions of European citizens. I will focus on a comprehensive timeframe of the crisis years of 2007-2016, seeing that these provided a much sharper and noticeable shift in the paradigm of the ECB operational framework and encompassing objectives. The single mandate of the ECB, aligned with the German Monetary Orthodoxy that was preponderant inside the institution's bodies, was deeply challenged and questioned during these years, including the participation in the "Troika" that was imposed in several single currency countries during the sovereign debt crisis.

Such schisms never come free: the challenge to conventions did not come exempt from provoking numerous ruptures at the political level, generating a previously non-existing divide between north and south European economies. The very notion of the European solidarity between its peoples was shattered for many in the south economies. However, it was precisely at this fork in the road that the ECB President at the time, Mr. Mario Draghi, did what was simultaneously simple and extremely hard to achieve: it reinforced market's trust in the institution and its mandate as the enforcer of the single currency. This text hopes to provide an insight into the context and specificities of this historical turning point, not only in material and financial terms, but also in institutional terms, and how its importance as a foundation moment of how the ECB looks at and interprets its own *raison d'être*.

It is not my intention to elevate myself to the attempt of charting a new path to the ECB as an institution and its policies. Rather, in a much humbler aim, I hope to provide a summary of the intentions and theoretical underpinnings. I intend to shed a light into what could have been lost in the way, when the wagon of good intents happens across the most cavernous faults on that very road should a paradigm shift never have taken place at the institutional level of the ECB.

2.Historical Background

To chart the course up to this point, I shall start with a brief background of the ECB as an institution and its evolution up to the present day. When it comes to the institutional framework, the founding member-states understood the need for an initial encapsulation of the monetary union and its newly founded institutions into the European treaties. Following the signature of the Maastricht Treaty of the European Union in February of 1992, which resulted from extensive council negotiations in this aspect, (which would later enter into force in November 1993), the decision to create both the European Monetary Institute and the European Central Bank in the German city of Frankfurt Am Main is taken in that same year of 1993. Starting in June 1998, the European Council mandates a committee coordinated by Jacques Delors (the "Delors Committee") to make proposals for the realization and implementation of a European Monetary Union (EMU). The resulting report was aptly named "the Delors Report" and preparations for the implementation of a single currency union proceeded according to the guidelines therein found in three "discrete but evolutionary steps" (Delors, Et al, 1988).

On the eve of the single currency implementation, in May of 1998, the bodies and respective personnel of the ECB were formally appointed by a common accord of the governments of the then 11 participating Member States. It consisted of two main bodies, a Governing Council and an Executive Board, by order of enclosure. Simultaneously, a deep interest in a "rapid and comprehensive changeover" (Scheller, 2006) from financial markets and the institutions operating therein, sector associations came together under the guidance of the EMI to create what would become the new

money market reference rates: EURIBOR and EONIA. As such, the transition first took place at the financial markets level and only later at a corporate level, with Euro-denominated bank notes and coins only being introducing on 1 January 2002. By February 2002, these said banknotes and coins were the only currency with legal tender in the economic territories of the recently formed Euro Area.

The legacy of this creation and historical achievement is nonetheless remarkable. However, for all its intents and purposes, the ECB was not a Community Institution in the official meaning of the term, despite performing a policy function predicted in the Community Treaty. It is never mentioned in Article 7 of the initial Community Treaty, which establishes the five institutions of the Union – The European Parliament, the Council, the European Commission, the Court of Justice and the Court of Auditors. The legal framing and basis of operation of the ECB arises, instead, directly from Article 8 of that same Treaty, where the mandate, tasks and goals of the ECB as well as of the ESCB. This is one of the main aspects of the institution's singularity in its early years, for its powers and aims were not delegated by other institutions and their respective political processes, but rather conferred upon directly by the Union Treaty. This was true until 1 December 2009, when the Treaty of Lisbon entered into force and the ECB was now envisaged as an official European Institution under the recently formulated Article 13.

It was also by this time that the main defining trait of the ECB as a Central Bank was defined: its single policy objective of price stability. Whereas other Central Banks throughout the world have defined multiple policy objectives – The Federal Reserve Bank, for instance, being the lead example, having both objectives of price stability and full employment in the economy – the ECB is solely focused on this goal. The reason for this, or at least what the ECB tells itself concerning this sole focus and can be found in official reports and records of the institutions below cited (Scheller, 2006) is that, in (liberal monetarist) theory, monetary policy can ultimately only influence the price level in the economy. I hope also to demonstrate, drawing from the very history of a particular ECB intervention, that this is not necessarily the case, in both the economic and political fields.

I should, however, note that, although the initial primary objective of the ECB being delineated right during its formation, it was only by October 1998 that it has specified what it understands as "price stability". To see and note how the institutions looks at its own objectives is also remarkably relevant in assessing its actions. The ECB operates with a specific quantitative definition of "price stability" in mind: In October 1998 the Governing Council of the ECB defined price stability as "a year-on-year increase in the Harmonized Index of Consumer Prices (HICP) for the euro area of below 2%" and added that price stability "was to be maintained over the medium term" (Scheller, 2006). A few years later, in 2003, the Institution, through its Governing Council, further specified that "in the pursuit of price stability, it aims to maintain inflation rates below but close to 2% over the medium term" (Scheller, 2006). This fetishization with the 2% target of inflation is neither new nor contingent to the ECB and has, for several years, been a matter of debate among economists of several schools of thought. However, I do not aim to focus on the specifics of such analysis of inflation target rates, given its broader reach and relevance further outside the ECB's scope of action.

The timing of this transition is nonetheless relevant, for the Great Recession was well on its way by that point. This text hope to shed some light on the events of those years as well as on the legal framings that the ECB had to deal with them: how they also evolved and changed over these years. During the crisis, the hardest hit part of the Euro system was undoubtedly the transmission mechanisms of the monetary policy used by the ECB to conduct its operations. Since then, one could either claim that, despite the nomenclature of "non-conventional" monetary policy actions, the institution has either focused its efforts in reconstituting the operability of the old systems or overcharging those very same hampered mechanisms in the hopes of achieving the intended outcomes. The very thought of questioning the said mechanisms and their adjustability in the present and future seems to be, remarkably, off the table for many in the institution.

Such *modus operandi* was thoroughly questioned and analyzed both inside and outside the institution during the crisis years that spanned from 2008-2014. Economists, investors and political stakeholders all discussed the ECB's actions and accountability

towards, firstly, the panic of the 2007 Crash and subsequent illiquidity in financial markets, which contaminated into an economic crisis; and secondly, the sovereign debt crisis that threatened the very stability of the Single Currency. One could claim, perhaps, that it was only due to the paradigm shift that the ECB took in relation to the extension of its mandate during these years – there shall be no price stability to be maintained if the very single currency crumbles upon itself due to fiscal insolvency of nearly half of its member-states – that allowed it to continue to be relevant and operate as an Institution that has a *raison d'être* beyond the mere application of monetarist textbook solutions to very specific problems and contexts. The single currency consisted in bringing forth a project never undertaken, considering its scale, complexities and ambition. An institution that does not understand this and that, unlike the creators of the project it oversights, fails to encompass the need for improvisation when all else seems to have its effectiveness hampered, is an institution which shall be condemned to withering and failing in the long run.

3.Literature Review

This project has the aim of analyzing discussions, both theoretical and practical, concerning the role of the ECB as the institution overseeing, not only the single currency but the economies of the euro area countries as well. The uniqueness of the ECB's single mandate of price stability is a matter which I hope to focus on and uncover the academic challenges in existing literature to this arrangement. It is my belief that this process will prove a deeper understanding of the current positions concerning the institution's sphere of activities, as well as the realm of possibilities moving forward in this regard.

For this purpose, I have chosen to start by reading academic literature concerning the topic of inflation expectations and how the ECB acts upon them. A 1998 paper authored by Michael J. Artis and Zenon G. Kontolemis titled "The European Central Bank and Inflation Targeting" develops some thoughts on the seemingly pernicious nature of this monetary policy focus. In the process of enshrining upon the ECB a single mandate, inspired by the monetary orthodoxy and the shallowness of the political compromises of the years leading up to the Maastricht Treaty (1993), the mandate of the institution

was kept, as we have seen, to a very strict focus on price stability. However, the authors pose a very relevant question: that of the pernicious cyclical nature of the ECB response to inflation expectations.

Given that the ECB was left to its own devices when it came to define and specify what it understands to be its main goal (i.e., what it understands as price stability in the medium-term and that which provides it with a measure of accountability to its actions), the very performance of the institution "is to be judged relative to its success in keeping forecasts of inflation within the pre-announced bands." (Artis and Kontolemis, 1998). This, however, can prove a hard background against which to ensure that inflation is satisfactory. The word "forecasts" takes a special emphasis here, considering that the said forecasts against which the ECB measures its own actions in monetary policy are often elaborated by itself. Hence, under the single mandate of inflation targeting, the ECB's reaction to inflation forecasts – which are very often of its own making – form also the existential basis for the judgements of its reactions. However, this can either prove to be a very calming and reassuring feedback loop or the opportunity for overreactions of monetary policy actions in relation to the economic conditions.

Another equally relevant fact raised by the authors is the nature of the "one-size-fits-all" measures of inflation expectations and forecasts used and issued by the ECB. By making use of a "common area inflation rate" the ECB erases the variation and differences of inflation dynamics between the economies of single currency member-states from its models. This variation, explained by differences in tastes and expenditure patterns among countries, degrees of economic activity, liquidity in national financial markets and inflation differentials can often lead to maladjustments of monetary policy objectives within the currency union. From its inception, the project of the currency union was a specially challenging one considering that it would occur over some of the most specialized economies in the world at the time – which is not a good predicament if one accounts for the Theory of Optimal Currency Areas (Mundell, Robert A., 1961) – nowadays, that persistent high level of specialization can deepen this challenge to the "one-size-fits-all" monetary policy operations which seems to have been forgotten

during the monetary orthodox imprinting of the ECB scope of objectives in 1993 Maastricht.

Following this logic of analyzing the literature that discusses the suitability of the ECB single mandate, I also found a very relevant paper titled "A New Two-Pillar Strategy for the ECB" authored by two Brussels-based researchers for the Center for European studies, Paul de Grauwe and Daniel Gros (De Grauwe and Gros, 2009). The main argument presented and developed over the course of the paper is that the entrenched ECB mainline argument which states that there is no tradeoff between price stability and financial stability is theoretically incorrect. In this effort to prove otherwise, the authors start by recognizing that, unlike the one specified above, the ECB – as most central banks do – recognizes other tradeoffs, namely the one between inflation and unemployment.

Through a theoretical exemplification that assumes a positive tech driven shock that increases economy-wide productivity, the authors point out that, by only targeting price stability, a monetary authority such as the ECB could generate unsustainable output gaps which, in turn, generate instability in the financial markets. This would occur since the price stability targeting would cause what was described and cited as a "Kindleberger Process of Monetary Accommodation" (Kindleberger, C.P., Aliber, R.Z., 2005): occurring when the CB uses its available mechanisms to enforce a stable price by generating changes in aggregate demand that are fueled by either excess of shortage of credit, both differing from the optimal level of market equilibrium. I should note, however, that from a reader's perspective, the absence of an accommodation of the fact that the Central Bank does not practically target a specific and stable price level, but instead a level of acceptable growth of the said price level.

Based on this point, there is an argument that the ECB should strive to complete a "lexicographic reordering of objectives" (De Grauwe and Gros, 2009) and abandon the idea that strict inflation targeting is consistently harmless to the financial stability of an economy. However, the authors leave a note concerning the road ahead of the institution should it endeavor to do so: to replace the existing lexicography, the ECB will

need to define (much alike what it did for price stability) what it understands as financial stability. This task might prove much more complicated and with larger consequences to the overall policy endeavors than the previous task of defining price stability. On the other hand, the monitoring aspect of this refocusing should not prove as challenging – the authors argue that data on asset prices and credit in circulation throughout the economy was already available in the years leading up to the financial crisis of 2008 which could have been used to spot the formation of a credit bubble and associated financial instability.

In an illustrative effort, it is pointed out that, in the years prior to the 2008 crisis, the levels of inflation targeting by the ECB were accomplished (2.2% inflation rate per annum measured by HICP on average from 1998-2008) whilst the levels of the monetary base (M3) wildly exceeded the values the ECB set out as its target reference of 4.5% (7.4% growth rate of M3 on average per annum from 1998 to 2008). The authors use these numbers to argue that the credit expansion was channeled into asset markets, fostering the accrual of a bubble of financial instability that was not duly monitored or targeted by the ECB Monetary Policy. There is another reason pointed out by the authors for the perceived blindness of central banks concerning the buildup of financial distress in markets: the economic models more commonly used in these institutions - Dynamic Stochastic General Equilibrium (DSGE) Models. These models assume full rationality and information from economic agents and, hence, any shock that might take place in markets is always and every time an exogenous shock impossible to predict and/or account for a priori. They then serve as "an intellectual device that prevents policy makers from seeing emerging problems in financial markets because, in these [DSGE] models, these problems simply do not arise." (De Grauwe and Gros, 2009)

The single mandate of the ECB is thus heavily questioned and criticized by the authors, who refer to a double mandate alternative: one where the ECB has at its disposal several other instruments to foster, simultaneously, financial stability using legal reserve requirements and macroprudential controls. In conclusion, it is argued that a double mandate does not necessarily lead to higher inflationary expectations (or a lack of

expectations thereof). Instead, it is claimed that lower perceived risk of bubbles would lead markets to stabilize expectations alongside the price stability mandate.

In order to associate the institution's guidelines and the respective theoretical basis for its policy actions, I have also considered the seminal paper from Marcel Fratzscher "Rules versus Human Beings, and the Mandate of the ECB" (Fratzscher, 2015) as an important step for this review. In it, Fratzcher begins by pointing out the vicissitudes of the placement of the ECB within European treaties and its respective evolution over the years. In the treaties, it is specified that the European Central Bank has the mandate to achieve price stability, primarily, and, as a second thought, to achieve economic stability.

Fratzcher points out, fittingly, that this second point is purposely vague. How is the institution to achieve this stability? Is it considered to be a mere byproduct of the price stability efforts? Should it serve to counterbalance possibly hawkish positions in policy which puts price stability forward above all other indicators? What are the theoretical foundations and underpinnings for this perceived recommendation? In fact, it was up to the ECB to specify what it should understand by its main mandate of price stability, as I mentioned in my introduction.

The author also points out several critiques of ECB monetary policy in a post crisis environment and assesses their empirical and theoretical foundations. For this purpose, I considered relevant to focus and refuting some of the arguments of the German Monetary Orthodox thinking in monetary policy objectives, namely on the aspects of price stability at zero percent inflation rates and the costs associated with deflation. In the first aspect, the author points out that, despite one of the arguments for price stability that stems from the German Monetary Orthodox perspective being that "true" price stability is achieved at zero percent inflation rate, there is an "upward bias to inflation" (Fratzscher, 2015). This "upward bias" is explained by the author as an underestimation of the goods and services with weaker inflation dynamics (i.e., differences in weights and elasticities of products and services baskets translates into

many products and services already experiencing deflation whilst overall inflation rate is at zero percent).

Moreover, the author also refutes the argument that deflation costs are negligible if such does take place while at zero or close to zero percent inflation presenting three main reasons: Deflation causes both consumption and investment demands in the economy to fall, opening the possibility of an output gap in the medium-term. The second argument being that deflation has an obvious impact in the levels of debt sustainability, making existing debt relatively more expensive to pay off. This is specially concerning in a European context of the post-sovereign debt crisis and the still existing political tensions that put a lot of pressure in the political cohesion of the single currency union during those years. Hence, this argument can never be an exempt one. The third and last argument being that without any level of inflation whatsoever, it is much more difficult to implement structural reforms due to a lack of inflationary opportunity momentums. The author points out the need for an overall price adjustment that needs to be undertaken amongst euro area countries and which I could point out that is still a remnant from a rushed implementation of the very single currency in the late stages of its creation, with convergence criteria being relaxed to facilitate the entrance of some of its adopting member states. In effect, without this inflationary opportunity, both nominal and real wages and income would be fixed.

Still relevant to my literature review on this paper is the author's considerations about the nature of the ECB mandate. However, these are only presented as a qualitative comparison to the mandates of other central banks around the world. Hence, it is pointed out that, due to its very restricted nature, the ECB has one of the most specific and ambitious objectives in the world of central banking, in line with my introductory considerations. This very narrow objective of "below but close to 2% inflation rate in the medium term" also confers upon the institution an aura of transparency and accountability. I should note, however, that, as an argument, to consider the straightforwardness accountability that comes with a smaller scope of quantified objectives does not come without its flair of institutional paternalism.

However, Fratzscher also elaborates a final critique of the ECB single mandate of price stability, stating that a broader mandate than the one currently adopted by the institution could provide monetary policy actions "more consistent with the social welfare function of society" (Fratzscher, 2015). Whether the term "society" here is employed in a vague and economic theory focused way or as a signifier for a stronger cohesion of euro area countries I believe is an equally relevant matter of debate. This political connotation is especially relevant if one considers a final observation the author makes about the legal independence of the ECB in the future: The perceived sanctity of the legal independence of the central bank has been broken and may now be up to challenge since its participation in the "Troika" of the crisis years that was imposed on several euro area countries. Fratzscher remarks, eloquently, that this participation has broken the veil of the ECB as a "non-political institution", something it never actually was or could be.

Continuing the effort to analyze the shifting ideas and theoretical frameworks in which the ECB operated both before and after the crisis, I have sought to analyze a more recent paper from 2021 authored by three Portuguese economists - Francisco Louçã, Alexandre Abreu and Goncalo Pessa Costa – titled "Disarray at the headquarters: Economists and Central bankers tested by the subprime and the COVID recessions". Although the timescope of the analysis of this paper is more extensive than the one I am basing my analysis in, it provides a more contemporary accounting of several of the discussions had by monetary policy actors during the years of the Great Recession.

The authors duly point out that Jean-Claude Trichet, president of the ECB at the time of the onset of the financial crisis, "stands alone […] as a central banker who publicly blamed the models used by his institution for their inadequate assumptions and inability to predict the crisis." (Louçã et al., 2021). However, despite this lamenting, Mr. Trichet did not, in fact, adopt anti-cyclical measures, as it would go against the reasoning of the DSGE models used by the ECB and over which his criticisms lie upon. Moving further in time, the authors remark that it was only by the end of Mario Draghi's mandate, who came to replace Mr. Trichet as president of the ECB in November 2011, that the recognition of a need for a structural redefinition of the institutions aims and ambitions

during the crisis was admitted. In his "Farewell Remarks", given on 28 October 2019, Mr. Draghi stated that "no one could have foreseen that the environment facing monetary policy globally was soon to abruptly reverse: that inflationary forces would turn into deflationary ones. In all advanced economies, this called for a new paradigm for central banking, which comprised two elements: the determination to fight deflation as strongly as inflation, and flexibility in the choice of instruments to do so" (Draghi, 2019). Hence, it is apprehended that the Great Recession did indeed open the possibilities for a relative relinquishment of the pre-existing monetarist orthodoxy that ruled the ECB institutional workings and the resulting policy actions.

Perhaps even more eventful is the light the authors shed into the considerations of the ECB regarding fiscal policy stances in the euro area countries. Mr. Draghi sough to combine calls for fiscal expansion in the medium and long-terms to aid the economic recovery being pushed by the new unconventional monetary policy mechanisms. However, simultaneously, Mr. Draghi also sought to combine calls for the above-mentioned fiscal expansion with "reminders of the inexorable need for fiscal consolidation to appease investors' confidence" (Louçã et al., 2021). One is indeed left to question if these two aims would have become contradictory, as the authors point out that Mario Draghi "never quite overcame this arguably inconsistent attempt at squaring the circle between fiscal expansion and fiscal consolidation and the previously dominant argument for expansionary austerity" (Louçã et al., 2021). All evidence pointed to a subtle but still existent shift in paradigm whose starting point took place around 2011 and was immediately tested by the years of the sovereign debt crisis in the euro area.

It is now with the knowledge and ideas of some of the existing literature around this theme that I shall endeavor on to the main part of this dissertation. This analysis of the critiques and acknowledgements of the background of the ECB's single mandate and monetary policy actions in line with its objectives might serve as a backbone onto which to assert and compare my hypothesis: Has the ECB been blindsided by its own aims? In this chapter I have seen that, as with all institutions of power, its actions are never performed in a vacuum of ideas, history or circumstances. The guidelines which orient

the ECB's actions are a direct consequence not of the context in which it was founded but also of the conditions which preceded it operations. The flaws of the single currency need not necessarily be the flaws of the ECB's monetary policy henceforth, but neither's shortcomings are indissociable from one another.

4.Data Used and Respective Theoretical Underpinnings

This project sought to acknowledge the European Central Bank's single mandate and its subsequent policy actions while also empirically analyzing it with available data. This aims provide an insight into the shifting communication stances of the institution during the crisis years and its impact on the sustainability of the currency union in sovereign debt markets.

Hence, I have started by gathering data on the daily EURIBOR market interest rates since January 2007 to December 2016 for the most used maturities: 1 week, 1 month, 3 months, 6 months and 1 year. The data was provided, upon email request, by the European Money Markets Institute (EMI). The aim of this initial endeavor was to provide an in-depth idea of day-to-day changes of market rates to Monetary Policy decisions taken by the European Central Bank. However, in order to compare this dataset to others which I have also collected and are not available on a daily basis, I have sought to adjust the above mentioned daily time series of market rates to a monthly one. To do this and still retain as most accuracy as possible, I opted to not use a general rule-of-thumb average of the daily observations of a given month. The reason for this was a simple yet a very technical one: the number of business or market days in a given month are not all the same within a year and not all the same in the euro area markets. Even notwithstanding the general differences in civil calendar days between months, the business calendars of respective euro area member states - and in some cases even regions within said member states - are not all the same. Hence, this had the possibility to skew the analysis due to differences in liquidity and volume of market operations. Thus, I opted to consider the monthly observations to be the observation of the market rates at the market close of the last business day of a given month. To directly analyze the movements of monetary policy in accordance with the ECB intentions, I have also

sought to create a continuous sequence of monthly observations for this period for all the ECB official standing facility rates: the ECB Deposit Facility, ECB Marginal Lending Facility and the ECB Main Refinancing Operations Facility.

Firstly, let us delve into more detail on the workings and aims of each of these standing facility operations, as well as their place in the framework of the various types of Quantitative Easing and their own, respective, aims. These 3 standing facilities whose rates are under the sole discretion of the ECB allow financial institutions to conduct euro-denominated refinancing operations. They are distinct in two main aspects: their maturity and their effects on the liquidity of financial institutions. The Marginal Lending Facility serves the purpose of obtaining "overnight liquidity from the central bank, against the presentation [collateralization] of eligible assets" (Standing facilities, 2022). The nature of these "eligible assets" serves on the other hand, the purposes of the various types of QE, which I will focus further. This allows financial institutions to increase their overall levels of liquidity by borrowing euro denominated currency from the ECB at the designated rates. Mirroring this standing facility we have the ECB Deposit Facility, which allows to make overnight deposits in the central bank accounts also at a designated rate. However, instead of increasing liquidity in financial markets, this standing facility is intended for the opposite: to withdraw excess liquidity away from financial institutions. Lastly, we have the Main Refinancing Operations Facility, which allows financial institutions to borrow from the ECB in euro denominated currency at maturities of, usually, one week. (European Central Bank Glossary, 2022.)

Let us also delve briefly into the workings of the various types of QE. As the Portuguese Economist Ricardo Reis (Reis, R. 2022) summarized it: QE Type 1 is aimed at increasing the deposits of banks at the CB. In this framework, the Central Bank borrows from banks by issuing reserves (i.e., the most liquid asset in the economy). The goal of QE1 is to increase liquidity in the private sector and has the effect of increasing the liability side of the CB Balance Sheet. QE Type 2 is aimed at shifts within the composition of the assets

of the CB. In its more basic form, QE2 seeks to lower long-term yields by selling[1] short-term bonds and buying long-term bonds. Lastly, QE Type 3 is often used to, either directly (when allowed) or indirectly, acquire assets that are in financial distress and/or provide emergency lending to financial institutions. QE3 is thus a measure of financial stability which serves the classical role of lender of last resort whilst also seeking to minimize moral hazard. Hence, all three standing facilities of the ECB can be used to conduct all types of QE.

It was in this effort that I have created a time series of monthly data for each of the rates of the three standing facilities of the ECB. Beforehand, I should note that some data transformations were enacted. All available data was extracted from the European Central Bank Statistical Data Warehouse (SDW). The data for the standing facility rates was extracted based on the actual level and associated date of change. Since this did not compose a continuous time sequence, I took it upon myself to translate it into a continuous sequence of monthly data between January 2007 to December 2016. This posed a specific technical question: since most changes took place in a specific day of the month, I assumed the rate change to be effective in that one month, even though the days prior to that change still had the previous rates. It is my belief that this simplifies the process without causing a major loss of fidelity to the effects of the variation of said facility rates given the relatively large number of observations (120 in total).

Considering the real economy effects of monetary policy to which it is to be hold accountable to, I have also gathered from the same source (ECB SDW) monthly data on both Euro Area Unemployment and Inflation measurements. The measure for inflation is that of the commonly used HICP - Harmonized Index of Consumer Prices - calculated for the Euro Area, which considers the variation in prices of a given basket of final

[1] In the context of sovereign debt, the term "selling" is here used in an elated context. As we have previously seen, the ECB, at least, is not allowed to directly acquire sovereign debt bonds. Instead, as part of the subsequent QE programs, it does, however, consider sovereign debt to be one of the "eligible assets" against which it accepts to collateralize debt to financial institutions through its standing facilities lending.

consumer goods and services in the single currency economies. The measure used for unemployment consisted of the full unemployment rate – not adjusted for excess unemployment[2] due to the existing differences in workforce composition and demographic distribution between the economies of the single currency. Since the timespan of the observations is relatively large there have also taken place relevant shifts in the shares of working age populations of the said economies.

Moreover, the timespan of observations also includes a major 21st century historical event, the Great Recession, which has left lasting impacts on the nature of the social and economic conditions of the Euro Area member states. Such impacts were felt, not only but also, at the level of workforce composition and behaviors of economic agents towards the labour market and demand for higher education. Hence, the measure of unemployment used is a total one, comprising everyone aged 15 to 74 and adjusted for seasonality.

Lastly, and picking from some of the ideas already covered in the literature review, I thought it suitable to also analyze a measure of financial risk. For this purpose, I used the Systemic Risk Measure used by an internal organization of the ECB, the European Systemic Risk Board (ESRB), in its Risk Dashboard Publication dated from 8th September 2022. This measure seeks to evaluate the "probability of simultaneous failures of multiple financial institutions" (2012. Financial Stability Review). To better understand the weights and proponents behind this measure, I should note that it is based upon a three-step procedure to evaluate the default risk of euro area Large and Complex Banking Groups (LCBGs): Risk inherent from individual Credit Default Swaps, Market beliefs and subsequent evaluation of an institution's performance and, lastly, an indicator of the perceived joint probability of at least two LCBGs defaulting simultaneously.

There was, however, some adjustments that needed to be made to the data extracted from the ECB Statistical Data Warehouse, as all the data collected was on a daily

[2] To be understood as the level of unemployment above what is considered the natural rate of unemployment in an economy at a given time.

recording basis. Since this generated a huge number of observations which would not be in line with the rest of the dataset I have been building thus far, I entailed to perform the needed adjustments to transform it into monthly data. Once again, a simple average of all the daily observations on a given month would be skewed and insufficient. Hence, I used the ECB Adjustment Regressor database of Euro Area working days (Buono, 2018) to build a time series of monthly observations which considered the following two main aspects: not all calendar months have the same amount of business days, neither is this number of business days in each month the same in all euro Area member states I am analyzing. The distribution of averages of working days, for each month and from all 19 euro area countries, which I used for this adjustment can be found on Table 1 in Annex 1. With this average, I was able to sum all daily observation for each of the 120 months of the sample observation and divide each by the corresponding ECB-calculated monthly average of working days. Finally, I had my dataset complete with an adjusted average of the monthly Systemic Risk measure.

5.Standing Facilities and Market Rates

Now being able to endeavor into the territory of analyzing the data collected, I will seek to interpret it in the light of the theoretical and historiographical questions this project aims to assess. Firstly, as we have seen that the only direct tools which the ECB determines in its monetary policy actions are the rates of its standing facilities, I considered it relevant to analyze their evolution and respective impact in Euribor market rates. Before this task, however, I sought to create a chronology of relevant events in monetary policy history for this time frame and juxtapose them with the evolution of the above-mentioned rates. For this aspect, I considered the occurred change in presidency terms of the European Central Bank - Jean-Claude Trichet stepped out of office on 31 October 2011, with Mario Draghi entering on the following day, 1 November[3]. I should admit that these dates shall prove irrelevant for the changes in the ECB standing facility rates, as the institutional workings and framework of the ECB are

[3] There is a double effect underlying in this date: This same day, the then Greek PM, Mr. Papandreou, announced a referendum on new Eurozone debt deal, causing a market reaction entailed by a possible non-compliance of Greece with austerity measures imposed by EU institutions (Reuters, 2010).

not known for encompassing immediate policy changes upon presidency term changes. They remain, however, relevant to assess the market reactions – through the various EURIBOR maturities – to such changes. It is my belief, also, that operating with monthly data confers a higher degree of liberty to account for a wider timeframe of market cycles of acknowledgment, reaction and early stages of eventual corrections of the initial reactions. Hence, the dates relevant in the data are as follows in the Table 2 in Annex 1. Henceforth, I shall refer to these dates on an alphabetical order used to simplify their acknowledgment.

6."Whatever the Cost" – The ECB's Initial Response

Looking at the temporal behavior of the standing facility rates, we can note some important takeaways. All three facilities had been experiencing increases in their rates prior to the start of the first signs of financial distress in 2007 (Moment A). When the full scale of the financial crisis was understood, forwarded by the bankruptcy announcement of the Lehman Brothers investment bank in September 2008, there seems to have been a small moment of hesitation, both within the ECB and within the markets, with the latter being oddly more unexpected. It was only on October 9 that the ECB enacted a change in all three standing facility rates to ensure "the provision of liquidity to reduce strains in financial markets" (Monetary Policy Decision Press Release, ECB. 2008). One remarkably interesting takeaway from the above-cited press release dated from 8 October 2008 is the framing that the ECB direction under Jean-Claude Trichet presidency conferred upon the rate cuts: they were claimed to only be possible because inflation expectations have lowered due to recent events:

> *"Inflationary pressures have started to moderate in several countries, partly reflecting a marked decline in energy and other commodity prices. Inflation expectations are diminishing and remain anchored to price stability. The recent intensification of the financial crisis has augmented the downside risks to growth and thus has diminished further the upside risks to price stability."*
>
> *-Monetary Policy Decision Press Release, ECB. 2008*

The *raison d'être* of the rate cuts was not due, on a first thought, to the financial collapse which was unfolding in markets and would soon start to contaminate sovereign debt markets of euro area member states as well. The ECB seemed to still be very much conscious of its single mandate of price stability, above all. Following this announcement, the largest ever to record rate drop took place on all three standing facilities. Several more rate drops, with the same motif in mind, took place and in the 3-month period between October 2008 and January 2009 the Deposit, Marginal Lending and Main Refinancing Facilities had seen its rates drop a total of 2.25, 1.25 and 1.75 percentual points, respectively.

A very similar behaviour ensued in the EURIBOR market rates for all maturities, having the highest recorded drop from October 2008 to February 2009, as markets adjusted to this newly found massive increase in liquidity supply and demand, as a documented steep risk aversion took over market sentiments over the world.

This environment of low standing facility and low market rates was kept until May 2010, when market rates started gaining some corrective momentum against the drops of the past 12 months. It was, however, only in April 2011 that the ECB increased its facility rates, causing a subtle but noticeable jump in market rates alongside. In a press statement, the logic given by the ECB President at the time, Mr. Jean-Claude Trichet, was the same as it had been nearly two years prior, only now reversed:

> *"The adjustment of the current very accommodative monetary policy stance is warranted in the light of upside risks to price stability that we have identified in our economic analysis."*
>
> *-Trichet, J.-C. (2011) "Introductory statement to the press conference"*

The ECB was ready to increase interest rates again in the market due to an increase of inflation expectations. More striking is the simultaneous acknowledgement of the possible effects this push would endeavour on the public finances of the countries already in financial and fiscal distress within the monetary union. One should note that,

by this time, the Greek government had already suffered through one bailout after the newly elected government of PASOK[4] announced – nearly one week later after taking office – that the budget figures of Greek public finances have been underreported for several years and, subsequently, several harsher austerity measures would be needed. In this same press conference, Jean-Claude Trichet makes a point of addressing the elephant in the room and does so with the sound of shattering glass coming from the broken illusion of institutional political exemption of the ECB. Regarding the fiscal "challenges" faced by some Euro Area member states and their respective effects on the monetary union, Mr. Trichet stated:

> *"Turning to fiscal policies, it is essential that all governments achieve the consolidation targets for 2011 that they have announced. […] it is crucial that substantial and far-reaching structural reforms be urgently implemented in the euro area to strengthen its growth potential, competitiveness and flexibility. […] On the labour market, the priority must be to enhance wage flexibility and incentives to work, and to remove labour market rigidities. However, in our view, the proposals [by the European Council] fall short of the necessary quantum leap in the surveillance of the euro area which is needed to ensure the smooth functioning of Economic and Monetary Union."*
>
> *-Trichet, J.-C. (2011) Introductory statement to the press conference*

This declaration has a multitude of meanings, however all pointing in the direction of the Zeitgeist surrounding European Institutions in early 2011: the crisis was already an opportunity which could not be missed. The financial distress in which the PIIGS[5] were

[4] Pan-Hellenic Socialist Movement. PASOK had won an absolute majority of 160 out of the 300 seats in the Greek parliament and would form a government headed my Mr. Georges Papandreous.

[5] PIIGS – Portugal, Italy, Ireland, Greece and Spain. This overtly derogative term was used in media and financial outlets to refer to the group of euro area countries whose public finances were most strained. by high indebtedness during this time. I shall, henceforth, refer to these countries in what I hope to be a more respectful term pointing to their perceived geographical – and seemingly financial – situation: euro area periphery countries

found in was not to be understood as a concern for the cohesion of the monetary union in so far as they faced only one possible way out of their economic and financial problems: to comply with the austerity programmes devised by the European Institutions and, in some cases, the IMF.

The striking aspect of this specific press conference above cited, which took place on 7 April 2011, was the questions posed by some journalists to Mr. Trichet. One journalist inquired about the possibility of the rate hikes being announced and putting further strain on the group of countries mentioned above, to which Mr. Trichet cryptically answered:

> *"I will only say that we are responsible for ensuring price stability for 331 million people, and all the decisions that we have taken since the very beginning of the euro, including today's, have been designed to deliver price stability to 331 million people."*
>
> *-Trichet, J.-C. (2011) "Introductory statement to the press conference"*

This specific press statement is, indeed, being cited often in this chapter for its encompassing nature of what was the ECB paradigmatic stance at the time: euro area countries that were harder hit by the recent financial crisis should strive to counteract this new position in which they found themselves via their fiscal mechanisms. Any trace of monetary policy aligned to ease these countries in their debt struggles was, seemingly, completely out of the political imagination of the ECB and other European Institutions.

Following these rate hikes, the market EURIBOR rates for all comprehensive maturities spiked, accordingly. Noteworthy, too, is the fact that the spike was even more acute in higher maturities than in lower ones, with the EURIBOR rate for 1 year maturity suffering the highest jump, in comparison with both the 6 months, 3 months and 1-month maturities. This could be interpreted, at the time, as a signal that even markets were not as weary of the conjunctural position of the single currency as they were, instead, of the

structural position and cohesion of the single currency. Could it be that markets have had a more encompassing degree of political imagination than that of European Institutions, the ECB included? One should note that, by this time, major political strikes and street manifestations were taking place across the euro area periphery countries to context the austerity measures and pay cuts introduced.

7."Whatever it takes" – A new perspective

As previously seen, the term of Jean-Claude Trichet as president of the ECB ended on 31 October 2011, with Mario Draghi entering office immediately the next day. The market reaction is difficult to assess due to the multiplicity of events that took place this same calendar day in relation to the euro area. That same day, PASOK Greek PM would announce a referendum on the Eurozone Debt Deal and its enforceability in Greece, out of which Mr. Papandreou would withdraw less than two days later, on 3 November amidst pressures from the German and France governments. These 48h were already enough for the markets to revaluate their demand for Greek and euro area public debt. Noteworthy, however, is the fact that the appointment of Mr. Draghi to the position by the European Council was already announced the previous June of 2011, thus markets already internalised, several months prior, their reaction to this announcement.

A mere two days later, the new Draghi ECB presidency announced a shift in direction of monetary policy: it would revert the course of the past months and decrease the interest rates on all three standing facilities of the Eurosystem, with effects starting on value date 9 November 2011. The rationality behind these rate cuts were simultaneously new and in line with the previous paradigm:

> *"While inflation has remained elevated and is likely to stay above 2% for some months to come, inflation rates are expected to decline further in the course of 2012 to below 2%. […] In fact, if sustained, sluggish economic growth has the potential to reduce medium-term inflationary pressure in the euro area."*
>
> *-Draghi, M. (2011) Introductory statement to the press conference*

The focus was still on price stability and inflation, indeed. However, the permissiveness of the level at which medium-term stability could be achieved in the euro area was now much wider. The admittance of an inflation rate well above the target rate of "close but below 2%" for an undetermined and unforeseen amount of time was well beyond any previous hint of a more comprehensive consideration of other factors into the monetary policy conducting processes of the EBC. There is, simultaneously, a hint of inclusion of financial stability concerns into the process of determination of the interest rates of the standing facilities. The stress given to the notion of "downside risks" to inflation, meaning, the risks of a too low inflation along a demarcated slowdown of economic activity in the euro area to trap economies in the underpinnings of a deflationary spiral in some goods and services markets.

> *"Downside risks notably relate to a further intensification of the tensions in some segments of the financial markets in the euro area and at the global level, as well as to the potential for these pressures to further spill over into the euro area real economy"*
>
> *-Draghi, M. (2011) Introductory statement to the press conference*

Notably missing, however, is any mention of the concerns of public debt sustainability in the countries experiencing higher rates of interest on public debt issuances – the euro area periphery countries.

Over the following months, several more rate cuts ensued on the three standing facilities, followed by steep drops in the market Euribor Rates alongside. Once again, the higher maturities showed signs of a steeper decrease than that of the lower ones, with Euribor 1 year and Euribor 6 Months dropping much more sharply in relation to the remaining two maturities in the analysed data. In the meantime, this did not stop the generalized deterioration of the fiscal borrowing conditions for euro area periphery countries. Furthermore, the political crisis in Greece was developing and deepening the sovereign debt crisis for the euro area periphery countries, with the legislative elections of May 2012 having been unable to form a majority government and demonstrations turning more and more violent in the streets of Athens. In early July 2012, news

circulated that the former Chancellor of the German Federation, Mrs. Angela Merkel, had allegedly called the Greek PM, Mr. Papandreou, in order to motivate the schedule of a referendum concerning a possible exit of the euro area. This event that was never officially confirmed by the German government cabinet had, nonetheless, motivated market reactions to the possibility that the very cohesion of the monetary union was being put in question.

It was amid this political, economic and financial turmoil that Mr. Draghi issued an historic speech, on 26 July 2012. Professor of Economic History at the European University of Rome, Mr. Giovanni Farese, classified this speech as being "highly political in the best sense" (Farese, 2022) in a public letter published in the Financial Times on the 10-year anniversary of the speech. Famously, Mr. Draghi starts his address on a rather poetic note:

> *The euro is like a bumblebee. This is a mystery of nature because it shouldn't fly but instead it does. So, the euro was a bumblebee that flew very well for several years. And now – and I think people ask, "how come?"*
>
> -Draghi, 2012

Mr. Draghi then goes on about the perceived and actual strength of the single currency, in comparison to that of two other major world economies, such as the US and Japan. However, perhaps the most striking feature of this speech comes from the acknowledgment of the "political capital that invested in the euro" and the deep assertiveness of the irreversibility of the single currency project. The main line then comes in with a noteworthy prefix: *"Within our mandate, the ECB is ready to do whatever it takes to preserve the euro. And believe me, it will be enough." -Draghi, 2012.* It is the "Within our mandate" that is the most resounding feature. It reasserts a commitment to a trustworthy measure of conducting monetary policy but is ambiguous enough to suggest a hint of a new paradigm of operational scope.

This is better understood when, at the very end of this address, Mr. Draghi specifically mentions the interest premia on sovereign bonds of euro area periphery countries, claiming that, although these factors are not endogenous to the monetary policy actions of the institution over which he presides, their financial effects hamper the transmission channels' effectiveness of ECB monetary policy. For this reason, Mr. Draghi then concludes in what could be understood as a very remissive tone that these premia come within the scope of monetary policy of the ECB.

For this purpose, a new programme of Outright Monetary Transactions (OMT) was introduced on 2 August 2012, a few days later, encompassing the possibility of the ECB to acquire sovereign debt bonds of euro area member states in the secondary market, with no ex ante quantitative limits set. The exact catch was that its legality within the European Treaties was, at best, ambiguous. But by the time it would be challenged politically by the German Constitutional Court and later referred by the former to the European Court of Justice, this simple move and assertive communication stance had already helped most periphery euro area countries sovereign debt yields to fall on most major maturities, major European stocks had already jumped by nearly 2% immediately after the speech on 26 July (Irrera, 2013). A new market stance was imposed.

The ECB never used the OMT programme and, partly for that reason, it was never questioned in its potential breach of European Treaties, nor its actual effectiveness tested in a market context. Even later, during the covid crisis, the ECB claimed early on, even if not on official channels – see (Koranyi, 2020) – that it would not use it to aid member states in their sudden rise in demand for budget liquidity to fight the public health situation.

8. Empirical part

8.1 Model Specification

In the effort to quantify, in so far as possible, the argument for a shift in paradigm of the ECB during this time, I have sought to create a model for a regression that could assess the explanatory value of a change in monetary policy stances. I was, of course, aware of the limitations inherent to any empirical model that seeks to analyse and quantify

constantly changing macroeconomic variables during a period of highly complex political events and intertwined market sentiments. In this effort, I have gathered data on the interest rates of sovereign debt securities for several countries of the euro area, namely Germany, Portugal, Ireland, Italy, Greece and Spain. The reason behind this choice was to provide a backdrop against which to compare the interest rates associated with public debt of euro area periphery countries, since Germany consistently has the highest rating and lowest euro-denominated spreads. It is not, however, the scope of my analysis to consider whether the German sovereign debt bonds resemble the closest asset to a risk-free reference rate in the euro currency but, instead, to assess the differences of interest rates on sovereign debt within euro area countries, I have opted to choose the former as a benchmark against which to form my comparison.

Hence, I gathered monthly data on the long-term sovereign securities interest rates of above-mentioned euro area countries from January 2007 to December 2016. Seeing the overall number and diversity of the debt securities issued by euro area governments, I sought to have a single value dependent variable to account for its behaviour along the timespan this empirical analysis focus on. Hence, I opted to use the Maastricht Treaty EMU convergence criterion series calculated by the Eurostat statistical services, which provides a weighted average of each countries sovereign debt securities in relation to their respective maturities and associated interest rates in the secondary market. To further develop a single dependent variable to be used in my model, I have sought to create a pondered average of the interest rate of the euro area periphery countries and calculate the difference between that series and the interest rates of the German sovereign debt bonds. Upon having calculated this measure of interest rate spreads for my time series, I have detrended it to avoid any stochastic effects from skewing my statistical analysis. This detrended result shall henceforth be mentioned as my dependent variable.

Moving on to the set of independent variables used, I started by setting a dummy variable to account for the possible effects what I believe to be the best proxy for this change in monetary policy paradigm: the 26 July speech by Mario Draghi. Seeing that

this was the moment in which market sentiment was overturned and a new pattern developed, I opted by setting a dummy variable with values zero for all monthly observations prior to July 2012 and values one for all remaining observations. Moreover, the next step was to isolate the effects of this dummy variable by including other independent variables in my regression model. This process was done along a rationale of a three-pillar approach: one pillar sought to isolate real economy effects, another sought to isolate market's risk assessments and, lastly, another sought to isolate the direct monetary policy effects on money markets.

For the first pillar, I have used a monthly time series for the euro area consolidated unemployment and inflation measures. For the second pillar, I have used the measure of financial risk mentioned above to account for the overall level of risk in the financial system. This measure which provides a probability of "simultaneous failure of two or more major banks" and encompasses all euro area countries can be understood as an indirect measure of the exposure of sovereign budgets to this risk, seeing that euro area governments have been called to the role of lender of last resort to many financial institutions during this timeframe. Not only did this severely hamper the transmission mechanisms of monetary policy, but it also accounted for a financial – and political – constraint to many of the budget reforms euro area countries were engaged during this time. For the last pillar, that of direct monetary policy effects, I sought to use the rates of the three standing facility rates set by the ECB. The reason for this choice instead of a measure of money market rates was owed to the fact that the latter would comprise other factors which would insert a high level of correlation between dependent variables in the model.

Hence, with all variables duly explained and contextualized, I have considered that there would be no proved statistical objection for the use of an Ordinary Least Squares (OLS) model estimation, which would assemble as the following equation:

$$SpreadsPubDebt_t = \alpha + \beta_1 26JUL_t^i + \beta_2 Infl_t + \beta_3 Unemp_t + \beta_4 FRM_t + \beta_5 DepFac_t + \beta_6 MargLendFac_t + \beta_7 RefinOpFac_t + \mu_t,\ with\ i = [1,0];\ t = (1, \dots, 120)$$

Where one ought to interpret:

- $SpreadsPubDebt_t$ as the dependent variable of detrended interest rate spreads for long-term sovereign securities between Germany and the mentioned euro area periphery countries
- $26JUL_t^i$ as the dummy variable introduced to assess the isolated effected of the "Whatever it takes" speech given by Mario Draghi on 26 July 2012
- $Infl_t$ as the monthly observation of inflation measured as the average of the percentage point changes in HICP for the 19 Euro Area economies
- $Unemp_t$ as the ECB-calculated monthly observation of unemployment rates, on average, for the 19 Euro Area Economies, adjusted for seasonality.
- FRM_t as the proxy variable for the time series of Financial Risk Measure, which accounts for the probability of simultaneous failure of two or more major banks in the Euro Area, with observations adjusted to fit monthly data.
- $DepFac_t$ as the continuous monthly time series for the reference rate of the ECB Deposit Facility.
- $MargLendFac_t$ as the continuous monthly time series for the reference rate of the ECB Marginal Lending Facility.
- $RefinOpFac_t$ as the continuous monthly time series for the reference rate of the ECB Deposit Facility.

As usual with an OLS model estimation, I am assuming a normal distribution of the error term, such as $\mu_t \sim N(0, \sigma^2)$.

8.2 Results

In Annex 1, Tables 1, 2 and 3 translate, respectively, the summary output of the model fitness, the table for the ANOVA tests conducted on the overall statistical significance of the model and the model estimates for each coefficient of the intercept and each independent variable, along with the respective individual statistical significance levels and tests. For each of the individual independent variables statistical significance tests conducted, I have a assumed a null hypothesis of a null coefficient value and an

alternative hypothesis of a coefficient value different from the null, as follows below in the adequate notation:

$$\begin{cases} H_0: \beta_i = 0 \\ H_1: \beta_i \neq 0 \end{cases}, \text{with i} = [1, \dots, 7]$$

Focusing first on the overall model fitness, I can claim that it has achieved an adequately good level of fitting, quantified by an adjusted R Square of, approximately, 87,6% derived from a total sample size of 120 monthly observations, from January 2007 to December 2016. The overall F-test also indicates a comfortable level of overall statistical significance. I should also note that both the t-stats and respective p-values for all 7 independent variables in the model suggest their statistical relevance in a standard t-test. Hence respective values of coefficients for each of the independent variables is thus noteworthy for the insight it provides into the effects of the monetary policy paradigm shift occurred in this timeframe.

Firstly, with a negative coefficient, one might find the value for the set dummy variable for the 26 July 2012 speech. It can be understood that, indeed, should one consider the empirical validity of this model, the speech alone explains a negative effect on the yield curves of euro area sovereign debt securities. This is unequivocally linked to the idea that the level of communication assertiveness and political capital affirmation of the ECB encased within this speech has had an historical significance due to its effects in the markets at the time. Aligned with this, if one considers, yet again, that the OMT programme that came in the wake of this speech was never actually used, thus having no actual direct market effects, and that its enforceability was even challenged by the German Constitutional Court and European Court of Justice, there is little room to attribute this effect to unaccounted outcomes other than the communication stance of the ECB. The level, itself of the coefficient is not residual either, seeing that for any observations in the detrended interest rate spreads time series that take place after the date of the speech, there is an average decrease of around 0.426 basis points.

Building up to the economic validity of the model, one can find the expected relationships between the independent variables used to account for the real economy

side. The positive coefficients in both inflation and unemployment values translates the built credibility on the single mandate of the ECB concerning price level expectations, as well as an evaluation of market fears of public budget constraints faced by governments in their fiscal revenues and expenditures in the framework of the automatic stabilizers in place in the euro area economies. As for the second pillar, one can also find a positive coefficient for the independent variable standing for the systemic risk measure of the simultaneous probability of insolvency of two or more major financial institutions in the euro area. This signals that markets internalized the risks of euro area governments as the ultimate lender of last resort during this period. As for the third and last pillar, the respective statistical significance tests of each individual independent variable are resoundingly positive. All three standing facility rates set by the ECB have proved to have a statistically relevant effect on the average nominal yield curves for euro area sovereign securities, as one would expect them to have. These three independent variables have showed coefficients bearing very high t-stats and very low p-values. This provides a degree of safety to the overall model adjustability, as one can understand that there are no residual effects of the direct effects of monetary policy unaccounted for, enhancing the explanatory value of my focus within the model: the paradigm shift signalled by the 26 July speech.

To test the robustness of my hypothesis further, I endeavoured to create two new alternative model regressions based, nonetheless, on the one already detailed above. Firstly, seeing that it could be argued that the generalized decrease in the spreads detailed by the dependent variable could be mainly owed mainly to the inflection on the direct monetary policy trajectories (i.e.: the evolution of the three standing facility rates of the ECB), I have generated a similar model where the first and second pillars detailed above were absent. Hence, this new model estimation, Model B, would resemble the following equation:

$$SpreadsPubDebt_t = \alpha + \beta_1 DepFac_t + \beta_2 MargLendFac_t + \beta_3 RefinOpFac_t + \mu_t,$$
$$with\ i = [1,0];\ t = (1, \dots, 120)$$

The variables in question follow the same nomenclature and time series as those detailed and used above in Model A. The results for this estimation can be found in Tables 6, 7 and 8 of Annex 1, similarly to those of Model A. What is clear on a first glance is the much lower level of explicability and overall fitness of Model B in comparison to Model A. In fact, the adjusted R square of Model B is only around 33,7%, a very low value. Moreover, the values for the statistical significance tests of each of the independent variables (which translate each of the standing facility rates in the time series) do not all allow for a rejection of the null hypothesis of a null coefficient value, as can be seen in Table 6 of Annex 1. Hence, the hypothesis that the overall evolution of the detrended interest rate spreads for long-term sovereign securities between Germany and the mentioned euro area periphery countries is owed mainly to the direct action of the ECB monetary policy transmission channels is a relatively feeble one.

On a similar tone, I have also endeavored to create a third model to encompass, alternatively, the absence of direct monetary policy transmission effects. Hence, I have generated a model where this third pillar is absent. The logic behind this was that it would provide me a degree of how much of the variation in the spreads described by the dependent variable can be assessed by the dummy variable of the 26 July speech while controlling for a degree of real economic variables expectations.
Hence, this third model estimation, Model C, would resemble the following equation:

$$SpreadsPubDebt_t = \alpha + \beta_1 26JUL_t^i + \beta_2 Infl_t + \beta_3 Unemp_t + \beta_4 FRM_t + \mu_t,$$
$$with\ i = [1,0];\ t = (1, \dots, 120)$$

Once again, the variables follow the same nomenclature and time series as those detailed and used above in Model A. The results for this estimation can be found in Tables 9, 10 and 11 of Annex 1, similarly to those of Models A and B. Once again, what can be assessed is that Model C also portraits a lower explanatory power than that of Model A, although still above that of Model B. In this model, much like in Model A, the statistical tests still allow for a rejection of the null hypothesis in relation to the statistical significance of the dummy dependent variable introduced to mark the event of the 26 July speech.

Considering these results, it is my belief that a relatively high level of robustness of the initial Model A is asserted and that I can argue that its explanatory power derives, to a higher degree, from the inclusion of the dummy independent variable for the 26 July speech. Moreover, the effects of direct monetary policy effects, embodied in the model by the three standing facility rates, are worth controlling for but their explanatory power, once isolated as in Model B, is very low and contradictory. Lastly, the full scope of the variables included in Model A can, to the best of my knowledge, be considered to provide a good fitness and level of statistical explicability for the variation of the independent variable.

9.Conclusion

Over the course of this project, I have sought to provide an emphasis on the theoretical underpinnings and relevant postures of the actors at play within the European Central Bank during the years of the financial and sovereign debt crisis. These events should not be understood apart from its relevant historical, political, economic and legal backgrounds, hence the reason why I endeavoured to provide a brief context of the institution and its evolution up until the crisis years. The institutional workings of the ECB within the monetary union and within the very project of European Integration should not be separated from an historiography of the latter. As such, its parturition was always a political project and ideological framings could not be ignored – hence my mentions of the German Monetary Orthodox school of thought which came to dominate and later be challenged within the ECB.

As is to be expected with any public institution, it is, inherently political. That understanding was, to me, the spark that led me to analyse the breaking point in which it could have gone a different direction. This inherently political nature went from being denied by one president of the ECB to being publicly admitted and flaunted, not as a weakness adherent to the currency union over which it superintends, but instead as a strength, by its predecessor a few months later. One would be left to wonder if the ECB has refined its own *raison d'être*.

The 26 July "Whatever it takes" speech of the now former president of the European Central Bank was an historical event in many things. However, its major novelty came from the realisation that none of the ECB's endeavours take place in a vacuum. Consequently, I have sought to analyse each of the consequences that arose, at the time, from this speech and, hopefully, isolate each effect from each other. In doing this, I trusted to take advantages of the very limitations of quantitative models to my advantage, by focusing my attention in the unexplainable. Having isolated the real economic effects, the financial systemic risk effects and the direct monetary policy effects, I hoped to be left with what I argued to be effects of a change in stance of the ECB towards its scope of objectives. It appraises me to say that the model I have estimated for this aim proved my point: alone, the new communication stance did, indeed, contribute for a decrease in the spreads of sovereign debt securities within the euro area. This provided a reconquering of access to debt markets for euro area periphery countries, and it should not be seen as an inevitability in a time when the very cohesion of the single currency was at risk.

Whether the envisaged OMT programme was a bluff or not was irrelevant, as these euro area periphery countries were now able to improve their respective economic and social contexts, due to the amount of pressure this took from the fiscal budgets of these countries over the following years. It would not be a large overstatement to claim that this saved the currency union itself. Such action coming from an institution whose mandate is, on a first glance, mainly technical and hyper focused could never, despite this fact, be understood as being politically exempt.

10.Acknowledgments

Writing a Thesis Project is always and foremost an exercise in humility. For all the moments of consideration, hesitation, despair and procrastination, it can never take place in a vacuum of support from all those that surround me and to whom I am forever grateful for their presence and encouragement. Hence, it is only natural that I start by thanking one of my major inspirations of sheer will: my grandmother. I will be forever grateful to her example for all the conversations, confidences and the unwavering encouragement over all these years. Next, to my parents and to my brother, whose never-ending support and infinite patience to my intellectual and personal vicissitudes and complexities shall always be an inspiration and source of courage and strength to whatever challenges might arise in my life henceforth. To my fantastic girlfriend, Cátia, I am grateful for all the loving support and the ironclad confidence that I would see to this project finished, even when I myself could not be so sure of this outcome. Since no man's an island, my gratefulness will always extend to my friends. To my best friend Leonor Rosas, the Sabina to my Franz, the Annie Hall to my Woody Allen, I could not be more thankful for all the conversations, support and mutual understanding throughout these years. To Daniel Conde, for keeping me grounded on reality all along and never letting me live up to less than my capabilities, never prostrating and never giving up. To all the others who make up who I am as a person and whose companionship I would not trade anything for: Fabian Figueiredo, for his eternal intellectual challenges; David, for all the economic debates; Catarina, for all the support in exile, Carlos, for holding the fort while I am writing this; Bernardo, Willie and Alejandro, for the companionship during this Masters' Programme (and more); Miguel, being such a trustworthy companion of all times; Tomás and Raquel, for the "push" who served as the first step on this journey and, finally, André, for being there on every step of the way so many years back. It was a pleasure to work on this project with someone who is one of my intellectual and political references: my coordinator Francisco Louçã, whose idea was the spark for this investigation. Lastly, on a personal note, I wanted to mention the city of Paris, where this thesis was partly written. I am forever thankful for the challenges, growth, walks, observations and romanticized solitude. Shall we meet again.

Annex 1 – Tables

Number of Working Days per Month (Avg.)	Euro area 19
Jan	21,2
Feb	20,1
Mar	21,7
Apr	20,0
May	20,3
Jun	20,6
Jul	22,0
Aug	21,6
Sep	21,4
Oct	21,7
Nov	20,7
Dec	19,9

Table 1 - ECB-calculated Euro-19 Average Working Days per month

Event	Date
A - BNP Paribas freezes three funds – first signs of financial distress	9 August 2007
B - Announcement of Bankruptcy of Lehman Brothers Bank in the US – start of generalized financial panic in the markets	15 September 2008
C - Newly elected government in Greece reveals budget deficits to be larger than previously reported	15 October 2009
D - Greece suffers 1st bailout and is imposed an austerity program by the Troika	2 May 2010
E - Jean-Claude Trichet steps out of ECB presidency. Mario Draghi enters.	1 November 2011
F - Mario Draghi gives the famous "Whatever it takes speech"	26 July 2012

Table 2 – Timeline of relevant events mentioned

Regression Statistics	
Multiple R	0,939964895
R Square	0,883534003
Adjusted R Square	0,876254878
Standard Error	0,014453649
Observations	120

Table 3 – Summary of Regression Output for Model A

	df	*SS*	*MS*	*F*	*Significance F*
Regression	7	0,177499496	0,025357071	121,3791528	2,86718E-49
Residual	112	0,023397691	0,000208908		
Total	119	0,200897188			

Table 4 – Summary of ANOVA overall significance tests for the model regression for Model A

	Coefficients	*Standard Error*	*t Stat*	*P-value*
Intercept	-0,083841441	0,023702757	-3,537202019	0,000589573
26JULYSPEECH	-0,042623713	0,005419961	-7,864209628	2,51857E-12
Inflation	0,008618447	0,002395212	3,59819828	0,00047848
Unemployment	0,010787205	0,002454132	4,395526598	2,52487E-05
Risk Measure	0,007821922	0,000707609	11,05402089	1,18697E-19
ECB Deposit Facility	-0,059040242	0,008589611	-6,873447993	3,73457E-10
ECB Marginal Lending Facility	-0,073945387	0,010012127	-7,385582101	2,89344E-11
ECB Main Refinancing Operations	0,128576068	0,013755501	9,347246924	1,06142E-15

Table 5 – Summary of Regression Coefficients and respective significance tests for Model A

Regression Statistics	
Multiple R	0,594704386
R Square	0,353673306
Adjusted R Square	0,336957961
Standard Error	0,033456768
Observations	120

Table 6 – Summary of Regression Output for Model B

	df	*SS*	*MS*	*F*	*Significance F*
Regression	3	0,071051973	0,023683991	21,15859979	5,29738E-11
Residual	116	0,129845215	0,001119355		
Total	119	0,200897188			

Table 7 – Summary of ANOVA overall significance tests for the model regression for Model B

	Coefficients	*Standard Error*	*t Stat*	*P-value*
Intercept	-0,006669734	0,009290056	-0,717943291	0,47423569
ECB Deposit Facility	-0,078992638	0,018992949	-4,159050818	6,15336E-05
ECB Marginal Lending Facility	0,068775276	0,016178267	4,251090486	4,32374E-05
ECB Main Refinancing Operations	-0,01300948	0,027540684	-0,472373157	0,637547942

Table 8 – Summary of Regression Coefficients and respective significance tests for Model B

Regression Statistics	
Multiple R	0,88896583
R Square	0,790260248
Adjusted R Square	0,782964952
Standard Error	0,019141606
Observations	120

Table 9 – Summary of Regression Output for Model C

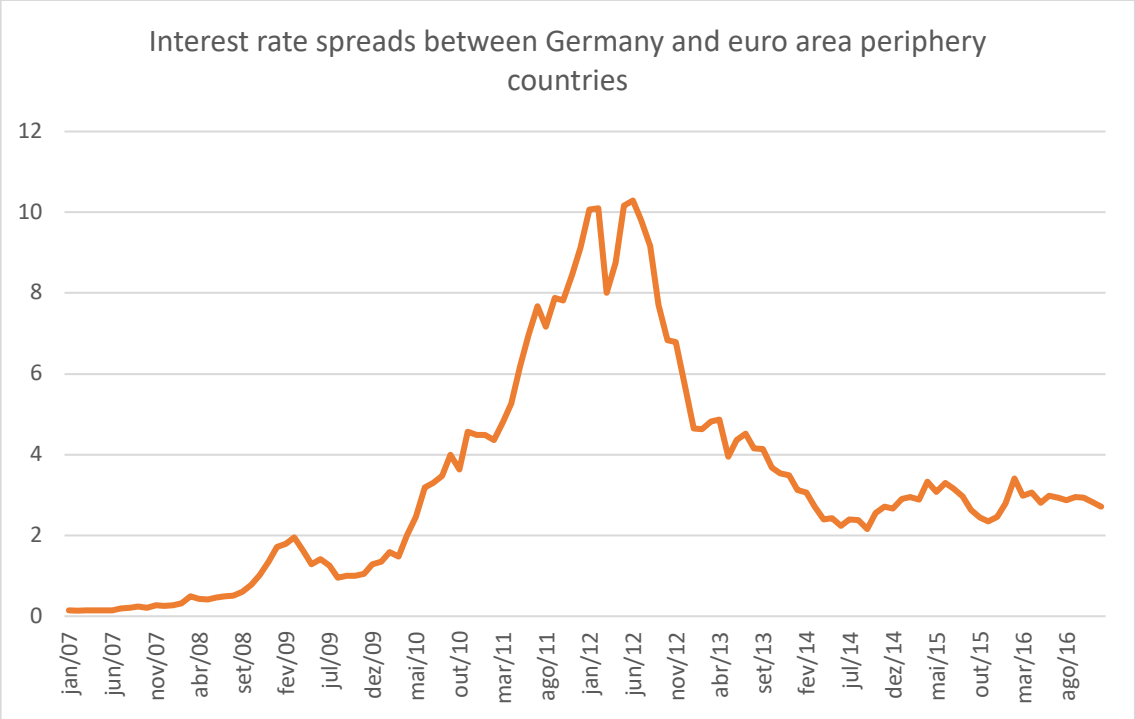
	df	*SS*	*MS*	*F*	*Significance F*
Regression	4	0,158761061	0,039690265	108,324635	4,60824E-38
Residual	115	0,042136126	0,000366401		
Total	119	0,200897188			

Table 10 – Summary of ANOVA overall significance tests for the model regression for Model C

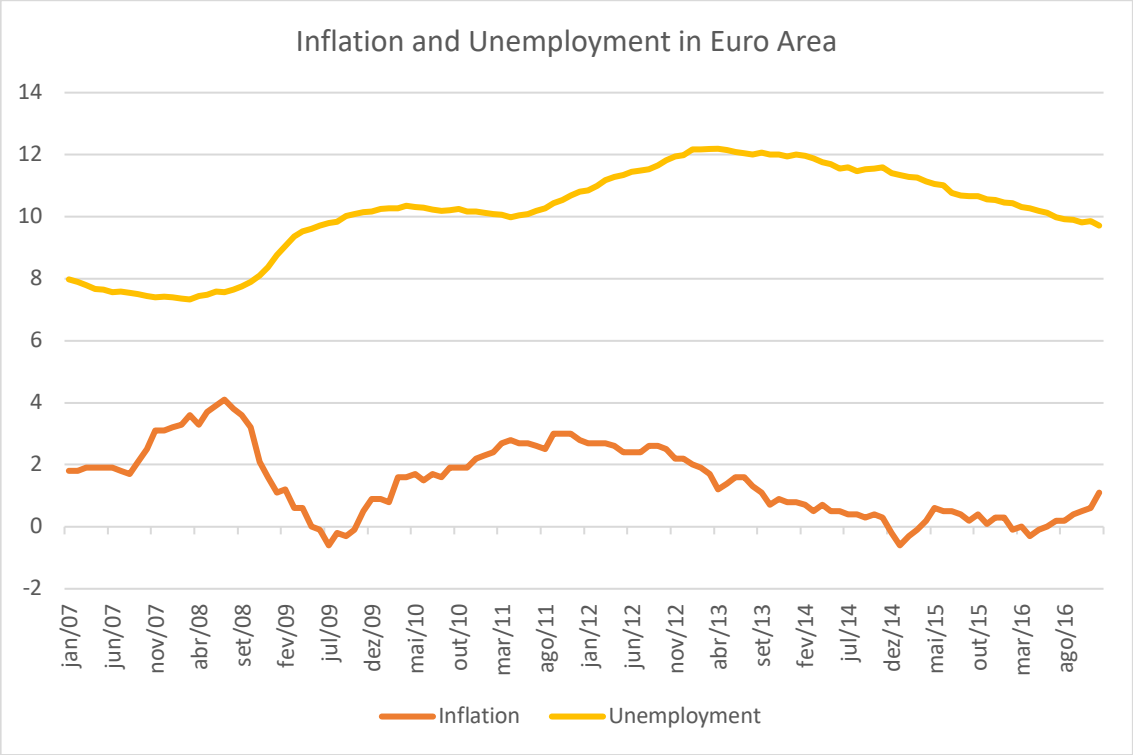
	Coefficients	*Standard Error*	*t Stat*	*P-value*
Intercept	-0,036078487	0,022942553	-1,572557658	0,11856857
26JULYSPEECH	-0,03116977	0,005628991	-5,537363767	1,96652E-07
Inflation	0,007075946	0,002110904	3,352092159	0,001086081
Unemployment	0,005348161	0,00260375	2,054022523	0,042240595
Risk Measure	0,007181419	0,000807164	8,897096095	9,58065E-15

Table 11 – Summary of Regression Coefficients and respective significance tests for Model C

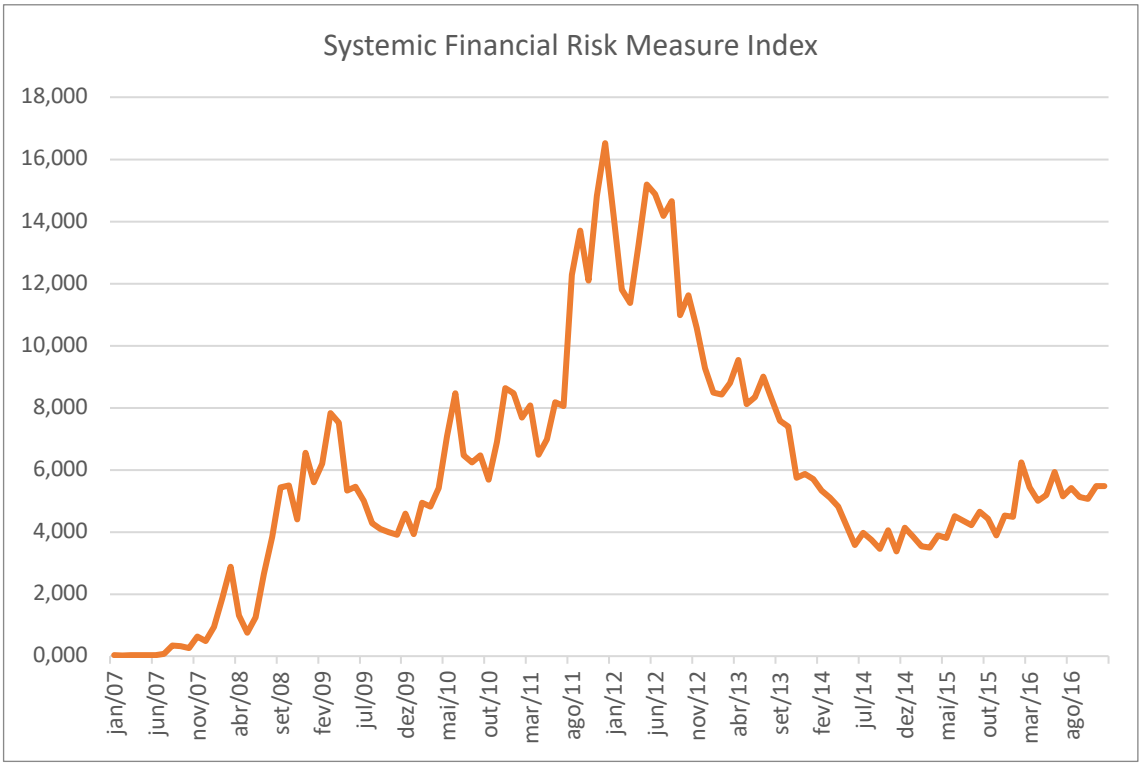
Annex 2 – Graphs



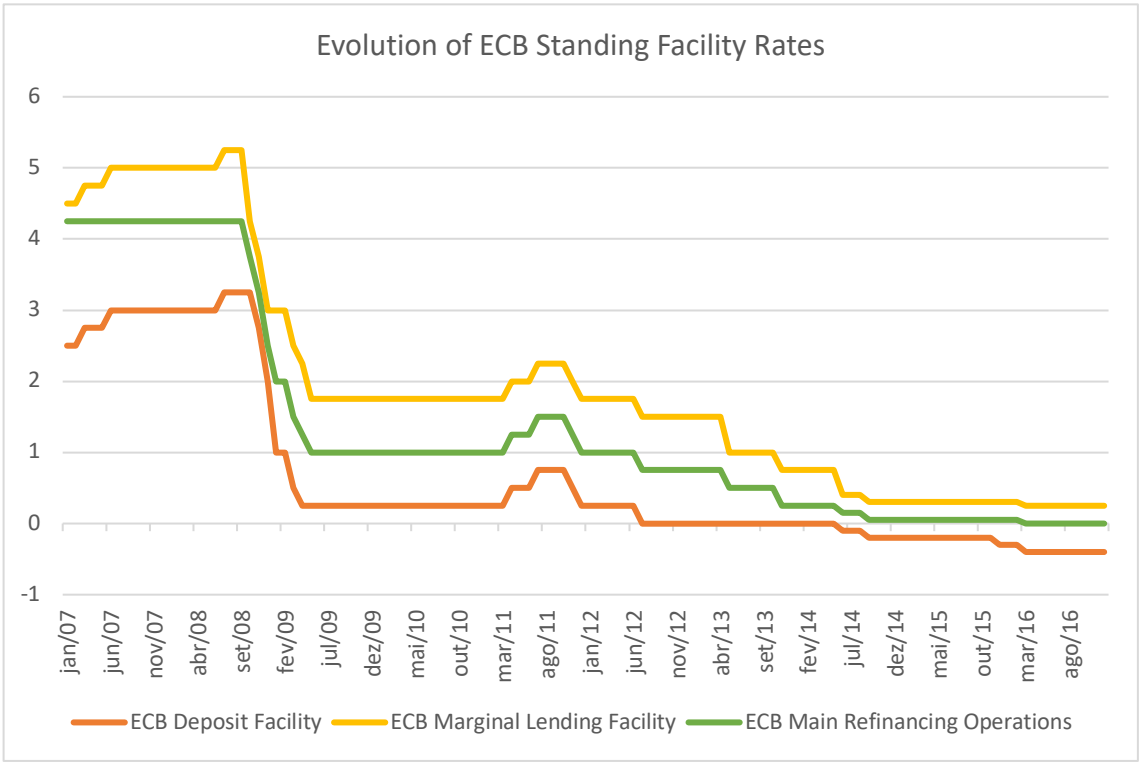
Graph 1 – Evolution of calculated interest rate spreads for long-term sovereign securities between Germany and the mentioned euro area periphery countries. Values in percentage. (Source: Eurostat)



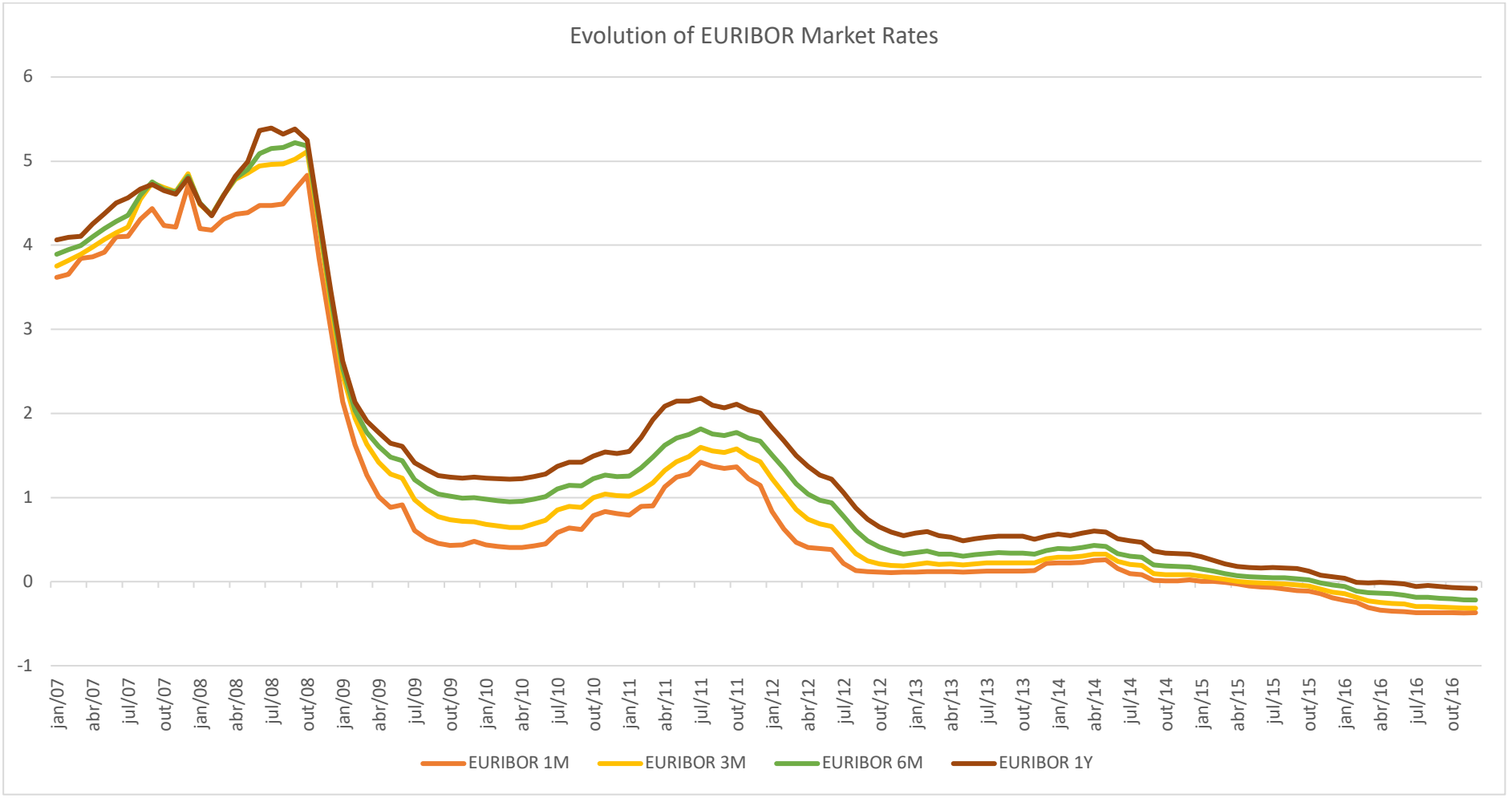
Graph 2 – Evolution of Inflation (HICP) and Unemployment Estimates for euro area. Values in percentage. (Source: ECB SDW)



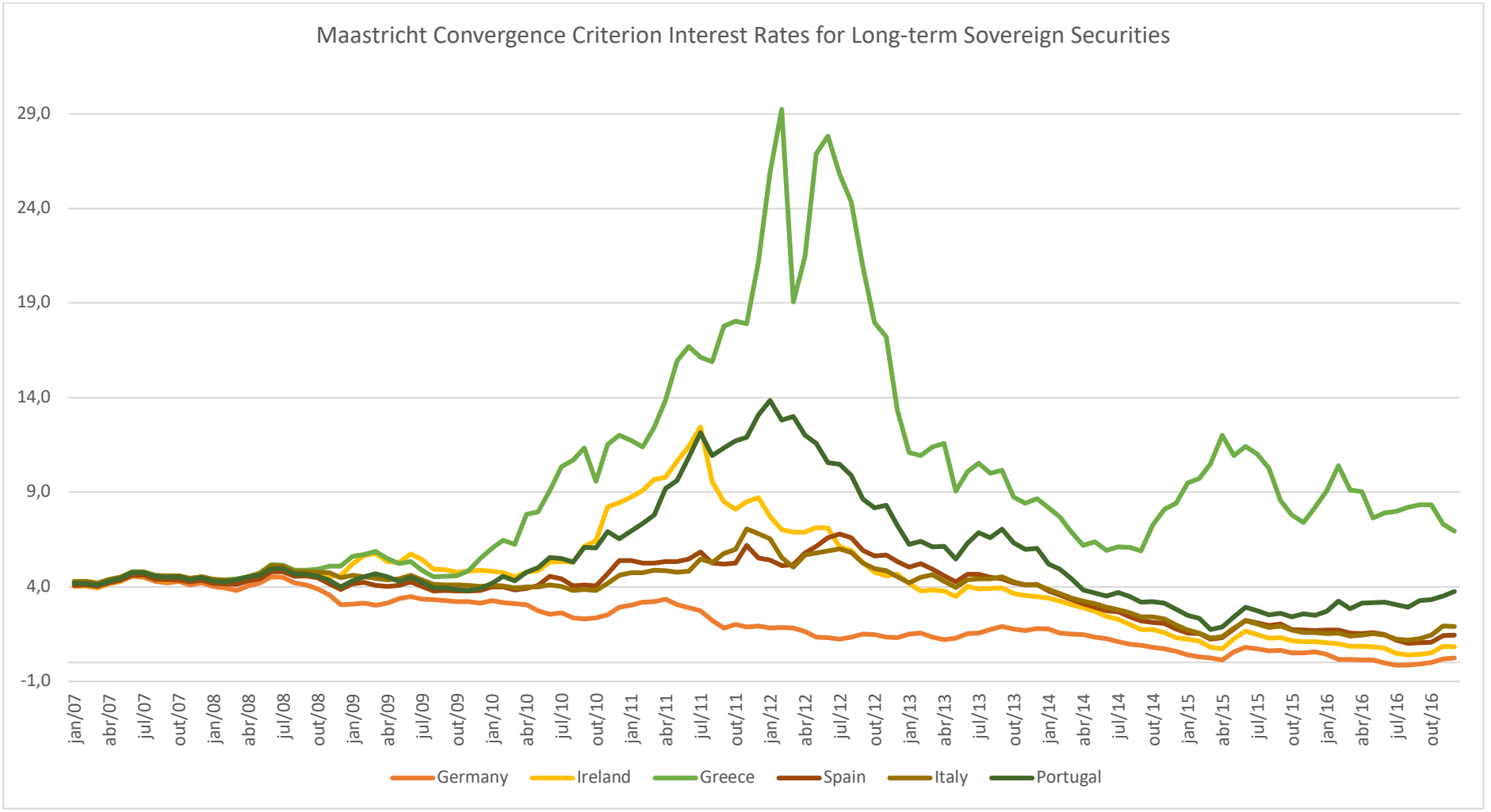
Graph 3 – Evolution of Systemic Financial Risk Measure of probability of simultaneous default of two or more large financial institutions (Source: ECB SDW)



Graph 4 – Evolution of interest rates of each ECB Standing Facility. Values in percentage. (Source: ECB SDW)



Graph 5 – Evolution of EURIBOR market rates for 1 month, 3 months, 6 months and 1-year maturities. Values in percentage. (Source: European Monetary Institute)



Graph 6 – Evolution of Maastricht Convergence Criterion Interest Rates for Long-term Sovereign Securities issued by Germany, Ireland, Greece, Spain, Italy and Portugal. Values in percentage. (Source: Eurostat)

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