# Politics and policies in the Eurozone. Should Romania adopt the euro?

Author: Adrian Bodea

---

PhD Thesis UDC / 2022

PhD Coordinator: José Manuel Sánchez Santos

Tutor: José Manuel Sánchez Santos

Ph.D. Program in Economic Analysis and Business Strategy

UNIVERSIDADE DA CORUÑA

# Politics and Policies in the Eurozone. Should Romania adopt the euro?

Adrian Bodea

PhD Thesis UDC / 2022

PhD Coordinator: José Manuel Sánchez Santos

Tutor: José Manuel Sánchez Santos

Ph.D. Program in Economic Analysis and Business Strategy

UNIVERSIDADE DA CORUÑA

The author of this doctoral thesis has benefited during the elaboration of the thesis of a grant for pre-doctoral studies awarded by the Department of Culture, Education and University Planning of the Regional Government of Galicia - Grant number ED481A-2017/226, whose resolution was published on Friday, July 28th, 2017, in the Official Journal of Galicia No. 143.

*To my dear and kind Iuliana, for her sincere love, and to my mother, and to Babus, for their continuous support.*

**Acknowledgements**

Back in the spring of 2016, while still a student in Iasi, I attended a conference organized by my master thesis coordinator, entitled "Should Romania adopt the euro?". The subject was a novelty for me since during my political science studies I never actually got to analyze it, but it instantly raised a great academic interest given the complexity and the multifaceted aspects one will have to consider when answering such a question. The speaker at that conference was José Manuel Sánchez Santos.

That is why, first and foremost, I would like to thank José Manuel, my thesis coordinator, for having piqued the academic curiosity in me regarding this subject and for being an excellent mentor during all these years.

I would also like to thank my dear colleagues from the Faculty of Economics and Business in the University of A Coruña: Juan, Pablo, Atilano, Paolo, Isabel, Mary, and Iuliana for their very helpful insights and tips in regards to the academic life and work, as well as to my undergraduate students, which helped me become a better teacher.

Last but not least, I would like to express my gratitude to the regional government of Galicia, for having awarded the research grant, and to the University of A Coruña, for being a fine educational institution, where one can really develop professionally.

Brussels, 2021

**Resumo**

O obxectivo da investigación desta tese é proporcionar unha resposta razoada e apoiada cientificamente á cuestión da idoneidade e o momento oportuno da adopción do euro en Romanía. Considéranse os aspectos económicos e políticos, para transmitir unha visión global e interdisciplinar da cuestión. O valor engadido deste traballo reside no feito de que, ademais da análise realizada en relación cos criterios de converxencia e de as Zonas Monetarias Óptimas, outros aspectos da adopción do euro, máis complexos e inexplorados ata o de agora, son avaliados á luz de os datos máis recentes e os modelos máis axeitados. Cuestións como as estimacións de señoriaxe no período post-comunista, as correlacións de choques de oferta e demanda coa zona do euro, o efecto da moeda única na resiliencia do mercado de traballo, e o impacto das dinámicas entre os intereses dos mercados financeiros e o pensamento estratéxico-politico nas medidas internas de devaluación en Europa son aspectos que preocupan moito no actual contorno económico e político, e son empiricamente probados nesta tese. A idea máis directa que se pode deducir da análise dos aspectos considerados é que Romanía debería adoptar unha estratexia proactiva de expectativa para a integración na UEM para preparar alternativas de segunda orde á política monetaria soberana e utilizar a súa influencia política para axudar a resolver os fallos da arquitectura da Unión Económica e Monetaria.

**Resumen**

El objetivo de investigación de esta tesis es dar una respuesta razonada y científicamente respaldada a la cuestión de la idoneidad y el momento oportuno de la adopción del euro en Rumanía. Se consideran tanto los aspectos económicos como los políticos, con el fin de transmitir una visión global e interdisciplinar de la cuestión. El valor añadido de este trabajo radica en que, además del análisis realizado en relación con los criterios de convergencia y de las Áreas Monetarias Óptimas, se evalúan otros aspectos de la adopción del euro, más complejos e inexplorados hasta ahora, a la luz de los datos más recientes y los modelos más adecuados. Cuestiones como las estimaciones del señoreaje en el periodo poscomunista, las correlaciones de las perturbaciones de la oferta y la demanda con la zona del euro, el efecto que tiene la moneda única en la resistencia del mercado laboral y el impacto que tiene la dinámica entre los intereses de los mercados financieros y el pensamiento político estratégico en las medidas de devaluación interna en Europa, son todos ellos aspectos de gran preocupación en el actual entorno económico y político que se prueban empíricamente en la presente tesis. La idea más directa que puede deducirse del análisis de los aspectos considerados, es que Rumanía debería adoptar una estrategia proactiva de expectativa para la integración en la UEM con el fin de preparar alternativas de segundo orden a la política monetaria soberana y utilizar su influencia política para ayudar a resolver los defectos de la arquitectura de la Unión Económica y Monetaria.

**Abstract**

The research objective of this thesis is to give a reasoned and scientifically backed answer to the question of euro adoption optimality and timing in Romania. Both economic and political aspects are considered, to convey an encompassing and interdisciplinary view on the matter. The added value of this work stands in the fact that, beyond the analysis done for the convergence and OCA criteria, further, more complex, and previously unexplored aspects of euro adoption, are assessed in the light of the latest data and most appropriate models. Issues such as the estimations of seigniorage in the post-communist period, supply and demand shock correlations with the euro area, the effect the single currency has on labor market resilience, and the impact the dynamics between financial markets interests and political strategic thinking has on the internal devaluation measures in Europe, are all aspects of great concern in the current economic and political environment and are all empirically tested in the current thesis. The most straightforward idea that could be inferred from the analysis of the considered aspects, is that Romania should adopt a proactive expectative strategy for EMU integration in order to prepare second-best alternatives to the sovereign monetary policy and to use its political leverage to help to address the flaws in the EMU architecture.

# TABLE OF ENTRIES

INTRODUCTION – MERE COMPLIANCE NOT ENOUGH .....17

CHAPTER 1. STYLIZED FACTS ON ROMANIA AND EURO ADOPTION.....23

**1.1. Recent historical economic background .....23**

**1.2. Considerations on euro adoption – Maastricht criteria .....24**

1.2.1. Inflation criterion ..... 25

1.2.2. Budgetary criteria..... 25

1.2.3. Exchange rate criterion ..... 27

1.2.4. Interest rate criterion..... 27

1.2.5. Post-2007 criteria compliance..... 28

**1.3. Considerations on euro adoption beyond the criteria; OCA theory on costs and benefits .....31**

1.3.1. Labor market mobility, wage flexibility, and internal devaluation..... 32

1.3.2. Self-fulfilling prophecies, capital runs, liquidity and solvency crises..... 35

1.3.3. Risk containment measures – fiscal, banking, and financial markets unions..... 37

1.3.4. Benefits and opportunities..... 39

1.3.5. Costs and benefits analysis – a matter of openness, flexibility and shock exposure ..... 44

CHAPTER 2. SEIGNIORAGE AND INFLATION TAX IN ROMANIA. WHAT IS THE EXECUTIVE GIVING UP BY ADOPTING THE EURO?.....47

**2.1. Introduction .....47**

**2.2. Literature review - debates over measurement of seigniorage. .....49**

**2.3. Methodology and data .....57**

**2.4. The results .....62**

**2.5. Conclusions .....68**

CHAPTER 3. EUROZONE UNDER STRESS. DOES HAVING THE COMMON CURRENCY HINDERS EMPLOYMENT RESILIENCE? .....69

**3.1. Introduction** ..... **69**

**3.2. Literature review – resilience and hysteresis** ..... **71**

**3.3. Research design and methodology for assessing labor market resilience** ..... **77**

**3.4. Results and discussions** ..... **82**

**3.5. Conclusions and future research directions** ..... **87**

CHAPTER 4. CABINET DURABILITY AND THE IMPLEMENTATION OF INTERNAL DEVALUATION POLICIES. EMPIRICAL EVIDENCE FROM EUROZONE ..... 91

**4.1. Introduction** ..... **91**

**4.2. Literature review** ..... **91**

**4.3. Research design, methodology and data** ..... **96**

**4.4. Results and discussions** ..... **105**

**4.5. Conclusions** ..... **108**

CHAPTER 5. GOVERNMENT RESPONSIVENESS IN TIMES OF INTERNAL DEVALUATION. HINTS AT A CRISIS OF REPRESENTATION IN EUROZONE? ..... 111

**5.1. Introduction** ..... **111**

**5.2. Literature review. Two contrasting hypotheses** ..... **111**

5.2.1. Strategical thinking and opportunistic behavior ..... 112

5.2.2. Financial markets' signals and sovereigns ..... 114

**5.3. Research design and methodology** ..... **117**

**5.4. Results and discussions** ..... **121**

**5.5. Conclusions** ..... **124**

CHAPTER 6. ASSESSING THE OPTIMALITY OF EURO ADOPTION IN ROMANIA THROUGH SHOCK CORRELATIONS ..... 127

**6.1. Introduction** ..... **127**

**6.2. Literature review** ..... **129**

6.2.1. The foundations of the OCA ..... 129

6.2.2. OCAs meta property – shock correlations ..... 130

6.2.3. Empirical studies on shock correlations ..... 131

**6.3. Methodology, data, and tools** ..... **134**

6.3.1. The AD-AS model ..... 134

6.3.2. The SVAR model for demand vs. supply shocks discrimination ..... 135

6.3.3. Data and statistical tool ..... 138

**6.4. Results, discussions, and implications** ..... **138**

**6.5. Conclusions and recommendations** ..... **146**

CONCLUSIONS – OVERALL ASSESSMENT. RECOMMENDATION FOR A PROACTIVE EXPECTATIVE STRATEGY ..... 149

APPENDIX A ..... 155

APPENDIX B ..... 156

APPENDIX C ..... 157

APPENDIX D ..... 158

RESUMEN EN CASTELLANO ..... 159

BIBLIOGRAPHY ..... 169

# LIST OF FIGURES


FIGURE 1. TOTAL POPULATION AND THE TOTAL STOCK OF ROMANIAN MIGRANTS (2007-2020) ..... 33

FIGURE 2. LABOR UNION DENSITY IN ROMANIA (1991-2016). ..... 33

FIGURE 3. UNIT LABOR COST AND LABOR PRODUCTIVITY EVOLUTION IN ROMANIA (2000-2020). ..... 34

FIGURE 4. BANKING INTEGRATION INDICATOR: ROMANIA-EURO AREA. ..... 38

FIGURE 5. EUR TO RON EXCHANGE RATE WITH TREND LINE (2013-2021). ..... 40

FIGURE 6. ROMANIA'S TRADE WITH THE EUROZONE AS SHARE OF GDP. ..... 44

FIGURE 7. DISTRIBUTION OF SEIGNIORAGE GENERATION BY SOURCES IN ROMANIA 1990-2016. ..... 62

FIGURE 8.COMPARISON BETWEEN THE RESULTS ESTIMATED USING ROVELLI'S METHOD AND THE CLASSIC METHOD. ..... 64

FIGURE 9. SCATTER PLOT INFLATION-SEIGNIORAGE WITH QUADRATIC REGRESSION LINE AND CONFIDENCE INTERVAL. ..... 65

FIGURE 10. SCATTER PLOT INFLATION-MONETARY SEIGNIORAGE ..... 66

FIGURE 11. HYPOTHETICAL SEIGNIORAGE GAINS ACCRUING TO ROMANIA, AS SHARE FROM TOTAL EURO AREA SEIGNIORAGE (2007-2016). ..... 67

FIGURE 12. QUARTERLY OUTPUT AND UNEMPLOYMENT GROWTH TIME SERIES. ..... 82

FIGURE 13. HYSTERESIS EFFECT OF THE CRISIS IN EA19 AND OECD-EA19. ..... 83

FIGURE 14. IRF FOR ACCOMPANYING THE VAR MODELS. ..... 84

FIGURE 15. COUNTRY-SPECIFIC POSITIONING FOR RESISTANCE AND RECOVERY INDICATORS. ..... 85

FIGURE 16. GRAPHICAL REPRESENTATION OF THE SURVIVAL FUNCTION AND HAZARD RATES FOR THE CABINETS IN OUR SAMPLE. ..... 105

FIGURE 17. SENTIMENTS REGARDING THE EMU IN SELECTED EU NON-EURO AREA COUNTRIES. ..... 128

FIGURE 18. QUARTERLY OUTPUT AND INFLATION VARIATION IN ROMANIA AND EU15 1995Q1-2019Q4 INCLUDING. SOURCE: OWN ELABORATION WITH DATA FROM EUROSTAT. ..... 139

FIGURE 19. HEAT MAP MATRIX OF PEARSON CORRELATION COEFFICIENTS BETWEEN OUTPUT GROWTH RATES FOR ALL THE ENTITIES IN THE SAMPLE. SOURCE: OWN ELABORATION WITH DATA FROM EUROSTAT. ..... 140

FIGURE 20. HEAT MAP MATRIX OF PEARSON CORRELATION COEFFICIENTS BETWEEN INFLATION RATES FOR ALL THE ENTITIES IN THE SAMPLE. SOURCE: OWN ELABORATION WITH DATA FROM EUROSTAT. ..... 141

FIGURE 21. MAPPING OF THE CUMULATIVE EFFECTS OF POSITIVE SUPPLY AND NEGATIVE DEMAND SHOCKS ON OUTPUT AND INFLATION RATES FOR ROMANIA AND EU15. ..... 142

FIGURE 22. BIDIMENSIONAL MAPPING OF THE P CORRELATION COEFFICIENTS BETWEEN SUPPLY AND DEMAND SHOCKS SERIES RECUPERATED FROM THE BQ MODEL – ROMANIA AS ANCHOR COUNTRY. ..... 144

FIGURE 23. BIDIMENSIONAL MAPPING OF THE CORRELATION RECUPERATED FROM THE BQ; MODEL USING THE SUBSAMPLE 2005-2019 – ROMANIA AS ANCHOR COUNTRY. ..... 145

FIGURE 24. THE UNIT ROOT CIRCLE GRAPHS OF THE VAR (2) MODELS FROM EQUATION (15). ..... 156

# LIST OF TABLES


Table 1. Convergence criteria compliance in Romania since 2007. ..... 29

Table 2. The results for seigniorage approximation by various authors for the Romania case. ..... 56

Table 3. OLS regression results. ..... 86

Table 4. Matrix of correlations. ..... 87

Table 5. Results for the Weibull parametric survival analysis. ..... 106

Table 6. Pairwise correlation matrix. ..... 107

Table 7. Anderson-Hsiao estimators for the dynamic panel data model ..... 108

Table 8. Variables considered. ..... 117

Table 9. Survival analysis results (Weibull regression). ..... 122

Table 10. Correlation matrix ..... 123

Table 11. Fixed effects model results ..... 124

Table 12. Linear regression for the long-term interest rate estimation purposes, with country specific fixed effects. ..... 155

Table 13. Linear regression using Cagan's equation for determining the value of constant b ..... 155

Table 14. Post-estimation Variance Inflation Factor test results. ..... 156

Table 15. AIC and BIC for Weibull model. ..... 157

Table 16. AIC and BIC for Cox proportional hazard model ..... 157

Table 17. Variance Inflation Factor for fixed effects model. ..... 157

Table 18. Results of the Johansen cointegration test for Romania and EU15 specific variables (in levels). 158

Table 19. Results of the Augmented Dickey-Fuller test for first-order difference (FOD) GDP and inflation for Romania and EU15 (1995-2019 sample). ..... 158

Table 20. Results of the Augmented Dickey-Fuller test for first-order difference (FOD) GDP and inflation for Romania and EU15 (2005-2019 sample). ..... 158

## Introduction – mere compliance not enough

In June 2000 and after successful negotiations, Greece was allowed to join, on January 1st 2001, the newly created euro area[1], even though it wasn't meeting at the time all the convergence criteria set up in the Maastricht treaty: price stability, sound and sustainable public finances, exchange rate stability and long-term interest rate (Council of the European Union, 2020). Specifically, the Hellenic Republic behave poorly under the chapter of sound public finances, the debt-to-GDP level being much above the 60% threshold set up in the treaty; in 1999 this value was around 104%. However, since two other member states (Belgium and Italy) who were allowed to join, were in the same situation, and since the Hellenic public debt was diminishing considerably and the budget deficit for the reference period was below the 3%, the Council in its ECOFIN composition decided that there was compliance with the public finance criterion (Herz & Kotios, 2000).

For the other three points, Greece made important steps towards converge with the rest of euro area countries and fitted right in time within the limits imposed by the reference rates on inflation, interest, and currency exchange.

On the other side, Spain, another Southern European member state, had no problem whatsoever with respect to the convergence criteria, meeting all of them. The public debt was just a bit above the 60% threshold and decreasing, the fiscal deficit was 1.1%, inflation was stable, the long-term interest rate was 2 points below the reference value (Herz & Kotios, 2000) and the Bank of Spain stayed true to its commitment for exchange rate stability; Spain has maintained a pegged exchange rate, some way or another, since mid-80s, and has never left the European Monetary System, not even at its crisis period in 1992, unlike Italy or UK (Bacchetta, 1997).

Fast forward 14 years later, the two countries are some of the most hard-hit by the crisis that erupted in 2008 and considered among the least benefited by the single European currency. A double-dip recession, high unemployment levels, especially

[1] Council decision of 19 June in accordance with Article 122(2) of the Treaty on the adoption by Greece of the single currency on 1 January 2001 (2000/427/EC).

among the youth, successions of fiscal deficits, increasing interest rate differentials, record high levels of public debt, and capital runs are just a few of the major hardships faced by Greece, Spain, as well as many other peripheral euro area countries.

This strikingly similar image between the "good" and the "bad student", proves that the mere compliance with the convergence criteria does not warrant good economic prospects for the post-euro adoption period, and the warning signal for the rest of non-euro area EU member states couldn't be clearer: a more careful in-depth analysis is required before giving a verdict with respect to the optimality of euro adoption.

The main objective of this thesis is to give a scientific and evidence-backed answer to the question posed in the title: "Should Romania adopt the euro?". As indicated in the previous paragraphs, answering this question *ex-ante* is crucial, since the entry into the European monetary union seems to be an irreversible process (at least as proven so far), with far-reaching implications on many aspects of the economic life of a country. This change in the seamlessly trivial legal tender system have the potential of affecting not only the health of the banking and financial system, but also the standing of the labor market, of the public national accounts, and that of the overall macroeconomic environment, just to name a few of the most obvious.

The point of departure for this complex undertaking is presenting the most relevant stylized facts regarding the Romanian economy and euro adoption. As such, in order to get an overview of the country-specific situation and on the adoption process, in Chapter 1, we will make a brief description of the recent-history economic background, we will debate the Maastricht criteria, and show Romania's standing in this regard. Furthermore, since the considerations on joining a monetary union are more complex and comprehensive than compliance with the criteria, in the same chapter, we will also refer to the Optimum Currency Area(s) (OCA/OCAs) literature in the search of more relevant aspects to be taken into account while also providing a brief assessment for the Romanian case.

The brief analysis in the first chapter will, however, be incomplete, since the OCAs literature is a continuously evolving field of research; reviewing it will not

provide answers to all the research questions that could surge, either because empirical studies focused on Romania were not conducted, either because the questions at hand were omitted or insufficiently developed. So, some crucial aspects remain to be determined; these represent much more complex issues, that will require a more in-depth analysis. Namely, we have been able to identify four points.

The first one is the issue of seigniorage generation: would it be costlier (from a purely rational perspective) for the Romanian executive to give up its monopoly on currency issuance and inflation generation? 0 is concerned with measuring the seigniorage in Romania since the fall of communism and the potential gains after passing to euro. Starting from the balance sheet of the central bank, we estimated these levels of seigniorage for a period of 27 years.

Our findings suggest that this source of revenue was at very high rates in the period of the 90's, mostly due to the huge, prolonged inflation rates. Ever since the independence of the central bank, these levels of seigniorage dropped and became constant, at around 1-2% of the GDP. Also, we computed the potential gains due to euro adoption. We showed that as Romania converges with the rest of the Eurozone its seigniorage potential gains from euro adoption drops. Because these gains are only very small in relation to national income, we argue that the implications of giving up own currency are not monetary or budget related.

Another question that should be settled is with respect to the resilience of the labor markets. EMU membership deprives the member states of their monetary corrective arm and limits their fiscal space (through the Stability and Growth Pact, which applies not only to the EA, but to all the EU countries); could this affect the resilience of their labor markets and make them less capable of facing shocks and recover from them? We address this question in Chapter 3, which is concerned with the effect that Eurozone membership has on the employment resilience, defined as the capacity of resistance to an output shock and recovery from it.

A preliminary analysis of both employment and output levels indicates a noticeable hysteresis effect of the 2008-2010 crisis on Eurozone economies, as opposed to the rest of the OECD countries. The main hypothesis we put to the test

is that Eurozone membership will negatively affect employment resilience of national economies.

Our findings are compatible with the argument that as a consequence of the lack of an independent monetary policy and the reduced fiscal margins, the countries with the single currency will be less resistant and will take longer to recover from negative shocks. After first checking the magnitude of the drop and the effect in time of a shock using a VAR model and the accompanying impulse-response function, we then compute an original relative resilience index for 41 OECD and EU economies and run a robust regression on it. Both models suggest that the adoption of euro is associated with a meaningful lower than average employment resilience, suggesting Eurozone is not actually an Optimum Currency Area (OCA).

A third point is related to the interplay between internal devaluation and a feature placing Romania at the top of the EU ranking – political instability. As indicated in the literature, internal devaluations are the second-best when it comes to correcting imbalances. However, at the same time, these measures are very hurtful politically since they imply wage reduction measures. Could political instability and the short-term mindset of the politicians impede such actions?

We explore this nexus in Chapter 4. The objective there is to deal with the relationship between cabinet durability and the implementation of the internal devaluation policies across Eurozone economies. The main hypothesis we put to the test is that cabinet durability play an impeding role in the implementation of internal devaluation due to opportunistic behavior and strategic thinking from the part of the incumbent governments. This hypothesis derives from an interdisciplinary analytical framework that combines features of the models used in the political business cycle and partisan theories.

Employing a panel dataset for the Eurozone countries and a dynamic regression model, after controlling for the relevant economic and financial variables, the results show that the expected survival time in office of the cabinets (computed using survival analysis) has no significant effect on the real unit labor cost (a proxy of

internal devaluation). To the best of our knowledge, no previous study ever tested this relationship.

These puzzling and intriguing results obtained in Chapter 4, call for a reinterpretation of the literature and a reassessment, done in Chapter 5. The main research objective there is to find out what is the best predictor of internal devaluation measures imposed by governmental decision. We devise a test for two competing hypotheses. On one hand, political instability may affect the implementation of internal devaluation due to opportunistic behavior and strategic thinking from the political parties in power. On the other hand, governments also respond in real time to the signals from the financial markets with respect to the necessity of such measures. We employ a panel dataset that spans from 2007 to 2017 for all the Eurozone countries and we include as an explanatory variable in our fixed effects model the expected time in office of each cabinet (previously estimated using a survival analysis regression), and the bond yields that the same governments have to pay to issue public debt into the financial markets, to accommodate for the two contracting hypotheses.

After controlling for the relevant macroeconomic and labor-and market-specific variables, the results show that expected time in office has no significant effect on the movement of unit labor cost, while the bond yields do have one with the expected (negative) sign, thing that might hint at a crisis of representation.

Lastly, we address the issue of shock similarities between Romania and other European economic entities in Chapter 6. The study starts from the relevant literature of the Optimum Currency Areas and identifies the most widely acknowledged *meta* property and methodological model for this purpose: the SVAR Blanchard and Quah decomposition for identifying the supply and demand shocks. Employing the indicated model and the most recent data, we are able extract and analyze the underlying shocks that have hit 34 European economic entities in the period 1995-2019. After performing the pairwise correlations between Romania and the rest of the economic entities for both the supply and demand disturbances, we map them on a bidimensional graph.

We discover that while there is relevant integration and connectedness that insures relatively high correlations between supply shocks, the politically motivated monetary and fiscal policy disturbances that created ample and hectic demand side movements, are a factor of great concern for the prospect of single currency adoption in this Eastern European country. Policy recommendations are made in the direction of less political influence on the economic cycle and more long-term oriented mind-set. As such, we are able to ascertain whether the Romanian preferences for monetary policy would be aligned with the ones of the other member states, and more importantly, with the ones at the core of EMU.

# Chapter 1. Stylized facts on Romania and euro adoption

## 1.1. Recent historical economic background

Romania switched to a market economy model in late 1989 after the Communists regime of Nicolae Ceausescu was ousted in December. The economic infrastructure at the time was dominated by an obsolete industrial base, a very problematic disconnect between demand and supply, and the lack of external markets for Romanian products (Moody's Analytics, 2021).

The first decade of transitionary period was characterized by prolonged recessionary periods, high inflation rates, privatization of the state-owned enterprises, and increasing unemployment, but important reforms, like the independence of National Bank of Romania were accomplished and paved the way ahead for the EU accession in 2007.

Access to the European single market and to the European structural funds warranted considerable growth rates since the mid-2000s and made of Romania one of the fastest growing economies in Europe. On the other side, the freedom of movement that came with the EU accession and the lack of appropriate job prospects, triggered a mass emigration phenomenon, especially among the highly skilled labor force (Mihai & Novo-Corti, 2020), which together with the aging population trend, underinvestment in human capital and considerable tax evasion, negatively affected the overall long-term growth perspective (Moody's Analytics, 2021).

The 2008 financial crisis brought a considerable slump in economic activity and in the public budget, which called for a precautionary stand-by agreement with IMF, EU and World Bank in 2011, to promote fiscal discipline, encourage structural reforms, and strengthen financial sector stability; however, no funds were ever drown (Moody's Analytics, 2021).

Lately, the expansionary fiscal policies sought by the executive, brought excessive fiscal deficits, higher than normal inflation rates, and mounting public debt (that nevertheless stays at levels below the 60% of GDP threshold).

The latest country report from the Commission[2] identifies, besides the above-mentioned demographic and fiscal sustainability threats, some other long-term problematic spots for the economic perspective in Romania. In the first place, there is an unhealthy growth model based on a strong domestic demand led by salary increases (which outpaced the productivity growth, posing a threat for the competitiveness) and tax cuts. Secondly, the lack of appropriate and uniform infrastructure investments negatively affects territorial cohesion and convergence path with the rest of the EU. On the social aspect, the country still faces high poverty rates and an increasing inequality, while on the public administration level, decades of corruption and excessive bureaucracy has stifled and continues to stifle the apparatus.

### 1.2. Considerations on euro adoption – Maastricht criteria

As it has been already signaled in the beginning of this section, compliance with the so-called Maastricht, or convergence criteria is the fundamental and legally most important requirement to meet in order to adhere to the Economic and Monetary Union.

Signed in 1992 and effective in 1993, the Treaty of Maastricht is a cornerstone in European integration; it is the treaty that established the European Union and the blueprint for the future Economic and Monetary Union (EMU), that would be materialized in 1999/2002, with the introduction of the euro and the physical euro banknotes and coins. The treaty stipulated that a country's accession to this final stage of the EMU would be conditional on five major criteria (de Grauwe, 2018):

1. inflation rate is not more that 1.5% higher than the average of the three lowest inflation rates among the EU member states;

[2] COMMISSION STAFF WORKING DOCUMENT Country Report Romania 2020 Accompanying the document COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE EUROPEAN COUNCIL, THE COUNCIL, THE EUROPEAN CENTRAL BANK AND THE EUROGROUP 2020 European Semester: Assessment of progress on structural reforms, prevention and correction of macroeconomic imbalances, and results of in-depth reviews under Regulation (EU) No 1176/2011 – available at: https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1584543810241&uri=CELEX:52020SC0522

2. the long-term interest rate is not more that 2% higher than the average of the three lowest inflation rates among the EU member states;
3. be a member of the exchange rate mechanism (ERM II now) and has not experienced a devaluation during the two years preceding the entry into the EMU;
4. the government budget deficit shouldn't be higher than 3% of GDP, or if it is, it should be declining continuously and substantially;
5. the government debt should not exceed 60% of GDP, or if it does, it should diminish sufficiently at a satisfactory rate.

### *1.2.1. Inflation criterion*

Of course, there are rationales for the imposition of these very exact and quantifiable thresholds/ceilings. The inflationary target reflects the fears coming from countries with preference for low inflation, like Germany; the adoption of the single currency for such countries represents a threat since the central bank of the monetary union would have a mandate to target inflation at a level that reflects the average preferences of the participating countries, which would be too high for them. This, in turn, might create welfare losses for countries like Germany as it will overheat their economies. The most straightforward way of protecting oneself from this source of risk, is to build the union's central bank on the same foundations as the national central bank (e.g. like Bundesbank), hence the specific inflationary target imposed in the treaty: close but below 2% (de Grauwe, 2018, p. 125). Nevertheless, this doesn't completely shield against this risk, as the union's central bank changes its composition constantly, which might the imply loss of control. This is where the monetary union entry barrier came into place – to insure that all the new members will have the same preferences in terms of inflation as countries like Germany (de Grauwe, 2018, pp. 124–125).

### *1.2.2. Budgetary criteria*

Tightly related to the first criteria, are also the budgetary ones – the public debt ceiling and the public deficit rule. Countries with high public debt levels always had

the incentive of engineering inflation surprises in order to lower the real value of the interest payments and debt principals issued in domestic currency. This has been the case of Italy, for instance (de Grauwe, 2018, pp. 126–127). This inflationary prone behavior will create problems for the member states with low-inflation preference and lower debt.

An extra argument for the imposition of the budgetary constrain on entry is related to the higher risk of default for the more indebted member states which could put pressure on the monetary union as a whole to accept a bailout in case the default materializes. This explains the no-bail out clause included in the Treaty. Consequently, in order to "correct" this behavior, the monetary union design addresses directly the source of the problem by imposing entry restrictions on both debt level and budget deficit (de Grauwe, 2018, p. 127).

While the arguments posed by such entry restrictions are valid, the numerical norms imposed, have attracted a great deal of criticism as being arbitrary (Buiter et al., 1993) and obsolete for the current state of macroeconomic affairs in Europe (Constâncio, 2020). To shed some light on how these two values were chosen, a bit of background is required: the 3% and 60% budgetary norms seem to have been derived from the formula determining the budget deficit needed to stabilize the government debt:

$$d = gb$$

where $b$ is the steady-state level at which government the debt is to be stabilized, $g$ is the nominal growth rate of output and $d$ is the budget deficit. As such, for a $b = 0.6$ (i.e., 60%) and for a nominal growth rate of $g = 0.05$ (i.e. 5%), it follows that the budget deficit must be 3%.

However, the critics pointed to the fact that there is no scientifically founded reason for which the steady-state level of debt should be at 60%, in the first place (apart from the fact that this was the average level of debt in early 90s), and that the 5% nominal growth rate was profoundly biased towards the old member states – the new Eastern and Central Europe countries have known nominal growth rates of output much higher than this, allowing them to run higher deficits and growth levels

(de Grauwe, 2018, p. 128). Furthermore, the current low interest rate and secular stagnation macroeconomic environment does not fit anymore with the 5% nominal growth rate assumption (Constâncio, 2020).

### *1.2.3. Exchange rate criterion*

In order to provide stability, more certainty, and to boost the intra-EU trade in a post-Bretton Woods system, member states have agreed on exchange rate fluctuation bands since 1979, with the advent of the European Monetary System.

This system that lasted for 20 years was flexible enough to allow also for competitive devaluations since the normal bands were wide (±15% since 1993). However, the new Exchange Rate Mechanism II (in place since 1999) implies a minimum of just 2 years of membership and considerably narrower fluctuation bands (±2.25%), in order to impede a more favorable entry into EMU (at a depreciated value to boost the competitiveness) (de Grauwe, 2018, pp. 128–129) – the exchange rate arrangement for the newcomers is similar, but much stricter.

### *1.2.4. Interest rate criterion*

The inclusion of the interest rate requirement among the convergence criteria was done in order to prevent capital losses and unfair financial transactions practices. A hypothetical example could shed some light on the matter at hand. Assume that Romania will join the EMU in 2024 and that the current spread between Romanian and German long-term bond is 2%. In this case and taking advantage of the fact that the RON/EUR exchange rate is fixed at the moment of the entry into EMU, financial agents can easily get involved in arbitrage practices (sell their German bonds and buy Romanian bonds) to benefit from the higher interest. The mechanism that would normally impede these unfair financial gains (i.e. the devaluation of the RON, due to excessive offer of this currency, at the moment when the bonds have been redeemed) would be inexistent – the exchange rate is permanently fixed. As such, not only that arbitrage practices would be allowed, but capital losses in Germany would take place as a result of this.

In order to prevent these two outcomes, the interest rate criterion has been included among the requirements for euro adoption. However, this rule, unlike the rest, is redundant, since the market forces will take care of the interest rate convergence much before the entry into EMU, i.e. expecting the inevitable euro adoption, the demand for better remunerated bonds in the new member state will increase, and this will automatically drive the interest rate to the point that the investors will be indifferent between the euro area bonds or the bonds coming from the new member state; this was the case of the peripheral countries like Greece, Spain, Ireland or Portugal, and the decreased interest rates there, allowed for the economic boom from early 2000s (de Grauwe, 2018, p. 129).

### *1.2.5. Post-2007 criteria compliance*

As underlined when talking about the rationales behind these criteria, the entry rules that were made up in the early 90s are obsolete in the current macroeconomic environment, inconsiderate for the specificities of the Eastern and Central European economies and biased towards protecting the interests of the low-inflationary, low-deficit and debt-averse countries in the core.

Nevertheless, given the considerable hypothetical advantages presented by the euro adoption (discussed at large in Section 1.3.4), many new EU member states imposed structural reforms and made considerable efforts in aligning their economies with the euro area, Romania including.

An up-to-day assessment of the compliance with the Maastricht criteria since the year of EU accession is presented in the Table 1.

The budgetary criteria have been respected with the exception of the deficit rule in three years during the period considered; two out of these three years were marked by recessions and 2020 is the year that brought the General Exemption Clause from the Stability and Growth Pact (probably here to stay until 2022 at least). Worrying is that no budget surplus has been recorded during the considered period; this, of course, had its toll on the mounting level of public debt. The debt level stayed well below the 60% ceiling (mainly because it started from very low values given the lack

of debt monetization options for Romania in the period of 90s and 2000s, but increased considerably in the past two or three years.

**Table 1. Convergence criteria compliance in Romania since 2007.**

| | Romania | | | | | Reference values | |
|---|---|---|---|---|---|---|---|
| **Year** | HICP | Long-term interest rate | Government gross debt | Government deficit/surplus | Exchange rate | HICP | Long-term interest rate |
| **2007** | 4.9 | 7.1 | 13 | -2.5 | 5.4 | 3 | 6.4 |
| **2008** | 5.9 | 7.1 | 13.6 | -2.9 | -10.3 | 3.2 | 6.5 |
| **2010** | 6.1 | 7.3 | 30.5 | -6.8 | 0.7 | 1 | 6 |
| **2012** | 3.4 | 7.3 | 34.6 | -2.8 | 5.2 | 3.1 | 5.8 |
| **2013** | 3.2 | 5.4 | 38.4 | -2.3 | 0.9 | 2.7 | 5.5 |
| **2014** | 2.1 | 5.3 | 39.8 | -2.2 | -1.6 | 1.7 | 6.2 |
| **2016** | -1.3 | 3.6 | 38.7 | -2.8 | -1 | 0.7 | 4 |
| **2018** | 1.9 | 4.1 | 35.3 | -3.4 | -1.9 | 1.9 | 3.2 |
| **2020** | 3.7 | 4.4 | 46.2 | -9.2 | -1.1 | 1.8 | 2.9 |

**Source: own elaboration with data from ECB's Convergence reports. Note: the convergence report is published by the ECB at least once every two years, or whenever a member state requests it[3].**

Since the nominal long-term interest rate is very dependent on the inflation rate (measured as the Harmonized Index Consumer Price – HICP), these two stayed most of the time above the reference values. However, the exchange rate between the RON and EUR, stayed well within the ±2.25% bands, even though Romania wasn't taking part in ERM II; this might have to do with the relatively low inflation differentials between the two economies and with the managed or "dirty" floating regime pursued by the NBR (as part of its inflationary target mandate) and recognized by the IMF (International Monetary Fund, 2019).

The only two pieces of information relevant for the state of compliance with the convergence criteria, that were not included in the Table 1, are (1) that Romania has never been part of the ERM II and (2) that the legislation regulating the status of

[3] Available at: https://www.ecb.europa.eu/pub/convergence/html/index.en.html

NBR and the monetary policy, is not fully compatible with the European requirements.

Regarding point (1), the most recent national plan for euro adoption we are aware of (Guvernul României, 2018), avoids giving a clear schedule for the accession to ERM II, so providing estimations on the time horizon until this event could take place, would be conjecture. This lack of certainty implies a lack of commitment from the authorities and a possible long stand-by phase, which might provide some time for taking the necessary actions to address structurally important imbalances, align the economy, and work on the legislative reforms for a fully compliant legal framework (discussed at large in the next paragraph).

Referring to point number (2) from above, the Law No. 312/2004 on the Statute of NBR (hereinafter referred to as "Law of NBR") is only partly compatible with the requirements for central bank independence, the monetary financing prohibition and legal integration into the Eurosystem. Specifically, the points that call for legislative reform are (as indicated in the last convergence report European Central Bank, 2020, pp. 203–209):

a. to expressly prohibit the Government from influencing the members of the decision-making board;
b. to clarify the grounds on which the members of the Board can be recalled from function, apart from the ones indicated in Article 33(6) of the Law of NBR (i.e. inability to exercise their functions and serious misconducts);
c. to warrant the financial independence on NBR on two counts: from the State budget by reforming the article 47 of the Law of NBR which, under certain circumstances, might account for an intra-year credit, and from the Court of Auditors specifying that the scope of audit from this institution strictly refers to the commercial operations of NBR;
d. to extend the range of public sector entities for which NBR is prohibited from monetizing (credit facilities or direct purchase of debt instruments on the primary market) in order to mirror the Article 123 of TFUE;

e. to adapt the secondary objectives of the NBR mandate (support for the overall economy policy) to the jurisdiction of the Union, not just the state;
f. to recognize the powers of the ECB in the fields of monetary policy, collection of statistics, official foreign reserve management, payment systems, exchange rate policy, the appointment of independent auditors for the annual financial statements, and issuance of banknotes (also the Council's powers must be recognized in these last three cases);
g. to update the templates for the annual financial statements in order to comply with the Eurosystem's ones;
h. to recognize ECB's entitlement of being consulted on draft national legislation in the areas outlined in Articles 127(4) and 282(5) of TFUE.

### 1.3. Considerations on euro adoption beyond the criteria; OCA theory on costs and benefits

The Optimum Currency Area (OCA) considerations for the creation of a monetary union are much older than the convergence criteria outlined in the Treaty of Maastricht, as they have been a subject of continuous debates since the early 60s and are at the core of the debate on monetary unions (for a useful review on the literature, refer to Mongelli, 2002).

In the next paragraphs we will focus on the main threats and opportunities related to euro adoption, as they are presented in the OCA and monetary union literatures, and we will try to assess Romania's position in certain relevant aspects. As such, this subchapter serves the purpose of making a first sketchy approximation of the fitness of the national economy for the adoption of the single currency.

While some aspects can be evaluated on the basis of basic empirical data, some others require a more in-depth analysis, which doesn't fall within the scope of this introduction and will be addressed into their respective dedicated chapters. In doing this exercise, we will also be able to identify gaps in the literature –points that might have been overlooked, but which constitute pertinent assessment criteria regarding euro adoption suitability.

### *1.3.1. Labor market mobility, wage flexibility, and internal devaluation*

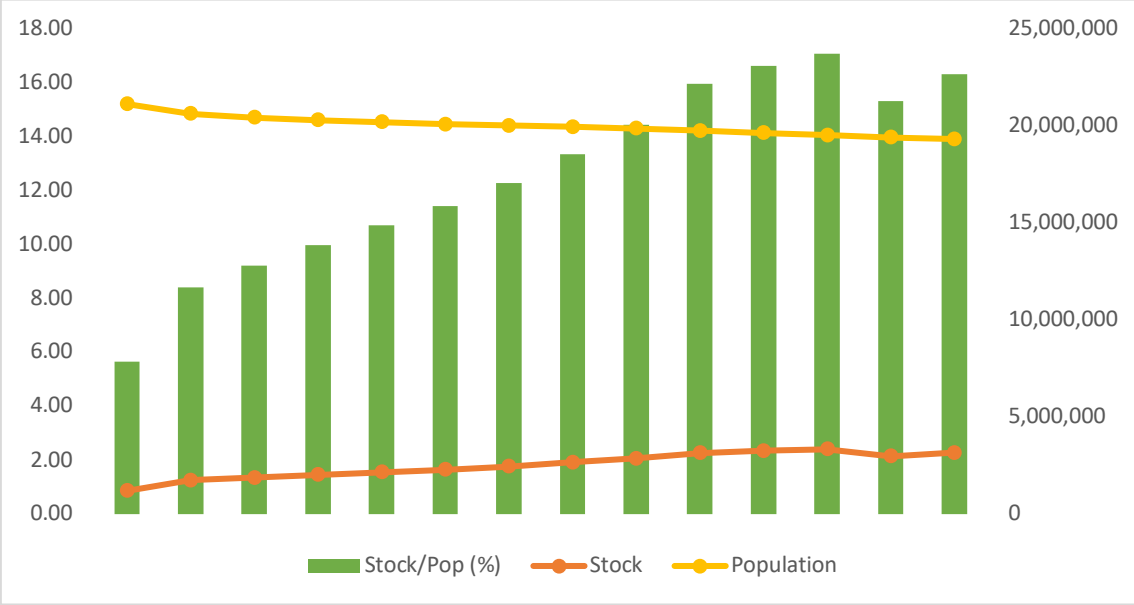
The most common argument against the euro adoption is related to the case of an asymmetric shock – what happens when the economies forming a monetary union face shocks that affect them in different ways? The tools of the monetary policy (interest, inflation, and exchange rate manipulations) are rendered useless since at the union level the positive and negative shocks would cancel out and there would be no need to take monetary policy action at all. In such a scenario, the economies will need to rely on internal mechanisms such as wage flexibility and labor force mobility to offset the negative effects of the exogenous shocks (McKinnon, 1963; Mundell, 1961) – i.e. in order to absorb the effect of, let's say drop in output, a country can either devalue the level of salaries in order to become more competitive, or it can allow labor force migration to areas not affected by the shock in order to ease off the pressure on its social security system.

When it comes to labor force mobility, the sheer number of Romanians outside the national borders speak for itself – the 3 million individuals all over the EU put Romania at the top of the labor force mobility ranking in Europe, but this is not to say that it comes without problems: an array of demographic, fiscal, and social negative implications related to this phenomenon are well documented in the literature (Dospinescu & Russo, 2018; European Union Agency for Fundamental Rights, 2017; P. Huber & Tondl, 2012), which might imply efforts from the executive to put a stop to this phenomenon. Furthermore, if the recent history of other countries is an indication of what would come, the migration trend might reverse once convergence it's achieved and this might mean less mobility (Jauer et al., 2018; Sánchez-Montijano et al., 2018; Sohst et al., 2020).

Wage flexibility depends on two main factors: on the one side, the bargaining power and the structure of the collective work agreements (Flemming, 1987; Hancké, 2014), and on the other, the political will to impose it. The structure of the employment and wage setting regime in Romania (mixed-market model as described in Hancké, 2014) might pose serious issues for the prospect of internal devaluations,

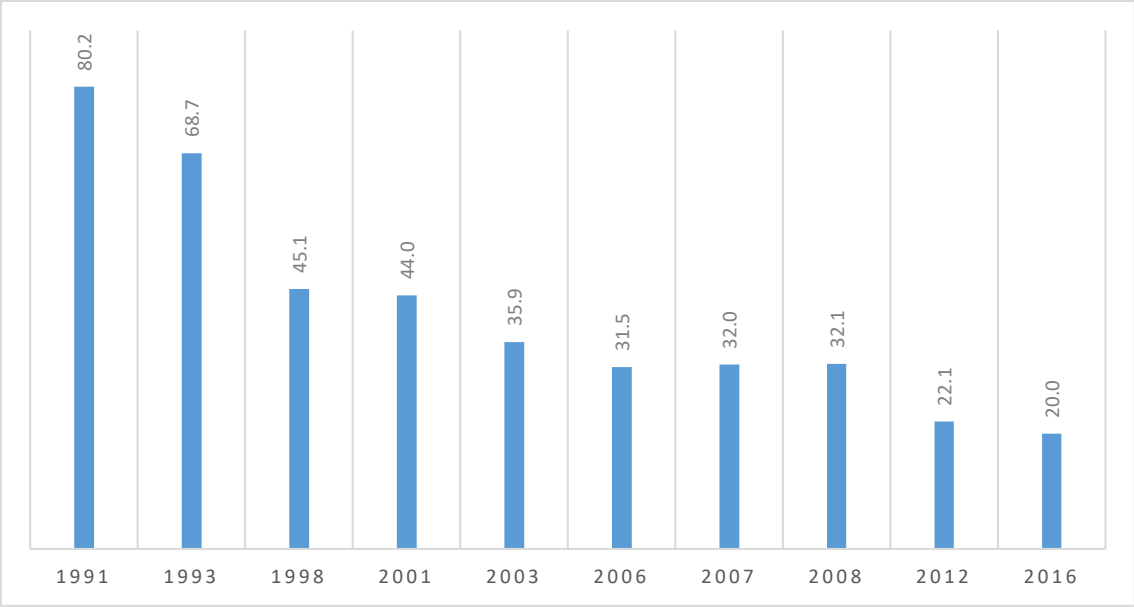
but the latest available data indicates decreasing levels of union density not just in Romania, but all over Europe, suggesting wage flexibility increases.

**Figure 1. Total population and the total stock of Romanian migrants (2007-2020)**




**Note: total population and total stock (in absolute value) plotted on the right axis, ratios between stock and population, on the left axis. Source: own elaboration with data from Eurostat.**

**Figure 2. Labor union density in Romania (1991-2016).**

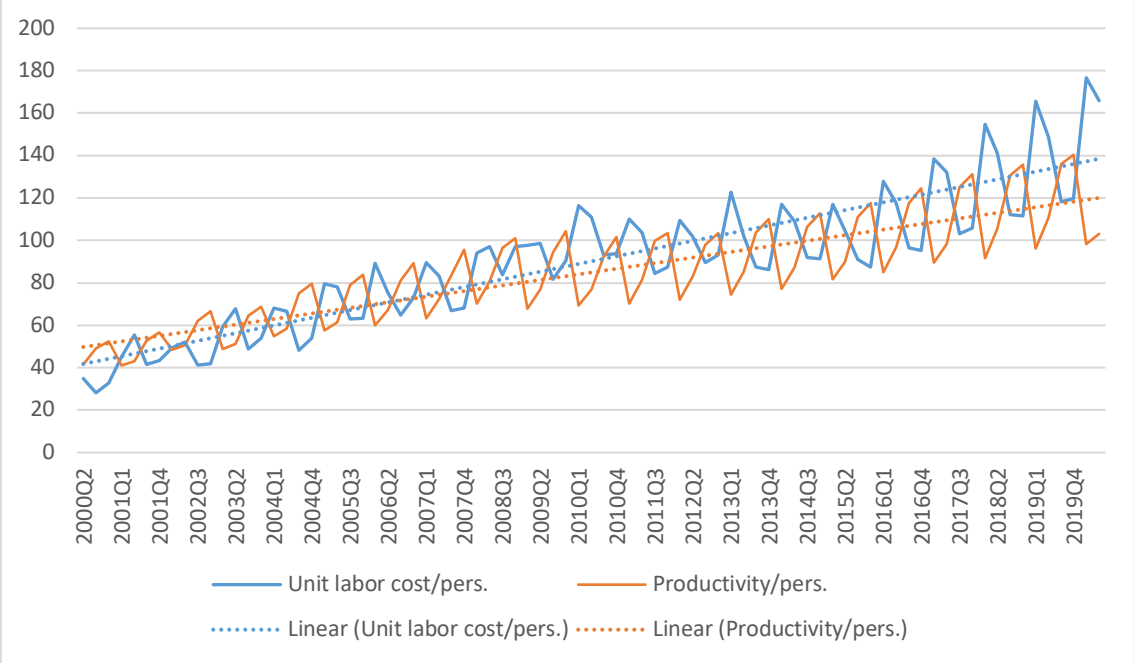



**Source: own elaboration with data from ICTWSS Database (Jelle, 2019).**

However, the plot with unit labor cost and labor productivity evolution (Figure 3) indicates increasing gaps; the latter seems to be rising at a higher pace than the former, posing questions with respect to the sustainability of wage increases in

Romania (as also signaled by the Commission in its latest European Semester exercise)[4].

**Figure 3. Unit labor cost and labor productivity evolution in Romania (2000-2020).**




**Note: unit labor cost per person and productivity per person as index (2015=100), not seasonally, neither calendar adjusted. Source: own elaboration with data from ECB's Statistical Data Warehouse.**

The seemingly flexible and mobile Romanian labor force should be a huge asset in offsetting the tight movement space given the lack of the sovereign monetary policy arm. However, reaching the most advanced level of EMU integration restricts even further the fiscal space and impose extra rigidities for the member state's economies (Mody, 2018; Stiglitz, 2016). Will this also have negative impacts on the resilience and flexibility of the labor market? We put this hypothesis to an empirical test in Chapter 3. If proven validated, it might raise serious questions to how well the labor market will fare with the extra rigidities imposed.

The literature is silent with respect to the other aspect of wage flexibility; by making an analogy with the classical political business cycle model proposed by Nordhaus (Nordhaus, 1975) there are reasons to suspect that in countries dominated

[4] Recommendation for a COUNCIL RECOMMENDATION on the 2020 National Reform Programme of Romania and delivering a Council opinion on the 2020 Convergence Programme of Romania – available at: https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1591720698631&uri=CELEX%3A52020DC0523

by very short-term political horizons there is less will to impose internal devaluations. As such, governments alternating in power will prefer to leave the issue of lack of competitiveness unaddressed, since taking measures against salary increases will affect their electoral scores. Having said that, and taking into account the fact that with close to 300 days of average cabinet duration, Romania stands out as the most politically unpredictable country in EU (Bértoa, 2019; Döring & Manow, 2019), we believe that this relationship is worth exploring; we do so in Chapter 4 and after obtaining some surprising and intriguing results, we deepen the analysis in Chapter 5.

### *1.3.2. Self-fulfilling prophecies, capital runs, liquidity and solvency crises*

One of the issues at the core of euro adoption debate is the loss of the so-called "lender of last resort" role of the central bank. This has become one of the centerpieces in the argumentation against monetary union, but unfortunately raised to prominence quite late, only after the *fait-accompli* of debt crises. The problem stands on the fact that now, Romania, just like any other country with a sovereign monetary policy and own currency, has the implicit backing of its own central bank for honoring its domestic currency denominated debt (the NBR will be ready to provide liquidity if the executive is faced with risk on rolling over its debt) (de Grauwe, 2018, pp. 8–10); if Romania decides to join the Eurozone, it will lose this backing, since NBR will be just a central bank subject of the Eurosystem. The ECB cannot act out in this sense in the interest of any single member state; although evidence exist that the mandate of the ECB might be more skewed towards national interest than the aggregate euro area inflationary preferences (Sanchez-Santos et al., 2011), the size of the Romanian economy doesn't allow for a relevant voice within the Eurosystem.

This particular problem is by far one of the most dangerous threats towards the smooth running of an economy in a monetary union, since given certain circumstances, capital markets might behave irrationally and might trigger a liquidity and solvency doom-loop (de Grauwe & Ji, 2013).

If fears arise with respect to the debt repayment capacity of the sovereign, their yields for placing debt will increase, and so does the debt level; this will put more

pressure on the budget and will fuel even further the fears regarding the solvency. The government might face a debt roll-over impossibility, triggering a liquidity crisis. However, this liquidity crisis does not imply insolvency – it only means that the executive does not have the funds *for the moment* to refinance its debt (at acceptable interest rates); but the markets are incapable of discerning between the two and will steer their investments away from debt securities issued by that sovereign.

Problems are amplified by two other factors. In the first place, by the free movement of capital in the EU and secondly, by the fact that the sovereigns faced with liquidity crises share the same currency with the ones that don't. In other words, there are no barriers (nor legal, given the free movement, neither financial, given the permanent fixed exchange rate) to stop the capital runs in flight-to-quality situations. This dynamic describes in broad lines the Spanish scenario unfolded during the financial crisis and it's noteworthy that is a self-fulfilling prophecy set in motion by the irrational behavior of capital markets (de Grauwe & Ji, 2013).

Admittedly, recent developments in the EU and the euro area, such as the creation of the Recovery and Resilience Facility (RRF) and the launch of the Pandemic Emergency Purchase Program (PEPP), could be seen as strong stabilizers against large spread movements and sovereign debt crises in the Eurozone, but should not be considered as solutions to the problem described above; the reasons for this are threefold.

In the first place, because these two measures acting on the fiscal and monetary corridors are specifically temporary; due to a change in perspective, austerity measures were no longer imposed and more fiscal space was given (including the activation of the General Escape Clause from the Stability and Growth Pact), improving the economic growth prospects and capital markets perspectives. Secondly, because the exogenous shock that hit the European economies in 2020, was symmetric, unlike the one from 2008. Lastly, because the funds put forward within the framework of RRF are complementary (they do not substitute the nationally available recovery funds) and do not have such a sizeable magnitude (mainly due to low EU budget/GDP ratio).

In conclusion, there are no guarantees that the Spanish scenario depicted in the above paragraphs, is not to happen to Romania, or any other country that joins the euro area. On the contrary, it becomes more likely, if one would take Romania's country ratings as good indication for the financial and capital markets outlooks (non-investment grade for a long time).

### *1.3.3. Risk containment measures – fiscal, banking, and financial markets unions.*

It is certain that members of a currency union lose their capacity to adjust to idiosyncratic shocks via nominal exchange rate adjustments or monetary policy actions[5]. In this context, internal devaluations and austerity measures have been put forward as second best solutions so far, to buttress competitiveness and improve the perceived solvency of the sovereigns in the eyes of the capital markets. However, a third option was from the start available for the euro area countries, but disconsidered and never integrated in the design of the monetary union: the fiscal/budgetary union – as it happened in the case of German reunification (de Grauwe, 2018, pp. 8–10).

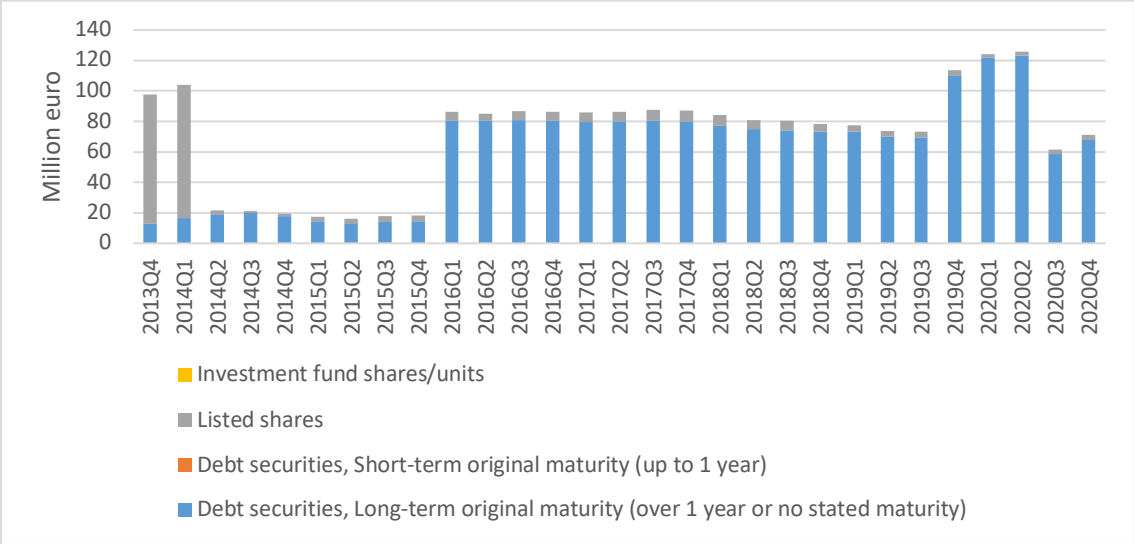
This would have allowed for a much smoother and less painful idiosyncratic shock absorption processes (Sachs & Sala-i-Martin, 1992), admittedly facing moral hazard risks from the peripheral states. Nonetheless, given the strong opposition from more fiscally conservative member states (especially Germany) and the lack of political will and public support in some countries for more integration in this direction, there doesn't seems to be any realistic probability of this project materializing soon (Aizenman, 2015; Stiglitz, 2016), which not only threatens the wellbeing of the peripheral economies, but also the very existence of the European monetary union (Daniele & Geys, 2015; Jones et al., 2016).

[5] Criticism of these original OCA literature points have been made on two grounds: (1) national monetary policies (such as exchange rate adjustments) are not that effective in combating the imbalances and (2) the same national monetary policies might actually be the very same source of the disturbances in the first place, since they are made by countries on an individual basis, i.e. not coordinated (Tavlas, 1993). However, empirical studies in the 80s and 90s proved the effectiveness of some exchange rate adjustments in Europe (de Grauwe & Vanhaverbeke, 1990; Sachs & Wyplosz, 1986) and with respect to point (2), there still remain relevant differences between the member states of EMU, in terms of legal and tax systems, as well as in terms of labor markets, which, if unaddressed by a specific monetary policy, might prove to be sources of economic imbalances (de Grauwe, 2018, pp. 52–53).

The lack of political will for a fiscal/budgetary union channeled the EU integration efforts into two others alternatives: banking union and capital markets union. The idea underpinning these efforts is that shock absorption capacity of the union could be improved in the presence of some private risk sharing mechanisms, i.e. if the national banking systems and the capital markets will be integrated enough, they will provide a good risk-sharing mechanism across the euro-area borders which would be able to better absorb an idiosyncratic shock (Juncker et al., 2017).

While the banking union is incomplete due to the absence of a European Deposit Insurance Scheme to complement the national ones (Stiglitz, 2016), and the capital markets union still requires national legislation harmonization and a great deal of supranational delegation of supervision competencies (Juncker et al., 2017), the combined shock absorption capacity of the two is considerable. As one of the latest empirical studies estimates, that cross-border banking channels provided a useful countercyclical impulse to consumption, smoothing up to half the negative income shocks (Kontolemis et al., 2020).

**Figure 4. Banking integration indicator: Romania-euro area.**




**Explanatory note: quarterly aggregated securities holdings by the euro area MFIs issued by the Romanian MFIs; the values for short-term debt securities and investment funds shares stand at 0. Source: own elaboration with data from ECB's Statistical Data Warehouse.**

However, the trend in banking integration across borders seems to have lost momentum and it actually declined since the financial crisis (Kontolemis et al., 2020). As such, it remains to be seen whether these two alternatives for fiscal union would

be able to provide enough buffers. In the case of the relationship between Romania and the euro area, the banking integration is even less impressive; the aggregate value of debt securities and equity issued by the Romanian Monetary and Financial Institutions (MFIs) that are held by the euro area MFIs, barely surpassed the figure of 100 million euro in the past few years (Figure 4).

### *1.3.4.Benefits and opportunities*

While the threats related to euro adoption were more relevant on the macroeconomic side, the opportunities and benefits are more microeconomic related. Among the two of the most cited are the reduction of the transaction costs and the disappearance of the uncertainty needs related to exchange rate.

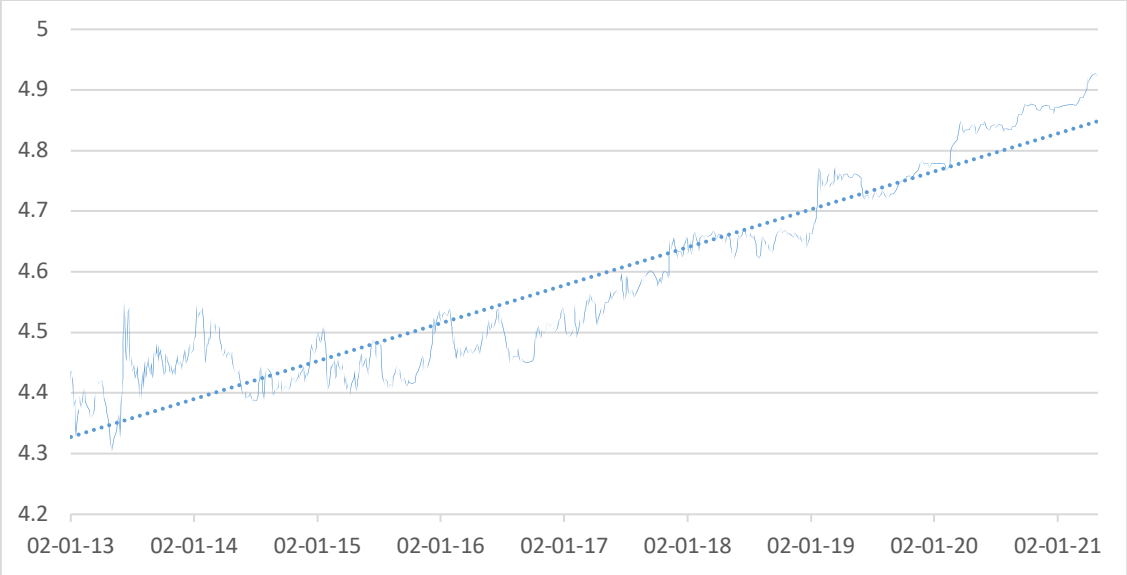
For the first of them, the seminal study ordered by the EC Commission in the pre-euro phase (Artis, 1991) estimated the value of these transaction costs at around 1% of the GDP, which given the sizeable euro area annual output, represents a considerable amount. Furthermore, this benefit for the consumers doesn't imply losses for the banking system, since the charges raised by the banks for exchanging currencies (estimated at around 5% of their revenue) is actually a deadweight loss – as such, resources invested in this operations could be redirected towards more productive economic activities (banks will, however face a problem of transition) (Brans et al., 2021; de Grauwe, 2018, pp. 55–56).

The integration into the Eurozone payment system (TARGET 2) is also considered a benefit for a country adopting the euro, since it entails smooth and safe cross-border payments and settlements between the commercial banks (de Grauwe, 2018, p. 56). For Romania, though, the integration already happened in 2011; NBR's centralized payments in EUR are made through the TARGET 2 system, in parallel with the running RON denominated payments on the national systems (ReGIS or SaFIR)[6]; one can conclude, thus that reaping the benefits of being part of the TARGET 2 system is not dependent on euro adoption.

[6] https://www.bnr.ro/Payment-Systems-1924-Mobile.aspx

Uncertainty due to exchange rate changes implies uncertainty about firms' future revenues, especially when conducting cross-border operations, which will ultimately lead to negative effects on economic activity. The reduction of this uncertainty by means of permanently fixing the rate (as in the case of a monetary union), will be a great asset for firms operating in multiple markets, and although there are models suggesting some firms may increase profits in uncertain scenarios (e.g. by increasing exports during currency appreciation periods), the consensus is that this structural change is preferable (de Grauwe, 2018, p. 61).

**Figure 5. EUR to RON exchange rate with trend line (2013-2021).**




**Source: own elaboration with data from ECB's Statistical Data Warehouse.**

RON-EUR exchange rate variation summarized in Table 1 indicates large swings in the period between 2007 and 2014, but since then, the rate stabilized, and the standard deviation of the series stayed around 0.15 (for 2015-2021). Furthermore, given the consistent positive inflation differential between Romania and euro area, the RON to EUR exchange rate kept a steady and predictable devaluation path (Figure 5). As such, taking into account the low variation in the past years and the overall increasing and predictable trend of the EUR in relation with the RON (due to positive inflation differentials), the overall benefits that could come with the disappearance of uncertainty related to the exchange rate are up to debate.

The argument that the disappearance of the exchange rate uncertainty will lead to a more pronounced economic growth path can also be made, and it is in fact one of

the main points raised in the Commission's report "One market, one money" that paved the way for the euro (Artis, 1991).

The argument is underpinned by the neoclassical growth model; with the permanent fixation of the exchange rate, structural risk due to uncertainty will reduce the real interest rate which will positively affect both production (more investments with the reduction in risk premium) and consumption (more agents will want to consume in the present as opposed to the future, given the lower discount rate). Although the argument posed by the theory makes a valid and reasonable point, the data shows there is little evidence to back it. The behavior of reduced interest rates and economic booms have been, indeed, observed in some peripheral Eurozone countries (like Spain, Portugal, Ireland and Greece), but only for a temporary period, followed by stagnation due to strong austerity measures. The comparison presented in de Grauwe (de Grauwe, 2018, p. 66) shows considerably lower growth paths for the overall euro area compared with the US or the rest of the EU countries without the single currency, for the same period (2000-2016).

The conclusion of this section could be that despite the fact that permanent fixation of the exchange rate that comes with the adoption of a single currency reduces the uncertainty in the economy, it cannot reduce the overall systemic risk (such as the risk of imbalances in the output, employment or budget). This means that even though the nominal interest rate drops, the real one might remain unchanged, since it will largely depend on many other underlying factors (de Grauwe, 2018, p. 65).

Prince transparency induced by the use of a single currency for multiple markets is, theoretically, another indirect benefit, i.e. the consumers will be able to shop around and make more easily price comparisons between the various producers, effectively encouraging competition (efficiency and consumer surplus).

Nonetheless, a great deal of empirical studies (Dvir & Strasser, 2014; Gatti & Kattuman, 2003; Haskel & Wolf, 2001) has shown that this is not the case in Europe. The reasons for this are, among others, the fact that the sample included supermarket products that cannot be traded across the borders (or there is no sense in doing that),

the fact that national retail markets are quite segmented due to being owned by national companies that set a single price in their jurisdiction, and the fact that there are different regulations, languages and cultures (de Grauwe, 2018, pp. 58–59). As such, euro cannot break down these barriers for price convergence and price transparency any time soon, and reasons for being too optimistic in this respect are very few since some studies concluded that the drop in price dispersion in the Eurozone has stalled around 2004-2005, and that surprisingly, the most of the convergence occurred only before 1999 (Engel & Rogers, 2004; Wolszczak-Derlacz, 2006).

The intuition dictates that the reduction of transaction costs and the elimination of exchange rate uncertainty will have, in theory, the advantage of boosting trade flows between monetary union member states (de Grauwe, 2018, pp. 68–69) – this is also referred to as the "Rose effect" (named after the author of this seminal paper Frankel & Rose, 2002). This claim can be criticized on two counts.

(1) Empirical studies found very mixed evidence of the effect taking place; on the one side there are studies that found no, little, or insignificant results (International Monetary Fund, 1984; A. K. Rose & Glick, 2015), some other identified relatively small to moderate trade increases, spanning from 5% to 20% (Baldwin et al., 2008; Berger & Nitsch, 2008; Flam & Nordström, 2006; Nitsch & Pisu, 2008), while the paper that gave the name to this effect (Frankel & Rose, 2002) encountered a staggering 200% higher trade flow among the monetary union members than among pairs of countries not in a monetary union. (2) For Romania specifically, as a peripheral member of the EU, euro membership might actually aggravate the trade diversion effect observed after integration (Bodea, 2016), due to the interposition of the customs union border between natural trade partners.

The advantages that stem from a dominant international currency are multiple (i.e. if Romania were to pass from RON to EUR), and not necessarily limited to the economy; (i) the increase of the central bank's balance sheet, due to a higher demand

for its liabilities, which also brings an increase in seigniorage[7]; (ii) lower transaction costs for its citizens and companies, since the external markets will trade in their currency; (iii) lower debt financing costs for the government from the safety and liquidity premium and net return gains (higher interest for foreign assets and lower interests for domestic liabilities); (iv) competitive advantage for domestic banks with the issuance of international relevant commercial money; (v) leverage and an additional geopolitical instrument for greater financial and economic autonomy; (vi) reputation (Claeys & Wolff, 2020; Cohen, 2012).

The disadvantages/costs related to a dominant currency are also quite relevant. (i) The dominant international position comes with the burden of guaranteeing the stability of the financial systems in times of crisis – the central bank needs to play the role of lender of last resort, which implies the need for readily available liquidity (through currency swap lines) and this might come against domestic policy stances. (ii) The risk of appreciation in times of economic and financial distress (due to higher demand for safe currency by the external sector) is quite high and will materialize in negative wealth effect if the public debt is denominated in the dominant currency and its assets in local currencies (Claeys & Wolff, 2020; Cohen, 2012). Furthermore, the appreciation also implies short-term difficulties for the issuing jurisdiction if an export-led growth model is followed (as is the case of the EA).

Nonetheless, when considering this aspect, one will also have to take into account the fact that even though euro certainly is an international currency, it has always been a second-distant to the dollar, and without a proper Banking Union, without a Capital Markets Union and, most importantly, without the establishment of a European Safe Asset guaranteed by the EU budget/by the Member States things are not expected to change in this regard (Micossi, 2020).

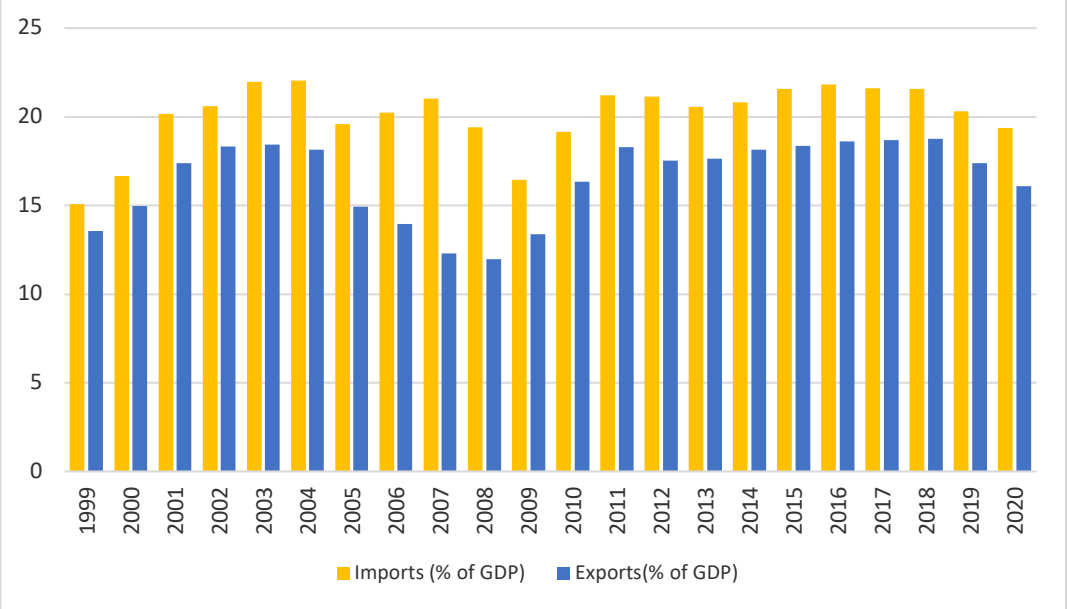
[7] As we show in 0, such gains from seigniorage are quite difficult to estimate and might make the executive and the central bank face a trade-off, in the sense that the accruement of a larger share from a considerably smaller seigniorage base might be preferable to a smaller share from a huge seigniorage base (i.e., the one generated by the ECB); this is valid especially when considering the inflation tax over which national executive and/or the central bank have full control.

### *1.3.5. Costs and benefits analysis – a matter of openness, flexibility and shock exposure*

By now it should be clear that, broadly speaking, the calculation on whether to join the monetary union or not rests on two major factors. On the one side there are the disadvantages associated with the loss of monetary policy sovereignty – lack of crisis control mechanisms and loss of monetary correctional arm in the face of imbalances, which could spiral out of control into a doom loop of debt, capital runs, liquidity and solvency crises. On the other side, vast benefits can be reaped, especially in terms trade, as the risk and transactional costs are reduced.

While the disadvantages can be combated (to a certain extent) by private-risk sharing channels, flexible wages, mobile labor force and a disciplined budgetary policy (which have been assessed in sections 1.3.1 and 1.2.5, respectively), for the assessment of the magnitude of advantages, the degree of economic openness constitutes the most relevant feature.

**Figure 6. Romania's trade with the Eurozone as share of GDP.**




**Note: total of imports and exports at current prices; GDP at current prices, EA changing composition. Source: own computations. with data from Eurostat.**

The time-series data on Romanian trade with the Eurozone (as a percentage of GDP – depicted in Figure 6) indicates that Romania registered moderate levels of openness with respect to the single currency area; the values displayed there, place Romania at the center of the ranking (which is dominated by small open economies),

above countries such as Greece, Cyprus, UK, Spain, or even France, but very distant from the levels registered by Slovakia, Hungary, or the Czech Republic (European Commission, 2015). However, no positive evolution has been registered with the EU accession (in 2007); the values of imports and exports as share of output remained in the past years at the same levels as the ones in early 2000s, raising the question of whether the upper limit of this indicator hasn't been already reached.

Nevertheless, the costs vs. benefits analysis has to take into consideration two other relevant aspects: the degree of completeness of the EMU and the nature of the shocks affecting the member states (de Grauwe, 2018, pp. 77–83). The former has been perceived as a big disadvantage of the EMU design, ever since its inception, the number of studies calling for a complete monetary and budgetary union being quite vast (Aizenman, 2015; Brans et al., 2021; Buti et al., 2017; de Grauwe, 2018, pp. 83–84; de Grauwe & Ji, 2019; Juncker et al., 2017; Kontolemis et al., 2020; Stiglitz, 2016) – calls for capital markets union and banking union fall in the same category. This aspect however will not be treated in the thesis, since, given the very politically sensitive topic, it involves a great deal of uncertainty and conjectural discussions.

The second aspect, though, can and will be scientifically evaluated. OCA literature identifies the property of shock symmetry between the member states of a monetary union as being the *meta* property since it revolves around a crucial question: are the supply and demand shocks that hit the economies alike? If the answer is affirmative, worries regarding euro adoption could dissipate since the monetary policy response for the union will be the one desired by the member state. We will dedicate the last chapter of the thesis to assessing this *meta* property for Romania and a sample of more than thirty European economic entities, making us capable of pinpointing the best candidates for a monetary union with this Eastern European country.

# Chapter 2. Seigniorage and inflation tax in Romania. What is the executive giving up by adopting the euro?

## 2.1. Introduction

The term seigniorage was first used in Medieval Europe and signified, in the beginning, the profit which the mints sent to the sovereign after the transformation of the precious metals, brought by individuals, into coins, but with time it came to include also other concepts like *brassage* (the value of the metal the mint kept for itself, as the cost of transformation process) and debasement – for the currency using precious metals, like gold and silver, the face value of the coin indicated the weight value of the material of the coin, but sovereigns have ordered the reduction of the weight of the issued coins in order to save precious metals (of course the face value of the coins kept indicating the same values). This method was widely used in Medieval and Modern times in Europe (Rolnick et al., 1996).

In time, seigniorage came to signify all the revenue that the sovereign made by having the monopoly on the minting process in its realm. Even though the age of sovereigns and their realms have long disappeared, seigniorage, the revenue that accompanies the monopoly for the creation of the money, keeps on being a steady source of income for many governments (Click, 1998). The term is referred as an attribute of the state, i.e. of the government, but nowadays, as more and more governments become insulated from the execution of the monetary policy, the central banks are the ones which collect this revenue. Still, many authors, as presented below, prefer to regard the central bank and the government as a single entity in order to facilitate the computation of seigniorage.

Seigniorage was very popular among political economists during the 1990's, especially in Europe due to the debates on the margin of the creation of a single currency and a European Central Bank. These studies posed a highly practical question: how much will the national governments lose when they will cede their sovereign monetary policy to the ECB. Nowadays, with the single currency and European bank already in place this subject is no longer so popular among academic

debates, but still poses the same practical importance, as in the past, for the other countries awaiting to become full members of the euro area.

This chapter is concerned with quantifying the seigniorage in Romania ever since the fall of the communist regime and quantifying also the seigniorage gains after a hypothetical passing to euro. In the pending process of being part of the Eurozone, is important for a country that still manages its own monetary policy to know how big the cost or benefit of giving it up is. Furthermore, as we show here, it is a good indicator of how the executive used monetary policy as a mean for smoothing the eventual financial difficulties of both the government and the banking system, created by the economic transition.

Of course, it can be argued that the National Bank of Romania, as part of the European System of Central Banks will receive its share of profit from the ECB, in accordance with the value of the assets it brings and other relevant factors (such as population and GDP share). In this case, even if the profits as an ESCB member will surpass the profits as an independent central bank, we know for sure that Romania will have no control over these profits in the eventual adoption of euro, whereas now, using some mechanisms that will be discussed later, it can.

Even though there were some other authors concerned with quantifying this phenomenon in post-communist Romania, none of them conducted a research on this after 2004, when the statute of the National Bank of Romania (NBR) changed, becoming more independent from government influence. Furthermore, this chapter also presents something new to this subject: it computes the optimal inflation-tax rate with respect to seigniorage. From here, it stems the originality of this study. The academic importance is given by the fact that the methodology we use gives us a better approximation of the seigniorage levels. Even more, the policy making implications of this study are high, as the estimates we make will show the exact gains or losses of the executive as it will give up the national currency by adopting the euro.

The rest of the chapter is structured as follows. In the second part we make a literature review about the concept of seigniorage and we address the debate of

measuring it. In the third part we present our chosen methodology and empirical data, while the last two parts are dedicated to results interpretation and study conclusions.

## 2.2. Literature review - debates over measurement of seigniorage.

Seigniorage, in the most general way possible, can be defined as the revenues that the state (as the sole issuer of currency) gains from minting currency, although there are many different interpretation of the concept depending on the authors (Drazen, 1985).

First, there is the concept of seigniorage as a cash-flow or monetary seigniorage. The idea is that the state can issue currency (which has virtually no cost of production) in order to pay for its spending. This monopoly that the state had in the past helped with paying its debt to domestic and international creditors, simply by expanding the monetary base and imposing to everyone a so-called inflation tax (in this sense, the hyperinflationary episodes from Germany and Hungary in the immediate period following World War I and World War II are iconic examples). The states that prefer to use this source of revenue, do it for two reasons: the money they are generating virtually have no cost and can go directly in the treasury and secondly, by launching these quantities in economy, they hope to push to a quick recover of the economy by the multiplier effect that government spending have on the economy. It can be measured as the real increase in value of the monetary base.

$$S_m = \frac{(M_t - M_{t-1})}{P_t} \quad (1)$$

$S_m$ is the monetary seigniorage, $M_t - M_{t-1}$ signifies the annual change in the monetary base and $P_t$ is the price level. As stated above the executive is printing money at virtually no costs, but faces a trade-off; as the monetary base increases, the real value of the money decreases. The lost value of this course of action can be measured as the revenues from a tax: the taxation rate (in this case the rate at which the real money devalues, or inflation) times the base of the tax (the value of the real balances) (Cagan, 1956):

$$T_{infl}=\pi*M/P \quad (2)$$

where $T_{infl}$ is the inflation tax, $\pi$ represents the rate of inflation. As in the case of any tax, as the taxation rate rises, the tax base decreases due to the deadweight loss of the tax imposed, hence the presence of a Laffer curve.

But, regarding this concept, two issues arise: the first one has to do with the fact that depending on the degree of institutional independence of the central bank, the inflationary pressure from the government could vary a lot, which in turn will influence the new stock of printed money (Klein & Neumann, 1990).

The second issue with this type of seigniorage have a more practical aspect: the newly issued currency will require the same value of assets in the balance of the central bank in order to be backed. Because the balance will have (at least in theory) to be maintained between assets and liabilities in the central bank's balance, increasing the monetary base (liability) will also create a minus of the same value in the liabilities side of the balance. In this case, what if the central bank orders the printing of new currency and as a counterpart to it buys interest bearing assets form the privates sector? Not only that the monetary base changes, but also there will be an unwanted wealth transfer from private to public sector. This shortcoming can be corrected using a methodology where we can include the eventual unwanted wealth transfer, but for this we will need to know the exact value of the interest bearing assets acquired by the central bank and the aggregate interest rate; as noted, this eventual correction presents high barriers in terms of data collection and computations.

A state that has amounted a huge debt will have no concern in this regard, but a state which strives to become more credible for its international financial creditors will face a tradeoff between inflation and credibility/stability.

Even with these shortcomings, the model of monetary seigniorage proposed by Cagan (Cagan, 1956) can be of great utility in computing the seigniorage in Romania for the period between 1990 and 2004 due to the fact that the government then still had a great influence on the central bank regarding the execution of the monetary policy, and due to the fact that in the first half of the 90s, Romania experienced

episodes of staggering inflation. It would also be interesting to compute the Laffer curve of the inflation tax in this country.

The second seigniorage concept is as an opportunity cost: by providing currency in form of cash holdings that do not pay any interest rate to the holder (as opposed to the case of investing the money in securities paying interest), the state incurs an opportunity cost of money holding to the domestic sector.

In the most general way it can be measured ($S_{OC}$) as the nominal interest rate ($i$) multiplied by the monetary base ($M$) (Marty, 1978; Phelps, 1973),

$$S_{OC} = i * M \tag{3}$$

Although it seems quite easy to compute seigniorage as opportunity cost only by multiplying the interest rate with the value of the monetary base, in practice is really hard to find a valid measure of the interest rate. As there are numerous securities (both public and private) that pay interest rate in an economy, choosing only one type for the whole economy is quite arbitrary (Klein & Neumann, 1990). Furthermore, it can be argued that this opportunity cost is in fact a price that the domestic sector assumes for having high liquid money.

The third type of seigniorage is the revenue generated from the central bank's assets and from the government's debt held in the central bank. The idea behind this type of seigniorage is that holding interest bearing assets in the central bank, generates some profit for the state. Furthermore, the state can monetize its debt in the central bank; when monetizing its debt, the state will (in theory) have to pay the credit issuer a certain interest rate, but if the issuer of the credit is the central bank (which is also a public institution), the government will pay no interest or a subsidized rate of interest for its debt (a smaller interest rate than the one that can be obtained if the debt would have been monetized on the free market). Of course, nowadays this practice is strictly forbidden in the Eurozone and in Romania since 2005 (Parliament, 2004), but the idea is to be used in computing the seigniorage before this year.

Drazen (Drazen, 1985), Klein and Neumann (Klein & Neumann, 1990) and Rovelli (Rovelli, 1994) were among the firsts to employ this idea of seigniorage from

central bank's balance sheet to approximate the value of the revenues, using different methodologies.

Drazen (Drazen, 1985) makes the distinction between fiscal revenues generated from the inflation tax imposed on the already existing real money holdings and the profit obtained from new issuance of money, but also provides a methodology for the unified revenue. The revenue of the first can be measured as the rate of the expansion of the money rate, multiplied by the real balances per capita. The revenue from the second is interest earned for state's net assets (held as a counterpart for the monetary base) adjusted for inflation and rate of population growth (everything is computed in per capita terms). He also concluded that many of the previous methodologies used before to compute seigniorage were in fact deviations from the measures proposed above (Drazen, 1985). The problem with this measure is that it is quite abstract and vague in regard to the specified variables and a very exact approximation cannot be done using it.

Klein and Neumann (Klein & Neumann, 1990) start from the assumption that the total seigniorage of a government is very dependent on its institutional framework and thus the previous measures of monetary seigniorage and seigniorage as opportunity cost are flawed. Indeed, the empirical data presented seems to suggest this fact; the examples the authors bring into attention regarding West Germany and UK for the year 1987 proved to be inconsistent with the two previous measure.

As suggested by the authors and already stated above, seigniorage as an opportunity cost presents the problem of arbitrarily choosing the true interest rate for the whole economy, whereas monetary seigniorage is flawed in the sense that what is actually measuring is the wealth transfer of the private sector for holding base money, which can be higher that the indicated by the monetary seigniorage.

Because of these problems, the authors proposed a new model of measuring seigniorage; the total revenue from money creation is distributed among the government (which receives a share of the central bank's annual profits – this figure is easy to look for in the annual statements), the central bank (which uses part of it for operating costs and for reinvestment in assets), the domestic sector (in form of

subsidized interest rates for borrowing) and the central bank's foreign debtors (in form of subsidized interest rates due to changes in nominal exchange rate) (Klein & Neumann, 1990). Still, in this work, we are only interested in the seigniorage accruing to the Romanian executive, i.e. to the central bank and government. In this sense, a more exact measure is the one proposed by Rovelli.

Starting from the ideas of Drazen (Drazen, 1985), Klein and Neumann (Klein & Neumann, 1990), Rovelli (Rovelli, 1994) in turn, suggested that this type of seigniorage is composed of two sources of income: the one generated by the central bank in base of the assets it has in order to manage the monetary policy (computed as the net difference between the interest earned for the assets and the interest paid for liabilities) and the second one consisting in monetization of the government's debt, also using the central bank's account.

The monetization of government deficits took place through three types of central bank operation: 1. purchases of government bills and bonds by the central bank on the primary market; 2. net funds lent to the government from the central bank on the basis of normal 'banking' operations (e.g. overdraft or deposit accounts); 3. open market operations in government bills and bonds (Rovelli, 1994). As specified above, these kind of operations are strictly prohibited since 2005 – although the National Bank of Romania can operate with government bonds and treasury bills (repo and reverse repo operations for injecting or sterilizing liquidity in the market) it can only do it on the secondary market, without being allowed to keep the securities until their maturity (National Bank of Romania, 2018). All these operations were clearly increasing the seigniorage; because the central bank bought the government's debt, the government saves by not paying the interest of the debt issued due to the institutional arrangements in each country between the two parts.

As a note in this regard, the central bank and the government should be considered a single economic unit for seigniorage to be accounted exactly. This is because the government appropriates a certain amount of the seigniorage generated by the central bank in the form of tax profits and debt monetization. Legally, the National Bank of Romania is obligated to transfer 80% its annual profits to the

Treasury (i.e. to the government), but even counting the 80% due to the government plus the remaining 20% (invested by the central bank in other interest bearing assets for further profit), will not give us an exact approximation of the seigniorage. This is because these sums do not account for other sources like the forgone wealth transfer from government to the creditors for the monetization of public debt in the central bank (is a cost-saving measure in the sense that it indicates what are the creditors losing by not buying state issued securities).

Due to the institutional arrangements between the government and the central bank and due to the fact that the central bank's profits not always equals to seigniorage, these two institutions are to be considered as one in this process of revenue generation.

Inferring from this observation, we can also note something quite interesting. These foregone interest payments that should have been made to bond investors could have represented big losses before 2005 since the government had no issue placing its debt with NBR; with the advent of central bank independence, these amount are virtually 0 as such practices are prohibited.

One can assume that this practice will be even more out of reach for the government, as the NBR will be part of the totally independent European System of Central Banks, in case of euro adoption and in such case not even a reversion of national legislation can bring once more the public debt monetization with the central bank. But, it might be misleading to believe that bond investors will actually be more safeguarded from such foregone interest payments; ever since the 2015 ECB launched a quantitative easing program which means massive buying of bonds (both corporative and government) which undoubtedly have put upward pressure on demand and prices and negative pressure on interest rates (for some of the effects of QE on bond yields, refer to Krishnamurthy and Vissing-Jorgensen, 2011 and Todorov, 2019). Such mechanism might mean that the Euro area government bonds have an artificially lower level than their EU counterparts (Romania also) which did not adopt quantitative easing measures and it means a potential loss in revenue for bondholders if Romania were to adopt the common currency.

Scanning the literature for measures of seigniorage in Romania we could found some works done in the 1990's and early 2000's. These works employed different methods and due to this fact, yield different results.

Hochreiter, Rovelli and Wrinkler (Hochreiter et al., 1996) made a comparative study among three economies in transition (Romania, Hungary and Czech Republic) and Austria and Germany (taken as benchmark countries) for seigniorage generation and distribution measurement purposes. In transition economies seigniorage is a good way of smoothing the financial difficulties of both the government and banking system. They discovered that in Romania, due to the high inflation rate, the value of the seigniorage is 30 time higher than that in the benchmark countries (as ratio to GDP).

In a study concerned with the value of seigniorage in a worldwide cross section of countries, Click (Click, 1998) concluded that the average annual rate of seigniorage for Romania between 1971-1990 is 2.44% of the GDP, although he does not provide a clear methodology nor a definition for it.

The method of seigniorage as cash-flow is included in the computations made by Cuckrowski and Fischer (2003) in a comparative study made across five Eastern and Central European countries - Bulgaria, the Czech Republic, Hungary, Poland and Romania. Using the methodology proposed by Neumann (Neumann, 1996), they computed the seigniorage as a sum of 3 sources: monetary, interest generated, and the one generated from central's bank financial operations. In order to avoid the accusation of using such a vague measure as monetary seigniorage in their computations, the authors of this study state that they took into consideration also the institutional framework (i.e. central bank's efficiency and independence). Still, it isn't clear how these variables have influenced because the authors did not provide any sort of country-specific methodology (only the final results have been provided).

Also, another problem is that the central bank's stock of government debt is not included; as discussed above this is clearly a forgone opportunity of investment for the private sector and should be included in the calculations. Furthermore, they are

not specific about what are the rest of the financial operations made by the central bank that generates seigniorage.

As can be noted in Table 2, which recompiles the data for the approximation of seigniorage found in all the previous works for the Romanian case, the results can be very different. Of course the periods took into consideration vary greatly, but still striking is the fact that the methodology used by Hochreiter et al. (Hochreiter et al., 1996) generates a very large result for seigniorage with respect to GDP (almost 30%).

**Table 2. The results for seigniorage approximation by various authors for the Romania case.**

| Author/s | Approximate value of the total seigniorage | Period covered |
|---|---|---|
| Hochreiter, Rovelli and Wrinkler (1996) | 29.4% | 1993 |
| Click (1998) | 2.44% annual average | 1971-1990 |
| Cuckrowski & Fischer (2003) | 3.29% | 1993-2001 |

To put it in contrast with other such findings, for example, Sachs and Larrain (Sachs, 1993) found that during 1975-1985, the highest seigniorage rate collected as ratio to GDP was in Italy (6.6%), but in terms of ratio to nonseigniorage revenues of the government, the highest was registered in Bolivia (139%). Cagan (Cagan, 1956), studying various hyperinflationary episodes from different postwar countries, found that the highest ever registered was Austria between October 1921-August 1922 with a value of 26% of the national income.

A study concerned with the revenue maximizing inflation tax in Argentina (Kiguel & Neumeyer, 1995) showed that an inflation that reached 170% in 1989 was able to bring to the government a revenue of close to 30% of the GDP. Thus, such high values are not to be considered flawed or unsupported by empirical evidence. In a previous work where he put the basis for the seigniorage formula, Rovelli also warned that this model of estimation, which was also used in Hochreiter et al. (Hochreiter et al., 1996) will end up giving higher estimated that the previous and simpler (Rovelli, 1994).

Another issue that will have to be clarified is the one referring to the inflation tax. Some authors (Easterly et al., 1995) have argued that there is a direct relationship between inflation and seigniorage (or what is known as inflation tax). The idea behind this relationship is twofold; on the one hand the real value of the debt that the

government will have to pay in its own currency is reduced (eroded) by the inflation. On the other hand, seigniorage increases with inflation due to the fact that the government orders printing money at an alert rate (thus increasing the monetary base which will eventually lead to higher inflation) due to the need to finance itself rapidly and cheaply (the cost of printing money is virtually 0), but at the cost of the whole population.

A number of researchers studied this link empirically, although the results are not that clear. The first and the most cited one is Cagan (Cagan, 1956), which starting from the demand for real money schedule, concluded that the maximizing point is somewhere between 2 and 3 times the value of the monetary base, i.e. between a rate of inflation of 200%-300% (Romer, 2012, p. 570).

Other studies' findings are not that clear. For instance, Easterly et al. (Easterly et al., 1995) using a panel with 11 high-inflationary countries for the period 1960-1990 discovered that half of their sample (5 countries) experienced maximizing-seigniorage inflation rates, which vary between 102 percent (Ghana) and 376 percent (Peru), whereas the other half did not experienced Laffer curves at all. Authors like Rovelli (Rovelli, 1994) cite other studies that found no empirical evidence between the two.

### 2.3. Methodology and data

First, as seen above, the classical sources (monetary seigniorage and seigniorage as opportunity cost) are flawed because they do not show the true quantity of the revenue generated by having the monopoly on the money creation. For this, we used Rovelli's (Rovelli, 1994) methodology, which employs the central bank's balance sheet in order to compute this revenue. Another advantage of this methodology is that we only need to look in one place to find all the variables of interest (i.e. in the annual reports of the National Bank of Romania). This methodology is summing the following sources.

1) The basic seigniorage, i.e. the interest earned by the NBR as a counterpart to the currency in circulation, under the assumption that the monetary base earns interest at the rate of the government bonds. In order to avoid the

eventual arbitrariness of taking a debatable interest rate of reference, we used the data from European Central Bank on long-term interest rate for convergence purposes because we believe this is the closest to the most objective indicator of such interest rate. These are the statistics for EU Member States related to interest rates for long-term government bonds denominated in euro for euro area Member States and in national currencies for Member States that have not adopted the euro at the time of publication. Where no harmonized long-term government bond yields are available, proxies derived from private sector bond yields or interest rate indicators are presented, where available. Unfortunately, the data span only for the period 2005-2016, so data previous to this period was estimated using the model indicated in (8). The basic seigniorage is computed as follows:

$$S_1 = i_B(B_C + \Phi + L_C - R) \quad (4)$$

where $i_B$ is the interest rate of government securities, $B_C$ represents the value of the debt of the state placed with the central bank, $\Phi$ represents the value of the foreign denominated securities, $L_C$ the value of the loans given by the central bank to the domestic sector and $R$ the value of the required reserves placed by the domestic sector with the central bank.

2) Seigniorage from bank reserves, from both required and free, i.e. the interest earned by the NBR as a counterpart for the reserves, under the assumption that these reserves could have earned an interest at the rate of governmental bonds minus the rate of the reserves that NBR pays, in absence of such a legal requirement. Just like in a game of divide the dollar, the central bank has the power of agenda setting in respect to the imposition of the interest paid for required reserves; it will clearly impose a lower interest rate in order to generate profit for itself and if the commercial banks do not agree with it, there is not much they can do about it – they either accept or they have their licenses revoked. This source can be computed as follows:

$$S_2 = (i_B - i_R)R \quad (5)$$

where $i_R$ represents the interest rate that the central bank has to pay for the required reserves place by the domestic sector with the central bank.

3) The excess monetization, i.e. the role that the inflation tax and the GDP growth rate has on the decrease of the debt-to-GDP ratio will be included, even after 2004 (the results of this excess monetization should be included because it will be 0 after 2004). The excess monetization can be computed as follows:

$$S_3 = \Delta B_C - (n + \pi)B_C \quad (6)$$

where $n$ represents the GDP growth rate and $\pi$ the inflation rate. This last source of revenue can be understood as the extra debt that the government can place with the central bank due to the increase in inflation and the increase in the GDP (which in turn decreases the debt-to-GDP ratio).

So, the total seigniorage generated by the government and the central bank is:

$$S_T = S_1 + S_2 + S_3 \quad (7)$$

A problem of this study is the lack of data on the interest rate of government bonds for the period 1990-2005 (at least from our searches in different databases and queries to the National Bank of Romania we could not find such data).

The fact that there is not public data for this variable and that NBR did not have such information could indicate that the Romanian government couldn't place public debt in the form of long-term state bonds (for a period of 10 years) due to the fact that it was a post-communist country in transition, and it had a very unstable investment position.

This is to be expected from such countries; most of the countries of this profile do not issue public debt into financial markets, since they use international financial institutions for credits. Indeed, a quick look at Romania's country rating confirms that only around 2005 the prospects for investment for this country improved (Country Economy, 2018).

Indeed, a more in-depth review of the literature about the public debt market in Romania, will show that the government hardly issued debt, especially in the 1990s decade; for instance, medium and long-term debt was only issued for the first time in 1999. (Pop et al., 2012; Stoica, 2002)

Still, this doesn't mean that there were no alternatives for investing in interest bearing securities in Romania before 2005. The question now is what is the best indicator for the aggregate interest rate? In order to avoid any debates over the right interest rate we have used the long term interest rate for convergence purposes as the right indicator (see European Central Bank, 2018) for the period 2005-2016. But for the period 1990-2005, there are no data points. So, we came up with an estimate of this.

We computed a synthetic indicator using the most relevant factors identified in the literature (Holston et al., 2017; Hsing, 2015; Ichiue & Shimizu, 2012) that influence the interest rate of public securities: the inflation rate from previous year (assuming that the expectation of the securities buyers are made on the basis of the previous year inflation rates), the debt-to-GDP ratio, the growth rate of GDP (which should influence the demand positively if the perspectives for growth are high) and the development of the country measured as GDP per capita (the more developed a country, the higher the demand for interest bearing assets and for government bonds implicitly). The model is the following:

$$\hat{\imath}_B = \beta_0 + \beta_1 inflation\ rate_{it-1} + \beta_2 debt\ to\ gdp\ ratio_{it} + \beta_3\ growth\ rate_{it} + \beta_4 gdp\ per\ capita_{it} + \mu_{it} \quad (8)$$

The model presents a high coefficient of determination (0.71) and was estimated with panel data from ten Eastern European countries (Bulgaria, Croatia, Czech Republic, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia and Slovenia) for the period 2005-2016 using fixed effects. The results of the estimation are robust and statistically significant (for more details see Table 11).

In relation to the possibility of existence of a Laffer curve of the inflation tax we have employed an OLS model where we accounted for eventual nonlinearities by squaring and used data from our findings. The model is the following:

$$S = \beta_0 + \beta_1 inflation + \beta_2 inflation^2 \quad (9)$$

The factor that will influence the potential seigniorage gains from adopting the euro in Romania is that the country will get a certain share of the benefits from a much larger central bank with a much larger balance sheet (de Grauwe, 2009, p. 72). The issue whether these smaller shares of much higher benefits will top the bigger share of smaller benefits is up for debate and computations.

Theoretically, the seigniorage considered by ECB is the monetary income, i.e., the profits made by the national central banks of the Eurosystem on account of assets they hold to back their monetary base, and the shares earmarked for each country from the total, should be accordingly to their asset shares in ECB. Still, in a union where there is total freedom of movement for persons and capital, such basis for dividing the revenue from central banks is quite unreliable; that is why, the accorded division scheme is based on the country specific percentage of population and GDP with respect to the Eurozone (Smaghi & Gros, 2000).

Fortunately, Gros (Gros, 2004) provides a very helpful methodology that can quantify these potential gains, based on the capital share formula used by ECB:

$$\frac{1}{2}\left(\frac{Population - of - the - country}{Population - of - the - Eurozone} + \frac{GDP - of - the - country}{GDP - of - the - Eurozone}\right) \quad (10)$$

In this formula only the seigniorage as opportunity cost is accounted for, which is quite alright because the ECB cannot generate seigniorage by buying Eurozone sovereign debt. Including the seigniorage gain from required reserves would have overcomplicated the model and would have not gave us a very different results. Consequently, the formula is:

$$r\left[\frac{1}{2}\left(\frac{1}{y_{RO}} + 1\right) m_{euro} - m_{ro}\right] \quad (11)$$

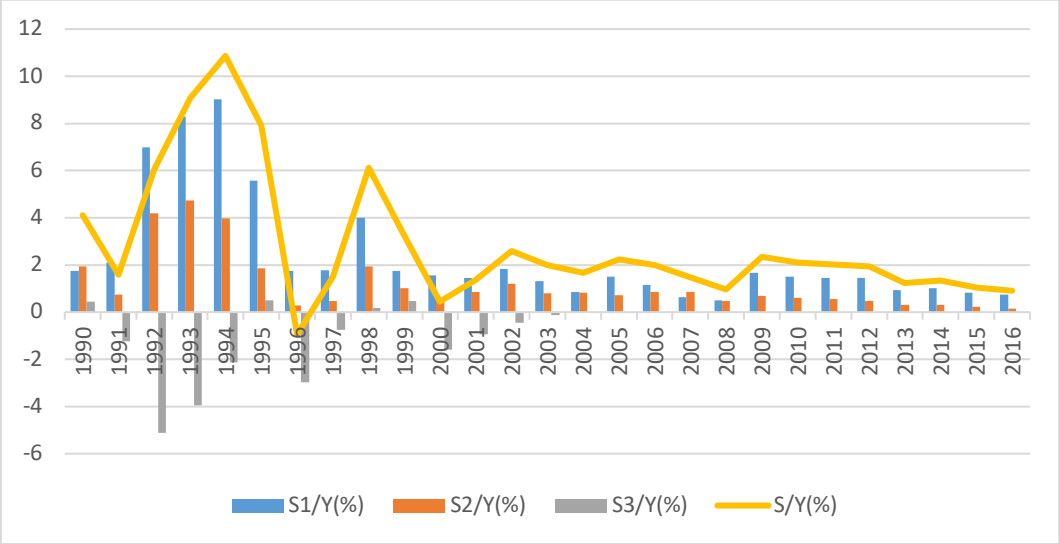
where $r$ stands for the interest rate, both in Romania and Eurozone (this assumption is quite realistic given the fact that is one of the convergence criteria), $y_{RO}$ represents the ratio between Romania's and Eurozone GDP/capita and the lower case $m_{euro}$

and $m_{ro}$ stand for the ratios between currency and GDP in Eurozone and Romania, respectively. Due to the fact that it is very difficult to predict these variables, both for Romania and the Eurozone, our computations were done for the period 2007 (the year Romania joined EU) to 2017, thus giving us an idea of how bigger the gains from seigniorage would have been, if Romania would have adopted the euro at any point between these years.

## 2.4. The results

The results in respect to seigniorage generation (Figure 7) show that seigniorage was a constant source of revenues for the government in period of 1990's, when the country passed a long and painful transition to market economy.

**Figure 7. Distribution of seigniorage generation by sources in Romania 1990-2016.**




**Source: own computations.**

Noticeable is the 10.8% of the GDP in its peak year (1994) when the annual inflation was at the staggering figure of 136%. These results are quite surprising; in the previous three years, the inflation rates were even higher (170.2% 210.4% and 256.1%, respectively), but the peak was reached in 1994. This peculiar observation seems to suggest that when inflation for Romania surpasses more or less 130% it already enters on the diminishing revenue side of the Laffer curve (this inflation rate seems to be the one where the peak of seigniorage generation is achieved). The policy implication for this finding is quite profound; the executive, not knowing the exact

limit of the efficiency curve of this inflation driven seigniorage, had fallen into the right-hand side of it, imposing excessive costs on an already financially impoverished domestic population.

Although using a very similar methodology as Hochreiter el al.(Hochreiter et al., 1996), our results are quite different (for the year 1993 for instance, the estimates difference is 18.6% of the GDP). This is explained by the fact that the above-mentioned authors have used inflation rates (due to the lack of data) instead of the interest rate for government securities; this is why their results are quite extreme. But, as we have showed in our regression regarding the determinants of the long run interest rates for the government securities in Eastern Europe, a marginal increase in the inflation with one percentage point only increases the interest rate with 0.348% (see in Table 11).

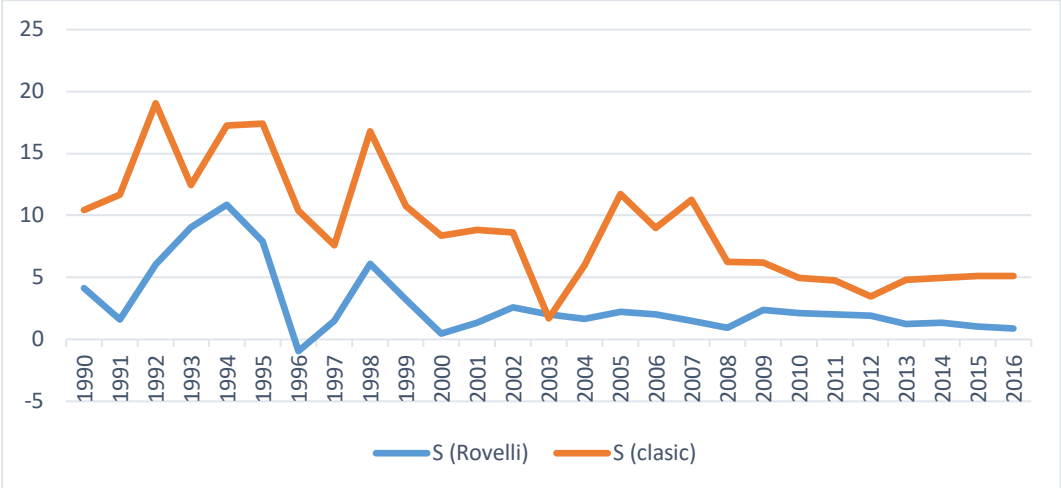
Also, one can notice the high drop in seigniorage in 1996, which translated in losses for the government (it is, in fact, the only year in our sample in which the executive generated a negative seigniorage). This has to do with what Zaman (Zaman, 2002) pointed out in his work: 80% of the central bank's loans for the period up to 1996 were handed to two highly unperforming public banks, controlled by the politicians – Bancorex and Banca Agricola. In the eve of the 1996 elections, these two financial entities had to be bailed out by the central bank with public money (thus diverting central bank's assets from investments in interest bearing assets).

Another result that stands out is the high variation (this is 11.8% of GDP) and two main periods of great drops (1996 and 2000). These two observations, both in variation and the existence of drops in seigniorage levels can be explained by the fact that Romania passed from being a communist country to a market economy with a non-independent central bank, and then again passed to a market economy with an independent central bank (this, of course, besides the already mentioned reasons for the drop 1996). The need of the NBR to adopt the rules of the games, as stated in Hochreiter et al. (Hochreiter et al., 1996) is a reason for which we can observe very high variations in seigniorage in Romania in the 90's and early 2000's. These phases implied structural changes that came at a cost in terms of seigniorage. This is very

evident in the period previous to 2004, when preparations were in process to give more independence to the central bank and when the seigniorage dropped so low that it came close to 0. Indeed, in our results it can be seen that after 2005 (when NBR became legally independent), the variance in seigniorage has dropped a great deal and the annual values for it are very stable (close to 2% of the GDP).

In relation to the sources, one can notice also that the most reliable and the most "lucrative" was $S_1$, i.e. the revenue generated from difference between the interest gained on the assets and the interest paid on the liabilities of the central bank; even after 2005 this sources brings in the highest bulk of the seigniorage. A very interesting finding is that the Romanian executive did not take advantage of the excessive monetization source ($S_3$) in the period previous of central bank independence, this being obvious through the fact that $S_3$ presents negative values in 11 out of 15 years from 1990 to 2004. Of course, after this year this source had totally disappeared, due to the legislative framework that prohibits the central bank to operate in the primary market of public debt. This puzzling fact might have two explanations; when generating seigniorage using the instrument of monetary policy (i.e. inflation), the other sources become secondary in importance and the second reason is that before 2004 independence, the executive needed some time to deplete the balance of the NBR of any remaining state securities in order to comply with the already agreed legal framework for central bank independence.

**Figure 8.Comparison between the results estimated using Rovelli's method and the classic method.**

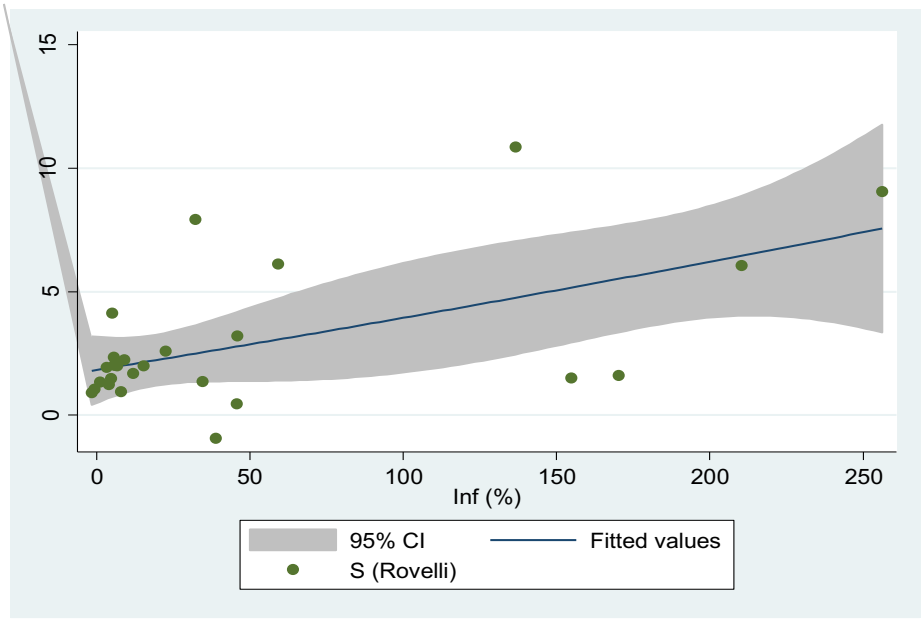



**Source: own computations.**

For comparative purposes we also added Figure 8, where besides the results from Figure 7, there are also the results of seigniorage estimation using the classical method (monetary seigniorage plus seigniorage as opportunity cost plus the foregone interest due to the placement of the state debt with the central bank). A simple look at this graph shows the shortcomings of the latter – the even higher variability and the upward bias of the estimation, i.e. extremely high values (with a peak of 19.05% of the GDP reached in 1992 – interestingly, neither in this case this peak was not reached in 1993 when the inflation was the highest). The trend though, seems to suggest the same thing: as the independence of the central bank was achieved and as the economy became gradually more performant, this source of revenue for the government budget decreased.

In relation to the Laffer curve of the inflation tax, our results suggest that the relationship with the squared term is nonsignificant. Although the linear relation between the two is significant, the coefficient of determination is not so high ($R^2$ = 0.3). The scatterplot with a quadratic term does not seem to indicate the existence of a Laffer curve (Figure 9).

**Figure 9. Scatter plot inflation-seigniorage with quadratic regression line and confidence interval.**



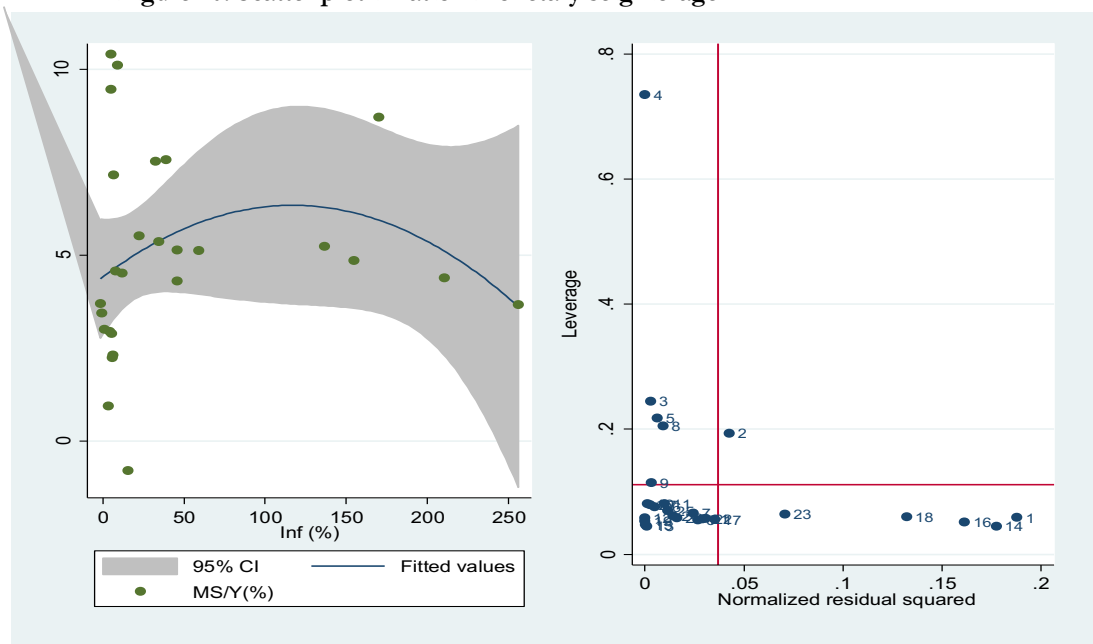

**Source: own computations.**

In fact, due to the high dispersion of the points, the line does not show any non-linear curvature. We cannot know for sure if this is the highest possible revenue that

can be achieved through inflation. This is to be expected due to the small sample (27 observations) and the fact that in our methodology, the impact the inflation has on seigniorage generation is diluted by adding more variables.

Still, one can determine this Laffer curve by using a quadratic regression line between inflation and the monetary seigniorage. As depicted in Figure 10, the results in this case are clearer than before. A clear curvilinear trend exists with a peak between 110% and 140% inflation rate. Thus the 136% inflation rate that we have identified as the peak in our computations seems to be in line with these findings. The results fail to meet the rigorous scientific standards for significance and the regression fit line with the 95% confidence intervals spreads does not accommodate many of the observations. This is due to the shortcoming stated above (small sample) and due to the fact that the empirical data presents such extreme values of inflation that the leverage of those observations bias the regression curve.

**Figure** 10**. Scatter plot inflation-monetary seigniorage**




**Regression line and confidence interval and leverage-normalized residuals square indicated; the numbers of the points in the graph indicate the ID number of the year. Source: own computations.**

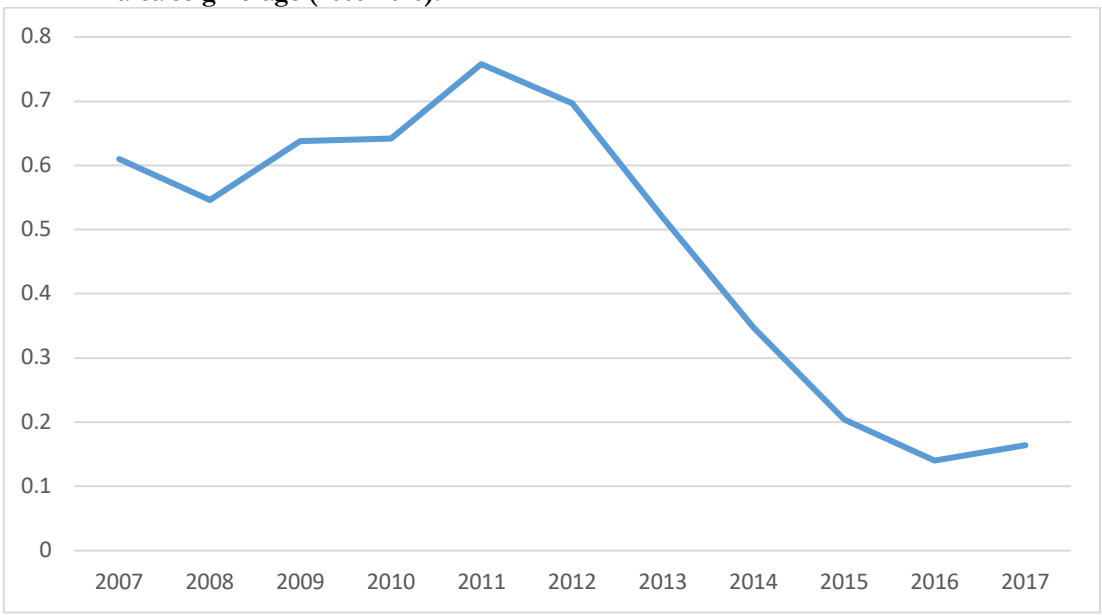
Even so, we also employed the model used by Cagan (Cagan, 1956) to determine the peak of seigniorage in a high inflation economy and the results are in line with the graphics presented above. The model is as follows:

$$ln\left(\frac{M}{P}\right) = a - bi + lnY \quad (12)$$

$\frac{M}{P}$ represents the real value of the monetary base (taken as M2), $i$ is the interest rate and $Y$ is the real value of the output. In this model, $b$ coefficient should be between 1/2 and 1/3, so the peak will be reached at values of monetary base growth between 2 and 3. In our empirical results, the value of $b$ is -0.85, so the peak will be reached at 1/-(-0.85), i.e. at 117% inflation.

The results for the hypothetical gains are presented in Figure 11 and shows that as Romania continue to converge with the rest of the Eurozone in terms of GDP/capita, these gains will continue to drop. An interesting effect is observed regarding the currency-to-GDP ratio: some of the gains are made due to the fact that the difference between the Eurozone and Romanian cash-to-GDP ratio is positive; if Romania were to adopt the euro, it is supposed that it would have the same ratio as the rest of the Eurozone, thus gaining additional seigniorage from it. Still, the small values and even smaller expected future values cannot represent for the Romanian executive a budgetary incentive to pass to euro. The wish to adopt the single currency is motivated by other rationales.

**Figure 11. Hypothetical seigniorage gains accruing to Romania, as share from total euro area seigniorage (2007-2016).**




**Source: own computations.**

## 2.5. Conclusions

In this study we have shown that seigniorage was a constant source of revenue generation for the Romanian executive in the period of the economic transition in the decade of the 90's, but as the economy improved and as the "rules of the game" were slowly adopted as prerequisites for the European Union accession, this source became insignificant. Furthermore, this source will not totally disappear for the executive, because as we have showed the distributed fiscal revenue from ECB to Romania is expected to be at least, or even a little bit, above the present values; what is really lost for good is the possibility of using your own monetary policy and the monopoly of creating money to generate fiscal revenue.

In our perspective, this is a good opportunity for the authorities to prove their commitment to fiscal discipline and to gain even further credibility in the eyes of the international creditors; after all, a high seigniorage level indicates a very weak and unthrusting government that generates its revenues from inflation tax. So, we believe that the implication of this process of giving up the sovereignty of the monetary policy is that the Romania government should become even less dependent on this source of revenue and should adopt a reform of the fiscal system.

Referring to our research work we must recognize the limitations of our findings. The calculations were greatly influenced by our estimate of the rate of interest on long term government issued debt, but in our opinion, this is the best way we could have dealt with the problem of missing data. Furthermore, the issue of extreme values of empirical data (like inflation) affected the statistical significance of some of the findings, but still, knowing this fact is already an advancement in the study of this issue. We are determined to continue this study in case the relevant data will become available.

# Chapter 3. Eurozone under stress. Does having the common currency hinders employment resilience?

## 3.1. Introduction

The aim of this chapter is to address the effect that Eurozone membership has on the employment resilience, defined as the capacity of resistance to an output shock and recovery from it. There is no consensus regarding the definition of the term "resilience" (Sabatino, 2019), maybe due to its wide usage in different sciences. Etymologically, the root is the Latin *resilire* which means to rebound, and it has been employed in engineering, ecology, physics, regional studies and lately economics, among other fields. In this work, as well as in a great number of other economic ones that used this concept, resilience meaning is twofold: resistance to a shock and recovery capability from it.

Recent empirical studies conducted after the 2008 crisis found evidence that the hysteresis of the labor market is in a trade-off relationship with the resistance to the shock, i.e. the economies where the rate of employment is less affected usually will present higher unemployment persistence afterwards and *vice versa*, as shown by the cases of Italy, Greece and Portugal on the one hand (i.e. resistance but persistence) and Spain and Cyprus on the other hand (lower resistance, no persistence) (Aksoy & Manasse, 2018). These findings were also confirmed by Hijzen et al. (Hijzen et al., 2018) and Sondermann (Sondermann, 2018) whose results are discussed in more detail afterwards.

While there are numerous studies that tackle the issue of growth and employment in Eurozone, as it can be seen below, there are very few studies that relate the membership of Eurozone to the concept of employment resilience. To the best of our knowledge, there is only one that approaches the idea in this chapter and found a statistically significand results (Ormerod, 2016), although it suffers from two problems: it has some methodological shortcoming that we were able to correct, and it is concerned with resilience understood just as recovery of GDP growth levels for the Eurozone and OECD economies.

Among the implications of a country's membership to the Eurozone, there is the relinquishment of its monetary sovereignty. It is well known that the transfer of sovereignty entails entrusting a supranational authority such as the European Central Bank with the conduct of the common monetary policy, which means depriving the national monetary authorities of their ability to deal with contingencies that are particularly unfavorable to their respective economies. Also, the countries that adopted the euro as currency accepted the submission to a kind of fiscal discipline. Governments were willing to tie their hands, which in turn lent greater credibility to their policies. In theory, the possible negative consequences of these renunciations would be compensated for, provided that the Eurozone met the conditions for an optimal currency area.

Problems arise because the same adversity can generate recession in some places and not in others and consequently would require a differential treatment. Such differential treatment seems implausible if the logic behind the European Monetary Union is taken to its extreme. To sum, the wide range of advantages attributed to the implementation of the single currency for the countries that will be part of the European Monetary Union is not enough to hide the concern about how they will react to the serious problems that affects national economies unevenly.

The main hypothesis we put to the test is that Eurozone membership will negatively affect employment resilience. The argument is that euro imposes rigidities in adopting countries and obligates the governments to give up their monetary policy correctional arm during and after a shock. This fact is reinforced by the tightening of the fiscal margin due to the Sustainability and Growth Pact and further reforms brought to it. It is thus expected that countries with euro will have a lower resilience than their peers. Even so, one can suspect that such a relationship will not exist due to the fact that labor force and the rest of input factors of production are very mobile in European Union and in the Eurozone respectively, thing that will positively affect resilience and counter the negative effects of euro area membership. As noted, the nexus is not that clear and requires a more in-depth analysis.

The Great Recession from 2008 was a first test for Eurozone economies. The crisis that erupted that year and lasted for a few more, and the period of recovery that followed up until now, provides a suitable framework for measuring and analyzing employment resilience. By any standards, the economic performance of the Eurozone in the period since 2008 can be regarded, at least as poor, if not "abysmal" in the words of Stiglitz (Stiglitz, 2016), in comparison with other developed economic areas like OECD countries, for instance.

In order to find empirical evidence for testing the abovementioned hypothesis, the methodological design is as follows. First, we propose a VAR(2) model in order to check both the magnitude and duration of the output drop on unemployment. Second, we compose an original relative employment resilience index for a sample of 41 countries belonging to OECD and EU that comprises information for both resistance and recovery. Finally, we run a robust OLS regression with the mentioned index as dependent variable and Eurozone membership dummy as independent variable, after controlling also for the effect of other country specific factors.

The results show that the Eurozone will take longer to recover from the output shock and furthermore, as predicted by the hypothesis, the single currency membership negatively affected the employment resilience of the respective economies. The results proved to be robust to certain pre and post estimation tests. We also were able to find a powerful hysteresis effect of the 2008-2010 crisis on both the employment and output levels of Eurozone countries as opposed to their OECD peers. Beyond the novelty of the issue researched we can also affirm that the findings of this study can signal the European countries that have prospects for single currency adoption that such a measure will most probably affect their labor markets, at least, if not having direr consequences.

### 3.2. Literature review – resilience and hysteresis

The complexities associated with the debates surrounding the concept of resilience are quite vast (Bruneckiene et al. 2019), as proven by the literature. Resilience is a multifaceted concept, trending and popular lately, that entered all the

economic and social sciences fields (Modica and Reggiani 2015) and is conceived both as a strength and weakness (Bruneckiene et al. 2019), certainly affecting more than one area; for instance, Briguglio et al. (Briguglio et al., 2009), focusing on the case of exogenous induced shocks due to openness, asses the resilience of an economy in terms of policy readiness in four main areas: macroeconomic stability, microeconomic market efficiency, good governance and social development.

The methodological approaches took into consideration when assessing the resilience of a system can be both static and dynamic, and the policy importance and implications are recognized by high-level official bodies and added to their long-term goals for a sustainable economic growth path (Milio et al., 2014).

The first definitions of the resilience concept refer to the speed with which a system is able to return to a previous state after a shock (Holling, 1973; Pimm, 1984). In many cases, the system is assumed to be in equilibrium previous to the shock, so resilience is defined in terms of the stability of the system near its steady state; thus, a system is said to be more resilient than another if, submitted to the same shock, it has a less pronounced reaction to it and is able to recover faster (Martin, 2011).

While the concept of equilibrium is widely used in ecology or physics when referring to resilience, in economics, giving the difference in meaning, it should not, and we can replace it by referring to an identifiable and stable growth path (Martin, 2010). In such case, an economy is resilient if the shock doesn´t affect it too much and if it can return the previous growth path. In this context another issue appears: that of hysteresis (Blanchard & Summers, 1986) posing the question of whether the potential growth path has been shifted altogether, that is, whether there is a 'memory' of the disturbance (the sock left traces in the economy even after it has passed), a process also known as 'remanence' (Cross et al., 2012). In order to clarify the difference between the two terms, we can affirm that, while resilience refers to both resistance and recovery capacity, hysteresis only refers to recovery and its presence will indicate a remanence (memory) effect of the shock.

Specifically referring to the European case, Blanchard and Summers (Blanchard & Summers, 1986) provided a theoretical framework for explaining the persistence of

high levels of unemployment on the continent, i.e. unemployment hysteresis. Basically, these two authors stated that high-unemployment levels in Europe can be explained by either two of the following theories; the membership theory, which states that the "insiders", rather than "outsiders" are the ones responsible for wage setting in an economy – in unionized settings, the wages are decided mostly by individuals already employed, with little consideration for the unemployed preferences, considerably lower. The duration theory, on the other hand, states that high unemployment levels do not put so much downward pressure on the minimum wage in Europe, due to a higher share of long-term unemployed individuals; only the short-term unemployment will negatively affect the wages.

A study of Cross, McNamara, and Pokrovskii (Cross et al., 2012), using a theoretical model based on an analogy of water flows in porous media, found evidence to support the idea that, usually, economic output displays hysteresis with respect to aggregate demand shocks.

Some other studies that are worth mentioning when talking about employment resilience in Europe are summarized in the following paragraphs. Dissart (Dissart, 2016), after making a comprehensive and exhaustive literature review, concluded that a more diverse production system will be more stable in the face of shocks. A 2010 study (Ormerod, 2010), concerned with the case of UK for the period 1983-2002, discovered that almost half of the variability in the employment of regions for this timespan can be accounted by two factors: the share of employment in coal mining (negative causality) and the level of militancy against the coal-mines closing (negative causality). The study of Martin (Martin, 2011), which can be credited for big advances in measuring the relative resilience, found evidence of the fact that due to the neoliberal policies taken in the 80s and 90s by various cabinets, the Northern and peripheral regions of UK have become more dependent on the public sector in terms of employment creation.

Authors such as Lagravinese (Lagravinese, 2015), focusing on the case of Italy, empirically proved that the regions with a higher share of manufacturing and temporary workers suffered more during the recent crisis and had a lower resilience,

while the opposite is true for the ones that have a higher share of public workers and a more developed service sector. More recently, Sabatino (Sabatino, 2019), focusing also on the Italian case and borrowing data and methodology from Lagravinese (Lagravinese, 2015) found evidence of the fact that the regions with an increased stock of social capital behaved better in terms of employment resilience during the financial crisis, although admitting that the results are not so sharply defined.

Hijzen et al. (Hijzen et al., 2018), in a recent report for the OECD, affirmed the important role of macroeconomic policies for stabilizing the labor market and for preventing a higher structural unemployment after the shock; in this context, the role of cyclical active labor market policies is prominent. Furthermore, the same study underlined the negative effect of overly strict employment protection (due to the promotion of temporary contract and slow job creation), but also the positive impact of a coordinated collective bargaining schemes (as opposed to centralized or uncoordinated) because it facilitates the wage and working time adjustments when necessary.

In a similar vein, Sondermann (Sondermann, 2018) also argues that sound economic structures will provide a buffer for the labor market against the shock, but at the same time, overprotection and overregulation from the government, might provide wrong incentives to the firms and employees – while it is true that these regulations will provide good safety nets for jobs and good incentives for labor productivity, they could discourage hiring, favor the employed over the unemployed, and negatively affect the responsiveness of price and wage adjustment when needed. Bureaucratic, financial, and economic framework conditions are also crucial as they can facilitate the entry of new firms and alleviate the administrative burden of the existing ones.

The hypothesis that we put to the test, even though it has an intrinsic logic, it isn't a clear-cut question. On the one hand, it can be argued that the EU countries definitely have a reduced degree of fiscal margin (which is instrumental in battling with unemployment levels) due to the Stability and Growth Pact and further European fiscal discipline mechanisms in place. Going even further, we can clearly

see that the degree of rigidity is increasing for the Eurozone countries as they have to abide by the same EU treaties and fiscal discipline mechanisms, but they also lack the monetary correctional arm (Stiglitz, 2016). In turn, the rest of OECD countries do not abide by such mechanisms with the exception of the case where the fiscal margins are fixed by law, but even in this case, the legislative can abolish such laws if necessary.

When an economy faces a downturn, there are various ways in which it can counteract; one of the most common ones was in the past the nominal devaluation – depreciating or devaluating national currency will make your exports cheaper and the increase in net exports will result in a higher GDP growth. Such depreciations came as a consequence of higher inflation, which, in the short run had a positive effect on employment levels and which would have saw the public debt issued in national currency artificially reduced (this is the so-called "surprise inflation" a technique very much used by Italy in the pre-euro era).

Since the adoption of the euro and the creation of the politically independent ECB, such a measure is inexistent in single currency countries. They have to rely on internal devaluation (cuts in labor costs) in order to secure a better competitive position, thing that clearly has negative effects on the employment levels and labor market in general, with numerous implications (Müller et al., 2015; Myant et al., 2016; Uxo, 2014). Furthermore, these so-called structural reforms came together with austerity measures which instead of providing a fiscal helping hand to the struggling economies and labor markets respectively, as they should (Díaz-Roldán et al., 2019), acted as "automatic" or "built-in-destabilizers", in the spirit of expansionary fiscal austerity (Baker, 2010; International Monetary Fund Research Department, 2010; Jayadev & Konczal, 2010).

On the other hand, it could be argued that highly integrated European economies, even though have less fiscal and monetary margin to adjust the economy after a shock, benefit from a high degree of mobility of production inputs: both capital and person (labor force) freedom of movement are realities and enforced by law at European level since almost three decades ago. This idea is in line with the original literature of Optimum Currency Areas (OCAs) starting from authors like Mundell (Mundell, 1961)

or McKinnon (McKinnon, 1963) and further developed by others (see, for instance, de Grauwe 2018); so in theory, due to the freedom of movement of factors of production in EU, the surplus of workers that are the result of a negative shock in an economy, could be absorbed by the other countries that find themselves in an economic boom.

These initial intuitions of the pioneering authors of OCAs received mixed results from further empirical testing underwent in the last decades (Mongelli, 2002). For instance, with respect to the labor market, we can find evidence that the labor force mobility in Europe is two to three times lower than in US (OECD, 1999), thing that affects the way in which these two economies respond to shocks; in the case of US, the unemployment resulted from a sudden fall in aggregate demand is not persistent, while in Europe it is (Decressin & Fatas, 1994). Eichengreen (Eichengreen, 1990) also found evidence that that the variation of unemployment in Europe is much higher than in US. The relative low mobility of labor force in Europe can be attributed to a wide array of factors that include cultural and language barriers, limited cross border portability of social protection and supplementary pension rights, administrative difficulties, lack of comparability and reciprocal recognition of professional qualifications, and restrictions on public sector employment (Mongelli, 2002). More recent studies also brought to light further impeding factors for labor mobility such as rigidities due to wage bargaining and housing market and the lower degree of sensitivity of employment with respect to positive rather than negative shocks (Ciani et al., 2019).

The literature review shows that the nexus between employment resilience and Eurozone membership is quite ambiguous; on the one hand limited acting margins of national government in fiscal but above all, monetary aspects, impose rigidities while the theory of OCAs suggest that high levels of economic and monetary integration will lead to a common labor market that will adjust more easily.

To the best of our knowledge, there is only one study that dealt with the relationship between Eurozone membership and resilience. Employing data for 20 Western economies for the period 2007-2015, Ormerod (Ormerod, 2016) found

evidence that high levels of corruption and being a member state of EMU resulted in a negative impact on the recovery paths of output growth, especially for the Mediterranean countries (Greece, Italy, Portugal, Spain). This study strictly referred to the resilience of the output and measured it only as the GDP differential between the pre-crisis peak (2007) and the one registered in 2015. In our study, we try to overcome two of the main shortcomings of this study. First, the resilience measure proposed fails to capture the duality of the concept that was discussed previously, i.e. it doesn't take into account the resistance and recovery potential of the economies. Second, in the linear regression no further relevant control variables are included, however, it has been proven that resilience of economic system is dependent on many factors. For instance, in the case of employment resilience (both in terms of resistance and recovery) some of the most relevant ones that can be reminded are: the competitive and innovative propensity of the firms, the resources, the stance and measures taken by national and/or regional authorities in order to cope with the unemployment shock, the entrepreneurial culture, the share of temporary workers and public workers, etc. (Martin, 2011).

### 3.3. Research design and methodology for assessing labor market resilience

First we need to disaggregate the data for OECD without the euro area (hereinafter OECD-EA19) and EA19, from the data provided by OECD. We have data for unemployment and output growth for Eurozone 19, but we do not have the data for OECD without the Euro area. In order to obtain such data, we have to start from the weighted average of output growth and unemployment and following the formulae (13) and (14), derive the values.

$$G_{OECD-EA19} = \frac{\left(G_{OECD} - \frac{G_{EA19} wg_{EA19}}{wg_{OECD-EA19} + wg_{EA19}}\right)(wg_{OECD-EA19} + wg_{EA19})}{w_{OECD-EA19}} \quad (13)$$

$$U_{OECD-EA19} = \frac{\left(U_{OECD} - \frac{U_{EA19} wu_{EA19}}{wu_{OECD-EA19} + wu_{EA19}}\right)(wu_{OECD-EA19} + wu_{EA19})}{wu_{OECD-EA19}} \quad (14)$$

where $G_{OECD-EA19}$ and $U_{OECD-EA19}$ are quarterly output growth and unemployment rates in OECD-EA19, $G_{OECD}$ and $U_{OECD}$, quarterly output growth and unemployment rates for OECD as a whole, $G_{EA19}$ and $U_{EA19}$ quarterly growth and unemployment rates for Euro area. The weights $wg_i$ are computed according to GDP shares and $wu_i$ according to the labor force shares of each of the considered economic blocks (OECD, OECD-EA19 and EA19).

In order to check the magnitude of the drop in unemployment due to a negative shock in output, we propose a bivariate Vector Auto Regressive (VAR) model for the period 1999 quarter 1 (the birth of euro) to 2019 quarter 4 (latest available data) for the two economic blocks under consideration: euro area and OECD-EA19. This model will not only show the magnitude of the drop, but, by including an Orthogonal Impulse Response Function, we will be able to assess also the effect over time of such a shock. We check first for the appropriate lag order of our model with the help of Akaike Information Criteria; the mathematical expression of the VAR model is given by the following system of equations:

$$U_t = \beta_0 + \beta_1 U_{t-1} + \beta_2 U_{t-2} + \beta_3 U_{t-3} + \alpha_1 G_{t-1} + \alpha_2 G_{t-2} + \varepsilon_{1t} \quad (15)$$

$$G_t = \alpha_0 + \alpha_1 G_{t-1} + \alpha_2 G_{t-2} + \alpha_3 G_{t-3} + \beta_1 U_{t-1} + \beta_2 U_{t-2} + \varepsilon_{2t}$$

where $U_t$ is the contemporaneous level of unemployment growth, $G_t$ is the contemporaneous level of output growth, $\alpha$ and $\beta$ are the estimation coefficients and $\varepsilon_1$ and $\varepsilon_2$ are the regression specific error terms. We also note that AIC reported 2 as the optimal lag length for OECD and 2 for Eurozone; we thus include only two lags for both cases in our VAR model.

We apply two pre-estimation treatments to our variables. In the first place, we apply a first-order difference for unemployment levels in order to make the series stationary (the GDP growth levels are already stationary). Secondly, we test for structural breaks in the series, in order to make sure no significant changes in average took place (one of the necessary conditions for the stationarity of our processes); if proven, the structural breaks might indicate hysteresis effects on our interest variables. The use of VAR in this case is motivated by the fact that we will be perfectly able to

assess the resistance of the employment levels to the negative drop in output and also the recovery by looking at how many periods did it take for the labor market to recover to pre-shock levels. We also avoid multicollinearity issues given the fact that we use two highly correlated variables. A post-estimation unit root circle test will also be drawn in order to assess the robustness and stability of the model.

VARs suffer from some limitations though, and some of those limitations are very obvious in the case of this hypothesis testing. For instance, when elaborating the IRFs, we can only see the effect of a standard deviation shock on average, of our impulse variable (i.e. in absolute value – no negative shock to account for). For this reason, we propose a complementary methodology: a resilience index.

There are various ways in which one can come up with a resilience index, but there is no consensus among researchers with respect to which one is optimal. There are at least two major methodologies in this sense. The first one tries to measure resilience as the cumulative deviation of unemployment from its pre-crisis structural trend (estimated by non-accelerating inflation rate of unemployment – NAIRU), and as such uses counterfactual data (Hijzen et al., 2018; Ollivaud & Turner, 2014). The second methodological approach, more common in regional studies, is relative (i.e. each region is compared to the national level) and uses only raw data on employment/output (Lagravinese, 2015; Martin, 2011; Sabatino, 2019).

The index suggested by these last three authors, as opposed to the one found in Hijzen et al. (Hijzen et al., 2018), is more appropriate for the purpose of this work for a few reasons: in the first place this indicator doesn't have to use counterfactual NAIRU data on unemployment; NAIRU is just an estimate and the real value of it is surrounded by some margin errors. Secondly, since is a relative indicator, i.e. it computes the resilience value for each country with respect to the population from which it comes (in this case OECD + EU), is more suited for an analysis which is centered on countries with the same economic structure; by relating the values of each observation to the sample average, one does not have to worry about the counterfactual post-shock trend. Lastly, is the only indicator that provides a single value for resilience derived from resistance and recovery indices. The crisis years were

considered across the whole sample 2008, 2009, and 2010 because it was a financial crisis that erupted at the same time in the whole world; even if some countries (like Australia or Poland, for instance) didn't register any negative growth rates during these years, it can be assumed that it was due to their great resistance. The recovery period is considered 2011-2018. The formula we use is the following:

$$\beta_{resilience} = \beta_{resistance} + \beta_{recovery} \tag{16}$$

where $\beta_{resistance}$ and $\beta_{recovery}$ are the two country specific estimates computed as follows:

$$\beta_{resistance} = \frac{\Delta E_{cc} - \Delta E_{sc}}{|\Delta E_{sc}|} \tag{17}$$

$$\beta_{recovery} = \frac{\Delta E_{cr} - \Delta E_{sr}}{|\Delta E_{sr}|} \tag{18}$$

$\Delta E_{cc}$ represents the country-specific difference in employment level between 2010 and 2008, $\Delta E_{sc}$ is the sample-specific difference in employment level between 2010 and 2008, $\Delta E_{cr}$ is the country-specific difference in employment level between 2018 and 2011 and $\Delta E_{sr}$ represents the sample-specific difference in employment level between 2018 and 2011. We were forced to develop this custom composite index and not use the one already provided in Sabatino (Sabatino, 2019) due to the mathematical impossibility of applying his own formula (exponentiation a negative base to a fractional number). A resilience level of 0 indicates no significant differences with respect to sample average, a positive value indicates a better resilience that the sample average and a negative one, the opposite.

The test we design for the validation of our hypothesis is a simple robust OLS regression where the resilience index is considered a dependent variable and the Eurozone membership, independent, coded as a dummy. The total number of observations will be 41, i.e., 36 OECD countries plus 5 EU countries that are members of EU, but not of OECD (Romania, Bulgaria, Croatia, Cyprus, and Malta).

By combining OECD plus EU countries, we can get a bigger sample which will guarantee us a better predictive power. OECD and EU countries can be considered

as being very similar in their economic development levels and economic structure and being the core of developed globalized economy, thing that also validates the idea of a relative resilience index (i.e., each country's values is compared to the one of the sample).

Due to the design of our main variable of interest (the resilience index), we are obligated to use the cross-section design for our database as opposed to panel data; even though we have data for these countries that span for the period 2008-2018, we still have to aggregate the time-specific variation of our dependent variable into the composite index; we did the same for the rest of the control variables in the sense that we average their time specific-variation into a single observation.

In order to check the robustness of our findings we employed a matrix of correlation and a Variance Inflation Factor test in order to check for possible multicollinearity problems. The expression of our econometric model is:

$$\hat{\beta}_{resilience} = \hat{\beta}_0 + \widehat{\beta_1}_{Eurozone} + \widehat{\beta_2}_{Sharepublic} + \widehat{\beta_3}_{Bureaucracy} + \widehat{\beta_4}_{Financing} + \widehat{\beta_5}_{Infrastructure} + u \quad (19)$$

The literature review also served the purpose of indicating relevant control variables. We noticed thus the fact that higher public employees share in an economy is a very solid indication of an economy's resistance, but an impeding factor to quick recuperation, while labor market efficiency and sound product markets will provide a swift bounce-back for the employment levels.

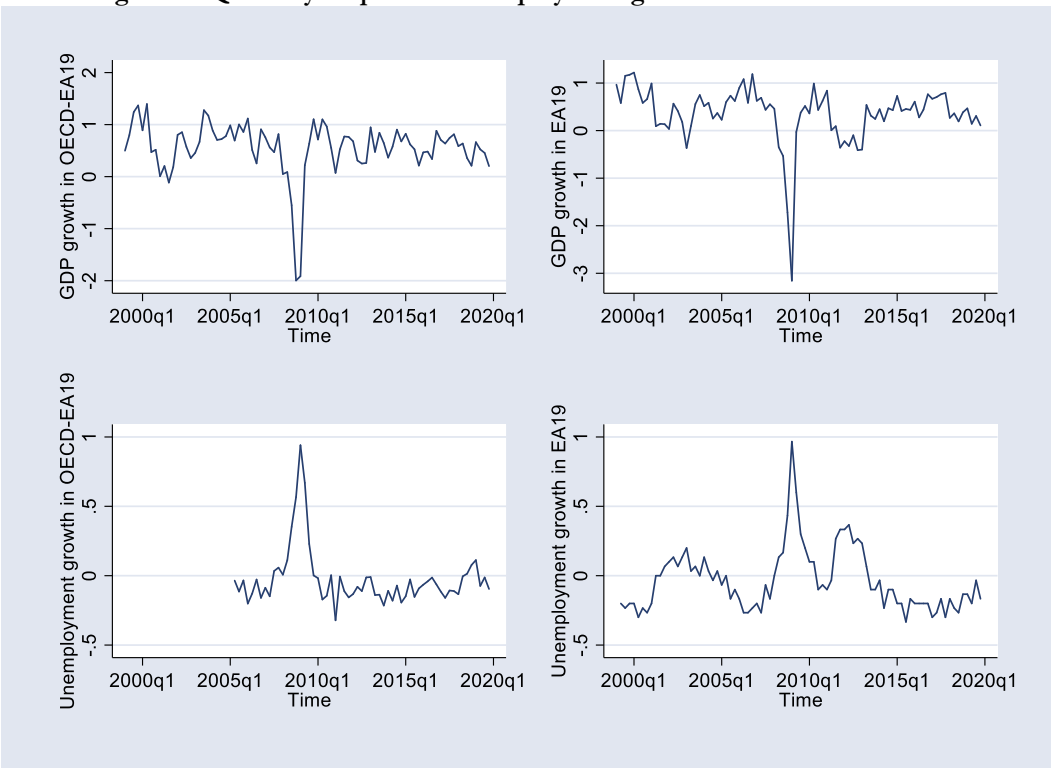
Taking into account these factors, the availability of data and the fact that we have to refrain from including too many control variables in our model, we reach the conclusion that some of the best control variables we can opt for are: the share of public employees from the active population (source: OECD and Eurostat), under the assumption that such jobs increase the resilience of an economy, an indicator for bureaucracy, one for the easiness of financing the entrepreneurial projects and another one for physical infrastructure available for entrepreneurs. The last three enumerated variables are indicators measured on a Likert scale by Global

Entrepreneurship Monitor through their National Expert Survey (*GEM Global Entrepreneurship Monitor*, 2020).

### 3.4.Results and discussions

As it can be noted from a look at the raw data on real GDP for both euro area 19 and OECD-EA19 countries (Figure 12 and Figure 13) the trend line has been shifted for both blocks, but in the case of EA19 the hysteresis effect is more pronounced as the slope of the trend line is evidently less steeper than before 2008, while in the case of OECD-EA19 the trend line with the actual values are parallel. In economic terms this means that the resilience of the Eurozone is lower than in the case of the OECD countries because the economic output levels haven't "bounced back" to their previous trend.

**Figure 12. Quarterly output and unemployment growth time series.**



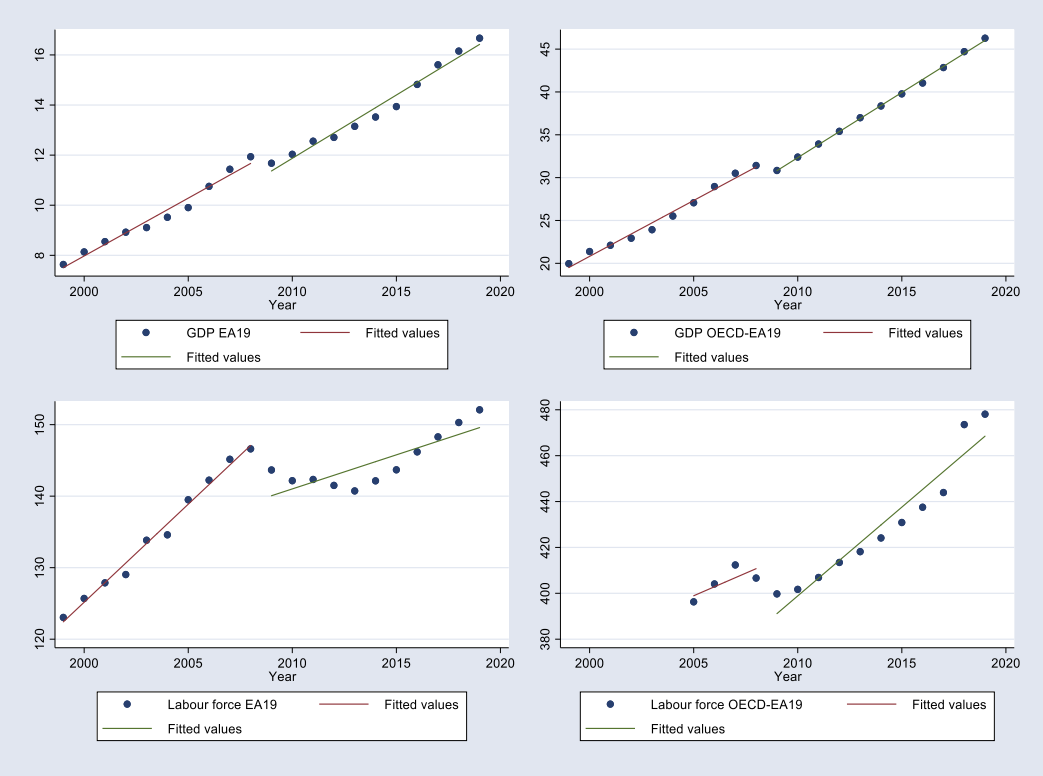

**Note: OECD-EA19 (left) and EA19 (right). Source: own elaboration**

The stationarity of our main variables is proven by the MacKinnon approximate p-value for the Augmented Dickey-Fuller tests (not shown here). The results of the structural break test indicate that they occurred in both unemployment and output growth around 2008-2009 for both the EU and OECD (H0: No structural break

failed to be rejected due to low p values – not shown here), suggesting a powerful hysteresis effect of the crisis. This effect is noticeable in Figure 12. Still, we continue to use the whole time series samples for our VAR models due to the fact that if we were to reduce it after the structural breaks occurred, we would have been left with non-stationary processes as suggested by Dickey Fuller tests; as indicated already above, the same test proved that the entirety of the samples is stationary.

A more pronounced memory effect is noticeable for the common currency economies, as opposed to their OECD counterparts, which again present a certain drop from the trend, but no remanence, i.e. the trend line is parallel to the counterfactual one. In the case of Eurozone countries, the pre-crisis levels of employment creation were never again reached, thing that validates in a certain measure our hypothesis.

**Figure 13. Hysteresis effect of the crisis in EA19 and OECD-EA19.**

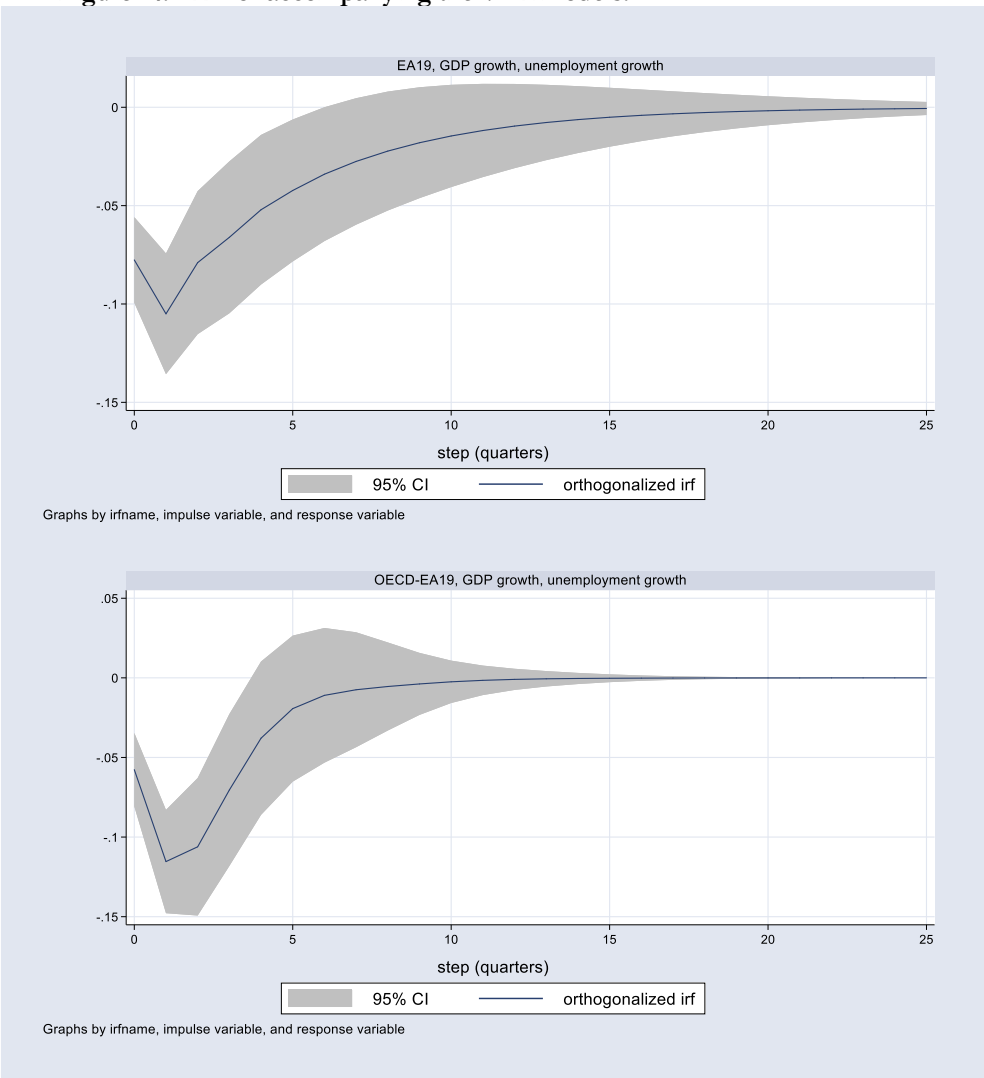



**Superior side of the graph – Hysteresis effect of the 2008-2010 crisis on the output of EA19 (left) and OECD-EA19 (right) economies trend line for the 1999-2008 and for 2009-2019; Inferior side of the graph – Hysteresis effect of the 2008-2010 crisis on the labor force levels of EA19 (left) and OECD-EA19 (right) with trend lines for the 1999-2008 period and for 2009-2019. Note: GDP measured in trillion USD and labor force in millions of persons. Source: own computations. with data from OECD.**

The Impulse Response Function graphs have been elaborated after running the VAR(2) models respectively, and are presented in Figure 14, where we notice from the start that a positive shock in GDP growth, i.e. a standard deviation of 0.52 for OECD-EA19 and 0.59 for EA19, will have a less pronounced effect on the magnitude of the drop in unemployment growth in Eurozone, suggesting that the resistance of this economic block is a little bit higher.

We cannot affirm the same thing for the recovery. One can notice that the effect of a shock in output in Eurozone will have a longer effect in time than in the case of OECD-EA19, as it takes more to return to previous equilibrium (4 quarters vs. 6 quarters for EA19), suggesting a weaker recovery capacity of single currency economies.

**Figure 14. IRF for accompanying the VAR models.**




**Note: Euzone (up) and OECD-EA19 (down). Source: own computations.**

These findings partly confirm our main hypothesis, in the sense that resilience might be affected by euro adoption, but only on the side of recovery, not necessarily resistance. These results are confirmed by the positioning of the countries on the resilience index (Figure 15); 9 out of 19 euro countries are above average when considering resistance, but only 6 small euro economies are actually above the recovery average of our sample. In light of these facts, we cannot fully validate the hypothesis and as a consequence we proceed to the presentation of the complementary methodology results.

**Figure 15. Country-specific positioning for resistance and recovery indicators.**


**Source: own computations.**

Figure 15 presents the positioning of each country in the resilience space, which is composed by the two dimensions: resistance to the shock and recovery from it. The red lines were added to indicate the sample average resistance and recovery. The high-right quadrant indicates the best-case scenario for an economy: better than average resistance to the crisis and better than average recovery from it; as noted, with the exception of Malta, there are no Eurozone member states present in this quadrant, but there are plenty of European Union member states from Central-Eastern Europe

(Bulgaria, Czech Republic, Poland, Hungary). It is also worthy of mentioning the fact that the lowest resistance values, but at the same time ones of the highest recovery values were recorded by four single currency economies: Ireland and the three Baltic States. This finding is in line with the results of a stream of literature that focused on the effects of labor market reforms (basically internal devaluation measures imposed due to the impossibility of nominal devaluations) during and after the crisis in order to increase the competitiveness of their respective productive structures; measures such as deep cuts into labor unit costs or decreasing labor union's bargaining power have assured in these countries better competitive positions, but they came at a high social cost (see, for instance, Feldmann 2013; Lehmann, Razzolini, and Zaiceva 2017).

The hypothesis of our study, that the Eurozone membership negatively affects the employment resilience is confirmed by the results of the robust OLS regression (see Table 3). Specifically, we find evidence that being an economy in Eurozone is associated with a lower resilience index with almost 0.8.

**Table 3. OLS regression results.**

| Resilience | Coef. | St.Err. | t-value | p-value | [95% Conf. | Interval] | Sig |
|---|---|---|---|---|---|---|---|
| Eurozone | -0.760 | 0.368 | -2.07 | 0.047 | -1.508 | -0.012 | ** |
| Share of public employees | -0.053 | 0.023 | -2.30 | 0.028 | -0.100 | -0.006 | ** |
| Bureaucracy | -1.074 | 0.534 | -2.01 | 0.053 | -2.161 | 0.013 | * |
| Financing | 0.459 | 0.794 | 0.58 | 0.567 | -1.155 | 2.074 | |
| Physical infrastructure | 0.163 | 0.811 | 0.20 | 0.842 | -1.488 | 1.814 | |
| Constant | 2.049 | 2.355 | 0.87 | 0.391 | -2.742 | 6.841 | |

| | | | |
|---|---|---|---|
| Mean dependent var. | -0.081 | SD dependent var. | 1.226 |
| R-squared | 0.269 | Number of obs. | 39 |
| F-test | 2.543 | Prob > F | 0.047 |
| Akaike crit. (AIC) | 125.368 | Bayesian crit. (BIC) | 135.349 |

**** p<0.01, ** p<0.05, * p<0.1*

We have thus evidence to suspect that the rigidities imposed by the current institutional design of Eurozone have a negative impact and further outweighs the benefits of higher mobility and integration of labor markets, in both their resistance capacity to a shock and their recovery. These results come to validate the already numerous findings of the of previous works related to the negative effects that the design of the Eurosystem, together with the accompanying expansionary austerity and structural reforms, had on the European labor market.

We check the robustness of our findings by computing the matrix of correlations and through a VIF test; by looking at the correlation matrix (pre-estimation) and VIF test table results (post-estimation), we confirm that there are no multicollinearity issues. For the VIF test, the rule of thumb is that a VIF values higher than 10 indicates multicollinearity; in our model, the highest value is 2.12 (Table 14).

Referring to the rest of our independent variables, we notice the fact that all have the expected relationship with employment resilience, with the exception of the share of public employees, which proved to have a negative impact at the level of our sample. Even though it comes against the findings in Lagravinese (Lagravinese, 2015) or Sabatino (Sabatino, 2019), this particular relationship is in line with others previous studies (Aksoy & Manasse, 2018; Nickell & Layard, 1999; Sondermann, 2018). Two of these control variables though, (easiness of financing and the availability of physical infrastructure) proved to have low statistical significance so we cannot infer on their impact.

**Table 4. Matrix of correlations.**

| Variables | (1) | (2) | (3) | (4) | (5) | (6) |
|---|---|---|---|---|---|---|
| (1) Resilience | 1.000 | | | | | |
| (2) Eurozone | -0.313 | 1.000 | | | | |
| (3) Share of public employees | -0.146 | -0.049 | 1.000 | | | |
| (4) Bureaucracy | -0.332 | 0.052 | -0.231 | 1.000 | | |
| (5) Financing | -0.072 | 0.096 | 0.232 | 0.233 | 1.000 | |
| (6) Physical infrastructure | -0.184 | -0.033 | -0.015 | 0.664 | 0.424 | 1.000 |

## 3.5. Conclusions and future research directions

Eurozone was one of the most prominent focal points of the 2008-2010 economic downturn in which the labor markets were the most affected; the massive losses in employment levels toped in countries such as Greece or Spain and the recovery of pre-crisis values took a lot of time. Furthermore, the labor markets in single currency economies manifest visible signs of hysteresis – the major shock have left a noticeable remanence in the trend of employment creation.

Starting from this observation we wondered if the rigidities imposed by the adoption of euro (such as the loss of sovereign monetary policy and compliance with the macro-prudential policies framework (especially the ones referring to fiscal discipline) can account for the poor resilience of their respective economies.

After checking the Impulse Response Functions of our VAR models, after computing an original relative resilience index, that accounts both for resistance to and recovery from the major 2008-2010 downturn for 41 OECD and EU economies, and after running a linear regression on it, including relevant control variables, we found evidence of the fact that belonging to the single currency area is associated with a meaningful lower resilience value. The results have proven robust to further testing.

Putting these results into perspective, gives us a certain indication of the fact that it is not necessarily the fault of the automatic destabilizers or of the structural reforms for the poor resilience values of Eurozone countries, but the lack of a country specific independent monetary policy. It is true that these single currency economies imposed such measures, but it is also true that other OECD member states did the same for the same period. Furthermore, countries such as UK, Poland or Romania, abode to the same macro-prudential European framework and saw their fiscal margins reduced, just as their Euro area counterparts, but they had their monetary sovereignty preserved during the downturn and undoubtedly made their pro-employment policies easier to implement. This means that, in terms of policy implications, and referring to the same EU non-EMU member states, the results of this study could represent a red flag that should be seriously considered when judging the optimality of common currency adoption.

The greatest comparative advantage of the Eurozone, i.e. higher labor markets integration, proved futile in combating the negative effects of the 2008 shock and left certain negative marks on it. Returning to the issue of OCAs and, in line with many studies, we must conclude that we have to refute the idea of Eurozone being one.

Arguably, the study has its own limitations, mainly imposed by the scarcity of data, time series breaks, or small sample size. Nevertheless, the results proved significant and further research in this direction will be conducted in the near future because of the new natural experiment provided by the economic crisis induced by the 2020 pandemic. Negative shocks in both output and employment will once again affect developed economies around the world and will provide an excellent comparison framework for EU and Euro area alike, which, this time, seems to have

a more stimulating approach materialized through a fund specially dedicated to resilience: Recovery and Resilience Facility.

# Chapter 4. Cabinet durability and the implementation of internal devaluation policies. Empirical evidence from Eurozone

## 4.1. Introduction

The idea for the present work originated from the observation of current state of affairs in the political economy literature about the problems facing the Eurozone; why did some countries lag behind their Eurozone peers and simply cannot make an internal devaluation in order to increase their competitiveness for solving their productivity issue? Although many authors have insistently pointed out to this and to the countries that are affected by it, one of the most cited examples being Italy (see for instance Gasparotti & Kullas, 2019; Grauwe, 2018), seemingly blaming the institutional framework, none is more specific; after all, the institutional framework is a very vast and encompassing concept. That is why, our interdisciplinary approach between economics and political science comes and tries to tackle the politics as an impediment for an efficient internal devaluation.

The chapter is structured as follows: the first part will treat the literature regarding the issues of partisan strategic and opportunistic behavior on one side and internal devaluation, austerity and fiscal discipline in Europe, on the other; the second one will be dedicated to the exposition of our research design together with the main research hypothesis, assumptions, methodology and a short review of the issue of cabinet durability measurement followed by a third part dedicated to the exposition of the results and discussion on the margin of them. The last part is dedicated to conclusions and prospects regarding this line of research.

## 4.2. Literature review

Internal devaluation comes as a necessity for countries that find themselves in the impossibility of devaluing their own currency (like in the case of Eurozone countries) – it could also be the case of countries that have a hard-peg exchange regime like in the case of Argentina in early 2000s or Hong Kong. Making a worldwide currency-crisis specific analysis that covered the 1975-1999 period, Sattler and Walter (Sattler

& Walter, 2010) reached the conclusion that autocratic regimes are more likely to defend in the long-run fixed-peg regimes in the face of speculative attacks in order to maintain monetary stability, than the democratic regimes (that use a combination of external and internal adjustments), which in the short and intermediate run might succeed, but fail in the long-run as they have to bow to voter's pressures – suggesting that the more democratic a political system is, the more it should pay attention to the internal economic hardships imposed by rigidities of fixed-peg exchange rates. This internal devaluation policies became the norm even from the beginning of the EMU project (early 90s) and it was imposed by the neoliberal ideology (Albano, 2017).

This readjustment policy was mentioned even from the beginning of the OCA literature. Robert Mundell (Mundell, 1961) in his famous paper, talked about how a currency union can respond to an asymmetric shock by adjusting wages and prices just in the affected region without the need to make a nominal devaluation of the single currency. During the crisis, this was also the idea put forward by other economists (Black, 2010; Levy, 2012), by the majority of the EU governments, and of course, by the bailing-out Troika and/or European Commission.

There is a clear differentiation between two types of austerity: *competitive austerity* (to which we refer in this work), which has to do with the idea that countries need to impose the so-called "structural reforms" in order to make their production system more competitive in relative terms, while *expansionary austerity* has its focus on the hypothesis of expansionary fiscal contraction: reductions in government spending will positively affect representative agent's expectations (i.e. they expect a decrease in future taxes), which in turn will expand private spending and investing (due to the absence of crowding out effect), finally achieving economic expansion (Meloni, 2016).

The issue of internal devaluation and austerity as a measure against the low growth and debt accumulation in Eurozone is a much-debated topic ever since the dawn of the financial crisis in 2008 in Europe. The debate not only divided the field of political economy, as the literature review will later show, but also the political landscape of the continent, to the point that both academia and politicians talk about either a break of the Eurozone either of the imposition of an important reform in order to save the

project. Many affirm that as members of a single currency area, each country has the duty of controlling for its competitiveness by means other than currency devaluation, as virtually none of these countries have full control over the value of the single currency. We must insist from the beginning on the fact that governments are not in total control of labor costs, but that they influence over them.

When considering whether to adopt or not unpopular measures such as imposing ceilings on wage increases, cuts in salaries or passing legislative packages in order to erode the bargaining power of the workers, every cabinet thinks to what the probabilities are of affecting their next elections results.

Most of these arguments are in line with the literature regarding the opportunistic behavior and strategical thinking of political parties, presented in the works concerned both with political business cycle and partisan theories.

The partisan theory assumes the existence of a short-run Phillips curve; whereas the leftist parties draw their electoral support from the working class they will decrease the unemployment at the cost of a higher level of inflation and the right-wing parties will act vice versa (Potrafke, 2012). It is worth mentioning the seminal work of Andrew T. Cowart which stated this idea of left-wing government being more deficit biased (Cowart, 1978, p. 432).

Further research on this line such that of Torsten and Svensson (Torsten & Svensson, 1989) showed that if a conservative government expects to be replaced by a left-wing one, it will be more fiscally irresponsible than knowing it will stay in power or be replaced by a cabinet of the same ideology. Still, the idea of Cowart was in a certain way confirmed by the work of some others, like Fredrik Carlsen (Carlsen, 1997), which argued that the leftist cabinets employ countercyclical fiscal policies, while the right wing cabinets employ procyclical ones and Alberto Alesina et al. (Alesina et al., 1993) which concluded that the left-wing governments have 0.5% higher real GDP fiscal deficits per year in office.

However, these last authors argued that due to confidence and reputational reasons, the politicians cannot go too far in this kind of behavior. The margin for opportunistic and strategic behavior of the parties in power was severely affected

during the decade of the 90s, when in the developed countries, measures were taken in order to assure the independence of the central banks, following the model of New Zeeland, and fiscal responsibility was asked of the countries with prospects to euro adoption in 1999. This argument is proven by Thomas R. Cusack (Cusack, 1999), while a more recent work, from Potrafke (Potrafke, 2012), argued that the left wing governments usually spend more in the first two years of a legislature.

The business political cycle theory assumes that irrespective of their political ideology, parties in power will implement expansionary economic policy right before elections in an attempt to boost their electoral score (Nordhaus, 1975; Rogoff & Sibert, 1988). Among some of the most cited contributions to this theory we can find those of Alesina, et al. (Alesina et al., 1999) Faust and Irons (Faust & Irons, 1999) or that of Heckelman (Heckelman, 2006), which reached different conclusions.

Still, some more recent contributions can be found that prove the existence of such behavior from the parties in power. We remind here the only a few; Shi and Svensson (Shi & Svensson, 2006) which employing a model of electoral moral hazard proved that the parties benefit from expansionary policies in the eve of elections, the more uninformed and naïve are the voters; Potrafke (Potrafke, 2012), which argued that political cycles are more prevalent in two-party systems because voters can more easily punish or reward political parties for governmental performance; Fortunato and Loftis (Fortunato & Loftis, 2018) which checked for the nexus between cabinet durability and fiscal discipline – employing a revision of the standard political budget cycle model applied to 15 European democracies for a period of almost four decades – came to the conclusion that when a party or a coalition of parties is expecting elections soon or expecting that their survival in power is not going to last long, they will try to improve their future electoral scores by spending as much as possible and that the cabinets that outlive their expected time in office will run higher deficits.

One thing should be noted though: the main assumption of both these theories might not have the same applicability for the Eurozone, as efficient expansionary economic measures and the Philips curve tradeoff can only be attained by a combination of monetary and fiscal policies, where the former is in the hands of the

ECB. While it is true that this is very obvious in Europe, it should also be noted that the margin for regulatory power of the government in the labor market seems at least larger than in the fiscal and monetary areas, thus giving us an extra reason to consider the possibility of the existence of a relationship between high government turnover (frequent government changes) and internal devaluation measures.

In both cases, though, it has been long established, that the same pattern arises: political parties in power, having strategic thinking and an opportunistic behavior, manipulate the economy on short-term in order to satisfy their electoral needs. Thus, we expect the national governments to behave opportunistically and not impose such devaluation measures when the expected time in office is short.

Even though is common sense among scholars assuming the high government turnover or short duration is intrinsically bad for democracy and economy broadly speaking [8], there are only a handful of articles (Fortunato & Loftis, 2018) in the political science literature that put government durability "on the right side of the equation", i.e. as an independent variable and that were able to find robust relationships.

Besides Fortunato and Loftis (Fortunato & Loftis, 2018) which was discussed above, Harmel and Robertson (Harmel & Robertson, 1986) employed four alternative measures of political stability in order to explore the effect over the satisfaction with democracy. They determined that high government turnovers negatively influence the overall satisfaction with democratic government, while also proving that the relationship between high government turnover and support for radical change may be spurious, the common factor for both being the macroeconomic performance.

Lastly, Huber (J. D. Huber, 1998) explores the nexus between political instability and political performance in Western Parliamentary democracies. Employing the success at health-care cost containment as an indicator of overall government performance (or effectiveness) he proved that short-run increases in portfolio volatility present problems for government decision-makers, but only in the short-

[8] there are some articles in the field of economics that refer to government turnover and political instability in a violent way (revolutions, civil wars, etc.) as a factor for poor economic output, but none is applicable to EU cabinets

run due to two factors: the instability in the partisan composition of cabinets makes it harder to the governments to adopt and implement new policies and instability in the partisan control of ministerial portfolios complicates the information obtaining efforts for the government during the formulation and implementation of new policies. Still, these difficulties are exceeded in the long run.

In theory, as the trade surplus, government surplus and/or output levels happens to fall, these austerity measures should automatically be imposed as this is the norm of the club (i.e., in European Union, as imposed by the Stability and Growth Pact and its further reforms, in order to tackle the macroeconomic imbalances). As indicated in the literature review part, the design of Eurozone is based on this idea; whenever a region is coping with problems regarding competitiveness and output, the free market and the laws of competitiveness are in place in order to readjust it, our assumption thus being that the only thing that differs between countries with respect to the imposition of such measures is the will of the cabinet, as we also control for other relevant economic factors.

### 4.3. Research design, methodology and data

Cabinet durability can be considered a political factor influencing policymakers' decisions. As stated by Laver (Laver, 2003), durability is a theoretical (latent) concept referring to the expected survivability of the cabinet and should be differentiated from duration, an empirical (observable) concept, which is the actual survival in office. We opt for using this measure because it encompasses much of the completeness of the information that a party might find while represented in the parliament. Alternative measures such as time elapsed since last election or average days of cabinets by country are only unidimensional and do not take into account the full information that a party might have when forming coalitions and policies. They would have also behaved like country constants in a panel data model, thing that would have defeated the purpose of this whole analysis.

Following Warwick (Warwick, 1995), we can identify two school of thoughts that were focused with the measurement of cabinet durability. The first one, which preferred to use an attributes analysis, i.e. independent variables that were statistically

related to government durations, argued that the survival in power is determined by to what degree and by how many of the following conditions can be met: majority in parliament, minimum winning coalition (or single party), compactness of the ideology, or low fragmentation index of the political system (otherwise identified as the complexity of the bargaining system). In turn, the other approach was based on what is called event analysis (or survival analysis) – starting from the basic assumption that the governments exist in a world of "critical events" (such as scandals, international conflicts, economic crises, etc.), each of which poses a threat to their existence, argued that this so-called hazard rate (the potentiality of termination at certain points in time), was not a function of the attributes, but that of probabilities of such events happening – these authors demonstrated that the pattern observed for government terminations resembles a Poisson distribution (Laver, 2003; Warwick, 1995).

Nowadays, the norm is using hybrid models of cabinet duration, that is, including both attributes and critical events – the attributes were considered as the prime factors in determining the stochastic process of critical events, but also vice versa (the critical events could shape attributes of the political landscape). One of the pioneering works in this sense are those of Lupia and Strøm (Lupia & Strøm, 1995), Diermeier and Stevenson (Diermeier & Stevenson, 1999) Merlo (1997), Diermeier, Eraslan and Merlo (Diermeier et al., 2003) and Laver (Laver, 2003), which makes an up-to-date review of the methodology and of the literature, indicating the missing pieces from each approach and showing points for future improvement.

More recently, Chiba, et al. (Chiba et al., 2015) brought to attention and solved (through a copula approach) a long-lasting problem in the literature: the issue of selection bias; because government formation and duration are said to be dependent and were commonly estimated, the sample of observed governments analyzed in studies of government survival may be non-randomly selected from the population of potential governments. When trying to determine the durability of a government, we can base out estimation on certain features as stated above, but we neglected the fact that the governments that we chose as researchers, were already preselected

through political bargaining when the coalition formed, and the criteria used by politicians might or might not have coincided with the ones we considered important for formation and duration.

Our main model employs a panel dataset for the 19 Eurozone countries for the period 2007-2017 (209 observations); although it could be argued that some countries adopted the single currency later than the start year of our sample (Cyprus 2008, Estonia 2011, Latvia 2014, Slovakia 2015, Slovenia 2007), one should not forget the fact that the road to euro adoption is very long (for instance, just the minimum required time in ERM II needs to be 2 years) and requires compliance with very strict criteria, similar in kind to those imposed once in the Eurozone (see Maastricht criteria discussed in Chapter 1.2). As we have pointed out from the beginning, we insist on the fact that it is true that governments are not in total control of labor costs, but it is true that they can influence them to some extent; for the other factors that influence costs, we include control variables. The variables and the reasons for which they were considered in the model are as follows.

1) Dependent Variable: real unit labor cost (ratio of compensation per employee to nominal GDP per person employed, base year – 2010).
2) Real unit labor cost with a lag – included as a determining factor due to wage and price stickiness.
3) Trade openness, measured as the aggregate of imports and exports as percentage of GDP under the assumption that a very open economy will have more flexible salaries and will drop its costs when confronted with lower productivity.
4) Real GDP growth rate as an indicator of the phase of the economic cycle assuming that labor costs and productivity will depend on the time of the cycle in which the economy finds itself.
5) GDP per capita as a proxy for the development of the country and region; the more developed, the higher the wages (Álvarez et al., 2018; Espinosa & Sanchez, 2016; Uxo, 2014).

6) Level of the education of the population by educational attainment level, only tertiary education level considered, as a proxy for productivity performance – the higher the proportion of the population that attained tertiary education, the higher the performance, thus the higher the wages.
7) Gross government debt as a percentage of GDP. If the debt to GDP ratio is very high, the government have a pressure to diminish it and in order to do this will bow to the pressures of creditors to cut the costs and public spending.
8) Interest rates for long-term government bonds. At present, harmonized long-term interest rates are available for 27 of the EU Member States. The indicator available at the moment for Estonia, taking into account the specific situation of this country, is not fully harmonized. The current indicator for Estonia represents a weighted interest rate on EEK-denominated loans to non-financial corporations and households with short, medium and long interest rate fixation periods. However, currently a large proportion of the underlying claims (on average 90%) are linked to interest rates with fixation periods up to one year. Basically, Estonia did not issue any kind of long-term debt, so interest rate for this country should be 0%.
9) Unemployment rate. Measured as a percentage of active population, introduced under the assumption that higher levels of unemployment will put negative pressures on the equilibrium salary and will drop the ULC. Although, in principle, one might suspect endogeneity with respect to the inclusion of this variable, we note that in literature (Rebitzer, 1988) it is proven that the influence of unemployment is mediated by the power of the syndicates. However, as is the result of our correlation matrix, the link between the unemployment rate and the power of trade unions is weak.
10) Relative power within Eurozone (source: own computations. with data from Eurostat) – measured as:

$$relative\ power = 0.5\frac{own\ GDP}{Eurozone\ GDP} + 0.5\frac{own\ population}{Eurozone\ population} \quad (20)$$

The assumption is that the more powerful a country is within the Eurozone, the more it can influence the legislation in its interest and the more it could suffer from moral hazard when it comes to taking painful actions when affected by economic downturns (thus, we are expecting a negative sign for this coefficient).

11) Government effectiveness reflects perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies.
12) Cabinet's programmatic position with respect to fiscal behavior; it is assumed that the parties on the left side of political spectrum are less prone to impose devaluation measures (source: Volkens et al., 2018). As suggested by Bräuninger (Bräuninger, 2005), we employ the programmatic position as opposed to the ideological one, as it is more representative.
13) Dummy for Troika bailout program (0 in the absence of the program, 1 in the presence of it per years). Assumption – a Troika bailout comes with harsh conditions, debilitating the domestic powers of the governments. In the case of Spain, a fund of 100 billion euro was made available but only 43 were used for banking system capitalization, and it wasn't contracted with the Troika, but through ESM (European Stability Mechanism). Still, critics have noted that the ESM severely confines the economic sovereignty of its member states (as Troika's interventions) and criticize that it provides extensive powers and immunity to the board of ESM Governors without parliamentary influence or control, that is why we also consider the Spanish case similar to a Troika's bailout (as a proof of the fact that the national sovereignty is affected, see the 2011 Spanish constitutional reform).

14) The power of labor unions, measured as trade union density. The more powerful the unions, the harder for the cabinets to impose internal devaluation. In this case two sources have been used due to the complementarity of the datasets and due to the fact that the data does not differ (ILOSTAT and OECD have the same data collection sources – the national statistics agencies).
15) Decentralization index, measured as the ratio of the aggregate local and regional government budget to general budget. Hypothesis: the more decentralized a country is, the harder it will be for the central government to impose austerity due to periphery's opposition (source: own computations. with data from Eurostat).
16) Budget balance measured as percentage of GDP (a positive value indicates budget surplus, whereas a negative one, budget deficit); in the presence of deficits, it is expected that the government will make cuts, which can affect the value of real unit labor cost.
17) Dummy variable for trade balance deficit; in the presence of deficits, it is expected that the government will want to make the domestic production more competitive, which can negatively affect the value of real unit labor cost. It is also a signal for knowing which countries require devaluation measures.
18) The durability of the government, which is estimated in a subsequent model. The variables considered, replicating the models of many political science papers concerned with cabinet durability, are:
    - Days in office of each cabinet – dependent variable (source: Bértoa, 2019). Note: In case there were two or more cabinets in the same year, the cabinet with the higher number of days in office was selected.
    - The numerical status, if in minority, 0, if in majority 1 (Bértoa, 2019; European Consortium for Political Research, 2019).
    - Ruling number of parties (Bértoa, 2019; European Consortium for Political Research, 2019).

- The range between the most distant positions among the parties forming the government. Up until the present work, these distances were computed using the left right ideological distance. But, in the contemporary European landscape, this left-right divide will give non-representative results; that is why, we introduced a new method and a new dimension. We took into account, besides the classical left-right dimension, also the pro vs. contra European integration perspective of the parties. Using these two dimensions, we computed a matrix of Euclidean distances between all the parties in the countries of the Eurozone, following the formula:

$$dist_{AB} = \sqrt{dist\ leftright_{AB}^2 + distproconEU_{AB}^2} \quad (21)$$

  Of course, the assumption here was that the more distant the governing coalition, the sooner it will break (source: own computations using data from Volkens et al., 2018).
- Returnability, measured as the proportion of parties from current government that were part of the previous government (source: Bértoa, 2019). Assumption: the higher the proportion, the lower the costs of the governing parties to break to current coalition, because they know it's a high probability of their return in power. Note: the independent portfolio holders in each cabinet were not considered, as theoretically they do not act as a political party *per se* and they are not represented as a group in the next government.
- The complexity of the bargaining system measured as the effective number of political parties (source: Gallagher, 2019), under the assumption that a complex bargaining system will create cabinets more prone to the shocks, thus lowering their survivability.
- Years elapsed since last election – the governments that form early in the inter-electoral period have higher chances of staying in office because of the longer possible tenure; the year of election is considered as year 0 if

the election takes part in the first half of the year, if not, year 0 is considered the next year.

This durability should be considered as expected time in office. Even though we have data for all the time in office of each government in the Eurozone for the time considered in our sample, we cannot use it as it is not realistic; the whole idea behind is that the governments form expectations regarding their time in office based on *ex-ante* available information. i.e., information at the time of government formation; this information, of course, is the one contained in the variables considered above.

What we are after in this study is not necessarily an exact result for the expected period, but an estimation of the expected survival period for the governments that already had/have the power (i.e. the expected time of survival from their perspective); that is why, the selection bias for our purposes will not serve, even more, it will produce estimates that are not fit for our purposes, as our population is the population of governments already formed, not that of all potential governments, as in the case of Chiba et al. (Chiba et al., 2015).

In order to produce these estimated times in office for each government, we employed a survival analysis model with a Weibull parametric regression (as opposed to a competing semiparametric Cox regression). Furthermore, it is also wrong for the purposes of our work to make a distinction between governments that end in dissolution and dismissal (as suggested by Diermeier & Stevenson, 1999), because there is no credible way in which a cabinet will know *a priori* how it will end. The regression output will be represented by hazard rates which have the following mathematical expression:

$$h(t) = \lim_{\Delta t \to 0} \frac{P(t \leq T < t + \Delta t | T > t)}{\Delta t} \tag{22}$$

where $h(t)$ represents the hazard rates at any given time, $P$ is the probability of the event happening, $t$ is the timeline and, $T$ is the moment (specific point in time) under consideration. The intuitive interpretation of this expression is that the hazard rates represent the instantaneous potentiality of the event to happen in a certain moment,

given that it didn't occur by then (Kleinbaum & Klein, 2012). The regression results will be used for estimating the duration of each observation in our sample.

Survival analysis requires a special treatment of data and cannot be substituted by regular linear regression mainly due to two reasons. 1. Because the dependent variable is always a time unit, its estimated value cannot be negative (in a linear regression case it can be). 2. Data from the survey can be censured and this is a special case of missing data, that offers important information on the observations (Kleinbaum & Klein, 2012). In our case, as the sample we extracted finishes in 2017, the cabinets still in office on January 1st, 2018, were considered censored observations.

As such, the econometric expression of our main model looks as follows:

$$real\ unit\ labor\ cost_{it} = \beta_0 + \beta_1 Control_{it} + \beta_2 Time\ left_{it} + \alpha_i + U_{it} \quad (23)$$

where $Control_{it}$ are the control variables indicated above and $Time\ left_{it}$ is the expected time left in office for the cabinets; in the case of governments that survived for different years, we discounted the days spent in office from the beginning of each year in the sample. The $\alpha_i$ indicates the unobserved heterogeneity and $U_{it}$ is the idiosyncratic error. After performing a preliminary correlation matrix, we discovered pairs of variables with very high correlation coefficients, and some variables were subsequently eliminated.

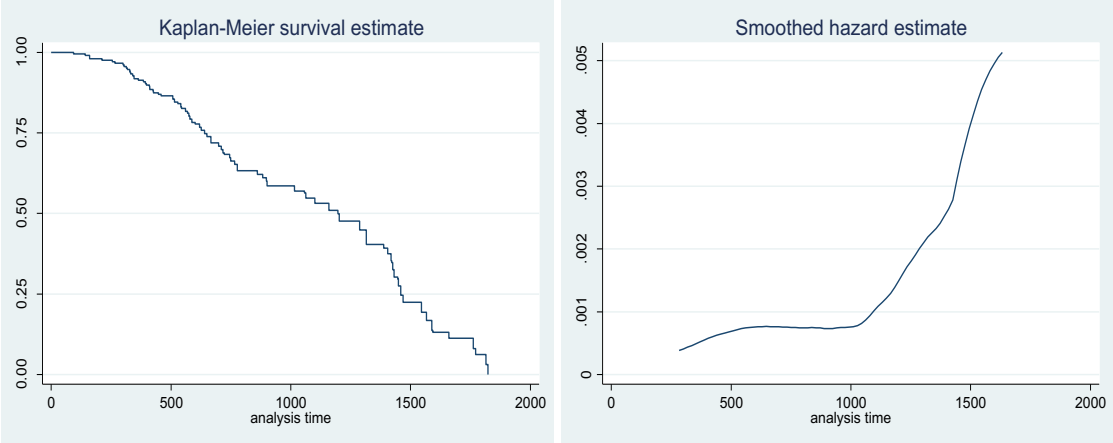
Furthermore, with the help of a Variance Inflation Factor test we tested the remaining variables for multicollinearity problems and eliminated those that had a VIF higher than 10. Under the assumption that the government have at least real-time indications on some variables (so it based its strategy on current information) and due to a higher level of determination, we decided to employ a concurrent model as opposed to a lagged model.

The only variable that is lagged is real unit labor cost. Due to the fact that this is also our dependent variable we employed a dynamic panel data model. We used the Anderson-Hsiao estimator, where the second lag of the real unit labor cost was used as an instrumental variable for the lagged value of it in order to avoid endogeneity problems.

## 4.4. Results and discussions

The results of our survival analysis are exposed below. In Figure 16 we have represented the survival function of the cabinets in our sample. As the graph shows, as the time goes by, the probability of survival (Y axis) diminishes. In Figure 16, we also have represented the hazard rate function, i.e., the potentiality for each moment in time for the critical event (in our case, the fall of cabinet) to happen, given that the subject survived by then. Both graphical representations are in accordance with the structure of our data and with our theoretical expectations.

**Figure 16. Graphical representation of the survival function and hazard rates for the cabinets in our sample.**




**Source: own computations.**

In Table 5 we have represented the results for our first model of survival analysis. As noted, the time elapsed since last elections, even though insignificant (p value = 0.493) and the proportion of parties that were part of previous government, significant only at 10%, are kept for the realism of the assumption that we made about the expected survival in office. The number of observations has dropped to 198 because we couldn't find data for computing the political distances matrix between parties in Malta.

As opposed to OLS, the coefficients for hazard rates in this case have a different interpretation; if lower than 1, the hazard rate indicates an increased chance of survival and *viceversa*. For instance, if the cabinet has majority in parliament, its chances of survival increase by 35%, while if the ruling number of parties increase by 1, its survival chances decrease by 1.313 – 1 = 31%. A counterintuitive effect (for us) was

observed in the case of the complexity of the bargaining system – measured as the effective number of parties, i.e. if the effective number of parties increases, the cabinet's chances of survival also increase; we suspect that this may be due to the fact that a higher number of parties in the legislature, even though represents a bigger pool of hypothetical political allies in the next cabinet formation, will also increase the costs associated with cabinet formation; thus once a government is formed in a complex legislature, it will want to maintain the *status-quo* so it won't incur further renegotiations costs.

The results of the survival analysis approximation were very good and robust. From the actual (observed) survival in office time of each considered cabinet, we subtracted the Cox-Snell residuals (Zhao et al., 2011) and we were left with the estimated time in office (which we assumed to be the true expectation from the perspective of each cabinet in our sample).

**Table 5. Results for the Weibull parametric survival analysis.**

| Duration | Haz. rates | St.Err. | t-value | p-value | [95% Conf | Interval] | Sign. |
|---|---|---|---|---|---|---|---|
| Government status | 0.357 | 0.065 | -5.62 | 0.000 | 0.250 | 0.512 | *** |
| Ruling parties | 1.313 | 0.096 | 3.72 | 0.000 | 1.138 | 1.516 | *** |
| Fragmentation | 0.803 | 0.058 | -3.03 | 0.002 | 0.697 | 0.926 | *** |
| Returnability | 1.004 | 0.002 | 1.68 | 0.093 | 0.999 | 1.008 | * |
| Ideological distance | 1.015 | 0.007 | 2.24 | 0.025 | 1.002 | 1.028 | ** |
| Elapsed time since last election | 0.957 | 0.061 | -0.69 | 0.493 | 0.846 | 1.084 | |
| Constant | 0.000 | 0.000 | -15.20 | 0.000 | 0.000 | 0.000 | *** |

| | | | |
|---|---|---|---|
| Mean dependent var. | 994.798 | SD dependent var. | 466.369 |
| Number of obs. | 198.000 | Chi-square | 62.524 |
| Prob. > chi2 | 0.000 | Akaike crit. (AIC) | 264.568 |

**** p<0.01, ** p<0.05, * p<0.1*

The pairwise correlation matrix for the variable in our model is presented in Table 6. Noteworthy is the negative, albeit very weak correlation between our dependent variable and time left in office. A preliminary Levin-Lin-Chu unit-root test for the real unit labor cost has been conducted and the result is that we rejected the null hypothesis (H0: Panels contain unit roots vs. alternative Ha: Panels are stationary).

**Table 6. Pairwise correlation matrix.**

| Variables | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| (1)Unit labor cost | 1.000 | | | | | | | | | | | | |
| (2)Unit labor cost lag | 0.793 | 1.000 | | | | | | | | | | | |
| (3)Programmatic position | 0.060 | 0.114 | 1.000 | | | | | | | | | | |
| (4)Real GDP growth | -0.537 | -0.283 | -0.048 | 1.000 | | | | | | | | | |
| (5)GDP/capita | -0.205 | -0.191 | -0.072 | 0.215 | 1.000 | | | | | | | | |
| (6)Trade openness | -0.171 | -0.137 | -0.019 | 0.326 | 0.514 | 1.000 | | | | | | | |
| (7)Education | -0.188 | -0.111 | -0.078 | 0.227 | 0.363 | 0.401 | 1.000 | | | | | | |
| (8)Debt/GDP | -0.231 | -0.107 | -0.018 | -0.081 | 0.034 | -0.429 | -0.215 | 1.000 | | | | | |
| (9)Decentralization | 0.308 | 0.251 | -0.005 | -0.140 | 0.085 | -0.504 | -0.190 | 0.184 | 1.000 | | | | |
| (10)Budget balance | -0.077 | -0.224 | 0.056 | 0.304 | 0.245 | 0.217 | 0.105 | -0.319 | 0.134 | 1.000 | | | |
| (11)Trade balance deficit | 0.138 | 0.118 | -0.066 | -0.184 | -0.350 | -0.409 | -0.202 | -0.001 | 0.117 | -0.220 | 1.000 | | |
| (12)Bond yields | 0.052 | 0.151 | 0.028 | -0.470 | -0.307 | -0.223 | -0.294 | 0.310 | -0.151 | -0.553 | 0.388 | 1.000 | |
| (13)Unemployment | -0.172 | 0.052 | -0.097 | -0.156 | -0.432 | -0.225 | 0.013 | 0.303 | -0.126 | -0.483 | 0.215 | 0.453 | 1.000 |
| (14)Relative power | 0.087 | 0.063 | 0.125 | -0.025 | 0.127 | -0.483 | -0.241 | 0.336 | 0.703 | 0.074 | 0.010 | -0.152 | -0.067 |
| (15)Gov. effectiveness | 0.040 | 0.008 | -0.066 | 0.144 | 0.608 | 0.196 | 0.486 | -0.178 | 0.268 | 0.245 | -0.296 | -0.397 | -0.498 |
| (16)Bailout | -0.164 | 0.042 | -0.015 | -0.251 | -0.166 | -0.098 | 0.062 | 0.421 | -0.267 | -0.466 | 0.114 | 0.619 | 0.580 |
| (17)Union density | -0.026 | -0.025 | 0.030 | -0.063 | 0.381 | 0.007 | 0.222 | 0.210 | 0.139 | 0.041 | -0.058 | 0.018 | -0.230 |
| (18)Time left | -0.034 | -0.001 | 0.061 | -0.051 | 0.173 | 0.082 | 0.022 | 0.045 | -0.010 | -0.009 | -0.094 | 0.069 | 0.080 |

The results of the main model are presented below, in Table 7.

**Table 7. Anderson-Hsiao estimators for the dynamic panel data model**

| Unit labor cost | Coef. | St.Err. | t-value | p-value | [95% Conf. | Interv.] | Sign. |
|---|---|---|---|---|---|---|---|
| Unit labor cost lag | 0.376 | 0.054 | 6.92 | 0.000 | 0.270 | 0.483 | *** |
| Programmatic position | -0.018 | 0.012 | -1.43 | 0.152 | -0.042 | 0.007 | |
| Real GDP growth | -0.344 | 0.047 | -7.26 | 0.000 | -0.436 | -0.251 | *** |
| GDP/capita | -0.001 | 0.000 | -7.57 | 0.000 | -0.001 | -0.001 | *** |
| Trade openness | -0.041 | 0.025 | -1.69 | 0.092 | -0.089 | 0.007 | * |
| Education | -0.008 | 0.129 | -0.07 | 0.947 | -0.261 | 0.244 | |
| Debt/GDP | -0.106 | 0.036 | -2.95 | 0.003 | -0.176 | -0.035 | *** |
| Decentralization | 0.024 | 0.187 | 0.13 | 0.896 | -0.343 | 0.391 | |
| Budget balance | 0.020 | 0.044 | 0.46 | 0.644 | -0.066 | 0.107 | |
| Trade balance deficit | 0.676 | 0.499 | 1.35 | 0.176 | -0.303 | 1.655 | |
| Bond yields | 0.077 | 0.104 | 0.73 | 0.463 | -0.128 | 0.281 | |
| Unemployment | -0.679 | 0.122 | -5.58 | 0.000 | -0.917 | -0.440 | *** |
| Relative power | 0.358 | 2.152 | 0.17 | 0.868 | -3.859 | 4.575 | |
| Gov. effectiveness | -1.167 | 1.584 | -0.74 | 0.461 | -4.271 | 1.938 | |
| Bailout | -0.299 | 0.565 | -0.53 | 0.597 | -1.406 | 0.808 | |
| Union density | 0.393 | 0.161 | 2.44 | 0.015 | 0.078 | 0.708 | ** |
| Time left | 0.000 | 0.000 | 0.90 | 0.366 | 0.000 | 0.001 | |
| Constant | 1.247 | 0.261 | 4.77 | 0.000 | 0.734 | 1.759 | *** |

| | | | |
|---|---|---|---|
| Mean dependent var. | -0.843 | SD dependent var. | 3.059 |
| Overall r-squared | 0.364 | Number of obs. | 104.000 |
| Chi-square | 475.565 | Prob. > chi2 | 0.000 |
| R-squared within | 0.727 | R-squared between | 0.006 |

**** p<0.01, ** p<0.05, * p<0.1*

The coefficient indicates that, our interest variable (Time left in office), is not significant in determining the imposition of internal devaluation measures, in line with the results presented in the pairwise correlation matrix, thus rejecting the main hypothesis of our study.

In turn, other economic and labor market specific variables such as the past level of unit labor cost, trade openness, levels of public debt or union density are all significant as expected and certainly affect the movement of our dependent variable. These results are upheld by the findings in Rose (S. Rose, 2006), in the sense that they show that the political factor's margin in the member states for influencing the business cycle has been dampened in the later years by fiscal rules.

## 4.5. Conclusions

As indicated above, after controlling for the relevant economic and institutional factors, we determined that in the modern Eurozone political landscape, the time horizon of each cabinet is not significant with respect to the imposition of internal devaluation

measures. As such, the cabinets seem to not care about their remaining time in office with respect to imposing or not the electorally painful devaluation measures when they have to. This certainly is an interesting and counterintuitive finding. It is true that a shortcoming of this study could be the fact that we lost sight of some other important institutional variables that could offer an answer to this puzzling question.

Still, the results seem to be in line with other very similar and very recent findings; there is a work in progress from André Sapir (Sapir, 2019) where the cases of Belgium and Italy are compared. At the time of Eurozone accession, these two countries were very similar economies (same levels of debt, comparable bond yields, same GDP/capita) and also politics-wise (authors addition) – they were and still are highly unstable. Still, the first one is now a country that seems to be at the core of the common currency, while the other one is struggling with competitive issues, it is on a collision course with the European institutions with respect to its fiscal discipline and its exit from Eurozone is regarded as a very real possibility.

This finding can also be corroborated with other two things. On the one hand, the insignificance of the relationship between expected time in office and the imposition of internal devaluation measures might hint at a very long debated issue: the democratic deficit in the EU – if the accountability of cabinets with respect to such measures to not lie with their voters, with whom it does then?

On the other hand, it might show a key problem of Eurozone institutional design; while the national states' monetary and fiscal margin have been very much reduced with euro adoption and Stability and Growth Pact, we note that no equivalent with respect to competitiveness has been enforced at communitarian level, i.e., no proper measures are in place to ensure, a "competitive discipline". The cases of PIIGS countries between early 2000 and the beginning of the financial crisis are relevant in this respect.

The lack of a European enforcement mechanism in order to assure better competitive positions for the national economies, while the national states' competences are reduced very much, might be the explanation for which such measures are not taken.

Providing an answer to the question "what makes a country unable to impose momentarily-painful measures in order to insure a better competitive position in the future?" is of crucial importance. It can show us a deep omitted variable, which is not only important from a scientific standpoint, but it can also signal the present and prospective

euro member states of their fitness to the common currency. As a consequence, we conclude that further research is definitely recommended in this respect.

# Chapter 5. Government Responsiveness in Times of Internal Devaluation. Hints at a Crisis of Representation in Eurozone?

## 5.1. Introduction

The main research objective of this this study is to find out what is the best predictor of internal devaluation measures imposed by governmental decision. We devise a test for two competing hypotheses. On one hand, political instability may affect the implementation of internal devaluation due to opportunistic behavior and strategic thinking from the political parties in power, idea consistent with the works concerned both with political business cycle and partisan theories. On the other hand, we can find evidence of the fact that governments also respond in real time to the signals from the financial markets (in this case the bond yields) with respect to the necessity of such measures. We employ a panel dataset that spans from 2007 to 2017 for all the 19 Eurozone countries. The first hypothesis is tested by including as an explanatory variable in our fixed effects model the expected time in office of each cabinet (previously estimated using a survival analysis Weibull regression); for the second one we consider as an explanatory variable the bond yields that the same governments have to pay to issue public debt into the financial markets.

After controlling for the relevant macroeconomic and labor market specific variables, the preliminary results show that the expected time in office has no significant effect on the movement of unit labor cost (the proxy for internal devaluation), while the bond yields do have one, with the expected (negative) sign. These results (in line with some very recent similar insights on the matter), prove that cabinets in Eurozone, when faced with decisions over the implementation of such measures are more prone to pay attention to signals from the financial markets rather than their time left in power, thing that might hint at a crisis of representation.

## 5.2. Literature review. Two contrasting hypotheses

The impossibility of achieving correctional measures against commercial imbalances through external devaluation measures as in the pre-EMU era, obliged the Euro area countries to look for alternative measures, especially in the case of peripheral countries like

Greece, Spain, Cyprus or Ireland, which saw their labor costs skyrocket after joining the common currency area (Villanueva et al., 2020).

The alternative imposed by the context of European state of affairs and economic macroeconomic frame after 2008 indicated clearly in the direction of internal devaluation measures: instead of devaluing their currencies in order to stimulate the exports (and disincentives the imports), the states were bound to devaluate the wages of their respective economies, through different channels (Villanueva et al., 2020), in order to gain a better competitive position (Calmfors, 1998; European Commission, 2011).

### *5.2.1. Strategical thinking and opportunistic behavior*

At the moment of considering the adoption of unpopular measures such as imposition of ceilings on wage increases, cuts in salaries or passing legislative packages for diluting the collective bargaining power of the workers, governments think to what the possibilities are of affecting their next elections results. This argument is in line with the literature regarding the opportunistic behavior and strategical thinking of political parties, presented in the works concerned both with political business cycle and partisan theories.

The partisan theory assumes the existence of a short-run Phillips curve; since the left-wing parties draw their electoral support from the working class they will decrease the unemployment at the cost of a higher level of inflation and the right-wing parties will act vice versa (Potrafke, 2012). Also, as it is mentioned in the seminal work of Cowart, leftist governments are considered more deficit biased (Cowart, 1978, p. 432), and Carlsen (Carlsen, 1997), found that the same cabinets employ countercyclical fiscal policies, while the right-wing cabinets employ procyclical ones.

Fiscal irresponsibility is not exclusively the trademark of leftist governments, as proven by further research conducted in the framework of this theory (Torsten & Svensson, 1989), which showed that if a conservative government expects to be replaced by a left-wing one, it will be more fiscally irresponsible than if knowing it will remain in power or be replaced by a cabinet of the same ideology.

Still, the original idea of Cowart (Cowart, 1978), was in a certain way confirmed by the work of some others, like Alesina, et al. (Alesina et al., 1993) which concluded that the left-wing governments have 0.5% higher real GDP fiscal deficits per year in office, and the

more recent work of Potrafke (Potrafke, 2012), which argued that the leftist governments usually spend more in the first two years of a legislature.

Alesina et al. (1993), though, argued that due to confidence and reputational reasons, the politicians cannot go too far with such behavior. The margins for opportunistic and strategic behavior of the parties in power were severely affected during the decade of the 90s, when in the developed countries, measures were taken in order to assure the independence of the central banks, following the model of New Zeeland, and fiscal responsibility was asked of the countries with prospects to euro adoption. This argument is proven by Cusack (Cusack, 1999).

On the other hand, the business political cycle theory assumes that irrespective of their political ideology, parties in power will implement expansionary economic policy right before elections in an attempt to boost their electoral score (Nordhaus, 1975; Rogoff & Sibert, 1988). Among some of the most cited contributions to this theory we can find those of Alesina, et al. (Alesina et al., 1999) Faust and Irons (Faust & Irons, 1999) or that of Heckelman (Heckelman, 2006), which, nevertheless, reached different or contradicting conclusions.

Still, some more recent contributions can be found that prove the existence of such behavior from the parties in power. We remind here the only a few. Shi and Svensson (Shi & Svensson, 2006), which employing a model of electoral moral hazard, proved that the parties benefit from expansionary policies in the eve of elections, the more uninformed and naïve are the voters; Potrafke (Potrafke, 2012) argued that political cycles are more prevalent in two-party systems because voters can more easily identify, punish, and reward political parties for governmental performance. Fortunato and Loftis (Fortunato & Loftis, 2018) checked for the nexus between cabinet durability and fiscal discipline; employing a revision of the standard political budget cycle model applied to 15 European democracies for a period of almost four decades, these authors came to the conclusion that when a party or a coalition of parties is expecting elections soon or expecting that their survival in power is not going to last longer, they will try to improve their future electoral scores by spending as much as possible, and that the cabinets that outlive their expected time in office will run higher deficits.

One thing should be noted though: the main assumptions of both these theories might not have the same applicability for the Eurozone, as efficient expansionary economic

measures and the Philips curve tradeoff can only be attained by a combination of monetary and fiscal policies, where the former is in the hands of the ECB. While it is true that this is very obvious in Europe, it should also be noted that the margin for regulatory power of the government in the labor market seems at least larger than in the fiscal and monetary areas, thus giving us an extra reason to consider the possibility of the existence of a relationship between high government turnover and internal devaluation measures.

In both cases, though, it has been long established, that the same pattern arises: political parties in power, having strategic thinking and opportunistic behavior, manipulate the economy on short-term in order to satisfy their electoral needs. Thus, we expect the national governments to behave opportunistically and not impose such devaluation measures when the expected time in office is short.

### *5.2.2. Financial markets' signals and sovereigns*

Contrary to the hypothesis developed in the previous paragraphs, one might suspect that the governments will have incentives to impose internal devaluation measures whenever the needs and interests of the financial markets will require them to do so. In our opinion, two crucial questions might arise when making this statement. In the first place, we would like to address the questions of "why would the governments want to satisfy such needs?".

The literature on financial markets admits the very close, almost intimate relationship between the sovereigns and the financial institutions (Fandl, 2018, p. 21). Such a relationship is almost exclusively that of interdependence materialized through at least four links/channels.

1) The first one is the crucial importance of the financial institutions for public debt monetization and dispersion into real economy. These institutions (especially the banks) are the ones that are legally able to participate both in the primary market and well as the secondary market of public debt securities, and consequently act as debt dealers for governments (Fandl, 2018, p. 21).
2) The second channel derives as a consequence of the first; since the financial institutions are debt dealers for governments, their exposure to the sovereign risk implies that their sanity and survival depend very much on the soundness of the government's balance sheets (Fandl, 2018, pp. 91–93). The intensity of this

dependence relationship proved much higher and dangerous in the peripheral countries due to increased incentives from the part of the banks to gamble on domestic government securities given by a combination of limited liability and quantitatively small expected losses for the banks the in case of default (independently of their exposure to such securities) as proven by a study (Ari, 2016).

3) The third channel through which the interdependence between sovereign and financial institutions is materialized is the implied liability of public sector towards the major actors within the markets, the so called "too-big-to-fail" (TBTF) actors. Even though lately steps towards solving the intrinsic moral hazard problem have been taken in the framework of macroprudential policy (such as the imposition of capital surcharges for systemically important banks and systemic risk buffers), the market share of first tier banks recognized by the European banking authorities and directly supervised by the ECB stood at around 75% (European Central Bank, 2017), which implies that the issue still persists and most likely would not disappear soon.
4) Lastly, there is the political dimension of credit provision; the states heavily rely on banking and financial markets to provide credit to the real economy in order to guarantee a steadily and easily accessible flow of financial resource crucial for economic growth, for which, the latter are, in the end, electorally accountable (Fandl, 2018, p. 22). The credit provision and expansion buttressed by the state has been lately under close scrutiny by the scholars preoccupied with inequality as there are evidences to suggest that the use of this tool (i.e. credit expansion supported by the governments) was one of the driving factors of the 2008 financial crisis (Perugini et al., 2013). The incapacity or lack of volition from the governments to deal with rising levels of inequality, forced them to find cheap alternatives towards welfare for their low and medium-income citizens and credit provision seemed like a good solution; such a measure had the unwanted effect of high levels for debt accumulation, non-performant loans or loan-to-values ratios, which in the end, proved to be a dangerous combination for the financial system and real economy (Rajan, 2010; Stiglitz, 2013).

Secondly, we would like to address the issue of "what are the interests of financial markets and why are they in conflict with the interest of the workers, especially in the case of a recession?". The financial system will require a sound and well-functioning macroeconomic environment in order to shield itself from risks arising from various sources (default, inflation, exchange rate, etc.) when lending money to the government. In order to shield themselves from such sources of risk, the bondholders act as a principal in relationship to an agent. The agent (the government) is required to refrain from expansionary fiscal policies so that it won't generate inflation, higher public debt/GDP ratios or insolvency and illiquidity worries (de Grauwe, 2011).

In the case of a recession, such expansionary measures are crucial for boosting the economic activities but prohibited by the European Commission within some limits (due to the fiscal deficit margins imposed by SGP) and regarded as dangerous by the financial institutions and government bondholders as they directly affect the fundamentals of the governments. The problem is more acute for the Eurozone countries as opposed to the rest non-EMU EU countries because the ECB is totally prohibited to act as a lender of last resort for them, in a situation in which the financial markets are totally incapable differentiating between solvency and liquidity issues of the governments (de Grauwe, 2011, 2018, p. 134), which will lead to self-fulfilling prophecies with respect to the fundamentals of the governments.

It is also quite clear that whenever the panic grips the financial markets with respect to government fundamentals (especially related to GDP/debt ratio), it pushes the spreads upwards and will eventually determine austerity measures from the governments (de Grauwe & Ji, 2013; Habbard, 2012). Furthermore, a relatively recent empirical study by De Santis and Stein (De Santis & Stein, 2015), found evidence that peripheral countries in the Eurozone are more prone to suffer from higher key-price interest rates (such as the lending rates to households and corporations) if their respective sovereign bond markets are in crisis, an extra reason for their respective governments to take into account the financial markets' signals. Due to the fact that sovereign bond yields are used as a benchmark for domestic key interest rates, the real economy of a country can be negatively affected; the threshold for crisis environment in bond markets for Spain and Italy, for instance, is estimated at around 90 basis points spread between their 5-year bond yields over the Overnight Indexed Swap (De Santis & Stein, 2015).

The signals from the financial markets might be exacerbated, whenever there is an increase in public deficit and/or inflation, by the so-called "bond vigilantes" – bond investors who protest structural government debt by selling bonds, increasing real yields, although criticism is not directed solely against them, but also against the government and regulatory agencies who failed to take decisive and preventive actions (Habbard, 2012).

Lastly, the informal signal channels from the financial markets are doubled by lobbying. Such efforts should not be disconsidered; at the level of EU (only in Brussels), the financial industry spent over 120 million euros yearly and employed some 1700 lobbyist from 700 organizations. Overall, the financial lobby outspent the rest of public interests in EU by a factor of 30 (Wolf et al., 2014). It´s not just the sheer massive expanses and numbers of the lobbying efforts, but also the intrinsic power of such practices: by providing the agenda-setter with a pool of policy options in a costly information environment, the lobbyist actually exerts a lot of influence on the outcome (Austen-Smith, 1993).

### 5.3. Research design and methodology

In order to be able to check which is the better predictor for the imposition of internal devaluation measures in Eurozone, we propose a panel data model in which the real unit labor cost is considered as the dependent variables and where the expected time in office (as postulated by the parties' opportunistic and strategic thinking hypothesis) and bond yields on long-term government debt (as postulated by the financial markets signals hypothesis) are the main independent ones. Besides the three already mentioned variables, we also include several relevant control variables; more details in this respect are provided in Table 8.

**Table 8. Variables considered.**

| Variable and Source | Comments |
|---|---|
| Real unit labor cost (AMECO database) | Ratio of compensation per employee to nominal GDP per person employed, base year: 2010 |
| Real GDP growth (Eurostat) | As an indicator of the phase of the economic cycle assuming that labor costs and productivity will depend on the time of the cycle in which the economy finds itself. |
| Trade openness (World Bank) | The aggregate of imports and exports as percentage of GDP under the assumption that a very open economy will have more flexible salaries and will drop its costs when confronted with lower productivity. |
| Debt/GDP (Eurostat) | If the debt to GDP ratio is very high, the government have a pressure to diminish it and in order to do this will bow to the pressures of creditors to cut the costs and public spending. |
| Budget balance (Eurostat) | Budget balance measured as percentage of GDP (a positive value indicates budget surplus, whereas a negative one, budget deficit); in the presence of deficits, it is expected that the government will make cuts, which can affect the value of real unit labor cost. |

| | |
|---|---|
| Trade balance deficit (Eurostat) | Dummy variable for trade balance deficit; in the presence of deficits, it is expected that the government will want to make the domestic production more competitive, which can negatively affect the value of real unit labor cost. It is also a signal for knowing which countries require devaluation measures. |
| Bond yields (Eurostat) | At present, harmonized long-term interest rates are available for 27 of the EU Member States. The indicator available at the moment for Estonia, taking into account the specific situation of this country, is not fully harmonized. The current indicator for Estonia represents a weighted interest rate on EEK-denominated loans to non-financial corporations and households with short, medium and long interest rate fixation periods. However, currently a large proportion of the underlying claims (on average 90%) are linked to interest rates with fixation periods up to one year. Basically, Estonia did not issue any kind of long-term debt, so interest rate for this country should be 0%. |
| Unemployment (Eurostat) | Measured as a percentage of active population, introduced under the assumption that higher levels of unemployment will put negative pressures on the equilibrium salary and will drop the ULC. Although, in principle, one might suspect endogeneity with respect to the inclusion of this variable, we note that in literature (Rebitzer, 1988) it is proven that the influence of unemployment is mediated by the power of the syndicates. However, as is the result of our correlation matrix, the link between the unemployment rate and the power of trade unions is weak. |
| Relative power in EU (own computations. with data from Eurostat) | The assumption is that the more powerful a country is within the Eurozone, the more it can influence the legislation in its interest and the more it could suffer from moral hazard when it comes to taking painful actions when affected by economic downturns (thus, we are expecting a negative sign for this coefficient). Measured as: $$relative\ power = 0.5\frac{own\ GDP}{Eurozone\ GDP} + 0.5\frac{own\ population}{Eurozone\ population}$$ |
| Bailout (own computations.) | Dummy for Troika bailout program (0 in the absence of the program, 1 in the presence of it per years). Assumption – a Troika bailout comes with harsh conditions, debilitating the domestic powers of the governments. In the case of Spain, a fund of 100 billion euro was made available but only 43 were used for banking system capitalization, and it wasn't contracted with the Troika, but through ESM (European Stability Mechanism). Still, critics have noted that the ESM severely confines the economic sovereignty of its member states (as Troika's interventions) and criticize that it provides extensive powers and immunity to the board of ESM Governors without parliamentary influence or control, that is why we also consider the Spanish case similar to a Troika's bailout (as a proof of the fact that the national sovereignty is affected, see the 2011 Spanish constitutional reform). |
| Union density (ILOSTAT and OECD) | The power of labor unions, measured as trade union density. The more powerful the unions, the harder for the cabinets to impose internal devaluation. In this case two sources have been used due to the complementarity of the datasets and due to the fact that the data does not differ (ILOSTAT and OECD have the same data collection sources – the national statistics agencies). |
| Programmatic position (Volkens et al., 2018) | Cabinet's programmatic position with respect to fiscal behavior; it is assumed that the parties on the left side of political spectrum are less prone to impose devaluation measures. As suggested by Bräuninger (Bräuninger, 2005), we employ the programmatic position as opposed to the ideological one, as it is more representative. |
| Time left (own computations.) | Computed as the durability of the government, which is estimated in a subsequent survival analysis model. Details below. |

It is quite difficult for the cabinets to know *ex ante* their survival time in power when facing the imposition of unpopular measures. Still, one can intuitively and correctly assume that their duration will depend on some political factors such as holding majority in legislative, the degree of fragmentation of the parliament or the ideological/programmatic

distance between the members of the coalition, just to name a few. Based on this idea, there is a whole body of literature which developed since the 80s in political science (Chiba et al., 2015; Diermeier & Stevenson, 1999; Laver, 2003; Lupia & Strøm, 1995; Merlo, 1997; Warwick, 1995) which tried to find the best predictors of cabinet durability using a methodology borrowed from health sciences: survival analysis. In order to produce these estimated times in office for each government, we employed a survival analysis model with a Weibull parametric regression (as opposed to a competing semiparametric Cox regression). Furthermore, it is also wrong for the purposes of our work to make a distinction between governments that end in dissolution and dismissal (as suggested by Diermeier & Stevenson, 1999), because there is no credible way in which a cabinet will know *a priori* how it will end. The regression output will be represented by hazard rates which have the same mathematical expression as in equation (22). The regression results will be used for estimating the duration of each observation in our sample.

The variables considered, replicating the models of many political science papers concerned with cabinet durability, are:

1) Days in office of each cabinet – dependent variable (source: Bértoa, 2019). Note: In case there were two or more cabinets in the same year, the cabinet with the higher number of days in office was selected.
2) The numerical status, if in minority, 0, if in majority, 1 (sources: Bértoa, 2019; European Consortium for Political Research, 2019).
3) Ruling number of parties (sources: Bértoa, 2019; European Consortium for Political Research, 2019).
4) The range between the most distant positions among the parties forming the government. Up until the present work, these distances were computed using the left right ideological distance. But, in the contemporary European landscape, this left-right divide will give nonrepresentative results; that is why, we introduced a new method and a new dimension. We took into account, besides the classical left-right dimension, also the pro vs. contra European integration perspective of the parties. Using these two dimensions, we computed a matrix of Euclidean distances between all the parties in the countries of the Eurozone, following the same formula as in equation (21). Of course, the assumption here was that the

more distant the governing coalition, the sooner it will break (source: own computations using data from Volkens et al., 2018).

5) Returnability, measured as the proportion of parties from current government that were part of the previous government (source: Bértoa, 2019). Assumption: the higher the proportion, the lower the costs of the governing parties to break to current coalition, because they know it's a high probability of their return in power. Note: the independent portfolio holders in each cabinet were not considered, as theoretically they do not act as a political party *per se* and they are not represented as a group in the next government.
6) The complexity of the bargaining system measured as the effective number of political parties (source: Gallagher, 2019), under the assumption that a complex bargaining system will create cabinets more prone to the shocks, thus lowering their survivability.
7) Years elapsed since last election – the governments that form early in the inter-electoral period have higher chances of staying in office because of the longer possible tenure; the year of election is considered as year 0 if the election takes part in the first half of the year, if not, year 0 is considered the next year.

Survival analysis requires a special treatment of data and cannot be substituted by regular linear regression mainly due to two reasons. 1. Because the dependent variable is always a time unit, its estimated value cannot be negative (in a linear regression case it can be). 2. Data from the survey can be censured and this is a special case of missing data, that offers important information on the observations (Kleinbaum & Klein, 2012). In our case, as the sample we extracted finishes in 2017, the cabinets still in office on January 1st 2018, were considered censored observations.

After performing a preliminary correlation matrix, we discovered pairs of variables with very high correlation coefficients, and some variables (not presented here), were subsequently eliminated. As such, the panel-specific econometric expression of our main model looks as follows:

$$real\ unit\ labor\ cost_{it} = \beta_0 + \beta_1 Control_{it} + \beta_2 Time\ left_{it} + \beta_3 Yields_{it} + \alpha_i + U_{it} \quad (24)$$

where $Control_{it}$ are the control variables indicated above, in Table 8, $Time\ left_{it}$ is the expected time left in office for the cabinets and $Yields_{it}$ are the long-term interest rates for governments debt; in the case of governments that survived for different years, we discounted the days spent in office from the beginning of each year in the sample. The $\alpha_i$ indicates the unobserved heterogeneity and $U_{it}$ is the idiosyncratic error. We also performed a Hausman test, which indicated the appropriateness of fixed rather than random effects or pooled OLS. Our post-estimation robustness check includes a Variance Inflation Factor test (we tested the remaining variables for multicollinearity problems and eliminated those that had a VIF higher than 10). Under the assumption that the government have real-time indications and forecasts on some variables (so it based its strategy on current information) and due to a higher level of determination, we decided to employ a concurrent model as opposed to a lagged model.

### 5.4. Results and discussions

We start this section by presenting the results of our cabinet durability estimations in Table 9. Postestimation tests for model fitness (Akaike's information criterion and Bayesian information criterion – see Table 15 and Table 16 in Appendix C) ran after a Weibull parametric and Cox proportional hazards regression models suggested the use of the former.

The results of the estimation have a high degree of significance (with the exception of time since last elections), and are in line with theoretical expectations and with the findings of many other empirical studies from the same vein of research. Specifically, the results suggest that having majority in parliament decreases the chances of government termination by close to 65%, the complexity of the system by 20%, while with each extra party in government coalition, the chances increase by 30% and returnability and programmatic distance both have little (although significant) hastening effects on termination.

The exposition of these results is merely indicative and it is meant to provide us with a certain guarantee that the survival analysis estimation is done correctly, because, for the purposes of this study, it must be used later for the main model. Concretely, we employ the estimates of the survival analysis model, subtract from them the Cox-Snell residuals (as

suggested in Zhao et al., 2011) and interpret them as if they were the expected time in office for each cabinet in our sample.

**Table 9. Survival analysis results (Weibull regression).**

| Time left | Coef. | St.Err. | t-value | p-value | [95% Conf. | Interval] | Sig |
|---|---|---|---|---|---|---|---|
| Government numerical status | 0.357 | 0.065 | -5.62 | 0.000 | 0.250 | 0.512 | *** |
| Ruling number of parties | 1.313 | 0.096 | 3.72 | 0.000 | 1.138 | 1.516 | *** |
| Complexity of the system | 0.803 | 0.058 | -3.03 | 0.002 | 0.697 | 0.926 | *** |
| Returnability | 1.004 | 0.002 | 1.68 | 0.093 | 0.999 | 1.008 | * |
| Programmatic distance | 1.015 | 0.007 | 2.24 | 0.025 | 1.002 | 1.028 | ** |
| Last elections | 0.957 | 0.061 | -0.69 | 0.493 | 0.846 | 1.084 | |
| Constant | 0.000 | 0.000 | -15.20 | 0.000 | 0.000 | 0.000 | *** |

| | | | |
|---|---|---|---|
| Mean dependent var | 994.798 | SD dependent var | 466.369 |
| Number of obs. | 198 | Chi-square | 62.524 |
| Prob > chi2 | 0.000 | Akaike crit. (AIC) | 264.568 |

**** p<0.01, ** p<0.05, * p<0.1*

For the main model variables, we employed a correlation matrix, presented in Table 10. As noted, none of the independent variables' pairs have correlation coefficients above ±0.8, which implies that there are no multicollinearity issues in our model.

At first, just by looking at the relations from Table 10, it seems that there is a positive association between unit labor costs and the bond yields and a negative one with cabinet durability, thing that could validate the strategic thinking and opportunistic behavior hypothesis, although the coefficients are very weak in both cases, and as a consequence we cannot infer on this association.

The results of the panel data model with fixed effects is presented in Table 11. The coefficients for four control variables, namely Bailout, Relative power, Programmatic position, and Trade deficit are not statistically significant.

This is a thing that deserves our attention; the fact that trade deficit, which is considered to be one of the main reasons for the need of internal devaluation measures, is not relevant (at least statistically), but the budget deficit is, suggests us that the imposition of such measures is mostly determined by the fundamentals of government financial soundness (as predicted by the financial signals hypothesis).

**Table 10. Correlation matrix**

| Variables | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| (1) Real unit labor cost | 1.000 | | | | | | | | | | | | |
| (2) Real GDP growth | -0.497 | 1.000 | | | | | | | | | | | |
| (3) Trade openness | -0.154 | 0.285 | 1.000 | | | | | | | | | | |
| (4) Debt/GDP | -0.206 | -0.176 | -0.404 | 1.000 | | | | | | | | | |
| (5) Budget balance | -0.104 | 0.359 | 0.184 | -0.362 | 1.000 | | | | | | | | |
| (6) Trade deficit | 0.120 | -0.085 | -0.405 | -0.040 | -0.167 | 1.000 | | | | | | | |
| (7) Bond yields | 0.046 | -0.408 | -0.227 | 0.288 | -0.505 | 0.367 | 1.000 | | | | | | |
| (8) Unemployment | -0.142 | -0.217 | -0.196 | 0.330 | -0.511 | 0.163 | 0.420 | 1.000 | | | | | |
| (9) Relative power | 0.070 | -0.059 | -0.482 | 0.337 | 0.059 | -0.000 | -0.138 | -0.047 | 1.000 | | | | |
| (10) Bailout | -0.143 | -0.270 | -0.083 | 0.418 | -0.469 | 0.085 | 0.599 | 0.583 | -0.147 | 1.000 | | | |
| (11) Union density | -0.053 | -0.064 | 0.011 | 0.206 | 0.073 | -0.094 | 0.029 | -0.220 | -0.185 | -0.007 | 1.000 | | |
| (12) Programmatic position | 0.081 | -0.013 | -0.008 | -0.043 | 0.087 | -0.057 | 0.026 | -0.118 | 0.108 | -0.019 | 0.039 | 1.000 | |
| (13) Time left | -0.050 | -0.027 | 0.082 | 0.012 | 0.008 | -0.102 | 0.059 | 0.078 | 0.069 | 0.127 | -0.012 | 0.024 | 1.000 |

The rest of the control variables seem to indicate expected coefficients in relationship with the unit labor costs, as backed by the theoretical macroeconomics framework.

The GDP growth rates indicates the wage stickiness in a growing economy, the trade openness demonstrates the competitiveness of wages in a labor market which have this characteristic, high or increased unemployment rates negatively affects the unit labor costs due to excess labor supply, while powerful unions account for higher wages.

The validity of the financial signals hypothesis and the refutability of the strategic and opportunistic thinking hypothesis are finally established by the coefficients of our interest variables.

Specifically, the expected time in power of the cabinets seem to be irrelevant (p value > 0.8), but not the signals from the financial markets. Concretely, we find evidence that, with each 1% increase in the bond yields for their long-term debt, the real unit labor costs drop by approximately 0.5%, *ceteris paribus*.

**Table 11. Fixed effects model results**

| Real unit labor cost | Coef. | St.Err. | t-value | p-value | [95% Conf | Interval] | Sig |
|---|---|---|---|---|---|---|---|
| Real GDP growth | -0.534 | 0.081 | -6.60 | 0.000 | -0.694 | -0.374 | *** |
| Trade openness | -0.081 | 0.028 | -2.88 | 0.005 | -0.137 | -0.025 | *** |
| Debt/GDP | 0.061 | 0.029 | 2.10 | 0.038 | 0.004 | 0.119 | ** |
| Budget balance | -0.349 | 0.093 | -3.77 | 0.000 | -0.532 | -0.166 | *** |
| Trade deficit | 0.187 | 0.909 | 0.21 | 0.837 | -1.611 | 1.985 | |
| Bond yields | -0.507 | 0.195 | -2.60 | 0.010 | -0.892 | -0.121 | ** |
| Unemployment | -0.586 | 0.140 | -4.20 | 0.000 | -0.862 | -0.310 | *** |
| Relative power | -1.813 | 2.070 | -0.88 | 0.383 | -5.907 | 2.281 | |
| Bailout | 0.704 | 1.472 | 0.48 | 0.633 | -2.207 | 3.616 | |
| Union density | 0.725 | 0.207 | 3.50 | 0.001 | 0.315 | 1.135 | *** |
| Programmatic position | -0.004 | 0.021 | -0.21 | 0.832 | -0.046 | 0.037 | |
| Time left | 0.000 | 0.001 | -0.15 | 0.884 | -0.002 | 0.001 | |
| Constant | 102.579 | 14.762 | 6.95 | 0.000 | 73.380 | 131.777 | *** |

| | | | |
|---|---|---|---|
| Mean dependent var | 98.606 | SD dependent var | 5.288 |
| R-squared | 0.586 | Number of obs | 163.000 |
| F-test | 15.691 | Prob > F | 0.000 |

**** p<0.01, ** p<0.05, * p<0.1*

The model has a high degree of determination (close to 60% of the variability in real unit labor costs is explained by our model) and the post-estimation robustness check done with the help of Variance Inflation Factor (Table 17) suggests that there are no multicollinearity issues (VIFs are below the suggested threshold – 10).

## 5.5. Conclusions

The results presented and detailed above come with mixed implications; on the one side, one can argue that such finding is encouraging and inherently good for the purposes

of maintaining fiscal discipline. The governments are less prone to take measures that have profound economic implications solely on electoral grounds, and more inclined towards listening to the relevant opinions (debatable) on the matter, like the ones coming from financial markets.

On the other side though, there might be an even greater issue; the fact that democratically elected governments do not seem to care about their time in power, might give hints at a crisis of representation, the crucial question here being: why should the governments be more responsive to financial markets signals than to the ones coming from their own voters? The implications of the later are even more far-reaching and problematic if we take into account the fact that, as presented before, the financial markets are not completely rational.

Our findings are, although still up for debate, in line with those of some other recent paper concerned with the more encompassing government preferences on EMU reforms; Târlea et al (Târlea et al., 2019), focusing on the drivers for the reforms between 2010-2015 in Euro area, gave proof that the degree of exposure of domestic financial sectors have sufficient explanatory power, while the political factors had no systematic impact.

Going even further, these authors argue that actually the domestic financial sectors positions rather that political and ideological views pitted creditor countries against debtor ones in the period taken into consideration. Our study concludes with the same concerning affirmation, that should also be taken as a warning: financial markets rather than voters seem have taken the central stage in European politics and policy-making arenas.

# Chapter 6. Assessing the optimality of euro adoption in Romania through shock correlations

## 6.1. Introduction

The main objective of this study is to provide an evidence-backed answer to whether, at this point in time, Romania is prepared to adopt the European single currency. The empirical evaluation of this very complex issue is done using the most widely accepted methodology in the optimum currency areas (OCA) literature: the SVAR Blanchard and Quah decomposition for the underlying demand and supply shocks (Blanchard & Quah, 1989). By correlating these shocks that hit the Romanian economy and the ones that hit some other European economic entities (both national economies and EU/EA economic aggregates) in the past 25 years (1995-2019), a clear conclusion on the matter at hand can be inferred.

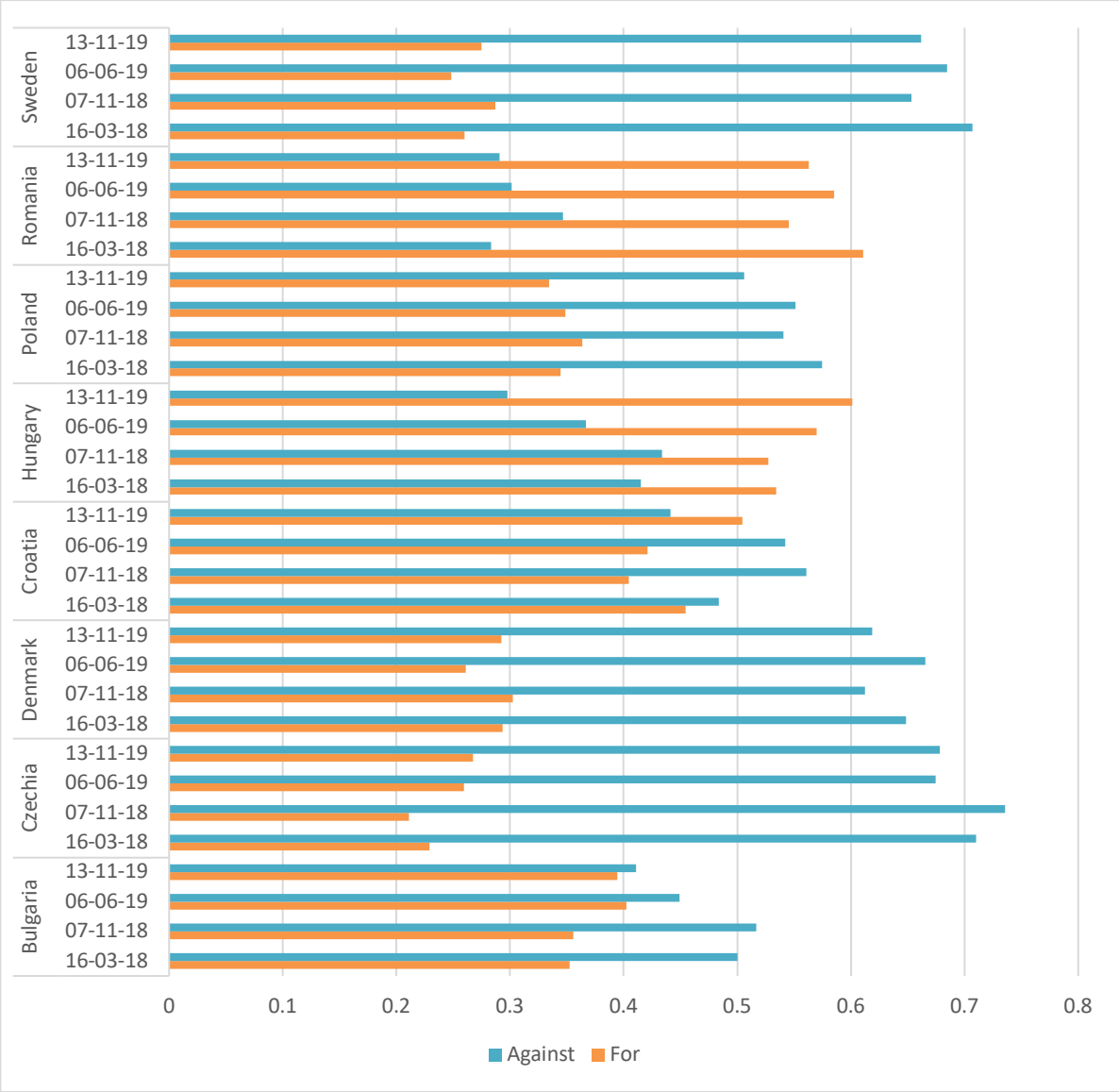
The relevance of this paper stems from the fact that it is the first study of this kind involving Romania taking into account the effect of two irreversible and structural changes that took place after 2005 (central bank independence and EU accession). As such, this study comes to reassess the situation after three decades of economic and political transition, after 14 years of central bank independence, and after 12 years of EU integration efforts.

Furthermore, the recent advances from neighbor countries on euro adoption, might also push the issue on the agenda of the executive from Bucharest. Given that the regional political and macroeconomic landscape has changed, a reassessment of the optimality of euro adoption is clearly demanded.

The literature on the optimum currency areas (OCAs) in Europe has developed a great deal since the seminal paper of Mundell (Mundell, 1961) and comprises both theoretical and empirical studies which shaped academic and the policy-oriented discussion on the creation and functioning of the single currency area we know today. At the same time and in parallel, the European single currency project advanced passing through various phases (European Monetary System, ECU, euro and cash euro, etc.) since the Werner Report and the end of Bretton-Woods system in the 70's. Nowadays, the euro area encompasses the economies of 19 European countries (with other micro and small states using the euro as

their *de facto* currency on the basis of agreements on monetary relations or due to the *euroization* of their economies), and close to 350 million citizens as daily users.

**Figure 17. Sentiments regarding the EMU in selected EU non-euro area countries.**




**Question: "What is your opinion on each of the following statements? Please tell me for each statement, whether you are for it or against it. A European economic and monetary union with one single currency, the euro." DK/NAs ("don't know/no answer") not included. Source: own elaboration with data from Eurobarometer.**

On the basis of EU legislation, all EU countries without the euro (except Denmark, which opted out) are required to adopt the single currency after having fulfilled the Maastricht convergence criteria[9]. Nevertheless, five countries (Czech Republic, Hungary, Poland, Romania and Sweden) preferred not relinquishing their monetary sovereignty at

[9] Art. 140 (1) TFEU

all, while other two (Bulgaria and Croatia) only recently expressed their intention to join the euro antechamber (i.e. ERM II)[10].

The most recent Eurobarometers (Figure 17) show very mixed feelings; while there are some euro-optimist member states, significantly low or decreasing popular support for the euro adoption and Economic and Monetary Union are registered in several of these countries, with governments and central banks also hesitant on advancements on the issue.

These facts pose a conundrum for both academic and policy-making spheres with respect to the optimal size and the right composition of the euro area. This study, although touching upon all EU member states, focuses on the Romanian case in the effort of making an empirical and measurable assessment of euro adoption optimality in this Eastern European country.

The rest of the paper is structured as follows. In the second section an in-depth literature review centered around OCAs is provided with subsections centered around its theoretical foundations, its properties and the most relevant empirical studies. The subsequent section details the economic and econometric model of choice, while also indicating the data source and the statistical tool. The fourth part consists of results and their interpretation, while the last one is reserved for conclusions and policy recommendations.

## 6.2.Literature review

### *6.2.1. The foundations of the OCA*

One of the most relevant costs associated with adopting the euro is the relinquishment of the sovereign monetary policy instrument, which has been extensively used in the past, especially during the decade of the 90s by the Romania government in concert with a non-independent National Bank of Romania (Bodea & Sánchez-Santos, 2020). Against the background of the hardships imposed by transition, monetary policy helped the executive in achieving both commercial policy objectives (devaluation to buttress exports) and fiscal policy objectives (inflation to reduce public debt denominated in domestic currency and raise seigniorage and other indirect taxes).

[10] "Commission welcomes Bulgaria and Croatia's entry into the Exchange Rate Mechanism II". European Commission. Brussels. Press release. 12 July 2020.

Nevertheless, the full range of costs, as well as benefits of joining a monetary union, is not limited only to achieving commercial and fiscal policy objectives, the issue being at the core of the literature of optimum currency areas (OCAs).

The theory of OCAs pioneered by Robert Mundell (Mundell, 1961) and McKinnon (McKinnon, 1963), established the prerequisites for monetary integration: price and wage flexibility, mobility of factors of production, financial markets integration, economic openness, production and consumption diversification, inflation correlation and fiscal and political integration – achieving fiscal integration is only possible if there is enough political drive (Issing, 2004).

Further studies focused on the cost-benefit analysis with a special focus on the need for real exchange rate adjustments in the absence of the fine-tuning option provided by the sovereign monetary policy (Corden, 1972). Moreover, the inability to steer the economy along the unemployment-inflation curve coupled with some unrealistic assumptions of the OCA theory might entail very high costs for a fixed exchange rate regime (Ishiyama, 1975), especially in the context of asymmetric shocks (Mongelli, 2002).

The advent of the monetarist critique of the short-term Phillips curve (i.e. wage bargaining takes into account expected, not current inflation) debilitated the argument for a sovereign monetary policy (Artis, 1991; McCallum, 1989) and subsequent debates centered around the negative effects of higher inflation (association with higher unemployment levels and lower income per capita) (Emerson, 1992), and on the credibility of the sovereigns. Countries with historical higher inflation might suffer from credibility issues when pursuing inflation reduction policies since there is always the risk of reversing them. One way of gaining credibility is by "tying its hands", i.e. entering a monetary union with another low-inflation anchor country (Giavazzi & Giovannini, 1989; Mongelli, 2002).

### *6.2.2. OCAs meta property – shock correlations*

The studies cited above, although setting up the theoretical framework for the debate, lacked nevertheless the empirical dimension. The already advanced state of the debate, coupled with a renewed interest for OCAs kindled by the integration push from the Delors Commission, and with methodological advancements, mainly in time series analysis, set the scene for the "empirical studies phase" in the literature of OCAs (Mongelli, 2002). Price and wage flexibility, labor, factor, and financial markets integration, as well as the

degree of economic openness and of political integration were all empirically assessed for a series of countries/regions (for a detailed literature review please refer to Mongelli, 2002). A vein of the literature concentrated on a "catch-all" or meta OCA property: the similarity of shocks; the present study falls in this category.

The reason for which the similarity of shocks is envisaged as some sort of catch-all property for an OCA is that in the presence of high correlation between the shocks affecting different economies, the need to have specific and divergent fiscal and monetary responses across the currency union drops, thus rendering the sovereignty in these areas less useful.

A major impediment in assessing the correlation between the shocks was with respect to the source of them; some of the shocks might not be totally exogenous in the case of countries with sovereign monetary policy, since the said policy might act as a source of asymmetric shocks (albeit temporary). In order to solve this issue, Bayoumi and Eichengreen (Bayoumi & Eichengreen, 1993) implemented a methodology first developed by Blanchard and Quah (Blanchard & Quah, 1989) in order to discriminate between permanent and temporary shocks (as the ones generated by a sovereign monetary policy). It consists of extracting from the time series of prices and output data the demand and supply shocks by first estimating a structural vector autoregressive model and then discerning between temporary (demand-side driven) and permanent (supply-side driven) shocks. A correlation between the series of demand and supply shocks is then computed for all the prospective countries of a monetary union, on the one side, and the average of the union (or an anchor country), on the other side, thus obtaining a quantifiable indication of the optimality of single currency adoption in each country (de Grauwe, 2018, pp. 78–80).

### *6.2.3. Empirical studies on shock correlations*

The firsts to discriminate between the supply and demand shocks on the basis of the effect they have on output and unemployment were Blanchard and Quah (Blanchard & Quah, 1989), establishing that the former have a permanent effect on the GNP after two years, reaching a plateau after five, while the latter will determine a hump-shaped mirror image on both GNP and unemployment.

Bayoumi and Eichengreen (Bayoumi & Eichengreen, 1993) borrowed from the previously-cited study the methodological apparatus and used it in the framework of OCA literature. Employing data spanning from 1960 to 1988 for output and inflation for 12 European Community (EC) member states, among others, they established that the underlying shocks are considerably more idiosyncratic across these countries, than across the US, which corroborated with the lower factor mobility, lead the authors to infer the increased difficulty of operating a monetary union in EC. Nevertheless, at the same time a cluster of countries concentrated around West Germany was identified as the core of the future EMU on the basis of increased shock synchronization. Their findings were confirmed by Bayoumi and Eichengreen and Demertzis et al. (Bayoumi & Eichengreen, 1996; Demertzis et al., 2000).

The finding that in Europe there is more symmetry on the demand side, mainly manipulated by the policy intervention, made Demertzis et al. (Demertzis et al., 2000) conclude that the Economic and Monetary Union, while not naturally an OCA, is held together by policies targeted at synchronization.

Unsurprisingly, shock similarity between regions within the same country was found to be higher than the one between countries in Europe, as the cases of US or Germany prove (Bayoumi & Eichengreen, 1993; Funke, 2000), but however, account for a big part of the variability across the Euro area, with peripheral countries having important regions in the core and *vice versa* (Forni & Reichlin, 1997).

Studies assessing the shock similarity between Central and Eastern European countries (CEECs) and their Western counterparts, are scanter than the ones solely concerned on Western Europe and are mostly concentrated in the period of early 2000, when the post-communist bloc was still struggling with economic transition and was in the process of EU accession.

Frenkel and Nickel (Frenkel & Nickel, 2002), building on previous research (Frenkel et al., 1999) with observations spanning from 1993 to 2001, found the highest correlations of demand shocks with EMU as a whole to be with Hungary and Poland, while on the supply side, the best candidates for euro adoption were Hungary and Slovenia. However, due to the lack of appropriate quarterly GDP data, Romania was not included in the sample.

The first study to include Romania produced clear-cut evidence against euro adoption, as the correlation values with the euro area were virtually 0 (Fidrmuc & Korhonen, 2003) and brought again into attention that among the CEECs, Hungary was by far the most aligned with the shocks in the single currency zone.

The literature focused on this *meta* OCA property lost momentum after the empirical researches conducted in late 90s and early 2000s. Campos and Machiarelli made a relatively recent reassessment of the shock similarity situation in the Euro area (reaching the conclusion that the core-periphery gap narrowed since the initial studies), but without including the CEECs (Campos & Macchiarelli, 2016).

The fact that these empirical researches are concentrated in early 2000 is due to two main reasons (Frenkel & Nickel, 2002): data availability (the lack of relevant or unreliable data for the decade of the 90s determined small sample sizes, affecting the estimation results and burdening the previous attempts), and political and economic uncertainty (when and by how much was the EU/EMU to expand in Central and Eastern Europe?). As such, the results obtained by these studies might not currently hold, as important structural changes might have taken place; CEECs had already known considerable periods of integration with their Western counterparts since then.

The most recent attempts to reassess the Romanian situation (we are aware of) are detailed in the following paragraphs. In a 2013 paper which briefly touched upon the shock similarity aspect in the context of a wider CEECs sample and confirmed the initial intuition in the literature: the EU integration period structurally modified the economies of the new member states and synchronized their shocks (Bobeica & Manu, 2013). Noteworthy is the fact that while the correlation of supply-side shocks reached 0.5, the demand-side one stayed close to 0, suggesting that in the transition period in Romania, the problem might have lied with behavior in consumption, which the authors link with the policy induced temporary disturbances such as the allowance of credit boom in the pre-2008 period and the cut in public sector wages in 2010 (highly pro-cyclical policies) (Bobeica & Manu, 2013).

Empirical studies conducted in the last two years seems to point towards mixed and inconclusive results. Deskar-Škrbić et al. (Deskar-Škrbić et al., 2020) assessing the three candidate countries from the third wave of expansion (Bulgaria, Croatia, Romania) found evidence that they are all fit for adopting the counter-cyclical ECB monetary policy, notwithstanding their different past exchange rate regimes. On the other hand, Grimm et

al. (Grimm et al., 2021) rejected the notion that these countries share a common cyclical response pattern with the EA aggregate (with the exception of Sweden), at best, their business cycles exhibiting very weak codependence (given the spillovers from the EA). In the same line, Arčabić & Škrinjarić (Arčabić & Škrinjarić, 2021), argue that due to the large spillovers, especially since 2007-2016 period of Great Recession, national stabilization policies proved ineffective, and a greater degree of international policy coordination is recommended.

One common shortcoming of these above-mentioned empirical studies is that they do not take into account two extremely important structural changes suffered by the Romanian economy that are particularly relevant for the shock correlation aspect. (1) In 2005 the National Bank of Romania was granted a new statute, considerably more independent from political mixtures (Bodea & Sánchez-Santos, 2020) and changed its mandate from monetary base targeting to inflation targeting (Deskar-Škrbić et al., 2020). (2) In 2007, Romania's EU accession happens, granting a more integrated approach towards the fiscal and monetary policy. As such, in order to control for these changes, we propose a competing model taking into account strictly the post-2005-time series of our variables of interest, being able to isolate the latest irreversible developments without "the noise" of the 90s and early 2000s period.

Noting the inclusiveness of the empirical researches on the similarity of shocks between Romania and the euro area, as well as the lack of any study to account strictly for the effect of the past decade of EU integration policies in Romania, the present paper comes to fill these gaps in the literature and reassess the situation at 30 years since the start of the economic and political transition, at more than 14 years since central bank independence, and at more than 12 years since EU accession. Of high importance is also the evaluation of the overall effect of policy induced short term disturbances (identified in the literature as the main driver for the demand side correlation); if for the immediately *ante-* and *post-*2008 financial crisis period, the economic policy has been highly pro-cyclical and resulted in null correlations with the overall euro area trends, where does it stand now?

## 6.3.Methodology, data, and tools

### *6.3.1. The AD-AS model*

The methodological framework starts from the basic aggregate demand and aggregate supply model (AD-AS) – not depicted here. The AD curve is downward slopping since demand is inversely related to the level of prices (lower prices boost demand). On the other side, short-run AS curve is upward sloping indicating the direct relationship between price level and firm output and the wage stickiness (implying that higher prices mean lower real salaries). At the same time, long-run AS curve is perfectly inelastic to changes in price level and real wages adjust to changes in prices in the long-run (Bayoumi & Eichengreen, 1993).

An expansionary aggregate demand shock will shift both output and price levels upwards in the short-run, but in the long run, the real output will come back to its previous level, while the prices will raise to a level permanently higher. On the other side, an aggregate long-run supply-side shock (such as a technology improvement) will result in the short-run in lower prices and higher output since it will shift downwards the short-run AS curve. In the long run, the new AS curve will become increasingly inelastic, shifting the long-run AS curve to the right and permanently increasing the output while, putting downward pressure on prices (Bayoumi & Eichengreen, 1993). The exercise within the AD-AS model proves that demand shocks will have a short-living effect on real output, while the supply shocks will have a permanent one.

### *6.3.2. The SVAR model for demand vs. supply shocks discrimination*

The methodology firstly proposed by Blanchard and Quah (Blanchard & Quah, 1989) and later employed and extended by Bayoumi and Eichengreen (Bayoumi & Eichengreen, 1993), is the procedure for decomposing permanent and temporary shocks. The model starts from the infinite moving average representation of the bivariate vector autoregressive system featuring GDP and inflation data as:

$$X_t = A_0\varepsilon_t + A_1\varepsilon_{t-1} + A_2\varepsilon_{t-2} + A_3\varepsilon_{t-3} + \cdots = \sum_{i=0}^{\infty} L^i A_i \varepsilon_t \tag{25}$$

where $X_t$ is the bivariate vector $[\Delta y_t, \Delta p_t]$, (stationary output and prices first-differenced time series), $L^i$ is the lag operator, and the matrix $A$ represents the impulse response functions of the shocks to $X$.

As such, expression (25) can be written in matrix form as:

$$\begin{bmatrix}\Delta y_t \\ \Delta p_t\end{bmatrix} = \sum_{i=0}^{\infty} L^i \begin{bmatrix}a_{11i} & a_{12i} \\ a_{21i} & a_{22i}\end{bmatrix}\begin{bmatrix}\varepsilon_{dt} \\ \varepsilon_{st}\end{bmatrix} \tag{26}$$

where $\begin{bmatrix}\varepsilon_{dt} \\ \varepsilon_{st}\end{bmatrix}$ is the vector of output and price disturbances and $a_{11i}$ represents the element $a_{11}$ for the country $i^{th}$ in matrix $A_i$ and so on.

In order to allow for the temporary effect of inflation on output (i.e. demand shocks have no permanent effect on GDP), one must impose the restriction that element $a_{11i}$ of matrix $A_i$ is equal to 0. Besides this restriction, there are three others to allow for the identification of all four elements of matrix $A_i$: the orthogonality (independence) of the demand and supply shocks and two restrictions regarding the normalization of the disturbances terms (Campos & Macchiarelli, 2016; Fidrmuc & Korhonen, 2003).

Another way to look at this is by starting from the Structural VAR expression of the system (i.e. allowing for contemporaneous relations between both endogenous variables). Assuming a bivariate SVAR(1) – with one lag, the expression is as follows:

$$AX_t = \beta_0 + \beta_1 X_{t-1} + u_t \tag{27}$$

which in linear forms is:

$$\begin{aligned} y_t + a_{12}p_t &= b_{10} + b_{11}y_{t-1} + b_{12}p_{t-1} + u_{yt} \\ a_{21}y_t + p_t &= b_{20} + b_{21}y_{t-1} + b_{22}p_{t-1} + u_{pt} \end{aligned} \tag{28}$$

and in matrix form is:

$$\begin{bmatrix}1 & a_{12} \\ a_{21} & 1\end{bmatrix}\begin{bmatrix}y_t \\ p_t\end{bmatrix} = \begin{bmatrix}b_{10} \\ b_{20}\end{bmatrix} + \begin{bmatrix}b_{11} & b_{12} \\ b_{21} & b_{22}\end{bmatrix}\begin{bmatrix}y_{t-1} \\ p_{t-1}\end{bmatrix} + \begin{bmatrix}u_{yt} \\ u_{pt}\end{bmatrix} \tag{29}$$

In order to solve for this system of equations, one must premultiply the whole expression in equation (27) with the inverse of the matrix $A$, which will result in the so-called reduced-form VAR, with the following expression:

$$A^{-1}AX_t = A^{-1}\beta_0 + A^{-1}\beta_1 X_{t-1} + A^{-1}u_t \tag{30}$$

and by substituting $A^{-1}\beta_0$ with $G_0$, $A^{-1}\beta_1$ with $G_1$ and $A^{-1}u_t$ with $e_t$ we get:

$$X_t = G_0 + G_1 X_{t-1} + e_t \tag{31}$$

The identification issue persists also in this case, since there are more unknowns than parameters to be estimated, so the most straightforward way is to proceed in the same

manner and impose the restriction that term $a_{12} = 0$ in matrix $A$, i.e. in the above-discussed case, allow for contemporaneous effect of output to prices, but not *vice versa*.

This will result in equation (28) to change to:

$$\begin{aligned} y_t &= b_{10} + b_{11}y_{t-1} + b_{12}p_{t-1} + u_{yt} \\ -a_{21}y_t + p_t &= b_{20} + b_{21}y_{t-1} + b_{22}p_{t-1} + u_{pt} \end{aligned} \tag{32}$$

Noteworthy is the fact that by imposing this restriction, the inverse of matrix $A$, i.e. matrix $A^{-1}$, will also change such that:

$$A^{-1} = \begin{bmatrix} 1 & 0 \\ -a_{21} & 1 \end{bmatrix} \tag{33}$$

and equation (31) in its matrix form will become:

$$\begin{bmatrix} y_t \\ p_t \end{bmatrix} = \begin{bmatrix} g_{10} \\ g_{20} \end{bmatrix} + \begin{bmatrix} g_{11} & g_{12} \\ g_{21} & g_{22} \end{bmatrix} \begin{bmatrix} y_{t-1} \\ p_{t-1} \end{bmatrix} + \begin{bmatrix} e_{yt} \\ e_{pt} \end{bmatrix} \tag{34}$$

which will be equivalent to:

$$\begin{bmatrix} y_t \\ p_t \end{bmatrix} = \begin{bmatrix} b_{10} \\ -a_{21}b_{10} + b_{20} \end{bmatrix} + \begin{bmatrix} b_{11} & b_{12} \\ -a_{21}b_{11} + b_{21} & -a_{21}b_{12} + b_{22} \end{bmatrix} \begin{bmatrix} y_{t-1} \\ p_{t-1} \end{bmatrix} + \begin{bmatrix} u_{yt} \\ -a_{21}u_{yt} + u_{pt} \end{bmatrix} \tag{35}$$

Note again how in this case also the errors (shocks) relate to one another, in the sense that an output shock will not be affected by price fluctuations, but the price level will be negatively affected by output increases, as the economic intuition dictates.

After the demand and supply shocks are recuperated from the system, we perform correlations between all the countries in the EU (with some exceptions due to missing data) and we map them on a bi-dimensional graph to have the overall picture regarding shock similarity (as in Bobeica & Manu, 2013; Campos & Macchiarelli, 2016; Fidrmuc & Korhonen, 2003).

In this regard, noteworthy is the common shortcoming of the previous papers of using uninterrupted time series. Arguably, this strategy is employed to obtain a larger sample, but the downside is quite serious – the ample shocks from 90s and early 2000s is camouflaged in the series. This pose the problem of having a past noise that is no longer relevant for the present outlook since irreversible changes (such as NBR independence and EU accession) took place. The only paper we are aware of using broken down time series (Deskar-Škrbić et al., 2020) made an debatable choice in this regard in our opinion. The

choice of 2009 as the break point is not a good reference since it's a common shock to all and is losing sight of 16 quarters of important reforms in Romania.

### *6.3.3. Data and statistical tool*

We employ quarterly country-specific time series from Eurostat for two variables: real GDP (in 2015 euro) and price index, both calendar and seasonally adjusted. To ensure the validity of using an SVAR, we performed two different tests: (1) a Johansen cointegration tests for the variables in levels and (2) a stationarity test (Augmented Dickey Fuller test). The results of these tests for Romania and EU15 specific variables (presented only for these two economic entities given the space constrains) are detailed in the Appendix D. The results of the Johansen test recommend the use of an SVAR model, as opposed to a vector error correction model (VECM). Noticing the non-stationarity of the output in levels, we took its natural logarithm and performed a first-order difference (inflation already is stationary as presented in Note: only the case of these two economic entities has been included due to space constraints.

Table 19 and Table 20) – a procedure also used in many other similar paper (Campos & Macchiarelli, 2016; Deskar-Škrbić et al., 2020; Fidrmuc & Korhonen, 2003).

The time span of both time-series variables is 1995q1-2019q4 including (with the exception of Czech Republic and Netherlands which start from 1996q1) and our sample covers 34 entities: EU28 countries (without Slovakia and Malta due to lack of relevant data), Switzerland, Norway, and Eurostat-aggregated data for EU28, EU27, EU15, EA12, EA19 and EA (changing composition). However, in order to take into account the very important issue of structural changes in the economy (discussed above), we employ the overall sample and another subsample (1995q1 – 2019q4 and the subsample 2005q1 – 2019q4).

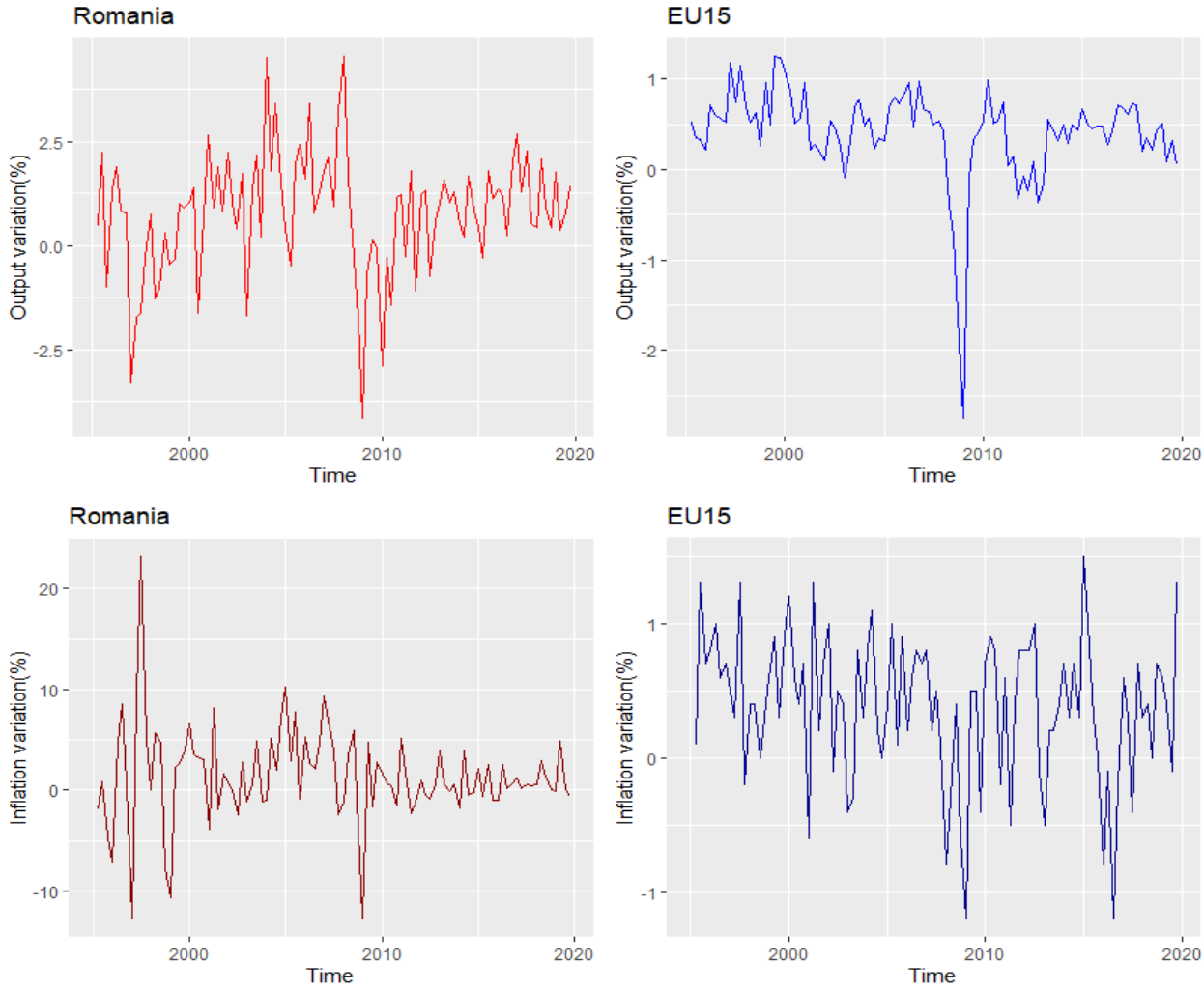
Data treatment and the econometric analysis were performed in R and the specific Blanchard and Quah decomposition was achieved by executing the *BQ{vars}* function developed by Pfaff (2021). The lag selection was done following Campos and Macchiarelli (2016), i.e. of order 2.

## 6.4.Results, discussions, and implications

Although Eurostat data included observations for the period previous to adoption of the euro, for all EA19 member states, for the sake of historical accuracy and due to continuous change in composition of the latter, the main comparison counterpart for Romania is set to be EU15.

We start from raw data representation. The graphs of quarterly (quarter-to-quarter change) output and inflation variation in Romania and EU15 are shown in Figure 18. The variation in both variables is noticeably much higher for Romania, observation consistent with two facts.

**Figure 18. Quarterly output and inflation variation in Romania and EU15 1995q1-2019q4 including. Source: own elaboration with data from Eurostat.**

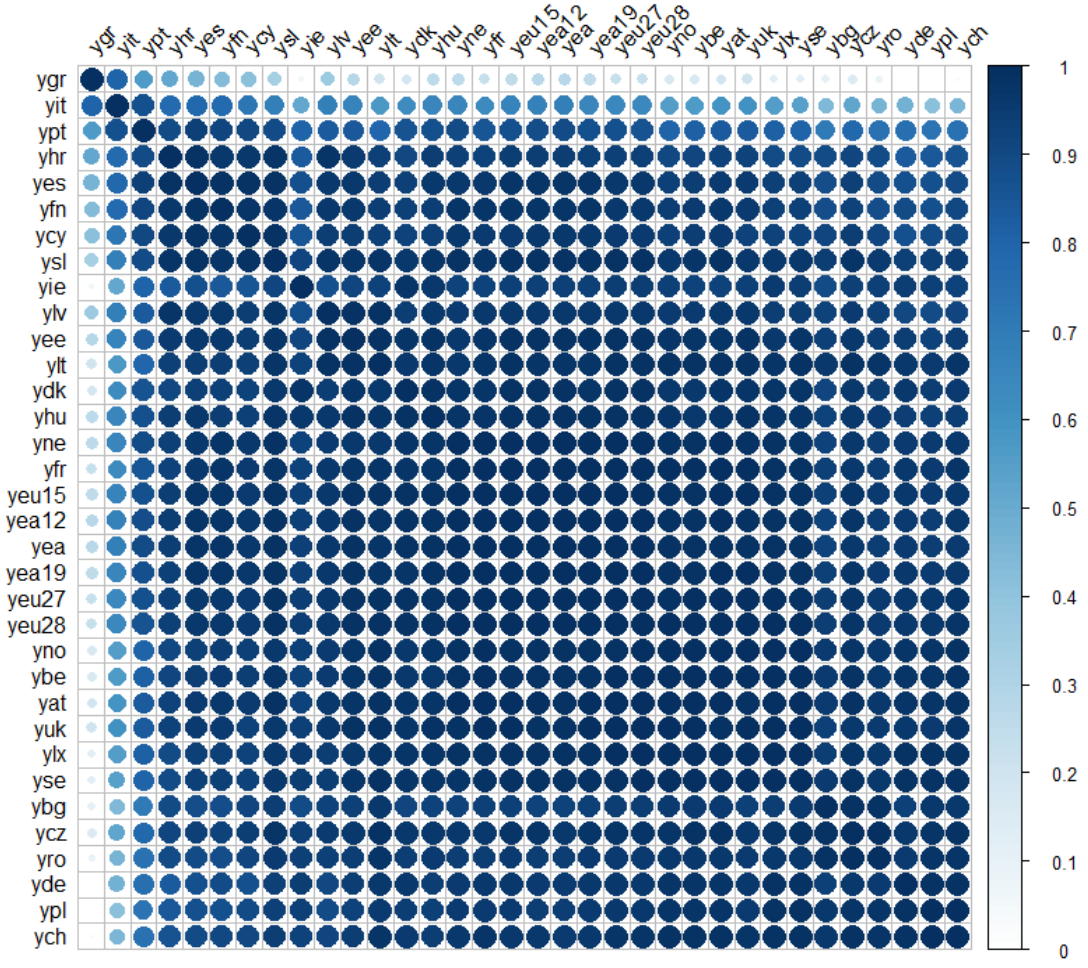



**Source: own elaboration with data from Eurostat.**

In the first place, the period of economic transition brought considerable ups and downs with a much higher magnitude and the catching-up process determined and still determines relatively higher output increases. The second fact is related to the crucial role played by the National Bank of Romania (NBR); the period up to 2005, i.e., up until the

independence of NBR, prompted politically determined massive inflation rates. Once the independence status was adopted, the said rates were brought to moderate levels; however, the lack of a clearly-stated inflation target, still allowed for relatively higher inflationary and deflationary periods, even after 2005 (Bodea & Sánchez-Santos, 2020). The last note-worthy observation that can be inferred from Figure 18, is that by the advent of the 2008 financial crisis, the Romanian economy was well synchronized with the European one, since 2008 marks the considerable slump in output and the subsequent deflation, for both.

**Figure 19. Heat map matrix of Pearson correlation coefficients between output growth rates for all the entities in the sample. Source: own elaboration with data from Eurostat.**



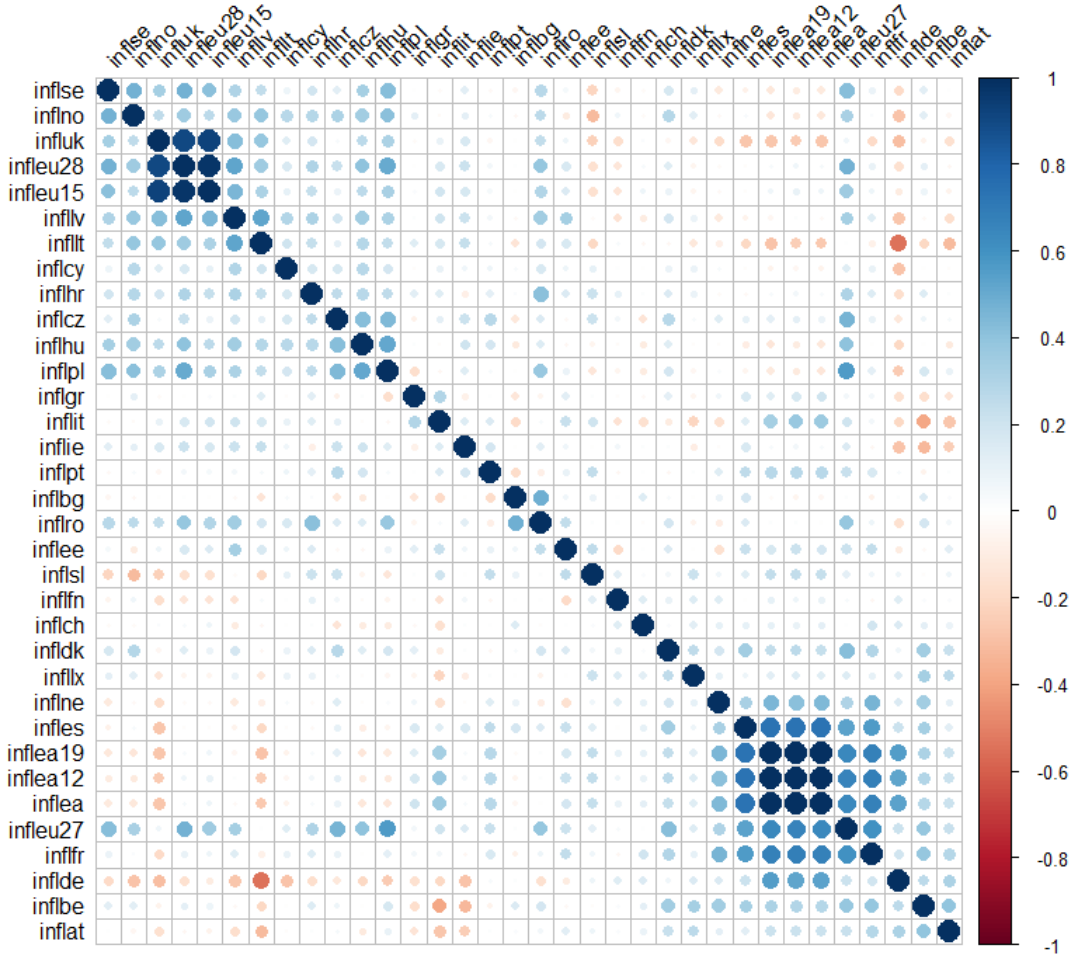

**Source: own elaboration with data from Eurostat.**

The correlations between inflation and output movements tell two different stories. The heat map of correlations for output variation shows similar growth patterns, since the correlation scores do not go below 0, and even the very small positive correlation coefficients are rare (Figure 19). The most obvious outliers in this case are surprisingly (membership to the Eurozone should have pushed in the direction of business cycle

synchronization) two euro area countries: Greece and Italy on the lower side of the spectrum, and two other non-Eurozone countries at the other: Poland and Switzerland (the latter not even being an EU member state).

Contrary to the image depicted in Figure 19, Figure 20 shows considerable misalignments in terms of inflationary trends, to the point that it would be more accurately to talk about clusters, instead of core vs. outliers. The price disturbances seem to be most aligned in two areas: Eastern Europe, UK, Norway and Sweden, on the one side, and in the area of what the literature identifies as the "core of the Eurozone": Germany, France, Netherlands, Belgium (to a smaller degree) and surprisingly Spain (country that has consistently been identified as being at the periphery).

**Figure 20. Heat map matrix of Pearson correlation coefficients between inflation rates for all the entities in the sample. Source: own elaboration with data from Eurostat.**



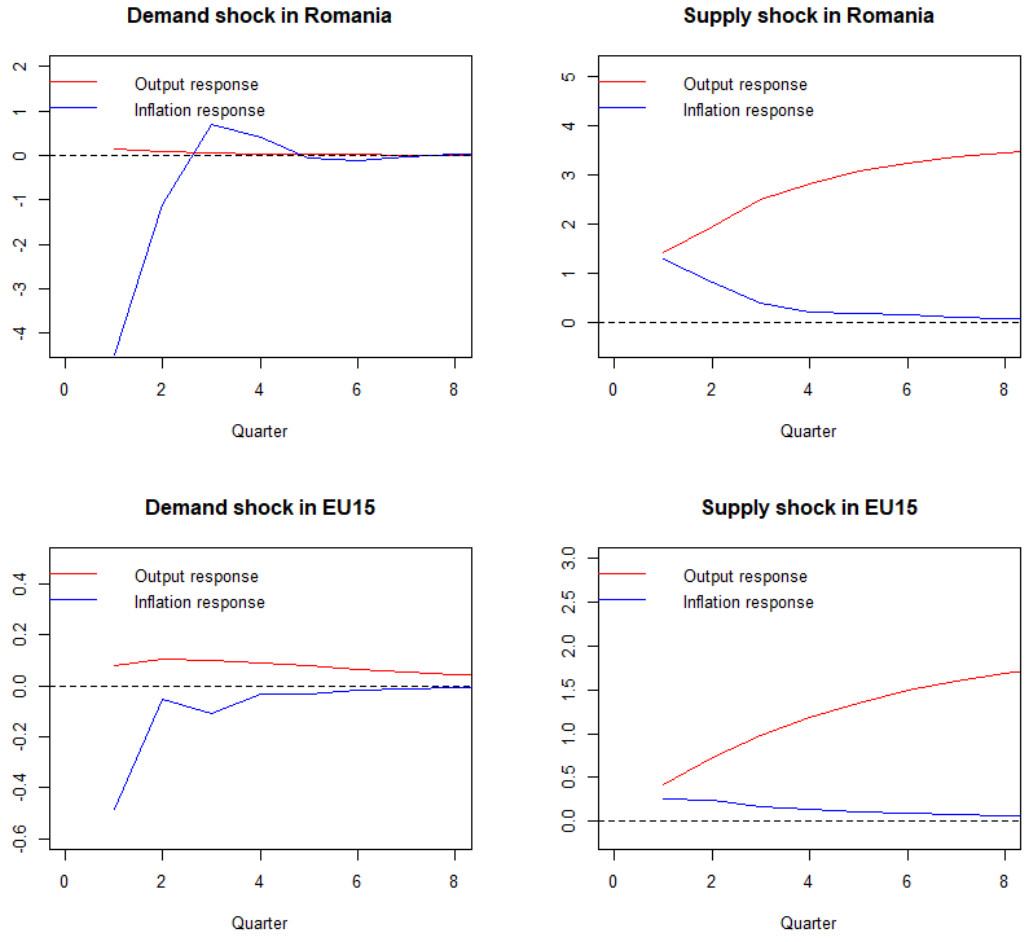

**Source: own elaboration with data from Eurostat.**

Pairwise country correlations in terms of output variation, place Romania among the most well integrated countries in Europe, with high scores across the board, the smallest

coefficients being recorder in relation with three peripheral countries: Greece, Italy and Portugal (although the same three countries registered the smallest scores with the rest of the entities in our sample). However, when it comes to inflation dynamics, the similarities with the rest of the countries seem inexistent, the highest (although weak) correlation coefficients being with other Eastern European countries: Croatia, Poland, Bulgaria and Latvia. Such fact can be explained by their similar contemporaneous economic history and transition's effects.

In a second step of the analysis, we perform the typical Blanchard and Quah SVAR modelling detailed in Section 6.3.2. We recover the responses of the output and inflation from the supply and demand shocks and map them on cumulative IRF graphs for both Romania and EU15.

**Figure 21. Mapping of the cumulative effects of positive supply and negative demand shocks on output and inflation rates for Romania and EU15.**




**Source: own elaboration.**

Such mapping depicted in Figure 21, conveys two very similar, albeit at different magnitudes, responses in behavior. In line with the economic theory and expectative,

positive supply shocks identified by the model, will have a permanent effect on output only, while price levels will suffer from a deflationary trend that will dissipate after 4 to 6 quarters. At the same time, demand shocks have very little effect on output for both Romanian and EU15 aggregate economy, but the response in price level is more apparent; initial negative demand shocks tend to cause deflationary periods for 1 to 4 quarters in Romania and for 1 to 6 quarters in EU15, after which the price levels will return to their baseline levels.

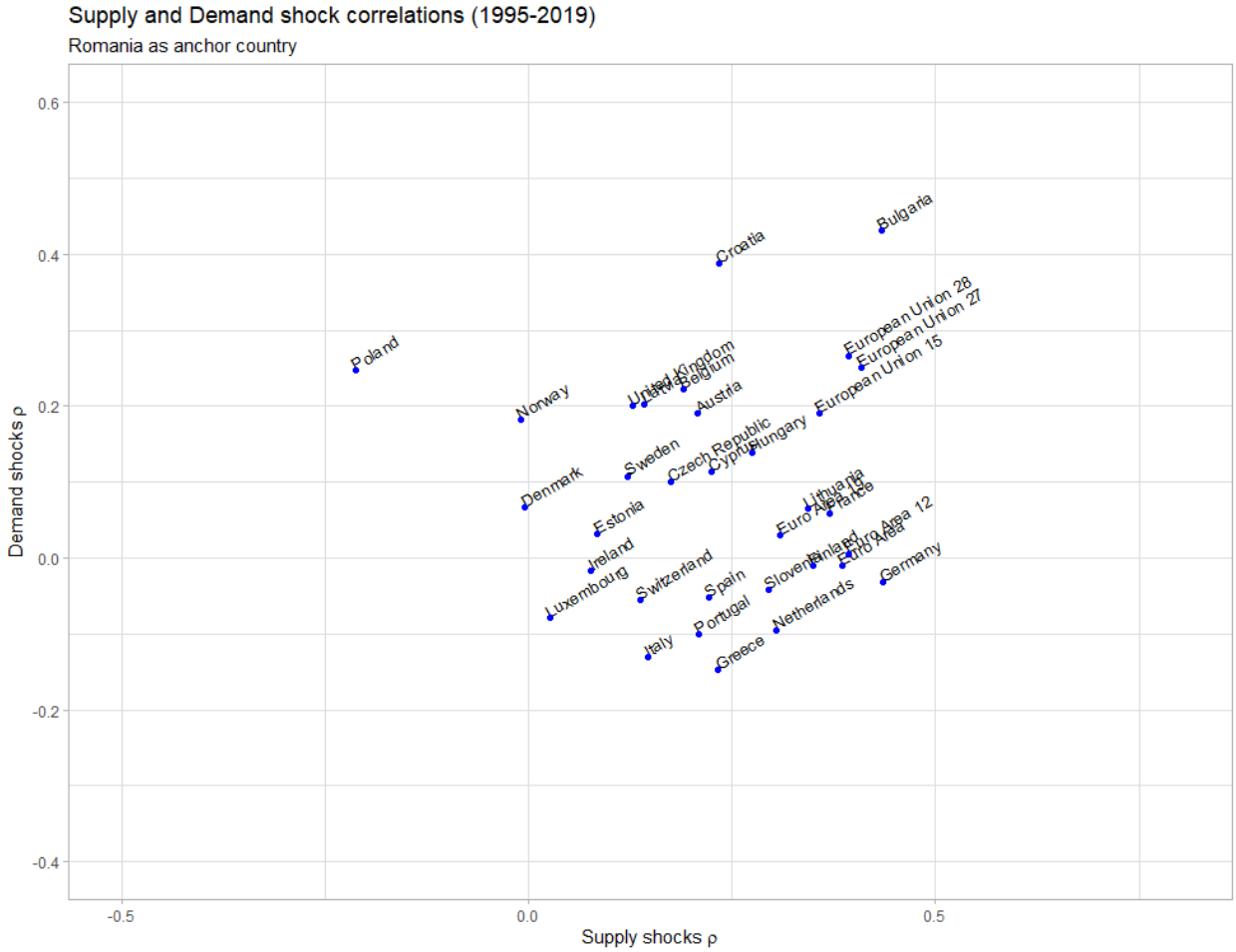
Noteworthy is the very high magnitude of responses in the case of Romania; with the exception of the output response to demand impulse, the rest of responses seem to have a much higher degree of variation than in the case of the EU15 counterpart. The cause of this behavior might be related to the higher magnitude of the shocks suffered by the transition economies and it might indicate that the Romanian economy is much more responsive to economic stimuli.

Finally, the bi-dimensional mapping of the countries according to their correlations with Romania on supply and demand shocks series (Figure 22) indicates large overall exogenous shock correlations with the other two newest members, Bulgaria and Croatia and with the two aggregated entities of EU27 and EU28. Besides these, and fortunately for the proponents of euro adoption in Romania, on the supply side shocks are most correlated with some of the biggest and most relevant countries at the core of the euro area: Germany, France and Netherlands and with the euro area aggregated respectively (EA, EA12 and EA19), signaling the strong ties and similarities between structural production systems. At the opposite end of the spectrum, stand three non-euro area economies (Norway, Denmark and surprisingly Poland) and Luxembourg (very service-intensive economy).

On the demand side, correlations are strong with three Eastern European economies (Bulgaria, Croatia and Poland) and with the EU27 and EU28 aggregates, while the ones with the Big Five euro economies (Germany, France, Italy, Spain and Netherland) are placed around the $\rho = \pm 0.1$ band. Given the large weight of these five countries, this is an indication of possible adjustment problems to the euro area monetary policy for the Romanian economy; a euro area-wide monetary policy, with inflation and interest rates largely influenced by developments in these member states, might not fit the Romanian macroeconomic needs. Overall, the least similarity is observed with a cluster of countries

consisting of the peripheral euro-area member states (Greece, Portugal, Spain, Italy, Ireland), Switzerland and Luxembourg.

**Figure 22. Bidimensional mapping of the ϱ correlation coefficients between supply and demand shocks series recuperated from the BQ model – Romania as anchor country.**




**Source: own elaboration.**

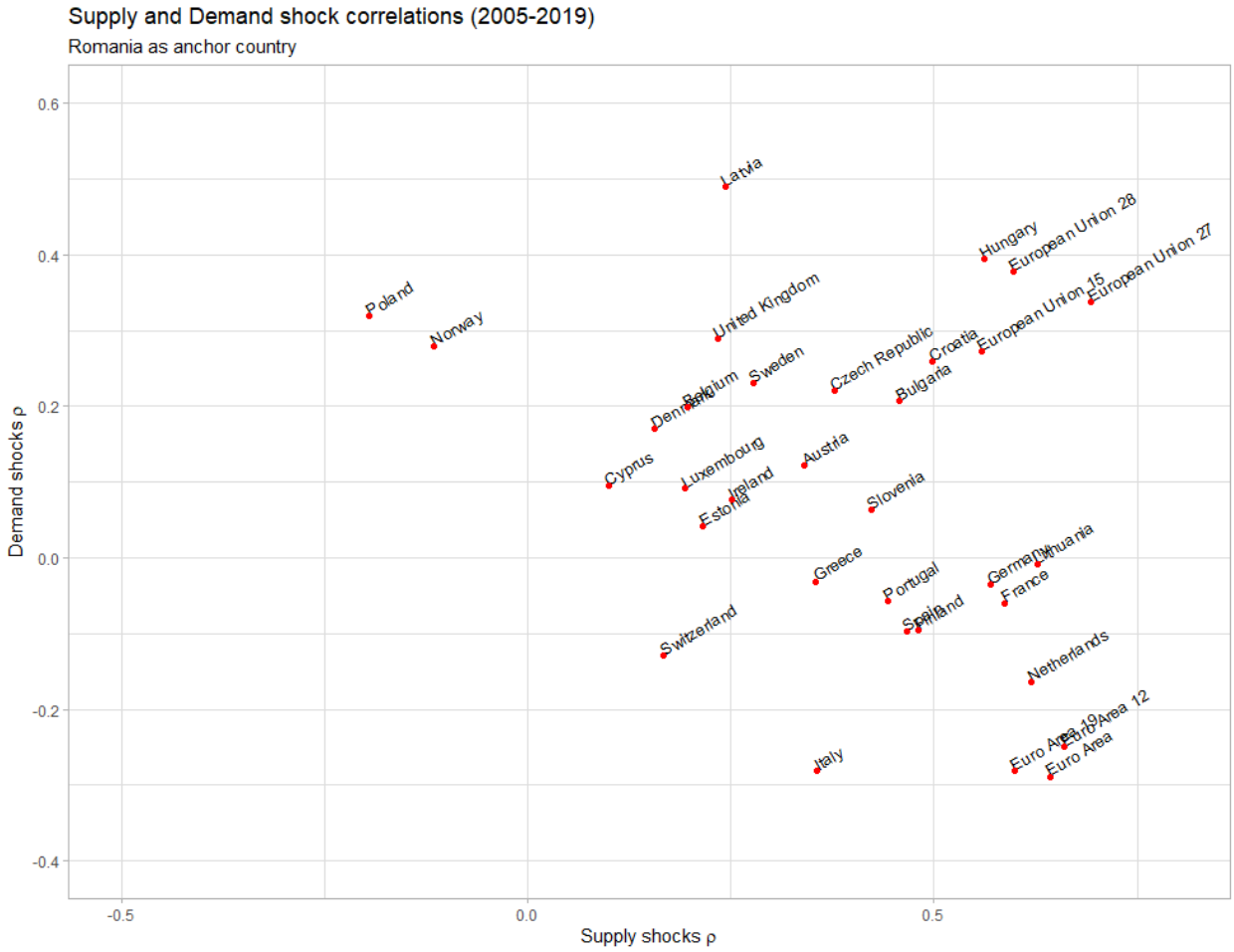
As previously indicated in the literature (Bobeica & Manu, 2013), the Romanian structure of the production system is relatively well integrated with the European one and with the ones of some other core countries. Nevertheless, the politically driven demand shocks make of Romania an unfit candidate for euro adoption. This is proved by the very low correlation coefficients across the board.

High-inflationary periods caused by a politically influenced central bank in the 90s, booms and busts in the economy propped by increases and cuts in salaries in the decade of 2000s, and large public budget misalignments in the late 2010s (which made the object of inquiries from the Commission within the SGP framework), caused hectic and ample

movements in the demand behavior of the Romanian economy, moving it further away from the prospect of euro adoption in good conditions.

Nonetheless, one should not forget that such demand shocks have temporary nature; a more disciplined fiscal behavior and more investment oriented with a long-term sustainable perspective, especially with respect to the public debt (of which increase has accelerated lately), could help in the alignment of the Romanian economy with the rest of euro area's core countries.

**Figure 23. Bidimensional mapping of the correlation recuperated from the BQ; model using the subsample 2005-2019 – Romania as anchor country.**




**Source: own elaboration.**

This point is proven by the results obtained after running the same model only for the subsample starting from 2005, i.e. after the implementation of the two structural changes (NBR independence and EU accession). Considering the distribution of the countries on the same bi-dimensional space from Figure 23, one can notice how both on the supply and demand side, the correlations increase; on the supply side, strong coefficients (above 0.5)

were registered with EU and EA aggregates, Germany, France, Netherlands (core countries), while on the demand side, the highest scores were in relation with other non-euro area economies (Latvia, Poland, Hungary, United Kingdom, Norway). Again, the fact that the coefficients were all but one lower than 0.5, points that lax fiscal policy and the sovereign monetary policy proved a factor of divergence in terms of demand shocks similarity.

## 6.5.Conclusions and recommendations

Arguably, this study, like any other focused on the *meta* property of shock similarity based on time series analysis, has the flaw of being backward looking and unable to predict/asses the full impact of a change in a monetary regime as the one implied by the entry into ERM II or the adoption of the single currency, which could bring more integration. Nevertheless, it has the merit of accurately capturing the effect of 12 years of European integration, of 14 years of central bank independence, and of roughly 3 decades of transitionary efforts on the alignment of Romanian economy with other European economies.

The preliminary analysis of raw data for output and inflation rates indicated much higher variations than the EU average and strong alignments in terms of the former, while for the latter the highest correlations (albeit weak in absolute terms) were registered with Eastern European peers. These facts are indications of a still ongoing catching-up process, a relatively well connected and integrated economy, and an inflationary-prone monetary policy.

The assessment and mapping of the similarities between the underlying demand and supply shocks suggest that on the supply side such shocks are correlated to a certain degree with some relevant core countries, results that are in line with findings in the previous studies and which might make a strong case for the euro-adoption proponents. Furthermore, the increase in correlation coefficients observed in the model using just the post-2005 subsample, is an indication that the Romanian economy heads in the right direction.

Nevertheless, the values are still low compared with the ones obtained by the biggest euro area countries in their pairwise correlations, which suggests that more efforts could be made in order to increase the similarity of the economic structure and the

connectedness; in this respect the recovery endeavors aimed at investments made in the post-pandemic period could represent a good opportunity to steer the economic structure in this direction.

The results obtained on the demand side are more unsatisfactory for a quick and optimal euro adoption; low correlation coefficients were observed across the board, with the exception of just two small-sized Eastern European economies. These feeble results could be linked to the politically motivated inflationary disturbances in the 90s and to the expansionary fiscal shocks consistently administered to the economy during the sample period. The post-2005 results, while better, still indicate that a lax fiscal policy and a sovereign monetary policy are divergence generator factors. As such, crucial for the preparation of single currency adoption in Romania is the need to address the ruinous economic cycles driven by vested interests of the political clout through a more long-term oriented and sustainable fiscal policy.

# Conclusions – overall assessment. Recommendation for a proactive expectative strategy

At last, we have arrived at the point where we should give an answer to the question posed in the title of this thesis. The intrinsic complexity of such a topic impedes us however in giving a clear-cut yes or no answer.

From a purely legal and goal-oriented perspective, Romania would have to work harder on all, but one of the convergence criteria; the exchange rate variation has been negative for the past few years, but has remained in the bands imposed by the treaty and the ERM II. However, the inflation almost always surpassed the reference values, which also induced a similar dynamic for the long-term interest rates, and the government deficits were higher than the 3% allowed limit for the past two convergence criteria exercises, carried out by the ECB. The governmental debt-to-GDP ratios were within the reference limits for the past years, but the very dangerous acceleration of this indicator raises concerns in regards to the sustainability of the public debt in Romania; if this trend continues, the 60% maximum limit will be reached in just a few years, jeopardizing the prospect of EMU integration.

The prospect of the benefits that would come with the adoption of the single currency are not that appealing. As already discussed, even though the lack of exchange rate uncertainty is welcomed, it isn't that relevant for Romania for at least two reasons. In the first place, the national currency, the RON, followed a relatively stable and predictable depreciation pattern in relation with the EUR; as such, rational agents already have realistic expectations on the future rate, and will prepare accordingly. Secondly, the disappearance of this source of risk doesn't necessarily entail decreases in structural interest rates; we have signaled problems on at least two fronts that could spiral out of control and raise the interest rates: labor market and public finances.

For the benefits derived from the reduction of the transaction costs, the feedback implied by the analysis of the empirical data is identical: not that appealing. Romania is not a small and open economy of the likes of other Eastern European EU member states that had a positive experience with the euro adoption (e.g., the Baltic states). The moderate levels of trade openness with the euro area would not warrant probably (at least at this stage) great benefits due to the disappearance of transaction costs.

The advantage of having an internationally relevant currency, might, nevertheless, be of some interest for the Romanian executive (and obviously for the economy in its entirety), since the loss of this monopoly, would only entail losing the capacity to generate excessive inflation tax – a tactic that should no longer be followed by any EU economy. After enumerating such advantages in the introduction, in 0, we tried to give an accurate estimation of the yearly revenues accruing from seigniorage. The direct and indirect financial benefits stood at very high levels in the transitionary period of 90s and early 2000s, but since the independence from political influence of the NBR, and with the need for compliance with the European legislative framework, such gains gradually decreased and became quite derisory.

Turning now to the assessment of the degree of effectiveness of the buffers, we have observed, unfortunately, that the private risk sharing mechanism that would allow, to a certain extent, to absorb some negative effects originating from an idiosyncratic shock, is almost inexistent. The integration of the Romanian banking industry with the one from the euro area is not mature enough and has always stayed at very modest levels.

However, in the introduction we have seen that Romania performed relatively well when it to comes to other buffer mechanisms against an asymmetric shock in a monetary union; labor mobility is very high, one of the highest among the EU member states, but there is no guarantee that with the convergence, this feature will not be negatively affected. Furthermore, in Chapter 3, we have come to the conclusion that euro area membership is associated with a considerable decrease in labor market resilience due to extra rigidities imposed by it, and that the hypothesis of increased labor mobility intuited by the classical OCA literature is actually refuted.

Wage flexibility has been a strong point of the Romanian economy up until the last decade, when a slowly paced, but constant increase in salaries has been noted, that has surpassed the increase in productivity; strictly from the point of view of competitiveness, this is a matter of concern and a considerable sideslip from the right track, as it might lead to imbalances in trade and national accounts – for the moment these can be corrected with the help of an inflationary-biased monetary policy, but within a monetary union, such a thing would be impossible.

Remaining in the framework of the same topic, that of wage flexibility, the result obtained in Chapter 4 and Chapter 5, those regarding the lack of a significant relationship

between political instability and the incapacity of imposing effective internal devaluation measures (at least at the level of the sample we employed), should not be reassuring for the Romanian executive. It is clear that there are certain unexplored factors that impede some countries in taking these painful, but nevertheless, necessary measures; the latest unsustainable increase in wages over the productivity levels observed nationally, hints that Romania might suffer from this deep and omitted condition, and indicates problems down the road, in case euro would be adopted. A very exhaustive analysis would be recommended in order to identify and address this problem.

The main finding in Chapter 5, that the signals coming from financial markets are more relevant (at least statistically) in taking internal devaluation measures than the expected time in power of the cabinets, might have come as a surprise first. It is intriguing the fact that measures taken to reduce salaries in an economy are "ruled" by markets, rather than the normal democratic mechanism of awarding or punishing governments for their actions; this is deeply disturbing on at least two counts. (1) Normatively speaking, markets should not be the ones dictating executives what to do when it comes to internal economic policy matters; voters, should have a say in that, through the normal mechanism of democratic representation. (2) As shown in the introduction, markets could have irrational fears, especially, in distress situations, and could lead to self-fulfilling prophecies on debt and solvency matters.

But it isn't to say that countries that have adopted the euro are less "democratic" than the ones that didn't; it might be just that more they are more prone to listening to signals coming from the markets, since they are more dependent on the perceptions the markets have on their fiscal health. This could be a side-effect of euro adoption, and in this case, Romania, and especially the Romanian voters, will have to ponder the implications of this fact more closely when deciding their country's membership to EMU.

Finally, the evaluation of the *meta* property of shock correlations indicated that on the supply side the underlying disturbances show signs of moderate co-movement with some relevant core countries (not as high as between the biggest euro area countries in their pairwise correlations), results that could make the case for the euro adoption. Nevertheless, more efforts could be made in the direction of increasing the similarity of the economic structure and the connectedness between economies. The results obtained on the demand side hint to a more disturbing picture; low correlation coefficients were observed all across

the board, with some exceptions, and they might be the result of years of politically motivated inflationary disturbances and expansionary fiscal shocks.

Considering all the above relevant findings, maybe instead of a clear-cut answer, some policy recommendations would be more suitable. A good euro adoption strategy for Romania would be a *proactive expectative*.

This implies a postponement of the adoption for the moment, and the use of this time to build up proper second-best alternatives to the monetary policy. More specifically, Romania could work on towards an enhanced capital market and banking sector integration to allow for smoothing the negative effects of a hypothetic idiosyncratic shock. This private risk-sharing solution is highly encouraged in the framework of the EU-wide efforts to build these two unions in support for the EMU. Romania should take this opportunity and closely cooperate in this regard, with other member states and the relevant European institutions.

To warrant the wage competitiveness of the Romanian production system, and be less affected by the very frequent changes in government, a cross-party "Ulysses pact" would be another suitable recommendation, so as to pass a piece of legislation that ties the wage levels to a certain benchmark which takes into account the productivity levels and the relative standing of its main trading partners (as it happened, for instance, in Belgium, in preparation for euro adoption in late 90s).

Furthermore, the greatest issue of all should be addressed with the political maturity and civic-minded spirit it deserves: the fiscal discipline. Considerable efforts should be made into the direction of reducing the fiscal deficits, the mounting public debt levels and in providing clear signals to the financial markets regarding the fiscal sustainability and the financial health of the public accounts. This should be achieved as soon as possible, not just for the sake of a fast euro adoption (i.e. complying with the budgetary convergence criteria), but also for the sake of having a good post-adoption economic performance as a country.

Lastly, there is always the chance (and the hope) that the EMU architecture will be completed by the creation of some sort of budgetary union, and again, in this respect, the emphasis should fall on the word proactive; Romania, as many other EU member states, should use its political leverage to push for such a reform that would not only benefit itself (by providing insurance mechanism in triggering automatic transfers in case of negative

shocks, and by consolidating a significant part of the national debt into a common debt), but the whole Union.

# Appendix A

**Table 12. Linear regression for the long-term interest rate estimation purposes, with country specific fixed effects.**

| Interest rate | Coef. | St. Err.. | t-value | p-value | [95% Conf. | Interval] | Sig |
|---|---|---|---|---|---|---|---|
| Lag inflation | 0.349 | 0.053 | 6.54 | 0.000 | 0.243 | 0.455 | *** |
| Debt to GDP ratio | -0.041 | 0.011 | -3.66 | 0.000 | -0.063 | -0.019 | *** |
| GDP growth | -0.187 | 0.036 | -5.24 | 0.000 | -0.258 | -0.116 | *** |
| GDP per capita | 0.000 | 0.000 | -2.31 | 0.023 | 0.000 | 0.000 | ** |
| Constant | 7.962 | 0.996 | 7.99 | 0.000 | 5.987 | 9.938 | *** |

| | | | |
|---|---|---|---|
| Mean dependent var. | 4.755 | SD dependent var. | 2.250 |
| R-squared | 0.626 | Number of obs. | 119.000 |
| F-test | 43.973 | Prob. > F | 0.000 |
| Akaike crit. (AIC) | 391.571 | Bayesian crit. (BIC) | 405.467 |

*** *p<0.01, ** p<0.05, * p<0.1*

**Table 13. Linear regression using Cagan's equation for determining the value of constant b.**

| M2 monetary base | Coef. | St. Err. | t-value | p-value | [95% Conf. | Interval] | Sig |
|---|---|---|---|---|---|---|---|
| Interest rate | -0.857 | 0.238 | -3.60 | 0.001 | -1.349 | -0.366 | *** |
| Log real GDP | 0.957 | 0.021 | 46.43 | 0.000 | 0.914 | 0.999 | *** |
| Constant | -0.438 | 0.309 | -1.42 | 0.168 | -1.075 | 0.198 | |

| | | | |
|---|---|---|---|
| Mean dependent var. | 11.901 | SD dependent var. | 2.957 |
| R-squared | 0.993 | Number of obs | 27.000 |
| F-test | 1820.658 | Prob > F | 0.000 |
| Akaike crit. (AIC) | 4.368 | Bayesian crit. (BIC) | 8.256 |

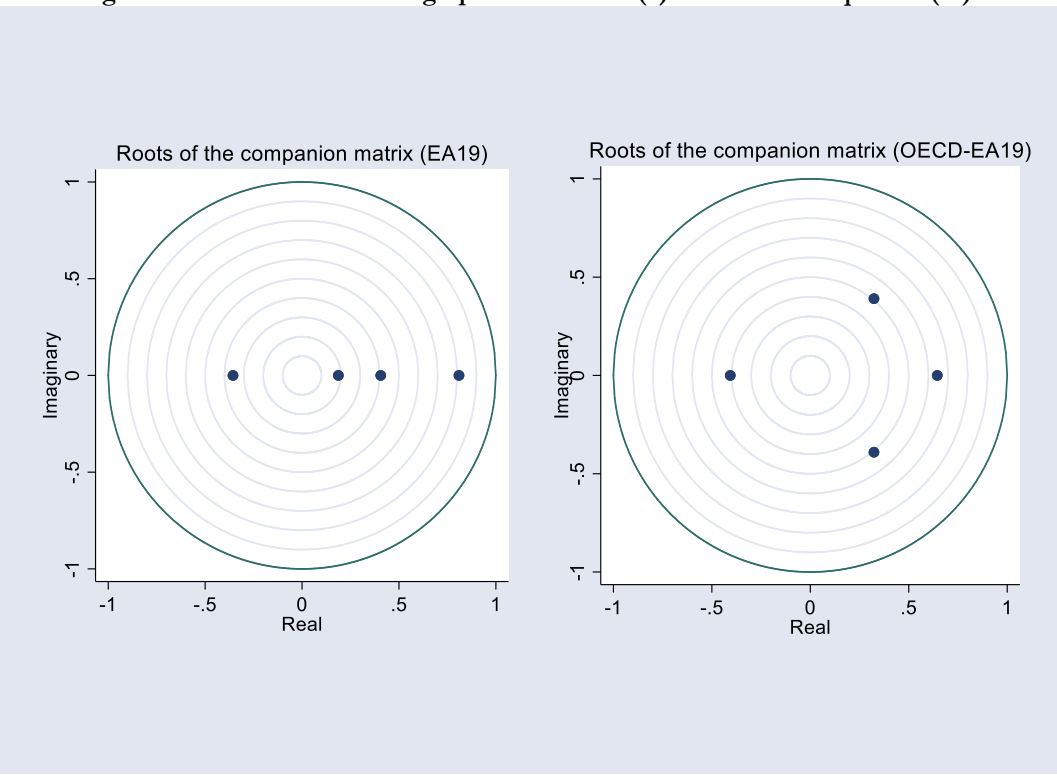
*** *p<0.01, ** p<0.05, * p<0.1*

# Appendix B

**Table 14. Post-estimation Variance Inflation Factor test results.**

| | VIF | 1/VIF |
|---|---|---|
| Physical infrastructure | 2.126 | .47 |
| Bureaucracy | 1.978 | .506 |
| Financing | 1.336 | .749 |
| Share of public employees | 1.176 | .851 |
| Eurozone | 1.032 | .969 |
| Mean VIF | 1.529 | . |

**Figure 24. The unit root circle graphs of the VAR (2) models from equation (15).**




**Source: own computations.**

# Appendix C

**Table 15. AIC and BIC for Weibull model.**

| Akaike's information criterion and Bayesian information criterion | ll(null) | ll(model) | Df. | AIC | BIC |
|---|---|---|---|---|---|
| N=198 | -155.546 | -124.284 | 8 | 264.568 | 290.874 |

**Table 16. AIC and BIC for Cox proportional hazard model.**

| Akaike's information criterion and Bayesian information criterion | ll(null) | ll(model) | df | AIC | BIC |
|---|---|---|---|---|---|
| N=198 | -751.196 | -714.165 | 6 | 1440.330 | 1460.059 |

**Table 17. Variance Inflation Factor for fixed effects model.**

| | VIF | 1/VIF |
|---|---|---|
| Debt/GDP | 8.96 | 0.111648 |
| Unemployment | 7.90 | 0.126508 |
| Bond yields | 6.41 | 0.155925 |
| Trade openness | 4.79 | 0.208793 |
| Time left | 4.21 | 0.237256 |
| Union density | 4.12 | 0.242970 |
| Budget balance | 3.03 | 0.329546 |
| Relative power | 2.54 | 0.393462 |
| Trade deficit | 2.32 | 0.430853 |
| Bailout | 2.29 | 0.435833 |
| Real GDP growth | 1.45 | 0.688436 |
| Programmatic position | 1.08 | 0.922203 |
| Mean VIF | 4.09 | . |

# Appendix D

**Table 18. Results of the Johansen cointegration test for Romania and EU15 specific variables (in levels).**

| Values of test statistic and critical values of test (Romania, maximum eigenvalue statistic): | Values of test statistic and critical values of test (EU15, maximum eigenvalue statistic): |
|---|---|
| test 10pct 5pct 1pct | test 10pct 5pct 1pct |
| r <= 1 \| 11.41 7.52 9.24 12.97 | r <= 1 \| 8.60 7.52 9.24 12.97 |
| r = 0 \| 55.23 13.75 15.67 20.20 | r = 0 \| 36.23 13.75 15.67 20.20 |

**Note: only the case of these two economic entities has been included due to space constraints.**

**Table 19. Results of the Augmented Dickey-Fuller test for first-order difference (FOD) GDP and inflation for Romania and EU15 (1995-2019 sample).**

| Augmented Dickey-Fuller Test FOD GDP Romania | Augmented Dickey-Fuller Test Inflation RO | Augmented Dickey-Fuller Test FOD GDP EU15 | Augmented Dickey-Fuller Test Inflation EU15 |
|---|---|---|---|
| Type 1: no drift no trend | Type 1: no drift no trend | Type 1: no drift no trend | Type 1: no drift no trend |
| lag ADF p.value | lag ADF p.value | lag ADF p.value | lag ADF p.value |
| [1,] 0 -5.76 0.01 | [1,] 0 -7.69 0.01 | [1,] 0 -3.45 0.01 | [1,] 0 -5.96 0.01 |
| [2,] 1 -3.88 0.01 | [2,] 1 -7.25 0.01 | [2,] 1 -3.04 0.01 | [2,] 1 -3.94 0.01 |
| Type 2: with drift no trend | Type 2: with drift no trend | Type 2: with drift no trend | Type 2: with drift no trend |
| lag ADF p.value | lag ADF p.value | lag ADF p.value | lag ADF p.value |
| [1,] 0 -6.87 0.01 | [1,] 0 -8.27 0.01 | [1,] 0 -4.40 0.01 | [1,] 0 -8.21 0.01 |
| [2,] 1 -4.72 0.01 | [2,] 1 -8.19 0.01 | [2,] 1 -4.01 0.01 | [2,] 1 -5.69 0.01 |
| Type 3: with drift and trend | Type 3: with drift and trend | Type 3: with drift and trend | Type 3: with drift and trend |
| lag ADF p.value | lag ADF p.value | lag ADF p.value | lag ADF p.value |
| [1,] 0 -6.93 0.01 | [1,] 0 -8.31 0.01 | [1,] 0 -4.52 0.01 | [1,] 0 -8.49 0.01 |
| [2,] 1 -4.82 0.01 | [2,] 1 -8.28 0.01 | [2,] 1 -4.16 0.01 | [2,] 1 -5.84 0.01 |

**Note: only the case of these two economic entities has been included due to space constraints.**

**Table 20. Results of the Augmented Dickey-Fuller test for first-order difference (FOD) GDP and inflation for Romania and EU15 (2005-2019 sample).**

| Augmented Dickey-Fuller Test FOD GDP Romania | Augmented Dickey-Fuller Test Inflation RO | Augmented Dickey-Fuller Test FOD GDP EU15 | Augmented Dickey-Fuller Test Inflation EU15 |
|---|---|---|---|
| Type 1: no drift no trend | Type 1: no drift no trend | Type 1: no drift no trend | Type 1: no drift no trend |
| lag ADF p.value | lag ADF p.value | lag ADF p.value | lag ADF p.value |
| [1,] 0 -3.90 0.01 | [1,] 0 -6.69 0.01 | [1,] 0 -3.03 0.01 | [1,] 0 -4.72 0.01 |
| [2,] 1 -2.84 0.01 | [2,] 1 -4.58 0.01 | [2,] 1 -3.04 0.01 | [2,] 1 -3.50 0.01 |
| Type 2: with drift no trend | Type 2: with drift no trend | Type 2: with drift no trend | Type 2: with drift no trend |
| lag ADF p.value | lag ADF p.value | lag ADF p.value | lag ADF p.value |
| [1,] 0 -4.91 0.01 | [1,] 0 -7.23 0.01 | [1,] 0 -3.31 0.0213 | [1,] 0 -5.69 0.01 |
| [2,] 1 -3.61 0.01 | [2,] 1 -5.09 0.01 | [2,] 1 -3.34 0.0198 | [2,] 1 -4.33 0.01 |
| Type 3: with drift and trend | Type 3: with drift and trend | Type 3: with drift and trend | Type 3: with drift and trend |
| lag ADF p.value | lag ADF p.value | lag ADF p.value | lag ADF p.value |
| [1,] 0 -4.86 0.0100 | [1,] 0 -7.40 0.01 | [1,] 0 -3.29 0.0814 | [1,] 0 -5.63 0.01 |
| [2,] 1 -3.58 0.0426 | [2,] 1 -5.29 0.01 | [2,] 1 -3.34 0.0732 | [2,] 1 -4.25 0.01 |

**Note: only the case of these two economic entities has been included due to space constraints.**

# Resumen en castellano

El principal objetivo de esta tesis es dar una respuesta científica y documentada a la pregunta formulada en el título: «¿Debería Rumanía adoptar el euro?». Responder a esta pregunta *ex ante* es crucial, ya que la entrada en la unión monetaria europea parece ser un proceso irreversible (al menos como se ha demostrado hasta ahora), con implicaciones de gran alcance en muchos aspectos de la vida económica de un país. Este cambio en el sistema de curso legal, que puede parecer trivial, tiene el potencial de afectar no solo a la salud del sistema bancario y financiero, sino también a la posición del mercado laboral, de las cuentas públicas nacionales y del entorno macroeconómico general, por citar solo algunos de los más evidentes.

El punto de partida de esta compleja empresa es presentar los hechos estilizados más relevantes en relación con la economía rumana y la adopción del euro. Así pues, con el fin de obtener una visión general de la situación específica de cada país y del proceso de adopción, en el primer capítulo se hace una breve descripción del contexto económico reciente, se debaten los criterios de Maastricht y se muestra la posición de Rumanía a este respecto. Además, dado que las consideraciones sobre la adhesión a una unión monetaria son más complejas y exhaustivas que el cumplimiento de los criterios, en el mismo capítulo también nos basamos en la literatura académica sobre las Zonas Monetarias Optimas (ZMO), en la búsqueda de aspectos más relevantes que deben tenerse en cuenta, al tiempo que se ofrece una breve evaluación para el caso rumano.

Sin embargo, el breve análisis del primer capítulo es incompleto, ya que la literatura de las ZMO es un campo de investigación en constante evolución; su revisión no dará respuesta a todas las preguntas de investigación que podrían surgir, ya sea porque no se llevaron a cabo estudios empíricos centrados en Rumanía, ya sea porque las preguntas en cuestión se omitieron o no se desarrollaron suficientemente. Por lo tanto, quedan por determinar algunos aspectos cruciales; se trata de cuestiones mucho más complejas que requieren un análisis más profundo. En concreto, hemos podido identificar cuatro puntos.

El primero es la cuestión de la generación de señoreaje: ¿sería más costoso (desde una perspectiva puramente racional) que el ejecutivo rumano renunciara a su monopolio sobre la emisión de moneda y la generación de inflación? El segundo capítulo se refiere a la medición del señoreaje en Rumanía desde la caída del comunismo y los posibles beneficios

tras el paso al euro. Partiendo del balance del banco central, estimamos estos niveles de señoreaje para un período de 27 años.

Nuestras constataciones sugieren que esta fuente de ingresos fue muy elevada en el período de los 90, debido principalmente a las enormes tasas de inflación que se prolongaron a lo largo del tiempo. Desde la independencia del banco central, estos niveles de señoreaje se redujeron y se mantuvieron constantes, situándose en torno al 1-2 % del PIB. Asimismo, calculamos los beneficios potenciales derivados de la adopción del euro. Hemos demostrado que, a medida que Rumanía converge con el resto de la zona del euro, sus beneficios potenciales de la adopción del euro disminuyen. Dado que estas ganancias son muy pequeñas en relación con la renta nacional, se argumenta que los incentivos para la renuncia a la moneda propia no son ni monetarias, ni relacionadas con el presupuesto.

Otra cuestión que debe resolverse es la de la resiliencia de los mercados laborales. La pertenencia a la UEM priva a los Estados miembros de su componente corrector monetario y limita su margen presupuestario (a través del Pacto de Estabilidad y Crecimiento, que se aplica no solo a la zona del euro, sino a todos los países de la UE); ¿podría esto afectar a la resiliencia de sus mercados laborales y hacerlos menos capaces de hacer frente a perturbaciones y recuperarse tras sufrir estos shocks negativos? Abordamos esta cuestión en el tercer capítulo, que se refiere al efecto que la pertenencia a la zona del euro tiene en la resiliencia del empleo, definida como la capacidad de resistencia a una perturbación en la producción y a la velocidad de recuperación.

Un análisis preliminar de los niveles de empleo y de producción indica un notable efecto histéresis de la crisis de 2008-2010 en las economías de la zona del euro, en comparación con el resto de los países de la OCDE. La principal hipótesis que ponemos a prueba es que la pertenencia a la zona euro afectará negativamente a la resiliencia de las economías nacionales en materia de empleo.

Nuestras conclusiones son compatibles con el argumento de que, como consecuencia de la falta de una política monetaria independiente y de la reducción de los márgenes fiscales, los países con la moneda única serán menos resistentes y tardarán más tiempo en recuperarse de las perturbaciones negativas. Después de comprobar primero la magnitud de la caída y el efecto en el tiempo de una perturbación utilizando un modelo VAR y la función de impulso-respuesta correspondiente, calculamos a continuación un índice de resiliencia relativo original para 41 economías de la OCDE y de la UE y aplicamos una

regresión robusta. Ambos modelos sugieren que la adopción del euro se asocia a una resiliencia significativamente inferior, en general, en materia de empleo, lo que sugiere que la zona del euro no es, en realidad, una ZMO.

Un tercer punto está relacionado con la interacción entre la devaluación interna y una característica que sitúa a Rumanía en el primer puesto de la clasificación de la UE: la inestabilidad política. Como se indica en la literatura, en lo que se refiere a la corrección de los desequilibrios, la devaluación interna es la alternativa que se impone al no tener una política monetaria nacional. Sin embargo, al mismo tiempo, estas medidas tienen importantes costes desde el punto de vista político, ya que implican medidas de reducción salarial. ¿Podría la inestabilidad política y la mentalidad a corto plazo de los políticos obstaculizar estas acciones?

Examinamos este nexo en el cuarto capítulo. El objetivo es abordar la relación entre la durabilidad de los gabinetes y la aplicación de las políticas de devaluación interna en las economías de la zona del euro. La principal hipótesis que ponemos a prueba es que la durabilidad del gabinete desempeña un papel inhibidor en la aplicación de la devaluación interna debido al comportamiento oportunista y al pensamiento estratégico por parte de los gobiernos en ejercicio. Esta hipótesis se deriva de un marco analítico interdisciplinar que combina características de los modelos utilizados en el ciclo económico político y teorías partidistas.

Utilizando un conjunto de datos de panel para los países de la zona del euro y un modelo dinámico de regresión, tras controlar por las variables económicas y financieras pertinentes, los resultados muestran que el tiempo de supervivencia esperado en el cargo de los gabinetes (calculado mediante análisis de supervivencia) no tiene un efecto significativo en el coste unitario real del trabajo (un indicador de la devaluación interna). A nuestro leal saber y entender, ningún estudio anterior ha puesto nunca a prueba esta relación.

Estos resultados intrigantes obtenidos en el cuarto capítulo requieren una reinterpretación de la literatura y una reevaluación, que se lleva a cabo en el quinto capítulo. El principal objetivo de investigación es averiguar cuál es el mejor indicador de las medidas de devaluación interna impuestas por decisión gubernamental. Concebimos una prueba para dos posibles hipótesis explicativas. Por una parte, la inestabilidad política puede afectar a la aplicación de la devaluación interna debido al comportamiento oportunista y al

pensamiento estratégico de los partidos políticos en el poder. Por otra parte, los gobiernos también responden en tiempo real a las señales de los mercados financieros con respecto a la necesidad de tales medidas. Utilizamos datos que abarcan de 2007 a 2017 para todos los países de la zona del euro e incluimos como variable explicativa en nuestro modelo de efectos fijos el tiempo de mandato previsto de cada gabinete (estimado previamente mediante una regresión de análisis de supervivencia), y los rendimientos de los bonos que los mismos gobiernos tienen que pagar para emitir deuda pública en los mercados financieros, para contrastarlas dos hipótesis planteadas.

Después de controlar por las variables macroeconómicas pertinentes y específicas del mercado del trabajo, los resultados muestran que el tiempo de mandato esperado no tiene un efecto significativo en la fluctuación de los costes laborales unitarios, mientras que el rendimiento de los bonos sí tiene el signo esperado (negativo), lo que podría apuntar a una crisis de representación.

Por último, abordamos la cuestión de las similitudes de choque entre Rumanía y otras entidades económicas europeas en el último capítulo. El estudio se basa en una revisión bibliográfica pertinente de las Zonas Monetarias Optimas e identifica el modelo metodológico y la *meta*-propiedad más ampliamente reconocido a tal efecto: la descomposición SVAR Blanchard y Quah para identificar las perturbaciones de la oferta y la demanda. Utilizando el modelo indicado y los datos más recientes, extraemos y analizamos las perturbaciones subyacentes que han afectado a 34 entidades económicas europeas en el período 1995-2019. Tras realizar las correlaciones de pares entre Rumanía y el resto de entidades económicas, tanto en lo que respecta a las perturbaciones de la oferta como a la demanda, las trazamos en un mapa bidimensional.

Descubrimos que, si bien existe una integración y una conexión pertinentes que aseguran correlaciones relativamente elevadas entre perturbaciones de la oferta, las perturbaciones de la política monetaria y fiscal motivadas políticamente que provocaron movimientos amplios y fiscales por el lado de la demanda son un factor de gran preocupación por la perspectiva de la adopción de la moneda única en este país de Europa Oriental. Las recomendaciones políticas se formulan en la dirección de una menor influencia política en el ciclo económico y de una mentalidad más orientada a largo plazo.

Sin embargo, la complejidad intrínseca de este tema impide ofrecer una respuesta categórica e inequívoca a la pregunta planteada en el título de esta tesis y obliga a matizar dicha respuesta

Desde una perspectiva puramente jurídica y orientada a los objetivos, Rumanía tendría que trabajar más en todos, excepto uno de los criterios de convergencia; la variación del tipo de cambio ha sido negativa durante los últimos años, pero se ha mantenido en las bandas impuestas por el Tratado de Maastricht y el Mecanismo de Tipos de Cambio II. Sin embargo, casi siempre la inflación superó los valores de referencia, lo que también dio lugar a una dinámica similar para los tipos de interés a largo plazo, y los déficits públicos fueron superiores al límite del 3 % en los dos últimos ejercicios de convergencia realizados por el BCE. Las ratios deuda pública/PIB se situaron dentro de los límites de referencia de los últimos años, pero la muy peligrosa aceleración de este indicador suscita preocupación en cuanto a la sostenibilidad de la deuda pública en Rumanía; si esta tendencia continúa, el límite máximo del 60 % se alcanzará en tan solo unos pocos años, poniendo en peligro las perspectivas de integración en la UEM.

La perspectiva de los beneficios que se derivarían de la adopción de la moneda única no es tan atractiva. Como se ha señalado, aunque se acoge con satisfacción la falta de incertidumbre sobre los tipos de cambio, esto no es muy relevante para Rumanía por al menos dos razones. En primer lugar, la moneda nacional, el RON, siguió un patrón de depreciación relativamente estable y previsible en relación con el euro; como tales, los agentes racionales ya tienen expectativas realistas sobre el tipo futuro y se prepararán en consecuencia. En segundo lugar, la desaparición de esta fuente de riesgo no implica necesariamente una reducción estructural de los tipos de interés; hemos señalado problemas en al menos dos frentes que podrían quedar fuera de control y aumentar los tipos de interés: mercado laboral y finanzas públicas.

En cuanto a los beneficios derivados de la reducción de los costes de transacción, el resultado del análisis de los datos empíricos es idéntico: no es atractivo. Rumanía no es una economía pequeña y abierta semejante a otros Estados miembros de la UE de Europa Oriental que han tenido una experiencia positiva con la adopción del euro (por ejemplo, los Estados bálticos). Los moderados niveles de apertura comercial con la zona del euro probablemente no representarían (al menos en esta fase) la obtención de grandes beneficios debido a la desaparición de los costes de transacción.

No obstante, la ventaja de tener una moneda relevante a nivel internacional podría ser de interés para el ejecutivo rumano (y, obviamente, para la economía en su conjunto), ya que la pérdida de este monopolio solo implicaría perder la capacidad de generar ingresos fiscales excesivos sobre la inflación, una táctica que ya no debería seguir adelante en ninguna economía de la UE. Tras enumerar estas ventajas en el primer capítulo, en el segundo, tratamos de proporcionar una estimación exacta de los ingresos anuales procedentes de señoreaje. Los beneficios financieros directos e indirectos se mantuvieron en niveles muy elevados durante el período transitorio de los años 90 y principios de la década de 2000, pero desde la independencia de la influencia política del Banco Nacional de Rumanía, y con la necesidad de cumplir con el marco legislativo europeo, estos beneficios se redujeron gradualmente y se pueden considerar insignificantes.

Volviendo a la evaluación del grado de eficacia de los amortiguadores, hemos observado, desgraciadamente, que el mecanismo privado de distribución de riesgos que permitiría, hasta cierto punto, absorber algunos efectos negativos derivados de un choque idiosincrático es casi inexistente. La integración del sector bancario rumano con la de la zona del euro no está suficientemente madura y siempre se ha mantenido en niveles muy modestos.

Sin embargo, en el primer capítulo hemos visto que Rumanía ha funcionado relativamente bien en lo que se refiere a otros mecanismos de amortiguación frente a una perturbación asimétrica en una unión monetaria; la movilidad laboral es muy elevada, uno de los más altos de los Estados miembros de la UE, pero no hay garantía de que, con la convergencia, esta característica no se vea afectada negativamente. Además, en el tercer capítulo hemos llegado a la conclusión de que la pertenencia a la zona del euro está asociada a una considerable disminución de la resiliencia de los mercados laborales debido a las rigideces adicionales impuestas por la moneda única y que se refuta la hipótesis de una mayor movilidad laboral inducida por la literatura clásica de ZMO.

La flexibilidad salarial ha sido un punto fuerte de la economía rumana hasta la última década, cuando se empieza a notar un ritmo lento, pero constante de aumento de los salarios que ha superado el aumento de la productividad; estrictamente desde el punto de vista de la competitividad, se trata de un motivo de preocupación y un distanciamiento considerable de la vía más ortodoxa, ya que podría dar lugar a desequilibrios en el comercio y en las cuentas nacionales. Por el momento, estos desequilibrios pueden corregirse con la

ayuda de una política monetaria inflacionista, pero formar parte de una unión monetaria supondría renunciar a esta posibilidad.

A primera vista, la principal conclusión del quinto capítulo, según la cual las señales procedentes de los mercados financieros son más determinantes (al menos estadísticamente) a la hora de adoptar medidas de devaluación interna que el tiempo esperado en el poder de los gabinetes, puede resultar un tanto sorprendente. El hecho de que las medidas adoptadas para reducir los salarios en una economía están «gobernadas» por los mercados, y no por el mecanismo democrático normal de conceder o castigar a los gobiernos por sus acciones; es profundamente preocupante, a lo menos en dos sentidos. (1) Desde el punto de vista normativo, los mercados no deberían ser los que dictan a los ejecutivos qué hacer en materia de política económica interna; los votantes deberían tener voz en este sentido, a través del mecanismo normal de representación democrática. (2) Como se muestra en el primer capítulo, los mercados podrían tener temores irracionales, especialmente en situaciones de dificultad, y podrían dar lugar a profecías autocumplidas en materia de deuda y solvencia.

Esto no quiere decir que los países que han adoptado el euro sean menos «democráticos» que los que no lo han hecho; es posible que sean más proclives a escuchar señales procedentes de los mercados, ya que dependen en mayor medida de las percepciones de los mercados sobre su salud fiscal. Esto podría ser un efecto colateral de la adopción del euro y, en este caso, Rumanía, y especialmente los votantes rumanos, tendrán que analizar más de cerca las implicaciones de este hecho a la hora de evaluar las consecuencias de la pertenencia de su país a la UEM.

Por último, la evaluación de la *meta* propiedad de las correlaciones de perturbaciones aporta evidencia de que, por el lado de la oferta, las perturbaciones subyacentes muestran signos de correlación moderada con algunos países clave (no tan elevados como entre los países más grandes de la zona del euro en sus correlaciones emparejadas), resultados que podrían utilizarse para justificar la adopción del euro. No obstante, podrían hacerse más esfuerzos para aumentar la similitud entre las estructuras económicas y para aumentar la interconexión comercial. Los resultados obtenidos en el lado de la demanda apuntan a una imagen más perturbadora; se observaron unos coeficientes de correlación bajos en general, con algunas excepciones, y podrían ser el resultado de años de perturbaciones inflacionistas motivadas políticamente y de perturbaciones fiscales expansionistas.

Teniendo en cuenta todas las conclusiones anteriores, quizá en lugar de una respuesta categórica e inequívoca a nuestra pregunta de investigación sería más pertinente ofrecer algunas recomendaciones a tener en cuenta a la hora de tomar decisiones políticas. En particular, y a la vista de los resultados de nuestra investigación, una buena estrategia de adopción del euro para Rumanía debería basarse en una *expectativa proactiva*.

Esto implica un aplazamiento de la adopción por el momento y el uso de este tiempo para crear alternativa adecuadas a la falta de política monetaria nacional. Concretamente, Rumanía podría trabajar hacia una mayor integración del mercado de capitales y del sector bancario para permitir suavizar los efectos negativos de una hipotética perturbación idiosincrática. Esta solución privada de compartir el riesgo está muy alentada en el marco de los esfuerzos a escala de la UE para construir estas dos uniones en apoyo a la UEM. Rumanía debería aprovechar esta oportunidad y cooperar estrechamente a este respecto con otros Estados miembros y con las instituciones europeas pertinentes.

Para garantizar la competitividad salarial del sistema productivo rumano y verse menos afectada por los cambios muy frecuentes en el gobierno, un «pacto de Ulises» entre partidos sería otra recomendación adecuada, a fin de aprobar un acto legislativo que vincule los salarios a un determinado valor de referencia que tenga en cuenta los niveles de productividad y la posición relativa de sus principales socios comerciales (como ocurrió, por ejemplo, en Bélgica, en la preparación para la adopción del euro a finales de la década de 90).

Además, en lo relativo a la cuestión clave de la disciplina fiscal, deben realizarse considerables esfuerzos en la dirección de reducir los déficits presupuestarios, los crecientes niveles de deuda pública y proporcionar señales claras a los mercados financieros en relación con la sostenibilidad presupuestaria y la solidez financiera de las cuentas públicas. Esto debe lograrse lo antes posible, no solo en aras de una rápida adopción del euro (es decir, para el cumplimiento de los criterios de convergencia presupuestaria), sino también en aras de unos buenos resultados económicos posteriores a la adopción, como país.

Por último, siempre hay la posibilidad (y la esperanza) de que la arquitectura de la UEM se complemente con la creación de algún tipo de unión presupuestaria y, una vez más, en este sentido, debe hacerse hincapié en la palabra *proactiva*. Rumanía, como muchos otros Estados miembros de la UE, debería utilizar su influencia política para impulsar una

reforma de este tipo que no solo se beneficiaría a ella (proporcionando mecanismos de seguro para activar las transferencias automáticas en caso de perturbaciones negativas y consolidando una parte significativa de la deuda nacional en una deuda común), sino a toda la Unión.

# Bibliography

Aizenman, J. (2015). The Eurocrisis: Muddling through, or on the Way to a More Perfect Euro Union? *Comparative Economic Studies*, *57*(2), 205–221. https://doi.org/10.1057/ces.2014.37

Aksoy, T., & Manasse, P. (2018). The Persistence-Resilience Trade-off in Unemployment: The Role of Labor and Product Market Institutions. In *Working Papers* (No. wp1121; Working Papers). Dipartimento Scienze Economiche, Universita' di Bologna. https://ideas.repec.org/p/bol/bodewp/wp1121.html

Albano, de F. (2017). Neoliberalism, Profitability, and the Crisis in the Eurozone. *Review of Radical Political Economics*, *49*(3), 410–429. https://doi.org/10.1177/0486613417703955

Alesina, A., Cohen, G. D., & Roubini, N. (1993). Electoral business cycle in industrial democracies. *European Journal of Political Economy*, *9*(1), 1–23. https://doi.org/10.1016/0176-2680(93)90027-R

Alesina, Alberto., Roubini, Nouriel., & Cohen, G. D. (1999). *Political cycles and the macroeconomy*. Massachusetts Institute of Technology; /z-wcorg/.

Álvarez, I., Febrero, E., & Uxó, J. (2018). *Internal devaluation in a wage-led economy: The case of Spain*. https://doi.org/10.1093/cje/bey027

Arčabić, V., & Škrinjarić, T. (2021). Sharing is caring: Spillovers and synchronization of business cycles in the European Union. *Economic Modelling*, *96*(C), 25–39. https://EconPapers.repec.org/RePEc:eee:ecmode:v:96:y:2021:i:c:p:25-39

Ari, A. (2016). Sovereign risk and bank risk-taking. *Working Paper Series*, *1894*, 55.

Artis, M. J. (1991). One market, one money: An evaluation of the potential benefits and costs of forming an economic and monetary union. *Open Economies Review*, *2*(3), 315–321. https://doi.org/10.1007/BF01886149

Austen-Smith, D. (1993). Information and Influence: Lobbying for Agendas and Votes. *American Journal of Political Science*, *37*(3), 799–833. JSTOR. https://doi.org/10.2307/2111575

Bacchetta, P. (1997). Exchange Rate Policy and Disinflation: The Spanish Experience in the ERM. *The World Economy*, *20*(2), 221–238. https://doi.org/10.1111/1467-9701.00067

Baker, D. (2010). *The Myth of Expansionary Fiscal Austerity*. 14. http://cepr.net/documents/publications/austerity-myth-2010-10.pdf

Baldwin, R. E., Di Nino, V., Fontagne, L., De Santis, R. A., & Taglioni, D. (2008). Study on the Impact of the Euro on Trade and Foreign Direct Investment. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.1163774

Bayoumi, T., & Eichengreen, B. (1993). *Shocking aspects of European monetary integration* (F. Torres & F. Giavazzi, Eds.; pp. 193–235). Cambridge University Press. https://doi.org/10.1017/CBO9780511599231.014

Bayoumi, T., & Eichengreen, B. (1996). Operationalizing the theory of optimum currency areas. In *CEPR Discussion Papers* (No. 1484; CEPR Discussion Papers). C.E.P.R. Discussion Papers. https://ideas.repec.org/p/cpr/ceprdp/1484.html

Berger, H., & Nitsch, V. (2008). Zooming out: The trade effect of the euro in historical perspective. *Journal of International Money and Finance*, *27*(8), 1244–1260. https://ideas.repec.org/a/eee/jimfin/v27y2008i8p1244-1260.html

Bértoa, F. C. (2019). *Database on WHO GOVERNS in Europe and beyond*. https://whogoverns.eu/

Black, S. (2010). *Fixing the flaws in the Eurozone*. https://voxeu.org/article/fixing-flaws-eurozone

Blanchard, O. J., & Quah, D. (1989). The dynamic effects of aggregate demand and supply disturbances. *The American Economic Review*, *79*(4), 655–673. http://www.jstor.org/stable/1827924

Blanchard, O. J., & Summers, L. H. (1986). *Hysteresis in Unemployment* (Working Paper No. 2035). National Bureau of Economic Research. https://doi.org/10.3386/w2035

Bobeica, E., & Manu, A. (2013). Empirical analysis of business cycle synchronization and shock similarity between Romania and the Eurozone. *Emerging Markets Finance and Trade*, *49*(4), 74–97. Scopus. https://doi.org/10.2753/REE1540-496X490404

Bodea, A. (2016). Trade creation and trade diversion in the EU periphery; the case of the North-East region of Romania. *The USV Annals of Economics and Public Administration*, *16*(2 (24)), 78–85.

Bodea, A., & Sánchez-Santos, J. M. (2020). Seigniorage and inflation tax in Romania. What is the executive giving up by adopting the euro? *Scientific Annals of Economics and Business*, *67*(1), 75–91. https://doi.org/10.2478/saeb-2020-0004

Brans, P., Clemens, U., Kattami, C., & Meyermans, E. (2021). Economic benefits of the euro. *Quarterly Report on the Euro Area (QREA)*, *20*(1), 47–61. https://doi.org/10.2765/49030

Bräuninger, T. (2005). A Partisan Model of Government Expenditure. *Public Choice*, *125*(3/4), 409–429. https://doi.org/10.1007/s11127-005-3055-x

Briguglio, L., Cordina, G., Farrugia, N., & Vella, S. (2009). Economic Vulnerability and Resilience: Concepts and Measurements. *Oxford Development Studies*, *37*(3), 229–247. https://doi.org/10.1080/13600810903089893

Buiter, W., Corsetti, G., Roubini, N., Repullo, R., & Frankel, J. (1993). Excessive Deficits: Sense and Nonsense in the Treaty of Maastricht. *Economic Policy*, *8*(16), 57. https://doi.org/10.2307/1344568

Buti, M., Deroose, S., Leandro, J., & Giudice, G. (2017, July 13). Completing EMU. *VoxEU.Org*. https://voxeu.org/article/completing-emu

Cagan, P. (1956). *The Monetary Dynamics of Hyperinflation* (M. Friedman, Ed.; pp. 25–117). University of Chicago Press.

Calmfors, L. (1998). Macroeconomic policy, wage setting, and employment—What difference does the EMU make? *Oxford Review of Economic Policy*, *14*(3), 125–151. https://doi.org/10.1093/oxrep/14.3.125

Campos, N. F., & Macchiarelli, C. (2016). Core and periphery in the European Monetary Union: Bayoumi and Eichengreen 25 years later. *Economics Letters*, *147*, 127–130. https://doi.org/10.1016/j.econlet.2016.07.040

Carlsen, F. (1997). Counterfiscal policies and partisan politics: Evidence from industrialized countries. *Applied Economics*, *29*(2), 145–151. https://doi.org/10.1080/000368497327227

Chiba, D., Martin, L. W., & Stevenson, R. T. (2015). A Copula Approach to the Problem of Selection Bias in Models of Government Survival. *Political Analysis*, *23*(1), 42–58. https://doi.org/10.1093/pan/mpu013

Ciani, E., David, F., & de Blasio, G. (2019). Local responses to labor demand shocks: A Re-assessment of the case of Italy. *Regional Science and Urban Economics*, *75*, 1–21. https://doi.org/10.1016/j.regsciurbeco.2018.12.003

Claeys, G., & Wolff, G. (2020, June). Is the COVID-19 crisis an opportunity to boost the euro as a global currency? | Bruegel [Bruegel - Policy Contribution]. *Is the COVID-19 Crisis an Opportunity to Boost the Euro as a Global Currency?* https://www.bruegel.org/2020/06/is-the-covid-19-crisis-an-opportunity-to-boost-the-euro-as-a-global-currency/

Click, R. W. (1998). Seigniorage in a Cross-Section of Countries. *Journal of Money, Credit and Banking*, *30*(2), 154–171. https://doi.org/10.2307/2601207

Cohen, B. J. (2012). The Benefits and Costs of an International Currency: Getting the Calculus Right. *Open Economies Review*, *23*(1), 13–31. https://doi.org/10.1007/s11079-011-9216-2

Constâncio, V. (2020). Fiscal and financial conditions for a stronger euro area. *European Journal of Economics and Economic Policies: Intervention*, *17*(2), 183–193. https://doi.org/10.4337/ejeep.2020.02.07

Corden, W. M. (1972). Monetary integration, essays in international finance. *International Finance Section*, *93*, 1–45.

Council of the European Union. (2020). *Conditions for joining the euro area: Convergence criteria*. https://www.consilium.europa.eu/en/policies/joining-the-euro-area/convergence-criteria/

Country Economy. (2018). *Rating: Romania Credit Rating*. https://countryeconomy.com/ratings/romania

Cowart, A. T. (1978). The Economic Policies of European Governments, Part II: Fiscal Policy. *British Journal of Political Science*, *8*(4), 425–439. Cambridge Core. https://doi.org/10.1017/S0007123400001484

Cross, R., McNamara, H., & Pokrovskii, A. V. (2012). Memory of recessions. *Journal of Post Keynesian Economics*, *34*(3), 413–430. https://doi.org/10.2753/PKE0160-3477340302

Cukrowski, J., & Fischer, M. M. (2003). Seigniorage Wealth and Redistribution in Central and Eastern European Countries. *Post-Communist Economies*, *15*(1), 27–46. https://doi.org/10.1080/1463137032000058377

Cusack, T., R. (1999). Partisan Politics and Fiscal Policy. *Comparative Political Studies*, *32*(4), 464–486. https://doi.org/10.1177/0010414099032004003

Daniele, G., & Geys, B. (2015). Public support for European fiscal integration in times of crisis. *Journal of European Public Policy*, *22*(5), 650–670. https://doi.org/10.1080/13501763.2014.988639

de Grauwe, P. (2009). *Economics of monetary union*. Oxford University Press.

de Grauwe, P. (2011). The Governance of a Fragile Eurozone. *CEPS Working Document*, 28. https://www.ceps.eu/wp-content/uploads/2011/05/WD%20346%20De%20Grauwe%20on%20Eurozone%20Governance.pdf

de Grauwe, P. (2018). *Economics of monetary union*. Oxford University Press.

de Grauwe, P., & Ji, Y. (2013). Self-fulfilling crises in the Eurozone: An empirical test. *Journal of International Money and Finance*, *34*, 15–36. https://doi.org/10.1016/j.jimonfin.2012.11.003

de Grauwe, P., & Ji, Y. (2019). Making the Eurozone Sustainable by Financial Engineering or Political Union? *JCMS: Journal of Common Market Studies*, *57*(S1), 40–48. https://doi.org/10.1111/jcms.12918

de Grauwe, P., & Vanhaverbeke, W. (1990). Exchnage rate experiences in small and EMS countries; Belgium, Denmark and Netherlands. In I. M. Fund, *Choosing an Exchange Rate Regime: The Challenge for Smaller Industrial Countries*. International Monetary Fund.

De Santis, R. A., & Stein, M. (2015). Financial indicators signaling correlation changes in sovereign bond markets. *Journal of Banking & Finance*, *56*, 86–102. https://doi.org/10.1016/j.jbankfin.2015.02.018

Decressin, J., & Fatas, A. (1994). *Regional Labour Market Dynamics in Europe* (CEPR Discussion Paper No. 1085). C.E.P.R. Discussion Papers. https://econpapers.repec.org/paper/cprceprdp/1085.htm

Demertzis, M., Hallett, A. H., & Rummel, O. (2000). Is the European Union a natural currency area, or is it held together by policy makers? *Weltwirtschaftliches Archiv*, *136*(4), 657–679. https://www.jstor.org/stable/40440810

Deskar-Škrbić, M., Kotarac, K., & Kunovac, D. (2020). The third round of euro area enlargement. Are the candidates ready? *Journal of International Money and Finance*, *107*, 102205. https://doi.org/10.1016/j.jimonfin.2020.102205

Díaz-Roldán, C., Parada-Rodríguez, J. L., & Carmona-González, N. (2019). Austerity policies in the Eurozone: How they affect youth unemployment? *The Central European Review of Economics and Management*, *3*(2), 7. https://doi.org/10.29015/cerem.753

Diermeier, D., Eraslan, H., & Merlo, A. (2003). A Structural Model of Government Formation. *Econometrica*, *71*(1), 27–70. https://doi.org/10.1111/1468-0262.00389

Diermeier, D., & Stevenson, R. T. (1999). Cabinet Survival and Competing Risks. *American Journal of Political Science*, *43*(4), 1051–1068. https://doi.org/10.2307/2991817

Dissart, J. C. (2016). Regional Economic Diversity and Regional Economic Stability: Research Results and Agenda: *International Regional Science Review*. https://doi.org/10.1177/0160017603259083

Döring, H., & Manow, P. (2019). *Parliaments and governments database (ParlGov): Information on parties, elections and cabinets in modern democracies. * http://www.parlgov.org/

Dospinescu, A. S., & Russo, G. (2018). *Romania – Systematic Country Diagnostic: Background note – migration* [Text/HTML]. World Bank Group. https://documents.worldbank.org/en/publication/documents-reports/documentdetail/210481530907970911/Romania-Systematic-Country-Diagnostic-background-note-migration

Drazen, A. (1985). *A general measure of inflation tax revenues* (Vol. 17). https://doi.org/10.1016/0165-1765(85)90252-6

Dvir, E., & Strasser, G. H. (2014). Does Marketing Widen Borders? Cross-Country Price Dispersion in the European Car Market. In *Boston College Working Papers in Economics* (No.

831; Boston College Working Papers in Economics). Boston College Department of Economics. https://ideas.repec.org/p/boc/bocoec/831.html

Easterly, W. R., Mauro, P., & Schmidt-Hebbel, K. (1995). Money Demand and Seigniorage-Maximizing Inflation. *Journal of Money Credit and Banking*, *27*(2), 583–603. https://doi.org/10.2307/2077885

Eichengreen, B. (1990). *Is Europe an Optimum Currency Area?* (CEPR Discussion Paper No. 478). C.E.P.R. Discussion Papers. https://econpapers.repec.org/paper/cprceprdp/478.htm

Emerson, M. (1992). *One market, one money. An evaluation of the potential benefits and costs of forming an economic and monetary union*. Oxford University Press on Demand.

Engel, C., & Rogers, J. H. (2004). European product market integration after the euro. *Economic Policy*, *19*(39), 348–384. https://doi.org/10.1111/j.1468-0327.2004.00126.x

Espinosa, E. G., & Sanchez, R. F. (2016). Unit Labour Costs in the Success of German Exports (1999-2007). *Revista de Economia Mundial*, *43*, 133–160.

European Central Bank. (2017). *Report on financial structures, October 2017* (p. 87). European Central Bank. https://www.ecb.europa.eu/pub/pdf/other/reportonfinancialstructures201710.en.pdf

European Central Bank. (2018). *Long-term interest rate statistics for EU Member States*. https://www.ecb.europa.eu/stats/financial_markets_and_interest_rates/long_term_interest_rates/html/index.en.html

European Central Bank. (2020). *Convergence Report—June 2020*. https://doi.org/10.2866/83541

European Commission. (2011). *Quarterly report on the euro area.* (Volume 10, Issue 3). Directorate General for Economic and Financial Affairs (ECFIN). European Commission. https://ec.europa.eu/economy_finance/publications/qr_euro_area/2011/qrea3_en.htm

European Commission. (2015). Statistical Annex of European Economy. *European Economy. Spring 2015*, 210. https://ec.europa.eu/economy_finance/publications/european_economy/2015/2015-sa-spring_en.htm

European Consortium for Political Research. (2019). *European Journal of Political Research Political Data Yearbook* (Vol. 2019).

European Union Agency for Fundamental Rights (Ed.). (2017). *Second European Union minorities and discrimination survey: Main results*. Publications Offices of the European Union.

Fandl, M. (2018). *Monetary and Financial Policy in the Euro Area: An Introduction*. Springer International Publishing. https://doi.org/10.1007/978-3-319-72643-4

Faust, J., & Irons, J. S. (1999). Money, politics and the post-war business cycle. *Journal of Monetary Economics*, *43*(1), 61–89. https://doi.org/10.1016/S0304-3932(98)00046-4

Feldmann, M. (2013). From the ruble zone to the euro zone: The political economy of Estonian macroeconomic policy. *Post-Soviet Affairs*, *29*(4), 354–370. https://doi.org/10.1080/1060586X.2013.780799

Fidrmuc, J., & Korhonen, I. (2003). Similarity of supply and demand shocks between the Euro Area and the CEECs. In *Royal Economic Society Annual Conference 2003* (No. 77; Royal Economic Society Annual Conference 2003). Royal Economic Society. https://ideas.repec.org/p/ecj/ac2003/77.html

Flam, H., & Nordström, H. (2006). *Trade Volume Effects of the Euro: Aggregate and Sector Estimates* (Seminar Papers No. 746). Stockholm University, Institute for International Economic Studies. https://EconPapers.repec.org/RePEc:hhs:iiessp:0746

Flemming, J. S. (1987). The Economics of Worldwide Stagflation: A Review. *Oxford Economic Papers*, *39*(1), 223–232. https://www.jstor.org/stable/2663137

Forni, M., & Reichlin, L. (1997). *National policies and local economies: Europe and the United States* (CEPR Discussion Paper No. 1632). C.E.P.R. Discussion Papers. https://econpapers.repec.org/paper/cprceprdp/1632.htm

Fortunato, D., & Loftis, M. W. (2018). Cabinet Durability and Fiscal Discipline. *American Political Science Review*, *112*(4), 939–953. https://doi.org/10.1017/S0003055418000436

Frankel, J., & Rose, A. (2002). An Estimate of the Effect of Common Currencies on Trade and Income. *The Quarterly Journal of Economics*, *117*(2), 437–466. JSTOR. https://www.jstor.org/stable/2696432

Frenkel, M., & Nickel, C. (2002). *How symmetric are the shocks and the shock adjustment dynamics between the Euro Area and Central and Eastern European countries?* (SSRN Scholarly Paper ID 880912). Social Science Research Network. https://papers.ssrn.com/abstract=880912

Frenkel, M., Nickel, C., & Schmidt, G. (1999). Some shocking aspects of EMU enlargement. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.164551

Funke, M. (2000). Macroeconomic Shocks in Euroland vs the UK: Supply, Demand, or Nominal? In *Quantitative Macroeconomics Working Papers* (No. 20001; Quantitative Macroeconomics Working Papers). Hamburg University, Department of Economics. https://ideas.repec.org/p/ham/qmwops/20001.html

Gallagher, M. (2019). *Election indices dataset*. https://www.tcd.ie/Political_Science/people/michael_gallagher/ElSystems/Docts/ElectionIndices.pdf

Gasparotti, A., & Kullas, M. (2019). *20 Years of the Euro: Winners and Losers*. https://www.cep.eu/en/eu-topics/details/cep/20-years-of-the-euro-winners-and-losers.html

Gatti, J. R. J., & Kattuman, P. (2003). Online Price Dispersion Within and Between Seven European Countries. In *Cambridge Working Papers in Economics* (No. 0343; Cambridge Working Papers in Economics). Faculty of Economics, University of Cambridge. https://ideas.repec.org/p/cam/camdae/0343.html

*GEM Global Entrepreneurship Monitor*. (2020). GEM Global Entrepreneurship Monitor. https://www.gemconsortium.org/data

Giavazzi, F., & Giovannini, A. (1989). *Limiting exchange rate flexibility*. The MIT Press. https://mitpress.mit.edu/books/limiting-exchange-rate-flexibility

Grimm, L., Steinkamp, S., & Westermann, F. (2021). *On optimal currency areas and common cycles. Are the acceding countries ready to join the euro?* (SSRN Scholarly Paper ID 3830221). Social Science Research Network. https://papers.ssrn.com/abstract=3830221

Gros, D. (2004). Profiting from the Euro? Seigniorage Gains from Euro Area Accession. *JCMS: Journal of Common Market Studies*, *42*(4), 795–813. https://doi.org/10.1111/j.0021-9886.2004.00530.x

Guvernul României. (2018). *Planul național de adoptare a monedei euro*. Romanian Government. https://www.cnp.ro/user/repository/Comisia_nationala_euro/Planul_national_de_adoptare_a_monedei_euro.pdf

Habbard, P. (2012). *The Return of the Bond Vigilantes – Overview of the sovereign bond market and negotiations around the Greek debt restructuring*. Trade Union Advisory Committee to the OECD. https://members.tuac.org/fr/public/e-docs/00/00/0C/75/document_doc.phtml

Hancké, B. (2014, March 1). *Employment Regimes, Wage Setting, and Monetary Union in Continental Europe*. The Oxford Handbook of Employment Relations. https://doi.org/10.1093/oxfordhb/9780199695096.013.014

Harmel, R., & Robertson, J. D. (1986). Government Stability and Regime Support: A Cross-National Analysis. *The Journal of Politics*, *48*(4), 1029–1040. https://doi.org/10.2307/2131011

Haskel, J., & Wolf, H. (2001). The Law of One Price—A Case Study. *The Scandinavian Journal of Economics*, *103*(4), 545–558. https://doi.org/10.1111/1467-9442.00259

Heckelman, J. C. (2006). Another look at the evidence for rational partisan cycles. *Public Choice*, *126*(3), 257–274. https://doi.org/10.1007/s11127-006-6070-7

Herz, B., & Kotios, A. (2000). Coming home to Europe: Greece and the Euro. *Intereconomics*, *35*(4), 170–176. https://doi.org/10.1007/BF02930258

Hijzen, A., Kappeler, A., Pak, M., & Schwellnus, C. (2018). Labour Market Resilience: The Role of Structural and Macroeconomic Policies. In J. de Haan & J. Parlevliet (Eds.), *Structural Reforms: Moving the Economy Forward* (pp. 173–198). Springer International Publishing. https://doi.org/10.1007/978-3-319-74400-1_8

Hochreiter, E., Rovelli, R., & Winckler, G. (1996). *Central banks and seigniorage: A study of three economies in transition* (Vol. 40). https://doi.org/10.1016/0014-2921(95)00075-5

Holling, C. S. (1973). Resilience and Stability of Ecological Systems. *Annual Review of Ecology and Systematics*, *4*(1), 1–23. https://doi.org/10.1146/annurev.es.04.110173.000245

Holston, K., Laubach, T., & Williams, J. C. (2017). *Measuring the natural rate of interest: International trends and determinants* (Vol. 108). https://doi.org/10.1016/j.jinteco.2017.01.004

Hsing, Y. (2015). Determinants of the Government Bond Yield in Spain: A Loanable Funds Model. *International Journal of Financial Studies*, *3*(3), 342–350. https://doi.org/10.3390/ijfs3030342

Huber, J. D. (1998). How Does Cabinet Instability Affect Political Performance? Portfolio Volatility and Health Care Cost Containment in Parliamentary Democracies. *The American Political Science Review*, *92*(3), 577–591. https://doi.org/10.2307/2585482

Huber, P., & Tondl, G. (2012). Migration and Regional Convergence in the European Union. *WIFO Working Papers*, *419*, 36. https://www.econstor.eu/bitstream/10419/128953/1/wp_419.pdf

Ichiue, H., & Shimizu, Y. (2012). Determinants of Long-term Yields: A Panel Data Analysis of Major Countries and Decomposition of Yields of Japan and the US. *Bank of Japan Working Paper Series*, *12-E-7*(May).

International Monetary Fund. (1984). Exchange Rate Volatility and World Trade. In *Exchange Rate Volatility and World Trade*. International Monetary Fund. https://www.elibrary.imf.org/view/books/084/02200-9781557750655-en/02200-9781557750655-en-book.xml

International Monetary Fund. (2019). *Annual Report on Exchange Arrangements and Exchange Restrictions 2018*. https://www.imf.org/-/media/Files/Publications/AREAER/areaer-2018-overview.ashx

International Monetary Fund Research Department. (2010). Will It Hurt? Macroeconomic Effects of Fiscal Consolidation. In *World Economic Outlook, October 2010: Recovery, Risk, and Rebalancing*. INTERNATIONAL MONETARY FUND.

https://www.elibrary.imf.org/view/IMF081/10685-9781589069473/10685-9781589069473/ch03.xml

Ishiyama, Y. (1975). The theory of optimum currency areas. A survey. *Staff Papers (International Monetary Fund)*, *22*(2), 344–383. https://doi.org/10.2307/3866482

Issing, O. (2004). Economic and Monetary Union in Europe. Political priority versus economic integration? In B. Ingo, C. Volker, & S. Bertram (Eds.), *Political Events and Economic Ideas*. Edward Elgar Publishing. https://EconPapers.repec.org/RePEc:elg:eechap:3131_2

Jauer, J., Liebig, T., Martin, J. P., & Puhani, P. A. (2018). Migration as an Adjustment Mechanism in the Crisis? A Comparison of Europe and the United States 2006–2016. *Institute of Labor Economics (IZA)*, *11328*, 29.

Jayadev, A., & Konczal, M. (2010). *The Boom Not The Slump: The Right Time For Austerity*. 9.

Jelle, V. (2019). *ICTWSS Database. Version 6.1*. Amsterdam Institute for Advanced Labour Studies (AIAS) University of Amsterdam. http://uva-aias.net/en/ictwss

Jones, E., Kelemen, R. D., & Meunier, S. (2016). Failing Forward? The Euro Crisis and the Incomplete Nature of European Integration. *Comparative Political Studies*, *49*(7), 1010–1034. https://doi.org/10.1177/0010414015617966

Juncker, J.-C., Tusk, D., Dijsselbloem, J., Draghi, M., & Schulz, M. (2017). *Completing Europe's Economic and Monetary Union. Reflection Paper on the Deepening of the Economic and Monetary Union* (p. 24). European Commission.

Kiguel, M. A., & Neumeyer, P. A. (1995). Seigniorage and Inflation: The Case of Argentina. *Journal of Money, Credit and Banking*, *27*(3), 672–682. https://doi.org/10.2307/2077742

Klein, M., & Neumann, M. J. M. (1990). Seigniorage: What is it and who gets it? *Weltwirtschaftliches Archiv : Zeitschrift Für Allgemeine Und Spezielle Weltwirtschaftslehre*, *126*(2), 205–221. https://doi.org/10.1007/BF02706356

Kleinbaum, D. G., & Klein, M. (2012). *Survival analysis: A self-learning text*. Springer.

Kontolemis, Z., Meyermans, E., & Uregian, C. (2020). Consumption smoothing and the role of banking integration in the euro area. *Quarterly Report on the Euro Area (QREA)*, *19*(2), 7–26. https://ideas.repec.org/a/euf/qreuro/0192-01.html

Krishnamurthy, A., & Vissing-Jorgensen, A. (2011). *The Effects of Quantitative Easing on Interest Rates: Channels and Implications for Policy* (Working Paper No. 17555). National Bureau of Economic Research. https://doi.org/10.3386/w17555

Lagravinese, R. (2015). Economic crisis and rising gaps North–South: Evidence from the Italian regions. *Cambridge Journal of Regions, Economy and Society*, *8*(2), 331–342. https://doi.org/10.1093/cjres/rsv006

Laver, M. (2003). Government Termination. *Annual Review of Political Science*, *6*(1), 23–40. https://doi.org/10.1146/annurev.polisci.6.121901.085530

Lehmann, H., Razzolini, T., & Zaiceva, A. (2017). Internal devaluation and labor market outcomes: Evidence from Latvia. *Working Papers, Dipartimento Scienze Economiche, Universita' Di Bologna.*, *wp1095*.

Levy, M. (2012). *Diverging competitiveness among EU nations: Constraining wages is the key*. https://voxeu.org/article/how-restore-competitiveness-eu

Lupia, A., & Strøm, K. (1995). Coalition Termination and the Strategic Timing of Parliamentary Elections. *The American Political Science Review*, *89*(3), 648–665. https://doi.org/10.2307/2082980

Martin, R. (2010). Roepke Lecture in Economic Geography—Rethinking Regional Path Dependence: Beyond Lock-in to Evolution. *Economic Geography*, *86*(1), 1–28. http://www.jstor.org/stable/27806893

Martin, R. (2011). Regional economic resilience, hysteresis and recessionary shocks. *Journal of Economic Geography*, *12*(1), 1–32. https://doi.org/10.1093/jeg/lbr019

Marty, A. L. (1978). Inflation, Taxes, and the Public Debt. *Journal of Money, Credit and Banking*, *10*(4), 437–452. https://doi.org/10.2307/1991574

McCallum, B. T. (1989). *Monetary economics: Theory and policy*. Macmillan ; Collier Macmillan.

McKinnon, R. I. (1963). Optimum currency areas. *The American Economic Review*, *53*(4), 717–725. https://www.jstor.org/stable/1811021

Meloni, W. P. (2016). Austerity and competitiveness in the Eurozone: A misleading linkage. *Departmental Working Papers of Economics, University Roma Tre.*, *0223*.

Merlo, A. (1997). Bargaining over Governments in a Stochastic Environment. *Journal of Political Economy*, *105*(1), 101–131. https://doi.org/10.1086/262067

Micossi, S. (2020). *An International Role for the Euro?* (SSRN Scholarly Paper ID 3717135). Social Science Research Network. https://doi.org/10.2139/ssrn.3717135

Mihai, I., & Novo-Corti, I. (2020). Cultural Distance and Migration Patterns in the EU: The Romanian Case. *European Research Studies Journal*, *XXIII*(3), 410–424. https://ersj.eu

Milio, D. S., Crescenzi, D. R., Schelkle, D. W., Durazzi, N., Garnizova, E., Janowski, P., Olechnicka, D. A., Wojtowicz, D., Luca, D., & Fossarello, M. (2014). *Impact of the Economic Crisis on Social, Economic and Territorial Cohesion of the European Union*. *I*, 166.

Mody, A. (2018). *Eurotragedy: A drama in nine acts*.

Mongelli, F. P. (2002). *"New" views on the optimum currency area theory. What is EMU telling us?*

Moody's Analytics. (2021). *Romania—Economic Indicators*. https://www.economy.com/romania/indicators#ECONOMY

Müller, T., Schulten, T., & Zuckerstätter, S. (2015). *Wages and economic performance in Europe* (pp. 259–282). European Trade Union Institute.

Mundell, R. A. (1961). A theory of optimum currency areas. *American Economic Review*, *51*(4), 657–665.

Myant, M., Theodoropoulou, S., & Piasna, A. (2016). *Unemployment, internal devaluation and labour market deregulation in Europe*.

National Bank of Romania. (2018). *Open market operations*. http://bnr.ro/Open-market-operations–3656.aspx

Neumann, M. (1996). A comparative study of seigniorage: Japan and Germany. *Bank of Japan Monetary and Econ MicStudies*, *14*(1), 104–142.

Nickell, S., & Layard, R. (1999). *Labor market institutions and economic performance* (pp. 3029–3084) [Handbook of Labor Economics]. Elsevier. https://econpapers.repec.org/bookchap/eeelabchp/3-46.htm

Nitsch, V., & Pisu, M. (2008, October 24). Scalpel, Please! Dissecting the Euro's Effect on Trade. *Economic Policy*. https://www.economic-policy.org/48th-economic-policy-panel/scalpel-please-dissecting-the-euros-effect-on-trade/

Nordhaus, W. D. (1975). The Political Business Cycle. *The Review of Economic Studies*, *42*(2), 169–190. JSTOR. https://doi.org/10.2307/2296528

OECD. (1999). *EMU: Facts, challenges and policies*. OECD. https://doi.org/10.1787/9789264172609-en

Ollivaud, P., & Turner, D. (2014). The effect of the global financial crisis on OECD potential output. *ECONOMIC STUDIES*, *2014*, 20.

Ormerod, P. (2010). Resilience after local economic shocks. *Applied Economics Letters*, *17*(5), 503–507. https://doi.org/10.1080/13504850801964331

Ormerod, P. (2016). Corruption and economic resilience: Recovery from the financial crisis in western economies. *Economic Affairs*, *36*(3), 348–355. https://doi.org/10.1111/ecaf.12198

Parliament, R. (2004). *Law 312/2004 regarding the Statute of the National Bank of Romania*. http://www.bnro.ro/Banking-Financial-Legislation-3179.aspx

Perugini, C., Hölscher, J., & Collie, S. (2013). Inequality, credit expansion and financial crises. *MPRA Working Papers*, *51336*, 32. https://mpra.ub.uni-muenchen.de/51336/1/MPRA_paper_51336.pdf

Pfaff, B. (2021). *BQ function. R Documentation*. https://www.rdocumentation.org/packages/vars/versions/1.5-3/topics/BQ

Phelps, E. S. (1973). Inflation in Theory of Public Finance. *Swedish Journal of Economics*, *75*(1), 67–82. https://doi.org/10.2307/3439275

Pimm, S. L. (1984). The complexity and stability of ecosystems. *Nature*, *307*(5949), 321–326. https://doi.org/10.1038/307321a0

Pop, C., Georgescu, M.-A., & Pop, I. A. (2012). *Piața obligațiunilor guvernamentale din România. XIX*(12), 28.

Potrafke, N. (2012). Political cycles and economic performance in OECD countries: Empirical evidence from 1951–2006. *Public Choice*, *150*(1), 155–179. https://doi.org/10.1007/s11127-010-9695-5

Rajan, R. G. (2010). *Fault Lines. How Hidden Fractures Still Threaten the World Economy*. Princeton University Press. https://press.princeton.edu/books/paperback/9780691152639/fault-lines

Rebitzer, J. B. (1988). Unemployment, Labor Relations, and Unit Labor Costs. *The American Economic Review*, *78*(2), 389–394. www.jstor.org/stable/1818156

Rogoff, K., & Sibert, A. (1988). Elections and Macroeconomic Policy Cycles. *The Review of Economic Studies*, *55*(1), 1–16. https://doi.org/10.2307/2297526

Rolnick, A. J., Velde, F. R., & Weber, W. E. (1996). The debasement puzzle: An essay on medieval monetary history. *Journal of Economic History*, *56*(4), 789–808. https://doi.org/10.1017/S0022050700017472

Romer, D. (2012). *Advanced macroeconomics*. McGraw-Hill/Irwin.

Rose, A. K., & Glick, R. (2015). Currency Unions and Trade: A Post-EMU Mea Culpa. *Federal Reserve Bank of San Francisco, Working Paper Series*.

Rose, S. (2006). Do Fiscal Rules Dampen the Political Business Cycle? *Public Choice*, *128*(3/4), 407–431. https://www.jstor.org/stable/25487566

Rovelli, R. (1994). *Reserve requirements, seigniorage and the financing of the government in an economic and monetary union* (pp. 11–55). European Commission.

Sabatino, M. (2019). Economic resilience and social capital of the Italian region. *International Review of Economics & Finance*, *61*, 355–367. https://doi.org/10.1016/j.iref.2019.02.011

Sachs, J., & Sala-i-Martin, X. (1992). *Fiscal Federalism and Optimum Currency Areas: Evidence for Europe from the United States* (CEPR Discussion Paper No. 632). C.E.P.R. Discussion Papers. https://econpapers.repec.org/paper/cprceprdp/632.htm

Sachs, J., & Wyplosz, C. (1986). The economic consequences of President Mitterrand. *Economic Policy*, *1*(2), 261–306. https://doi.org/10.2307/1344559

Sachs, Jeffrey D. ,. Larrain B. ,. Felipe. (1993). *Macroeconomics in the global economy*. Harvester Wheatsheaf.

Sánchez-Montijano, E., Kaya, A., & Sökem, M. J. (2018). *Highly Skilled Migration between the EU and Turkey: Drivers and Scenarios*. https://doi.org/10.5281/zenodo.2602642

Sanchez-Santos, J. M., Varela, D., & Cancelo, J. R. (2011). Interest rate setting at the ECB: Individual preferences and collective decision making. *Journal of Policy Modeling*, *33*(6), 804–820. https://doi.org/10.1016/j.jpolmod.2011.08.017

Sapir, A. (2019, July 25). *High public debt in the euro area: A tale of Belgium and Italy*. JCMS: Journal of Common Market Studies. https://onlinelibrary.wiley.com/doi/abs/10.1111/jcms.12950

Sattler, T., & Walter, S. (2010). Monetary Credibility vs. Voter Approval: Political Institutions and Exchange-Rate Stabilization During Crises. *Economics & Politics*, *22*(3), 392–418. https://doi.org/10.1111/j.1468-0343.2010.00367.x

Shi, M., & Svensson, J. (2006). Political budget cycles: Do they differ across countries and why? *Journal of Public Economics*, *90*(8), 1367–1389. https://doi.org/10.1016/j.jpubeco.2005.09.009

Smaghi, L., Bini, & Gros, D. (2000). Who gets the seigniorage? In *Open Issues in European Central Banking* (pp. 94–117). Palgrave Macmillan.

Sohst, R., Tjaden, J. D., Valk, H. de, & Melde, S. (2020). *The future of migration to Europe a systematic review of the literature on migration scenarios and forecasts*. International Organization for Migration, The Netherlands Interdisciplinary Demographic Institute. https://publications.iom.int/system/files/pdf/the-future-of-migration-to-europe.pdf

Sondermann, D. (2018). Towards more resilient economies: The role of well-functioning economic structures. *Journal of Policy Modeling*, *40*(1), 97–117. https://doi.org/10.1016/j.jpolmod.2018.01.002

Stiglitz, J. E. (2013). *The price of inequality: How today's divided society endangers our future*. W.W. Norton & Company.

Stiglitz, J. E. (2016). *The euro: How a common currency threatens the future of Europe*.

Stoica, O. (2002). *Mecanisme şi instituţii ale pieţei de capital. Pieţe de capital emergente*. Economica.

Târlea, S., Bailer, S., Degner, H., Dellmuth, L. M., Leuffen, D., Lundgren, M., Tallberg, J., & Wasserfallen, F. (2019). Explaining governmental preferences on Economic and Monetary Union Reform. *European Union Politics*, *20*(1), 24–44. https://doi.org/10.1177/1465116518814336

Tavlas, G. S. (1993). The 'New' Theory of Optimum Currency Areas. *The World Economy*, *16*(6), 663–685. https://doi.org/10.1111/j.1467-9701.1993.tb00189.x

Todorov, K. (2019). Quantify the quantitative easing: Impact on bonds and corporate debt issuance. *Journal of Financial Economics*, S0304405X19301941. https://doi.org/10.1016/j.jfineco.2019.08.003

Torsten, P., & Svensson, L. E. O. (1989). Why a Stubborn Conservative would Run a Deficit: Policy with Time- Inconsistent Preferences. *The Quarterly Journal of Economics*, *104*(2), 325–345. JSTOR. https://doi.org/10.2307/2937850

Uxo, J. (2014). Internal devaluation in the European periphery: The story of a failure. *Documentos de Trabajo, Departamento de Análisis Económico y Finanzas, Universidad de Castilla - La Mancha*, *DT 2014/2*.

Villanueva, P., Cárdenas, L., Uxó, J., & Álvarez, I. (2020). The role of internal devaluation in correcting external deficits: The case of Spain. *Structural Change and Economic Dynamics*. https://doi.org/10.1016/j.strueco.2020.03.008

Volkens, A., Krause, W., Lehmann, P., Theres, M., Merz, N., Regel, S., & Weßels, B. (2018). *The Manifesto Data Collection. Manifesto Project (MRG/CMP/MARPOR). Version 2018b*. https://doi.org/10.25522/manifesto.mpds.2018b

Warwick, P. (1995). *Government Survival in Parliamentary Democracies*. Cambridge University Press. https://doi.org/10.1017/CBO9780511528132

Wolf, M., Haar, K., & Hoedeman, O. (2014). *The fire power of the financial lobby. A Survey of the Size of the Financial Lobby at the EU level*. Corporate Europe Observatory (CEO), The Austrian Federal Chamber of Labour (Arbeiterkammer) and The Austrian Trade Union Federation (ÖGB). https://corporateeurope.org/en/financial-lobby/2014/04/fire-power-financial-lobby

Wolszczak-Derlacz, J. (2006). *One Europe, One Product, Two Prices—The Price Disparity in the EU* (SSRN Scholarly Paper ID 934312). Social Science Research Network. https://doi.org/10.2139/ssrn.934312

Zaman, C. (2002). *Fiscal Consequences of EMU Integration: The Case of Romania.*

Zhao, Y., H, A. L., Yau, K. K. W., & Mclachlan, G. (2011). *Assessing the adequacy of Weibull survival models: A simulated envelope approach* (Vol. 38). https://doi.org/10.1080/02664763.2010.545115