

UNIVERSITY OF LJUBLJANA
SCHOOL OF ECONOMICS AND BUSINESS

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**THE DYNAMICS OF ECONOMIC INEQUALITY IN EURO AREA
BASED ON THE MARXIST THEORY OF EXPLOITATION**

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THE DYNAMICS OF ECONOMIC INEQUALITY IN THE EURO AREA BASED ON MARXIST THEORY OF EXPLOITATION

SUMMARY

This doctoral dissertation investigates the origins and dynamics of the euro area economic inequalities through the reintroduction and revision of the unequal labour exchange and dependency theories. Inspired by the works of Prebisch-Singer, Lewis, and Emmanuel, the following exposition refutes the mainstream, market-fundamentalist narrative regarding the inequalities in two ways. The first one challenges the incentive-oriented and merit-oriented systems via the development of a model which studies inequality as a derivative of labour force exploitation. The second opposes the notion of international trade as a positive-sum game. The cornerstone of this research is a Marxian, desert-based principle which defines the inequalities as a result of the capital-labour antagonism originating from the class monopoly over the ownership of the means of production.

The point of departure is that the euro area's unequal exchange, arising from the inner-country labour force exploitation, plays a key role in governing cross-country inequality. On these grounds, the axis of this research evolves around the premise that the euro area countries, with distinct exploitation rates, realize vastly unequal gains from trade. This implies that the euro area's structure generates new and amplifies existing inequalities, leading to the cross-country divergence in the social recognition of the used labour.

The arguments being advanced in this study are examined through three sections. The first section presents the theoretical model of the unequal labour exchange used to explain the creation and the nature of the inequality. Backed by the static economic analysis between 2004 and 2013, the findings indicate that the euro area's cross-country inequality is determined by the country-specific utilization of the existing market disequilibria, by the country-specific capital-labour ratios, and by the country-specific economic efficiencies. The effects of these inequality determinants are manifested through the cross-country deviations in the labour incomes, profit incomes, and labour force exploitation. Consequently, this forms a division between the exploitative (net-winning) countries and the exploited (net-losing) countries, thus confirming that the unequal labour exchange phenomenon is the driving cause of the euro area's cross-country inequality.

Building upon these foundations, the second section accounts for the changes occurring over time and captures the dynamic influence of the economic cycle on the euro area's inequality. The empirical employment of the aforementioned inequality determinants and their effects allows for the trend-cycle decomposition and the clustering of the euro area countries in accordance with the similarities in exhibited trends. Within the reference period between 2003 and 2014, the euro area member countries failed to demonstrate a tendency to uniformly share economic cycles, thus proving their differentiability based

on the distinct utilization of advantages arising from the cyclical influence. Certain euro area members became less resilient to shocks and downturns while asymmetrical benefit distribution, inflicted by the unequal labour exchange, resulted in cross-country divergence. The economic cycle exacerbated the conflicting interests between the euro area's core and the periphery. This brought to the surface structural inconsistencies, as a result of the underlying economic laws that set in motion the exploitative cross-country dynamics.

The third section furnishes empirical content based upon the proposition that the euro area's inequalities emerge from country-specific economic structures. The panel data analysis between 2003 and 2016 confirms the asymmetrical consequences of the euro area's development and demonstrates that the geographical distribution of the economic output is disproportionate to the labour consumed in its production. The latter was connected to the country-specific sectoral and technological compositions. The research disclosed that a country's heterogeneity in structural compositions is a crucial component of the unequal recognition of the consumed labour that constitutes the cross-country inequality and determines the countries' profit rates, wage rates, and exploitation rates.

This investigation contributes to the field from both theoretical and empirical viewpoints. The arguments raised within this doctoral dissertation represent a novel extension of the unequal exchange theory, carried out by abandoning previously criticized aspects. This includes an exclusive focus on the capitalist mode of production, discarding the labour immobility assumption and the equivalence between the market prices and prices of production, and choosing the sample size for which the international and national law of value operate in a like manner. The advanced postulates remedy the disputed conceptual and methodological issues and contribute to the theory. This adds to the understanding of the complex nature of cross-country inequalities and enables a straightforward empirical assessment of the hypothesised effects. Such an innovative approach quantitatively confirms that the euro area is in a deadlock regarding the fact that the current state serves the affluent countries at the expense of their less-developed neighbours. This proves that the euro area integrates countries into relations of unequal exchange and that its structure intrinsically contradicts the aims of effective single market integration. The existence of the value-transferring mechanism of the unequal labour exchange exposes the tension between countries and challenges the sustainability of the European social model. Given the lack of adequate supranational institutional arrangements, which should serve as corrective institutes to prevent a growing disintegration bias, this investigation is a platform for re-questioning the euro area's neoliberal policy discourse, which is deeply rooted in and incentivized by the inequalities that favour the interests of capital over labour as well as affluent countries over destitute ones.

Keywords: economic inequality, unequal labour exchange, labour force exploitation, trend-cycle decomposition, structural decomposition.

DINAMIKA EKONOMSKE NEENAKOSTI V DRŽAVAH EVRO OBMOČJA NA TEMELJU MARKSISTIČNE TEORIJE IZKORIŠČANJA

POVZETEK

V doktorski disertaciji avtor raziskuje izvore in dinamiko ekonomske neenakosti v območju evra, in sicer tako, da obudi in revidira tako imenovano načelo neekvivalentne menjave dela in teorijo odvisnosti. Navdahnjen z deli Prebisch-Singerja, Lewisa in Emmanuela avtor po dveh poteh zavrača prevladujočo, na trgu osnovano razlago neenakosti. Pri prvi izpodbija razlago, ki temeljijo na vzpodbudah in zaslugah, in sicer s pomočjo modela, ki omogoča analizo neenakosti na temelju eksploatacije delovne sile. Pri drugem pa zavrača razumevanje mednarodne menjave kot igre s pozitivno vsoto. Ključna točka te raziskave je marksistična razlaga, ki pripiše neenakost antagonizmu med kapitalom in delom, ki izvira iz razrednega monopola nad lastnino produkcijskih sredstev.

Začetna točka njegove analize je, da je neekvivalentna menjava ključna za nastanek neenakosti med državami, neekvivalentna menjava pa izvira iz eksploatacije delovne sile znotraj držav. Na tej podlagi avtor oblikuje raziskavo okoli domneve, da države evro območja zaradi različnih stopenj eksploatacije znotraj držav realizirajo neenake dobrobiti iz medsebojne menjave. To pa naj bi pomenilo, da struktura evro območja povzroča nove neenakosti (in krepí že obstoječe) na način, da razlike med državami na tem območju vodijo k različnemu družbenemu priznanju v posamezni državi porabljenega dela.

Omenjena stališča avtor raziskuje v treh delih. V prvem delu predstavlja teoretični model neekvivalentne menjave dela, ki omogoča razlago nastanka in narave neenakosti. Pri tem se naslanja na empirično ekonomsko analizo obdobja med letoma 2004 in 2013, po kateri so neenakosti med državami na območju evra determinirane z izkoriščanjem učinkov obstoječih tržnih neravnotežij, različnih odnosov med kapitalom in delom v posameznih državah ter različne ekonomske učinkovitosti v posameznih državah. Posledice neenakosti na teh treh področjih se potem izražajo v razlikah med državami v velikosti delovnih in profitnih dohodkov ter stopnji eksploatacije delovne sile. Na tej podlagi avtor meni, da je možno države razdeliti v skupino držav, ki so izkoriščevalskega značaja in neto dobitnice, ter skupino držav, ki so izkoriščane in neto izgubaši, kar naj bi potrjevalo tezo, da neekvivalentna menjava dela v resnici vodi do neenakosti znotraj evro območja.

Na podlagi teh ugotovitev avtor v drugem delu analizira dinamični vpliv ekonomskega cikla na neenakost znotraj evro območja. Empirična opredelitev determinant neenakosti, ki jih teoretsko in empirično opredeljuje v prvem delu, in vpliv teh neenakosti omogočata razvrščanje in grupiranje posameznih držav znotraj evro območja glede na podobnosti v teh državah, ki se pojavljajo s cikličnim gibanjem držav evro območja. Na podlagi podatkov v obdobju med letoma 2003 in 2014 tako ugotavlja, da značilnosti držav evro območja ne kažejo na tendenco k prevladi enakih posledic ekonomskega cikla in da je

mogoče države razlikovati glede na to, kako so se učinki cikličnega gibanja izražali v posameznih državah. Nekatere države evro območja so se pokazale manj odporne na šoke in zastoje v gospodarski rasti, saj je nesimetrična distribucija učinkov cikla na menjavo dela povzročala razlike med posameznimi državami. Ekonomski cikel je tako povečal konflikt interesov med državami evro območja, kot strukturne posledice delovanja ekonomskih zakonitosti, ki vodijo do izkoriščevalske dinamike med državami.

V tretjem delu se avtor usmeri na empirično raziskovanje domneve, da neenakosti evro območja izvirajo iz specifičnih ekonomskih struktur posameznih držav. Analiza, ki temelji na panelnih podatkih za obdobje 2003-2016, potrjuje neravnotežne posledice razvoja evro območja in kaže, da je geografska distribucija ekonomskega outputa neskladna z distribucijo dela, ki ga potrošijo v posameznih državah. To neskladje pa izvira iz specifičnih sektorskih in tehnoloških sestav gospodarstev v posameznih državah. Avtor v raziskavi tako sklepa, da heterogenost v gospodarskih strukturah posameznih držav omogoča odločilno razlago neenakega priznavanja potrošenega dela v posameznih državah, kar je v ozadju neenakosti med državami in tudi v opredeljevanju profitnih in mezdnih stopenj ter stopenj eksploatacije v posameznih državah.

Avtorjeva raziskava v doktorski disertaciji pomeni originalen razvoj teorije neekvivalentne menjave dela na način, da avtor opušča v preteklosti kritizirane vidike te teorije. S tem je izpostavil originalen pogled na proizvodni model kapitalizma, zavračajoč predpostavko o mobilnosti dela in ekvivalentnosti med tržnimi ter produkcijskimi cenami, da bi potem z empiričnimi podatki potrdil, kako zakon vrednosti deluje na enak način na mednarodni in nacionalni ravni. S tem odpravlja nekatere nesporazume o konceptualnih in metodoloških vprašanjih v ekonomski teoriji ter doda novo razumevanje teorije na področju, ki ga obravnava. Ustvari tudi pomemben prispevek k razlagi kompleksne narave neenakosti med državami in podlago za empirično raziskovanje hipotez na področju disertacije. Inovativni pristop avtorju omogoča kvantitativno potrditev, da je evro območje v določeni obliki tudi past, znotraj katere vplivne države razvijajo svoje gospodarstvo na račun manj razvitih. To dokazuje, da evro območje povezujejo odnosi, ki temeljijo na neekvivalentni menjavi, kar pa pomeni tudi, da struktura tega območja onemogoča nastajanje učinkovitega enotnega trga. Obstoje mehanizmov prenosa vrednosti v obliki neekvivalentne menjave dela povzročata napetosti med državami in izziva vprašanje obstojnosti evropskega socialnega modela. V razmerah, ko ne obstajajo nadnacionalne institucije, ki bi lahko izvajale korekcijo *dezintegracijskih sil* znotraj tega območja, ugotovitve avtorja lahko uporabljamo kot način ponovnega preverjanja neoliberalne politike v evro območju, ki je vzpodbujena z neenakostmi v korist kapitala in ne dela, pa s tem tudi vplivnih držav nad manj razvitimi državami.

Ključne besede: ekonomska neenakost, neekvivalentna menjava dela, eksploatacija delovne sile, dekompozicija trendov in ciklov, strukturna dekompozicija.

TABLE OF CONTENTS

1. INTRODUCTION	1
1.1. The relevance of Marxian economic thought regarding the study of inequality	2
1.2. The economic inequality of the euro area	6
1.2.1.The dilemma of the theoretical approach to euro area inequality	9
1.2.2.Economic inequality and the European integrational project	12
1.3. Research problem and purpose	15
1.4. Research questions	18
1.5. Research goals	19
1.6. Scientific contribution	20
1.7. Structure of the doctoral dissertation.....	23
2. LABOUR FORCE EXPLOITATION AND UNEQUAL EXCHANGE AS THE ROOT CAUSE OF THE EURO AREA'S INEQUALITY	24
2.1. Introduction.....	24
2.2. The theoretical models' foundation	26
2.3. Production prices, labour force exploitation, and the competition	29
2.4. Empirical model.....	33
2.5. Methodological and data issues	37
2.6. Results and implications	43
2.7. Conclusion	51
3. THE INFLUENCE OF THE ECONOMIC CYCLE ON THE EURO AREA'S CROSS-COUNTRY INEQUALITY DYNAMICS.....	53
3.1. Introduction.....	53
3.2. Literature overview.....	55
3.3. The theoretical model of cross-country inequality.....	57
3.3.1.The influence of market disequilibria.....	58
3.3.2.The influence of capital-labour ratios.....	59
3.3.3.The influence of economic efficiency	60
3.3.4.Formation of wage and profit rates	60
3.3.5.Labour force exploitation.....	61
3.4. Methodological issues, the model's restrictions, and data sources.....	62

3.5. Results-based implications and the synthesis of main findings	63
3.6. Conclusion	72
4. SECTORAL AND TECHNOLOGICAL ANALYSIS INTO THE ORIGINS AND DETERMINANTS OF THE ECONOMIC INEQUALITY WITHIN THE EURO AREA	75
4.1. Introduction.....	75
4.2. Literature overview.....	77
4.3. Measuring the cross-country economic inequality of the euro area....	79
4.4. Methodological considerations and data issues.....	83
4.5. The specification of euro area unequal exchange empirical model....	86
4.6. The results	89
4.7. Conclusions and discussion.....	95
5. GENERAL DISCUSSION AND CONCLUSIONS	98
5.1. Summary of main findings.....	98
5.2. Summary of main implications.....	106
5.2.1.Theoretical implications	106
5.2.2.Methodological implications.....	108
5.2.3.Practical implications	110
5.3. Summary of limitations and future research projects.....	114
REFERENCE LIST	117
APPENDICES	130

LIST OF FIGURES

Figure 1: The ratio between the actual gross domestic product and new value created in the euro area (ten-year average for the period 2004-2013)	44
Figure 3: The ratio between new value created and equilibrium gross domestic product in the euro area (ten-year average for the period 2004-2013)	45
Figure 4: The capital to labour force ratio of the euro area member states (ten-year average for the period 2004-2013).....	46
Figure 5: The ratio between actual gross domestic product and equilibrium gross domestic product in the euro area (ten-year average for the period 2004-2013).....	47
Figure 6: The average annual profit rate of the euro area member states (ten-year average for the period 2004-2013).....	48

Figure 7: The average annual wage rate of the euro area member states (ten-year average for the period 2004-2013).....	48
Figure 8: The influence of productivity and efficiency on the economic performance of the euro area (ten-year average for the period 2004-2013)	49
Figure 9: The euro area's exploitation rate (ten-year average for the period 2004-2013)	50
Figure 10: The ratio between equilibrium exploitation rate and the actual exploitation rate in the euro area (ten-year average for the period 2004-2013)	51
Figure 11: Dating the euro area's economic cycle (2003-2014).....	64
Figure 12: Cyclical influence on the countries' market position (2003-2014).....	65
Figure 13: Cyclical influence on the countries' capital-labour ratios (2003-2014).....	66
Figure 14: Cyclical influence on the countries' economic efficiency (2003-2014).....	68
Figure 15: Cyclical influence on labour income formation (2003-2014).....	69
Figure 16: Cyclical influence on profit income formation (2003-2014).....	70
Figure 17: Cyclical influence on the countries' labour exploitation rates (2003-2014). 71	
Figure 18: The euro area's social labour recognition and the hours worked (nine-year average for the period 2008-2016).....	84

LIST OF TABLES

Table 1: Relevant economic indicators of the euro area (average for the period 2003-2016).....	7
Table 2: The intra-trade export of goods and services of the chosen euro area member states in 2013.....	38
Table 3: The intra-trade import of goods and services of the chosen euro area member states in 2013.....	39
Table 4: The display of the most relevant indicators of the euro area countries (ten-year average for the period 2004-2013)	43
Table 5: The sectoral and technological compositions as the share of the gross value added	89
Table 6: The influence of the sectoral composition on the cross-country inequality dynamics of the euro area (2003-2016).....	90
Table 7: The influence of the technological composition on the cross-country inequality dynamics of the euro area (2003-2016).....	91

LIST OF APPENDICES

Appendix 1: Extended Summary in the Slovenian language	1
Appendix 2: The absolute values of the euro area's relevant indicators (ten-year average for the period 2004-2013).....	15
Appendix 3: Cyclical influence on the countries' market position (Actual GDP / equilibrium GDP ratio, 2003-2014).	16

Appendix 4: Clustering of the euro area member countries: Cyclical influence on the countries' market position (2003-2014).....	17
Appendix 5: Cyclical influence on the countries' capital-labour ratios (New value created/equilibrium GDP ratio, 2003-2014).....	19
Appendix 6: Clustering of the euro area member countries: Cyclical influence on the countries' capital-labour ratios (2003-2014).....	20
Appendix 7: Cyclical influence on the countries' economic efficiency (Equilibrium GDP / efficient GDP ratio, 2003-2014).....	23
Appendix 8: Clustering of the euro area member countries: Cyclical influence on the countries' economic efficiency (2003-2014).....	24
Appendix 9: Cyclical influence on labour income formation (Actual labour income / equilibrium labour income ratio, 2003-2014).....	27
Appendix 10: Clustering of the euro area member countries: Cyclical influence on labour income formation (2003-2014).....	28
Appendix 11: Cyclical influence on profit income formation (Actual profit income / equilibrium profit income ratio, 2003-2014).....	31
Appendix 12: Clustering of the euro area member countries: Cyclical influence on profit income formation (2003-2014).....	32
Appendix 13: Cyclical influence on the countries' labour exploitation rates (The exploitation rate, 2003-2014).....	35
Appendix 14: Clustering of the euro area member countries: Cyclical influence on the countries' labour exploitation rates (2003-2014).....	36
Appendix 15: The absolute values of the euro area's relevant indicators (ten-year average for the period 2003-2016).....	39
Appendix 16: The influence of the sectoral composition on the cross-country inequality dynamics of the euro area (2003-2016).....	40
Appendix 17: The influence of the technological composition on the cross-country inequality dynamics of the euro area (2003-2016).....	41

LIST OF ABBREVIATIONS

Countries	
AUS	– Austria
BEL	– Belgium
CYP	– Cyprus
EST	– Estonia
FIN	– Finland
FRA	– France
DEU	– Germany
GRC	– Greece
IRL	– Ireland
ITA	– Italy
LVA	– Latvia
LTU	– Lithuania
MLT	– Malta
NLD	– The Netherlands
PRT	– Portugal
SVK	– Slovakia
SVN	– Slovenia
ESP	– Spain
Economic categories	
I	– Unit matrix
A	– Input (coefficient) matrix
a_{ij}	– Technical coefficient (the element of A)
x	– Column vector of production
s	– Column vector of physical surplus
s_w	– Column vector of physical surplus appropriated by workers
w	– Commodity value (row) vector
l	– Consumed labour (row) vector
p	– Commodity price (row) vector
v	– Physical surplus in the price system (row) vector
NV	– New value created
NI	– National income
GDP	– Gross domestic product
NI_{pc}	– Equilibrium national income
GDP_{pc}	– Equilibrium gross domestic product
$GDP_{p/c}$	– Gross domestic product per capita
NI_u	– Efficient, equilibrium, national income
GDP_u	– Efficient, equilibrium gross domestic product
W	– Total non-profit (labour) income
W_{cg}	– Compensation of employees
w	– Uniform wage rate
w_{pc}	– Equilibrium wage rate
w_u	– Efficient wage rate
Π	– Total profit type income
Π_{cg}	– Gross operating surplus
π	– Profit rate
π_{pc}	– Equilibrium profit rate
π_u	– Efficient profit rate
Π_{ex}	– Extra profit
e	– Exploitation rate
e_{pc}	– Equilibrium exploitation rate
I	– Investments
K_t	– Capital stock
K_0	– Initial capital stock
δ	– Depreciation rate
L	– Total labour consumed
K/L	– Capital-labour force ratio
GVA	– Gross value added
VA_{ue}	– Gross mixed income
VA_c	– Gross mixed income earned by enterprises
PPP	– Purchasing power parity
T_{pm}	– Indirect taxes
S_{pm}	– Subsidies

1. INTRODUCTION

“Mankind always takes up only such problems as it can solve; since, looking at the matter more closely, we will always find that the problem itself arises only when the material conditions necessary for its solution already exist or at least in the process of formation.”

Karl Marx (1904, pp. 12-13)

“The problem of inequality is not so much a matter of technical economics. It’s really a problem of practical politics.”

Joseph E. Stiglitz (2015, p. 302)

The contemporary deluge of academic writings, as well as political and public debates, centred around the nature of economic inequalities is as diverse as the economic well-being of the societal members intended to be covered by such activism. These foreseeable circumstances are the finest example of the severity of the omnipresent and conflicting economic interests. Given that the issue of economic inequalities encompasses not only individuals within the society but also their relative position *vis-à-vis* all other individuals, it comes as no surprise that the investigation into the origins of economic inequality is highly controversial. With this in mind, in order to avoid any potential misunderstanding of this complex matter, the basis of this dissertation must include a concise explanation of the choice of method used to investigate the economic inequalities. It must position the favoured, Marx-based approach in relation to the existing works within the domain of inequalities as well as explain why this method is the preferred analytical tool for the investigation of this specific case of the euro area.

In order to introduce the reader to this doctoral dissertation in the most appropriate manner, it bears mentioning that this doctoral dissertation is written as a collection of papers. It comprises three mutually connected individual scientific papers which share a common introduction and conclusion. The first paper, i.e., the second chapter, is based on a scientific paper written in co-authorship with prof. dr. sc. Maks Tajnikar and first published in the scientific journal *Društvena istraživanja*. The second paper, i.e., the third chapter, is based on a scientific paper written in co-authorship with prof. dr. sc. Maks Tajnikar and accepted for publication in the scientific journal *South-Eastern Europe Journal of Economics*. The third paper, i.e., the fourth chapter, is written in co-authorship with prof. dr. sc. Nina Ponikvar and prof. dr. sc. Maks Tajnikar, and is currently in the process of publishing. The articles’ full information is disclosed as the respective chapters’ opening part. Having said that, it must be mentioned that the content presented within this doctoral dissertation slightly deviates from the content displayed in the journals. This is because the length of this doctoral dissertation is not constrained by a rigid word limitation and hence allows for a more detailed explanation of the concepts

used. However, while the author did use this feature to improve the overall readability of his work, it was of prime concern to preserve the original content to the highest degree, meaning that alterations were kept to a minimum.

1.1. The relevance of Marxian economic thought regarding the study of inequality

Broadly speaking, the subject of economic inequalities can be summarized by explaining the opposition between the starting ideological positions of two prominent intellectual currents. Within the present-day capitalist mode of production, this duality rests on the conflicting attitudes aimed at providing an answer to the questions of whether to and how to address the issue of economic inequalities.

The first school of thought is rooted in the neoclassical economic theory (e.g., Marshal, 1981; Walras, 1954) designed with the purpose to modify the economic theory in order to meet the standards inherent to the natural sciences. The relevance of the neoclassical theory with respect to its outlook on economic inequality must be considered as a derivative of the *Equi-marginal* principle, which is a cornerstone of *marginalist* economics. This principle places the individual in the centre of attention and argues that the utility maximization is a prime concern of economic science. In this sense, as long as the factors of production are reimbursed in accordance with their marginal productivities, as this theory argues, the grounds for utility maximization will be put into motion. This stance shifts the attention from the distribution of economic rewards to the *laissez-faire* principle, guided by the notion that individual agents can transmute their self-interest into the optimal level of societal wellbeing.

That being said, the analogous viewpoint of Robert E. Lucas (2004), who writes: “*Of the tendencies that are harmful to sound economics, the most seductive, and in my opinion the most poisonous, is to focus on questions of distribution*”, comes as no surprise. This position is in line with Deaton’s (2013) *The Great Escape*, which argues that inequality, although not widely welcomed, raises everyone’s living standards. These academics clearly advocate what Foster and Sen (1973), in their analytical framework on the concept of the desert, define as incentive-oriented and merit-oriented inequality systems. Sen (1992) argues that the incentive-oriented system can, through inequality of outcome, play a useful role in encouraging an individual’s economic activity, whereas the merit-oriented system creates inequality by “*giving more income to the naturally talented people*” (Foster and Sen, 1973, p. 104). These systems, in one way or another, imply that economic inequality is a natural consequence of the market economy.

Therefore, the distribution of rewards follows the theory of *marginalist* economics, where the factors of production are reimbursed in accordance with their marginal contribution, as the level of wages tends to their marginal productivity (Wicksell, 1954). In such an environment, economic inequality is often perceived as the outcome of skill-biased

technological change (Goldin and Katz, 2008). This stance is shared by Mankiw (2013), who holds that inequality is predominantly driven by the asymmetrically distributed gains from economic growth. Mankiw justifies the existing inequality by arguing that the unequal income distribution favouring the high earners is a simple outcome of the fact that the high earners have made significant economic contributions and, accordingly, have reaped equivalent economic gains.

In support of this reasoning, Conrad (2016) argues that society should consider the success of the top one percent an asset rather than a liability. Watkins and Brook (2016) assert that the primary purpose behind arguing for a lesser degree of economic inequality is the creation of land inhospitable to opportunity. Feldstein (1998) argues that it is wrong to consider income inequality as a problem, while Krueger (2002) considers focusing on the inequality of the outcome to be misleading. As a consequence, this intellectual current presents a case against the redistribution and advocates for a smaller role of the government through appropriation of the well-known rationale of Milton and Rose Friedman (1990, p. 321): *“A society that puts equality, in the sense of equality of outcome, ahead of freedom will end up with neither equality nor freedom... On the other hand, a society that puts freedom first will, as a happy by-product, end up with both greater freedom and greater equality”*.

Regardless of their individual and partial scientific importance, the arguments of this stream of economic literature will be disregarded from further analysis based on the following grounds. Firstly, as will be shown in the remainder of this study, there exists a broad consensus across the scientific community that the arguments proposed by the aforementioned scholars are oversimplifying complex phenomena of economic inequality, and are lacking an adequate empirical confirmation in support of their theories. Secondly, and more importantly, the usage of the *marginalist* approach shifts the attention away from the distinct starting points connected to the primitive capital accumulation and places the focus on the individual agents and their prospects, thus effectively abandoning the concept of social classes (Wolff and Zacharias, 2013). This intellectual cohort holds that economic inequality should not be addressed via specific public policies, insists on the use of approaches aimed at targeting individual rather than general perspectives, and, to a large extent, eliminates the question of inequality from the mainstream economic agenda (Guidetti and Rehbein, 2014). Such practice significantly alters the way economic inequality is conceptualized and poses a severe limitation to the holistic investigation of the subject matter, which is a prime concern of this study.

The alternative approach is offered by one of the founding fathers of political economy, David Ricardo (2001, p. 5), who argues that the determination of laws which regulate the distribution of the produce of the earth among the proprietor of the land, the owner of capital, and the labourers, is the principal problem in political economy. This much broader approach is used by a large intellectual community that recognizes that a

sustainable society cannot function without a certain degree of compulsion. This group consists of individuals with diverse economic backgrounds and introduces a broad spectrum with respect to the necessary degree of interference and methods to be used. In this respect, Shaikh (2016) identifies rising inequality as a general feature of global capitalism. This leads to the conclusion that the capitalist development has yet another acute property. The evident economic segregation is based on the unequal distribution of gains, where the benefits arising from the economic growth are enjoyed by the populations' minorities concurrently with the deterioration of standards experienced by the vast majority. Atkinson (2009) states that this can be tied to the factorial income distribution, which provides a valuable foundation for understanding the distribution of income inequality and social justification of distinct income sources. Stiglitz (2013; 2015) holds that inequality is an indicator of a system's failure, which is the creation of a system that is neither efficient nor fair.

Through the creation of monopolies, rent-seeking activities, deregulation and downsizing of the government, misalignment between social returns and private rewards, and the socialization of losses and privatization of gains, the current system creates instability and endangers the future. Because the existing system is so inefficient, the gains at the top are not substantial enough to justify far larger losses at the middle and the bottom. Stiglitz presents economic arguments in favour of redistribution intended to eliminate extreme inequalities. Galbraith (2016) states that the excessive inequality intrinsic to present-day capitalism alters the societal ability to utilise the available resources optimally. Galbraith (2000) shows that extreme inequalities cannot be legitimized and are a sign that the unobstructed competitive model is not working properly. Piketty (2014) concludes that capitalism is characterized by a sharp rise in inequality with a high concentration of wealth and income. He shows that, for as long as the rate of interest exceeds the rate of growth of the economy, the ratio of capital to national income, and correspondingly capitalist wealth, will rise forever. This continuous and limitless wealth increase undermines meritocratic values, results in a waste of human capital (Piketty, 2015), and calls for an efficient redistribution. Milanović (2005, 2016) argues that the globalization, via uneven distribution of gains and winner-take-all principles, has severely affected the global inequality and presents the reasons for a redistribution on a worldwide scale.

These works represent just a small fraction of the extensive body of literature written by reputable experts in an attempt to show that unobstructed economic inequality poses a severe threat to society. Regardless of the fact that high-quality work can be found among these studies, including state-of-the-art methods and perfected data sets when it comes to the end result, the majority of these works deal with a specific type of inequality. For example, Galbraith puts most of his efforts into pay inequalities, Milanović investigates predominantly global inequalities and income inequalities, Piketty scrutinizes the upper tail of the income distribution and capital, and Stiglitz analyzes special issues such as

those described earlier. Thus, it is evident that the majority of the work is directed toward a single dimension of inequality and is limited by geographical coverage as well as data restrictions (especially important in investigations based on surveys). Given the abundance of inequality dimensions (e.g., geographical inequalities, inequality of outcome, inequality of opportunity, and categorical inequalities), these works are extremely adept to explain, down to the smallest details, specific inequality concepts. However, since all dimensions of inequalities are inherently intertwined and cannot be singled out, the majority of these works fall short in explaining economic inequality in the broadest sense. This is brought about by an inevitable outcome of the fact that these works, and numerous others, are based on underlying economic theories that are not founded on the issues of distribution and arising inequalities. Thus, in order to achieve the highest possible level of explanatory power, within the remaining part of this dissertation, the attention will be primarily directed towards another representative of the second group that, even though marginalized, represents a concept paramount for the investigation of economic inequalities.

This is achieved through abandoning the paradigm centred around the concept of scarcity and bringing back into focus the paradigm centred around the concept of surplus. The latter entails the return to the intellectual landscape of classical economics, where the inequalities will be primarily dealt with through the prism of Marxian economic tradition. The Marx-based theory, as will be shown, offers a dominant, alternative viewpoint, paramount to the comprehensive investigation of economic inequalities. This standpoint originates in Rousseau's (1984) instituted inequality which, as opposed to natural inequality, is derived, established, or at least authorized by the consent of men. The institutionalized, moral or political, inequality is established by the law and the institute of private property and provides a foundation for a primary distinction between social classes. According to Marx (1990), the natural basis that constitutes inequalities and defines the inegalitarian capitalist system departs from class antagonism, arising as a consequence of the unequal ownership over the means of production. Therefore, the class structure shapes inequality by allowing the capitalist class to, through alienation of the produce of their labour, appropriate a part of the surplus value produced by the workers. This is achievable since the workers, barred from possession of the means of production, are forced to partake in the exploitative relations in order to acquire their means of subsistence. Hence, the labour force exploitation as the outcome of the class struggle is established as a point of departure in the Marxian investigation of the inner-country economic inequalities. Marx's reasoning is aligned with that of Amartya Sen (2006), to the extent that the people (workers) are not able to and do not have the freedom to lead the life they would like to lead. These opposing interests between the labour force and the capitalists, mirrored via the distributive conflict between wages and profits, inevitably produce an unequal society. As recognized by Peet (1975), once initiated, these relations will create an inequality spiral that will, without fundamental alterations of the mode of production, lead to growing interclass inequalities and relative worsening of the social

position of the labour force, even if the workers' situations improve. This is conditioned by the dynamics inherent to capitalism which, driven by the profit motive and primitive accumulation of capital, threatened by the competition, and under the forces of concentration and centralization, initiate a vicious cycle that permanently reproduces the unequal hierarchical class structures. Driven by the inequality of opportunities, the normal operation of capitalism enables the transfer of the existing inequalities from one generation to another and creates an environment where "*...the strong do what they can and the weak suffer what they must*" (Thucydides, 2015, p. 226).

In light of these arguments, it is imperative to clarify that the common denominator of the second group is that their representatives consider extreme inequalities to be the ultimate market failure, rather than a natural consequence of the market economy. That being said, it must be explicitly stated that this dissertation does not regard inequality phenomena as a question of morality. This dissertation investigates the question of unsustainable inequalities generated by the capitalist society not because they are inherently wrong, but because they are fundamentally wasteful (Varoufakis, 1998). In light of this, these inequalities must be considered as generators of dysfunctional societies that produce adverse effects for poor and rich alike (Wilkinson and Pickett, 2009). Thus, despite the acceptance that a certain degree of inequality can incentivize economic progress, by definition, the eradication of excessive inequalities is undeniably an allocative improvement that must become a prime concern within the economic science.

1.2. The economic inequality of the euro area

The euro area encompasses 19 out of 28 member states of the world's largest trading block and world's second largest economy, the European Union (European Commission, 2019a). Besides being the members of the European Union, the euro area countries share a common currency, which is the second largest reserve currency and the second most traded currency in the world (Papadia and Efstathiou, 2018). According to the World Bank (2019), in 2016, the economic output of the euro area was more than 15% of the global economic output, achieved by less than 5% of the world's population.

However, the euro area group of countries are not interesting merely because of the aggregate size of their economic output. With the economic inequality in question, the euro area is germane due to the fact that it comprises member states with diverse economic endowments and vastly different productive capabilities which are closely integrated by the free market relations.

Due to the latter, in the following table, the research attention is focused on the proper understanding of this cross-country diversity as a groundwork for the investigation of the euro area economic inequalities.

Table 1: Relevant economic indicators of the euro area (average for the period 2003-2016)

ISO3	Accession (European integration)	Accession (euro area)	Total population (thousands of people)	Total employment (thousands of people aged 20-64)	GDP (millions of constant 2011 PPP\$)	GDP growth (% of GDP)	GDP p/c (constant 2011 PPP\$)	Capital stock (millions of constant 2011 PPP\$)	General government consolidated gross debt (% of GDP)
AUT	1995	1999	8381	3745	362410	1.44	43216	1108208	75.77
BEL	1952	1999	10859	4330	442828	1.46	40756	1201008	99.62
CYP	2004	2008	1094	354	26331	1.61	24084	54137	73.78
EST	2004	2011	1335	591	32942	3.24	24700	73268	6.92
FIN	1995	1999	5353	2335	212622	1.17	39722	614584	47.48
FRA	1952	1999	64760	25079	2403028	1.13	37095	7773910	80.32
DEU	1952	1999	81737	36475	3339930	1.32	40877	8768319	70.91
GRC	1981	2001	10989	4032	304828	-0.66	27722	790302	138.79
IRL	1973	1999	4457	1869	215091	4.10	48099	536235	66.18
ITA	1952	1999	59146	21981	2142771	-0.04	36253	5710453	114.20
LVA	2004	2014	2119	895	41928	3.37	19896	84291	28.47
LTU	2004	2015	3125	1322	69152	3.86	22316	103354	29.09
MLT	2004	2008	418	158	12134	3.61	28932	23247	65.74
NLD	1952	1999	16588	7643	750933	1.23	45254	2212102	57.08
PRT	1986	1999	10488	4481	279556	0.18	26655	682192	95.17
SVK	2004	2009	5394	2303	131177	4.14	24308	210621	42.25
SVN	2004	2007	2035	907	57642	1.84	28318	132303	45.42
ESP	1986	1999	45488	18239	1478063	1.30	32500	4486403	65.10
Total	-	-	333767	136739	12303367	-	-	34564936	-
Average	-	-	18543	7597	683520	2	32817	1920274	67

Note: Austria (AUT), Belgium (BEL), Cyprus (CYP), Estonia (EST), Finland (FIN), France (FRA), Germany (DEU), Greece (GRC), Ireland (IRL), Italy (ITA), Latvia (LVA), Lithuania (LTU), Malta (MLT), the Netherlands (NLD), Portugal (PRT), Slovakia (SVK), Slovenia (SVN), and SPAIN (ESP).

Source: Total population, GDP, GDP growth, and GDP p/c are retrieved from World Bank (2019); Total employment is retrieved from Eurostat (2019a); General government consolidated gross debt is retrieved from Eurostat (2019c); Capital stock is authors' own calculation based on Hardberger (1978).

At this point it must be noted that within all tables and figures, as stated within the note to the previous table, the country names are abbreviated using country codes adopted from the International Organization for Standardization (ISO 3166-1 alpha-3). The concise analysis of euro area cross-country differences, in order to preserve consistency and comparability throughout the doctoral dissertation, omits Luxembourg due to reasons which will be explained in the remainder of this study. The sheer size and the economic relevance of the euro area becomes apparent as soon as it is acknowledged that this group includes more than 330 million people, of which more than 130 million labourers, with an average gross domestic product *per capita* ($GDP_{p/c}$) exceeding that of the world by the factor higher than two. However, a straightforward calculation from Table 1 points out that four euro area countries (France, Germany, Italy, and Spain) account for more than 76% of the aggregate output of the entire group. When it comes to the production factors, Germany has more than 36 million workers, whereas Malta has only 158,000. In terms of capital stock, Germany's capital stock exceeds the across-the-board-average by more than 4.5 times, while Malta's capital stock barely exceeds 1% of the across-the-board-average. As will be shown in the following chapters, these differences remain substantial even when they are weighted by, among others, the countries' labour power. Moreover, measured through the $GDP_{p/c}$, the development differences of the euro area countries become apparent as soon as it is confirmed that the Irish $GDP_{p/c}$ is higher than 48,000 2011 purchasing power parity (PPP) \$, whereas that of Latvia is below 20,000 2011 PPP \$. Additionally, there exist huge differences in the share of the government's debt with Estonia's smallest debt (6%) and Greek's highest debt (138%).

That being said, it comes as no surprise that the above-mentioned differences must be reflected within the living standards across the euro area member countries. Provided the lack of significant supranational redistribution policies, these differences must be mirrored through the euro area economic inequalities. In this sense, this forms grounds for Shachar's (2009) "Birthright Lottery", where the citizenship alone determines the extent of the individuals' quality of life. As will be thoroughly elaborated within this doctoral dissertation, in light of the integrational goals of the euro area, it needs not be mentioned that such an unequal state of affairs poses a severe limitation to the overall wellbeing of European citizens, and hence must be investigated accordingly.

The third millennium brought about a serious challenge that threatened the very foundation of the European integration project. The nineteen euro area member states, often referred to as the eurozone countries, are experiencing growing economic inequalities that are questioning the European social model's ability to survive the onset of the twenty-first century. According to the official statistics by Eurostat (2019d), from 2005 to 2016, the number of people at risk of poverty or social exclusion within the euro area increased by more than six million. Accordingly, people at risk of poverty or social exclusion constituted 23.1% of the total population. During the same reference period, the S80/S20 income quintile share ratio rose from 4.7 to 5.2, concurrent with the increase

in the percentage of the total population living in severe material deprivation. In contrast with the European Union trends, the Gini coefficient of the euro area for the period between 2006 and 2014 reported a slow and continuous increase followed by the crisis (Filauro, 2018). In addition, throughout the period between 2003 and 2016, the euro area's factorial income distribution remained unchanged and displayed a dominance of capital over labour. The across-the-board-average labour share of income was calculated, by using methodology presented in the subsequent chapters, to be 62% of the total national income, while the profit share of income exhibited a comparably high share of 38%.

1.2.1. The dilemma of the theoretical approach to euro area inequality

As will be thoroughly discussed within the remaining parts of this dissertation, the aforementioned data are of utter importance because in addition to the previously stated types of economic inequalities, this information discloses another type of inequality – cross-country inequality. This dimension is becoming an increasingly important component in the age of globalization, as is recognized in numerous works. Weller (2002) demonstrates that the ratio of median *per capita* income between the richest and the poorest ten percent of the countries has risen sharply. Given that, in comparison to the poorest countries, the income of the richest countries was 77 times greater in 1980, 120 times greater in 1990, and 122 times greater in 1999, Weller undeniably confirmed that the rich countries are getting richer and the poor countries poorer. This supports the claim of Anand and Seal (2015), stating that the cross-country inequality explains most of today's overall economic inequality and the claim of Milanović (2013), indicating that more than a half of the total variability in personal incomes can be explained via the country of residence.

The latter is further exacerbated by the fact that the cross-country economic inequality plays a significant role in the lives of ordinary citizens. This is described by Preston (1975). He showed the positive relationship between life expectancy and economic well-being and confirmed that the citizens of richer countries live longer. Along the same lines, Anand and Ravallion (1993) showed that the basic capabilities of the individuals from rich countries tend to exceed the capabilities of those from the poor countries. In this respect, Anand and Ravallion concluded that the higher income plays a significant role in governing populations' ability to live a healthy and long life deprived of hunger and illiteracy. Finally, as will be demonstrated, the full complexity of the issue becomes apparent when one draws a connection between the cross-country inequalities and the cross-country deviations in recognition of the labour invested. At this point, it must be noted that the recognition of the labour invested is an indicator of the quantity of the labour consumed within a country's production process that is received (recognized) in the respective country's domestic product, once the commodities have been exchanged among countries and once the cross-country transfer of values has occurred. Then, as

asserted by Illouz (2007), one concludes that it is not only the worker's skills and abilities but the entire worker as a human that is being evaluated within the production process. Accordingly, and strikingly, the unequal recognition of labour indicates that the existence of the cross-country economic inequalities implies the existence of the unequal "evaluation" of individual humans/citizens.

As was the case within the previous section, when it comes to cross-country inequality, which is inevitably affiliated with international trade, there exists an opposition amongst various intellectual schools of economic thought. The orthodox theory of international trade (e.g., Ohlin, 1993; Barro, 1997) holds that all involved parties will draw benefits arising from the commodity exchange, whereas the modern institutionalists (e.g., Acemoglu and Robinson, 2013) argue that trade plays a key role if governed by the appropriate institutions, which are considered to be core determinants of the nations' economic success. However, it is important to emphasise the fact that the stance used in this doctoral dissertation opposes the claims of these authors. First, it opposes the mainstream approach to international trade via the adoption of the concept of the uneven and combined development, which integrates the countries into dependent relations and relations of unequal exchange. Second, it decidedly debunks the modern institutionalists' arguments with respect to the cross-country inequalities, through the prism of historical materialism, by accepting that a country's institutions must be accounted for as a mere reflection of the underlying social conflicts predetermined by the historical events, such as primitive accumulation of capital (Preobrazhenski, 1967) and imperialism (Amin, 1976). On these grounds, the necessity of in-depth analysis of the euro area cross-country inequalities is recognized through the adoption of Roemer's (1998) reasoning. Given that the origin of the described euro area's cross-country inequalities is not primarily the result of individual's/country's efforts, but is a result of, as will be shown, underlying economic forces (external circumstances) which are beyond the control of the respective individual/country, the evident disparities in the well-being cannot be considered acceptable. Therefore, they must be reduced significantly. Additionally, the growing economic inequalities are a sign that the euro area countries are drifting apart from economic cohesion and solidarity, as well as that they are not promoting the equality of the well-being of all citizens. The far-reaching consequences of such a state are threatening the economic and social cohesion, while simultaneously, one of the paramount goals of the European Union is set to decrease disparities between regions and the backwardness of the least-developed regions.

In a way that transcends the shortcomings of the mainstream approach, the euro area cross-country economic inequalities will be addressed via the Marx-based theories founded on the concept of surplus. The previous section explained how the Marxist theory of inequality arises from labour force exploitation. Regardless of the fact the Marx was focused on the inner-country dynamic, the same theoretical framework can be applied in the context of cross-country analysis. In the latter case, the cross-sectoral model is applied

within the cross-country environment. When it comes to the euro area, such an approach is justified given that the member states share a single market and a single currency. Accordingly, the euro area's cross-country inequality is studied as a derivative of the labour force exploitation arising from the inner-country level. The emerging problem is that when countries with distinct factor endowments, distinct development, distinct technology, and distinct labour force exploitation trade, they realize vastly different benefits. The fact that international trade has a potential to beget the cross-country inequalities is, amongst others, identified by Mill (2000, p. 8), who, by discussing the laws of interchange between nations, states that "*we may often, by trading with foreigners, obtain their commodities at a smaller expense of labour and capital than they cost to the foreigners themselves*". On the grounds of comparative advantage, Mill considered this bargain to be advantageous to the foreigner. However, even if all countries gain through the exchange (Marx, 1971), such a bargain suggests that the cross-country interchange is connected to the un-equivalent commodity exchange. This implies that the commodities are not being exchanged in accordance with their values. Thus, the trading countries may receive more or less value within the commodities they have received comparing to the commodities they have sold, which proves that cross-country interchange has a potential to facilitate cross-country inequalities. This lays the groundwork for the unequal exchange between trading parties.

When investigated through the Marxian viewpoint, given that the capital (means of production) is seen as the product of past labour, the un-equivalent commodity exchange is related to the notion that the commodities being exchanged between the trading partners differ in the value of the labour embodied within them. Consequently, the capitalist mode of production, in its first stage, rests on the labour exploitation and the appropriation of the surplus value by an owner of the capital from a labourer. Whereas, in the second stage, the capitalist mode of production rests on the appropriation of the surplus value by the more developed (core) countries from the rest (Wallerstein, 1974). Here, it should be stressed that the existence of the inner-country inequality (first stage) is a necessary condition for the emergence of cross-country inequality, as defined within this doctoral dissertation. The same stance is found in the work of Preobrazhensky (1965, p. 91), who argues that the second stage is made possible by the unequal exchange when the "*...exchange of a smaller quantity of labour by one system of economy or one country for larger quantity of labour furnished by another system of economy or another country*" takes place.

Given that it is not specified which social class within the developed country benefits from the arising exploitative relations among countries, it must be emphasised that as a result, the euro area's cross-country inequality indicates a potential contradiction to the concept of international solidarity of classes. Furthermore, additional support for Wallerstein's claim is found in Marx's (1963) address on the question of free trade: "*If the free traders cannot understand how one nation can grow rich at the expense of*

another, we need not wonder, since these same gentleman also refuse to understand how within one country one class can enrich itself at the expense of another". The concept of the cross-country unequal labour exchange has been studied extensively by many experts (e.g., Prebisch, 1950; Singer, 1950; Emmanuel, 1972; Amin, 1976; Grossmann, 1992; Bauer 2000), whose works will be presented in the following sections. At this point, it is necessary to establish that, from this point forward, the cornerstone of this dissertation is a study of the euro area's cross-country inequality as a function of the unequal labour exchange. Consequently, the comprehensive investigation presented in the remaining chapters is focused on answering how international trade alters cross-country value transfers, to what extent the latter affects the geographical distribution of the recognition of the used labour, and what are the ultimate implications of such dynamics for the well-being of the euro area countries.

1.2.2. Economic inequality and the European integrational project

The research problem and purpose are evolving around the premise that the future of the euro area is closely tied to economic inequality. This self-evident observation becomes apparent as soon as it is accepted that, after years of focusing on the capitals' demands for market expansion, the European Union has shifted its attention and incorporated the fight against social exclusion, poverty, and inequality into its core guidelines. This is well-documented by Eißel (2014), who points out that a breakthrough in social policy came in 1997, when the Treaty of Amsterdam was added as an amendment to the Treaty on the European Union (European Communities, 1997). The Treaty of Amsterdam went into effect in 1999, after being ratified by all countries of the European Union, and introduced the social policy aimed at reducing the "*...disparities between the levels of development of the various regions and the backwardness of the least favoured regions...*" (Article 130a). This initiative towards economic and social cohesion was further strengthened by the 2000s Lisbon Strategy targeted at promoting equality, eradication of poverty and social exclusion, and building an active welfare state (European Parliament, 2019). The Lisbon Presidency concluded that a high level of poverty is unacceptable and that prioritizing a more inclusive Union is crucial for achieving sustainable development and greater social cohesion. These policies were renewed in the European Commission's (2019b) Europe 2020 strategy launched in 2010. This strategy emphasised that it is through the inclusive growth that the European structural weaknesses can be overcome, and a sustainable social market economy can be achieved. In this sense, given that the actions against poverty and exclusion remain within the domain of the national governments, the European Union acts as a coordinator that filters out suboptimal methods and promotes the practices yielding the best outcome. The Europe 2020 strategy has set targets to be met by 2020. Within the context of this dissertation, the most relevant of these targets are a reduction in the number of people at risk of poverty or social exclusion by twenty million and achieving 75% employment rate among the working population aged 20-64. However, even though Europe 2020 has

formed a reference framework for tackling these inequalities, at the time of writing this dissertation, the targets mentioned had not been achieved and the economic inequalities have risen. That being said, the failure to achieve the outlined targets and address economic inequalities (European Commission, 2017) has brought to the surface the intrinsic contradiction (Eißel, 2014) between the European Union's ability to achieve cross-country solidarity and well-being for all citizens and the institutional structure that should act as its support.

The inadequacy of the institutional structure to resolve the conflict between the integrational goals and the integrational design is most apparent in the case of the euro area. Prior to adopting the common currency and becoming a euro area member state, according to the euro convergence criteria put forward by the Treaty on European Union – Maastricht Treaty (Council of the European Communities, 1992), the member state is required to meet the following criteria: the inflation rate of the applicant member state must not exceed the inflation rate of the three best performing (lowest inflation) member states by more than 1.5 percentage points, the ratio of annual government deficit relative to the applicant member state's gross domestic product must not exceed 3%, the gross government debt of the applicant member state must not exceed 60% of the gross domestic product, the applicant member state should not have devaluated the central rate of their euro pegged currency over the last two years, and the long-term interest rates of the applicant member state must not be more than 2% higher than those of the three best performing (lowest inflation) member states. Once these conditions are satisfied, the applicant member state can proceed to enter the euro area and adopt the common currency. Besides adding dimension, the euro area membership implies a higher degree of integration and a loss of the ability to use one's own monetary policy in managing national affairs. This, as argued extensively by Stiglitz (2016, p. 94), poses a severe limitation to the national policymakers because it effectively disables euro area member states from using the three primary mechanisms of the active economic policy. The common currency prevents the national governments from using interest rates as a means of stimulating consumption and investments, as well as disables the national governments from stimulating exports via national exchange rate adjustments. The remaining mechanism, the fiscal policy, is severely restricted by the fiscal criterion comprised of debt and deficit criteria. These criteria, to a large extent, deny the government's ability to employ active taxation and budget policies, effectively eliminating the fiscal policy from the list of instruments for proactive management of the country's affairs.

This necessitates a digression. It must be remembered that, once a country becomes a member of a single market integration, the country effectively renounces the possibility of any protectionist policies with which, through the use of trade barriers (tariffs, customs, quotas, etc.), the country can employ an active role in managing the competitiveness of the national economy relative to that of its trading partners. Moreover, this dynamic creates grounds suitable for the creation of the cross-country economic inequalities and

exposes a tension between the euro area member countries. The latter is argued by Lapavitsas et al (2012, p. 22), who stated that the single monetary policy combined with the fiscal constraints imposed through the Stability and Growth Pact placed a focus on the labour market policies as “...one of the few levers available to different countries to improve external competitiveness”. As will be confirmed throughout this doctoral dissertation, this represents an especially important factor that widens the euro area’s core-periphery gap and perpetuates the economic inequalities. As explained by many authors (e.g., Prebisch, 1950; Singer, 1950; Lapavitsas et al, 2012), this occurs because the affluent (core) countries with historically high real wages, strong social policies, and highly competitive markets can maintain their economic performance on a desirable level much more easily than their peripheral counterparts characterized by lower wages, weaker welfare states, and less competitive economies. Consequently, within such an environment, the euro area’s peripheral countries are forced to use downward pressure on their wages as leverage to temporarily restore relative competitiveness of their national economies within the euro area.

The combination of a common currency and nominal convergence criteria is creating restrictive circumstances that constitute the basis of this research. Accordingly, the euro area’s concept inherently falls short of expectations with respect to creating an adequate and well-functioning set of institutions that would prevent the growing inequalities and restore economic prosperity for all citizens. It is precisely the latter which creates an environment suitable for the investigation of the research problem that is the root cause of the euro area’s problem – cross-country inequalities. Thus, the euro area member states create a theoretical surrounding that allows for a sophisticated study of the claim that the current institutional framework sets in motion the underlying economic laws that create the cross-country inequalities.

Of the array of possible inquiries, this doctoral dissertation offers an alternative approach to the investigation of the economic inequality phenomena. As opposed to the mainstream approach, the viewpoint offered within this research is based on a synthesis of the Marxist and the heterodox tradition. As a result, the economic inequality is studied as the function of the labour force exploitation seen through the (market-driven) process of the labour force recognition. Accordingly, the economic inequality conceptualized in this way is the economic inequality that is underlying the mainstream concepts including but not limited to inequality of outcome and inequality of opportunity.

Consequently, the economic inequality is studied on two interconnected levels. The inclusion of the labour theory of value and the value system enables a study of the inner-country economic inequality through the social stratification founded on the social class as an analytical category. Relatedly, the inner-country economic inequality within the capitalist mode of production is investigated as the capitalists’ appropriation of the part of the value produced by the wage labourers, based on their monopoly over the means of

production. On the other level, the existing inequality is further exacerbated through the cross-country inequality, studied as the function of the unequal labour exchange. There, disguised as freedom of exchange, the unequal exchange of labour enables the more developed countries to systemically derive unrequited transfer of values from their less developed trading partners.

To summarise, this doctoral dissertation investigates the euro area's inner-country and cross-country economic inequalities through twofold exploitation, the one where the capitalist exploits the labourer, and the other where the more affluent member state exploits the destitute. That being said, the present-day relevance of this doctoral dissertation arises from the fact that it introduces an economic model that is able to quantitatively measure whether the structural design of the euro area meets its integrational expectations with respect to cross-country equality, solidarity, and shared economic prosperity.

1.3. Research problem and purpose

Despite the growing attention to the economic inequalities, the mainstream approach has not been successful in presenting a theoretical model which would depict the state of the euro area's overall economic inequalities in a satisfactory way. This is due to the tendency of *marginalist* economics to blur the concepts of economic inequality, class stratification, and exploitation through its preoccupation with the selfishness of preference-driven economic agent. In other words, the theoretical framework of the *marginalist* approach is not capable of investigating the economic inequalities as described earlier. Accordingly, there exists a need to offer an alternative model that can be used for the investigation of the euro area's economic inequalities and dynamics. For this purpose, within this dissertation, the euro area's economic inequalities will be studied through the use of the Marxist theory of exploitation and the theory of unequal labour exchange. These theories, although marginalized and underexplored, have drawn the attention of several scholars who have tried to revive the use of such an approach within the contemporary economic science (e.g., Seretis and Tsaliki, 2012, 2016; Tsaliki, Paraskevopoulou, and Tsoulfidis, 2017; Ricci, 2019). However, no previous research has been successful in presenting the uniform theoretical framework or in displaying the complementary empirical findings that would comprehensively explain the origins of the economic inequalities of the entire euro area, seen through the markets' recognition of the labour consumed. Moreover, once the economic inequalities were connected to the unequal labour exchange, all research performed, thus far, did not offer a supportive, in-depth analysis necessary for the comprehensive understanding of the matter. Due to such deficiency, within this doctoral dissertation, the gap in the existing literature will be filled by focusing on the following three research problems. First, there exists a need to create a theoretical model for the measurement of the euro area's cross-country inequalities. Second, there exists a need for the investigation of the year-to-year euro area cross-country economic inequality

dynamics. Third, given that the Marx-based inequality theory, founded on the concept of surplus, emphasises that the process of value creation is connected to the economic structure, there exists a need to incorporate the investigation of the influence of the country-specific economic structures on the euro area's economic inequality.

To address the identified research questions and to answer how the underlying economic laws enable the concealed forces of the unequal labour exchange to create the euro area cross-country inequality, this doctoral dissertation aims to fulfil the following research purposes.

The first purpose of the research is to develop a novel theoretical model that will be able to capture the euro area cross-country economic inequalities. This is achieved in the second chapter, by combining theoretical findings similar to that of Emmanuel (1972) with the Marx-based structural model constructed by the following contributions of, among others, van Schaik (1976) and Morishima (1973). This innovative approach overcomes numerous obstacles that followed the theories of unequal labour exchange since their initial exposition by Emmanuel. The developed model is based on methodological improvements created for the investigation of the specific case of the euro area cross-country economic inequalities. This will shed new light on the economic laws that, via the cross-country value transferring mechanism, create and perpetuate the economic inequalities within the euro area. In addition, the model is empirically tested, using deflated data from the period from 2004 to 2013, with a purpose of identifying the winning and losing countries, and pointing out the inequality determinants (drivers), their effects, and the overall magnitude of the euro area cross-country inequality.

The second research purpose is to, by building upon the above-mentioned model, analyse the dynamics of the euro-area cross-country inequalities. This is achieved through the time series model and trend-cycle decomposition performed on the euro area dataset for the period between 2003 and 2014. This research will disclose the role that the economic cycles played with respect to the converging/diverging trends recorded amongst the euro area member countries. Based on the similarity between reported trends, the clustering of the euro area countries will identify the polarizing effect that divides the countries, in line with Prebisch (1950) and Singer (1950), into the European (affluent) core and the European (dependent) periphery.

The third research purpose is to provide an answer to the questions of whether and how the cross-country heterogeneity in economic structures affects the euro area's value transfers. The necessity of addressing this question is brought about as a logical consequence of the two preceding sections. Once the existence of the euro area's cross-country inequalities is confirmed, the third question becomes a paramount issue that links these inequalities to the process of value creation. Given that the prevailing opinion among classical political economists was that the secondary sector is responsible for the

majority of the value creation, the study of how the distinct cross-country economic structure affects the value transfers, and accordingly, inequality, becomes a concern that cannot be overlooked. Influenced by the work of Prebisch (1950), Singer (1950), Lewis (1954), and Emmanuel (1972, 1975), through the innovative methodology proposed in the second chapter, the effects of the economic structure will be analysed through the fixed-effects panel data models for the period between 2003 and 2016. This section will include the investigation based on the sectoral and technological decomposition of the national economies that will exhibit the extent to which the gains/losses from international trade, derived from the unequal labour exchange, are influenced by the country-specific economic structure.

Ultimately, the final purpose of this dissertation is to prove that, guided by the laws of the unequal labour exchange, the euro area inevitably integrates the countries into unequal relations that yield asymmetrical benefit distribution across countries. On these foundations, the persisting euro area cross-country inequality is not only natural but also an unavoidable outcome of the existing institutional arrangements. Therefore, the current euro area structure must be thoroughly re-questioned, adjusted, and improved to ensure the maximization of what Alexis de Tocqueville (2010) defines as self-interest properly understood. This entails that there exists a “*greater need for collective action to ensure that each does more of those things that benefit the other countries in the Union and less of those things that hurt others*” (Stiglitz, 2016, p. 51). Hence, it is in the self-interest of the euro area to eradicate wasteful cross-country economic inequalities by fundamentally altering the mechanisms of capitalism (Peet, 1975) related to the economic laws of the unequal exchange. The need to act accordingly and tackle the systemic issues of the euro area can be addressed by enhancing cross-country solidarity only through the consent of affluent countries benefiting from the unequal exchange. Therefore, the latter can only be carried out by ensuring that the implementation of the concept of self-interest properly understood will produce an increase in the euro area’s common welfare from which all member countries will draw greater benefits than is currently the case.

1.4. Research questions

Within this section, the arguments advanced thus far are structurally organized in the form of research questions used to further clarify and precisely determine the domain scrutinized within the realm of this doctoral dissertation. These questions are conceptually structured within three groups, each of whom is related to a specific chapter of this doctoral dissertation.

The first group displays three research questions related to the second chapter of the doctoral dissertation. The imposed questions are used as the cornerstones for the in-depth investigation of the euro area's cross-country inequality phenomena. These include:

Research Question 1: How can the euro area's economic inequalities be investigated through the prism of the Marx-based economic model? What features must such a theoretical model possess in order to successfully resolve the so-called "transformation problem" and enable an advanced empirical analysis?

Research Question 2: How does the unequal labour exchange create, perpetuate, and maintain the euro area's economic inequalities? How does the unequal labour exchange affect the euro area's cross-country differences in the social recognition of the consumed labour?

Research Question 3: What are the key drivers behind the euro area's economic inequalities? How do these determinants manifest via the cross-country economic performance?

The second group of research questions is closely related to their respective counterparts from the first group. The subject matter of these questions is thoroughly investigated within the third chapter, where, by building upon the second chapter, the analysis of the euro area's economic inequalities is narrowed down. These questions are:

Research Question 4: What is the influence of the economic cycle and the crisis on the euro area's cross-country economic inequality dynamics? How does the cyclical fluctuation affect the difference between the economic performance of the core and the peripheral countries?

Research Question 5: How do the cycle and the crisis affect unequal labour exchange determinants, their manifestations, and the core-periphery division across the euro area?

The first two groups of questions exhibited the underlying pattern that indicates the deductive logic of questions' formations. Once the questions about the origins and the time dynamics of the euro area's economic inequalities have been raised, the next step is to further focus the investigation on the country-specific properties that are closely related

to the analysed matter. Accordingly, the third and the final group of questions, that will be studied within chapter four, includes the following:

Research Question 6: Is the euro area cross-country heterogeneity in the economic structures, size and level of development, the organic composition of capital, and unemployment a determinant of the economic inequality inflicted by the unequal labour exchange?

Research Question 7: Which country's characteristics, sectors and technologies are paramount for the country's utilization of the benefits arising from the environment affected by the unequal labour exchange?

Research Question 8: Which policy implications can be derived from the described state of affairs? What can national policymakers do in order to enhance their country's relative position, and how can the euro area's overall cross-country economic inequalities be reduced?

The aim of this doctoral dissertation is to provide the answers to these research questions, which consequently constitute the research goals that are established within the subsequent section.

1.5. Research goals

Drawing from the research questions, the research goals advanced by this doctoral dissertation can be summarized through the holistic investigation of the euro area's economic inequalities. This is done by utilizing the theories commonly grouped under the unequal labour exchange umbrella, which investigate consequential cross-country and inner-country relations, and the relative country's position with regard to capitalization of the existing inequalities. Derived from the latter, a more precise determination of the research goals is presented below:

Research Goal 1: To develop a Marx-based theoretical model that will be able to explain the existing euro area economic inequalities and provide an adequate solution to the so-called "transformation problem".

Research Goal 2: To explain how the unequal labour exchange creates, perpetuates, and maintains the euro area's cross-country and inner-country economic inequalities. To empirically confirm and quantify the extent of the euro area's unequal labour exchange through a country's social recognition of the consumed labour.

Research Goal 3: To identify the fundamental economic forces that are drivers of the existing unequal labour exchange, which is the root cause of the euro area's economic inequality. To empirically establish how, and quantify to what extent, these determinants influence the euro area's cross-country economic performance.

- Research Goal 4: To investigate and empirically validate the country-specific dynamics, cross-country similarities, and core-periphery division with regards to the influence of the economic cycle and the crisis on the euro area's cross-country unequal labour exchange and economic inequality.*
- Research Goal 5: To empirically exhibit how the cycle and the crisis affect the determinants of the unequal labour exchange, their manifestations, and the euro area's core-periphery division.*
- Research Goal 6: To theoretically and empirically investigate the significance of the country-specific economic structure (sectoral and technological composition), size and level of development, the organic composition of capital, and unemployment on the euro area's unequal labour exchange and cross-country inequality.*
- Research Goal 7: To quantify to what extent the country-specific economic structure (sectoral and technological composition), size and level of development, the organic composition of capital, and unemployment are influencing a country's relative position (gain/loss) inflicted by the euro area's unequal labour exchange.*
- Research Goal 8: To explain the arising policy implications with respect to what national policymakers can do to enhance the relative position of their country within the integration and lower the euro area's overall economic inequality.*

The fulfilment of the assigned objectives will bring about the original findings on the euro area's economic inequalities which are introduced and comprehensively disclosed within the upcoming section.

1.6. Scientific contribution

This doctoral dissertation will propose a theoretical schema with a straightforward empirical application designed to investigate the specific economic laws that are at the root cause of the euro area's economic inequalities. That being said, the scientific contribution of this doctoral dissertation is not resting on the efforts to create a general theory of inequality but will develop a special theory which will enable the empirical investigation of the advanced hypothesis. Such a methodological approach relies on Merton's (1967) middle range theory, founded on the general theoretical orientation provided by Marxist economic tradition. In this sense, this doctoral dissertation will investigate the particular case of a more general formulation that, when applied to the euro area conceptual setting, will contribute to the science from both theoretical and empirical perspectives.

The dissertation will contribute to the theory through development of a theoretical model of the “unequal labour exchange”, which will extend the existing knowledgebase and suggest new relationships regarding the inequality phenomena. This will be achieved through the adjustment of the standard Marxian framework relying on the work of van Schaik (1976), Bródy (1970), Wolfstatter (1973), Newman (1962), Sraffa (1960), and Morishima (1973). On this basis, this newly developed model will investigate the euro area cross-country economic inequalities as a derivative of the unequal labour exchange arising from the national labour force exploitation. Through the systematic upgrade based on the criticized aspects of Emmanuel’s (1972) theory of unequal exchange, with which the developed model shares numerous tendencies and properties, this dissertation will build upon the existing knowledge by focusing on the case of the euro area. The significance of this (euro area’s) geographical restriction is analytically recognized by Lewis (1852, p. 112), who writes: “...we are enabled to form limited theories, to predicate general tendencies, and prevailing laws of causation, which might not be true, for the most part, if extended to all mankind, but which have a presumptive truth if confined to certain nations...”. Therefore, by limiting the scope of the analysis on the euro area member countries, this study will exclusively deal with the capitalist mode of production, and consequently will investigate the specific economic laws that operate in such an environment. This will bypass Bettelheim’s (1972) critique of Emmanuel and will allow for the assumption that the law of value operates in the euro area in the same way it does in a single country. The former holds, given that the euro area member states share a common currency and a single market, and will allow for the straightforward application of the Marxian cross-sectoral model on the cross-country analysis. Another distinctive feature of the approach that will be used is that it improves the theory by abandoning Emmanuel’s assumptions of a simple commodity mode of production, equality between market prices and prices of production, and the labour force immobility. Furthermore, the developed theoretical model will overcome Bettelheim’s (1972) objection to the theory of unequal labour exchange, which rests on the grounds that Emmanuel’s theory “*creates the impression that the incomes received by producers constitute value*” (Özden Birkan, 2015, p. 160). This will be achieved by assuming that the physical surplus is reflected in both national income and the new value created, implying that there must exist a proportionality between the price and the value systems, which sets the groundwork of the theoretical model. Moreover, unlike Emmanuel’s, the model that will be developed within this dissertation does not consider the wages as the exogenous variable, thus omitting the negative consequences recognized by Bettelheim (1972), Evans (1976), and Amin (1977). In addition to these points, the innovated theoretical model will rule out two objections made by de Janvry and Kramer (1979). First, it will dismiss the possibility that the competition between the affluent (core) countries and the less advanced (peripheral) countries cannot occur due to the distinct nature of the traded goods, i.e., it will dismiss the impossibility of a value transfer when the traded goods are country non-specific (see Gibson, 1980). Second, it will debunk the misconception that the capital mobility can be a significant mechanism that corrects the unequal transfers of values. This

research will prove that the opposite motion holds within the euro area, i.e., that the capital mobility exacerbates the unequal value transfers.

The aforementioned theoretical improvements will contribute to the methodological advancement of the domain of economic inequality investigated through the labour theory of value. The Marx-based approach to inequality linked to the distribution of surplus value that will be employed in this study will primarily contribute to the development of the fields of Marxian political economy, connected to the unequal exchange theories, unequal development theories, and dependency theories. Through the application of an upgraded analytical framework, this study will disclose and clarify that the euro area economic inequalities are connected to the underlying economic laws inherent to the capitalist mode of production. As will be shown, these laws perpetuate the cross-country inequalities via an asymmetrical benefit distribution driven by the forces of unequal labour exchange.

From the empirical viewpoint, this doctoral dissertation will contribute through the systematic validation of the innovated model of unequal labour exchange. This will be achieved in three stages. Within the first stage, the theoretical model will be put into practice through a static analysis performed on the ten-year annual average data. The findings will confirm that the distinct levels of national labour force exploitation can become, supported by the dependency theory, permanent sources of inequality. In the second stage, the applied time series analysis will be used as a basis for a trend-cycle decomposition. Additionally, in the third stage, the study will be extended to include a panel data analysis performed via fixed-effect models. The scientific contribution of second stage will be carried out by disclosing the dynamic effects of the economic cycle on the euro area's inequality and enhancement of the division of core-periphery relations. For this purpose, the cluster analysis will be used. The contribution of the third stage will be connected to the display of the influence that the heterogeneous cross-country economic structure has on the euro area's unequal value transfer, and the display of how a worse-off country can use the economic structure to improve its position and lower the overall inequality. The latter will be achieved through a sectoral and technological decomposition of the national economies. All of the abovementioned will bring about a greater understanding of how the forces of unequal labour exchange create and perpetuate the euro area cross-country inequalities.

By taking into account the related works from the available body of literature, the study presented in this doctoral dissertation undeniably represents the most extensive research of the euro area's unequal labour exchange phenomena. Given the integration of numerous improvements into the original theoretical model and their application through the in-depth, multidimensional empirical investigations, this study represents a genuine contribution to the field of economic science that sheds new light on the appropriateness of the Marxian economic thought and the euro area's economic inequalities.

1.7. Structure of the doctoral dissertation

This doctoral dissertation is written in the form of a series of articles based on a common denominator, the investigation of the euro area's cross-country economic inequality. Within the introductory part, the reader can familiarize themselves with the research purpose and goals, background motivation, and the expected scientific contribution of the dissertation.

After the introduction, the three following sections display separate, yet mutually connected articles. The second chapter introduces and thoroughly breaks down the theoretical model used for the investigation of the euro area's cross-country economic inequalities. The second stage within this section is reserved for the supportive empirical model that verifies the hypothesized theory through the static analysis performed on the ten-year annual average data for the period 2004-2013. The third section extends upon previous research and investigates the matter more closely by capturing the inequality dynamics of the euro area through the use of trend-cycle clustering. Accordingly, this chapter accounts for the changes in the euro area's trade inequalities by relating them to specific phases of the economic cycle that occurred between 2003 and 2014. The subsequent fourth chapter further builds upon these foundations by introducing another dimension, that is, by analysing the inequalities through the heterogeneous economic structure across the euro area's member states. This is performed on the extended data set that investigates the period from 2003 to 2016.

At this point, it bears mentioning that the aforementioned chapters are separate articles with common elements tied to the underlying theoretical model. This implies that all three chapters have similarities related to the methodological and data issues. They all have subchapters dealing with the theoretical background, methodological and data considerations, results, and the arising discussion. The primary difference in these otherwise similar sections are the period covered, the chapter-specific methodology and the literature overview, and the minor methodological adjustments carefully crafted to meet the strict criteria of academic consistency. Given that these subchapters are not identical, they are kept within each article and presented separately.

After the detailed exposition of the discussed matter, chapter five closes the study by exhibiting and thoroughly elaborating on the findings. This is achieved by providing the answers to the imposed research questions and evaluating the doctoral dissertation's expected scientific contribution. Moreover, the final chapter includes a discussion that identifies acute issues with regards to the euro area's cross-country economic inequalities, both from the theoretical and practical viewpoints. Since the theoretical arguments outlined within this dissertation are based on the economic model constrained by the appropriateness of its assumptions, within this section, a special focus is placed on the recognition of the research limitations. In addition, this section discusses the research

problems that need to be addressed as a part of future projects. This, in turn, not only emphasises the relevance of the researched subject but also ensures the long-term sustainability of the initiated research. Finally, after the concluding chapter, the remaining parts deal with the bibliography and appendices as well as include an extended summary of the doctoral dissertation written in the Slovene language.

2. LABOUR FORCE EXPLOITATION AND UNEQUAL EXCHANGE AS THE ROOT CAUSE OF THE EURO AREA'S INEQUALITY

This chapter is based on an original scientific paper written in co-authorship with prof. dr. sc. Maks Tajnikar and first published in the scientific journal *Društvena istraživanja*. The published article's full citation is: Rubinić, I. and Tajnikar, M. (2019). Labour Force Exploitation and Unequal Exchange as the Root Cause of the Eurozone's Inequality. *Društvena istraživanja*, 28 (2), 207-228.

The matter discussed within this chapter was presented in various forms at the following scientific meetings:

- 12th Winter School on Inequality and Social Welfare Theory "Space, Mobility and Opportunities" in Alba di Canazei, Italy, 9-12 January 2017.
- 12th International Conference "Challenges of Europe: Innovative Responses for Resilient Growth and Competitiveness" in Bol, Croatia, 17-19 May 2017.
- Paris School of Economics Summer School "Development" in Paris, France, 26-30 June 2017.
- 3rd Central European PhD Workshop "Economic Policy and Crisis Management" in Szeged, Hungary, 13 April 2018.
- 9th Annual Conference organized by International Incentive for Promoting Political Economy (IIPPE) in Pula, Croatia, 12-14 September 2018.

In addition, the matter discussed within all chapters of this doctoral dissertation is a foundation for the upcoming chapter of the second edition of the Palgrave Encyclopaedia of Imperialism and Anti-Imperialism, titled: "Political Economy of the European Periphery".

2.1. Introduction

A soaring number of scientific inquiries into the domain of inequality come as a consequence of extreme disparity among social classes. Despite the extensive literature, contemporary economists have failed to adequately address the subject from the perspective of the theory founded on inequality. The value theory, as will be shown, can be used as an impressive explanatory tool regarding inequalities and, therefore, its usage should be reintroduced, re-examined, and updated through the achievements of contemporary economics. Thomas Piketty, the contemporary authority in the field of

economic inequality, recognizes this importance by stating that: “*This [Marxian] view of inequality as purely a question of capital versus labour has exerted, and will continue to exert, a profound influence on the way redistribution is conceptualized*” (2015, p. 26). Further support of such a stance is given by Desai (1974, p. 55), who concludes: “*We need value theory to make sense of why prices and profits are what they are and thereby to understand why capitalist societies are ridden by inequality and class divisions*”.

In accordance with the former, this doctoral dissertation investigates the cross-country inequalities through the construction of a model similar to that of Karl Marx and is influenced by the work of Amin (1974). The empirical part of this study encompasses the single/unique market of the euro area, allowing for the straightforward implementation of a theoretical model.

From the Marxian viewpoint, inequality represents an intrinsic component of capitalist societies arising from the private property institute. To paraphrase Dragičević (1979, p. 1488), inequality represents the result of disparities in production, where there exists a distinction among those who own the means of production and enjoy the surplus value (capitalists) and those who sell their labour and produce the value for the first group (workers). Consequently, inequality emerges, and its study must depart from the notion of exploitation (Bose, 1980, p. 10).

Inequality is further enhanced when the country is involved in international trade. Accordingly, cross-country inequality is studied as a function of the unequal labour exchange arising from exploitation on a national level. This exchange describes how much of the consumed labour used by a country for the production of commodities is, through trade, recognized within that country. In his review of the unequal exchange theories, Brolin (2007) displays the breakdown of the matter, which can serve as an introduction into the topic that is omitted within this chapter. According to Brolin, the theory of unequal exchange can be traced back to Ricardian socialists. Among economists dealing with the topic, Bauer (2000), Grossmann (1992), and Prebisch (1950) must be mentioned, in addition to Emmanuel, who widely popularized the theory. Emmanuel (1972, p. 265) holds that unequal exchange is an elementary transfer mechanism, whereby value is transferred from one group of countries to another, enabling the advanced countries to grow at the expense of the less advanced ones. The importance of unequal exchange in the case of the euro area is investigated by Seretis and Tsaliki (2016, p. 449), who concluded that due to the trade, “*the weak Eurozone countries constantly reimburse for the well-being of the strong ones*”.

The research is based on a set of so-called conclusions, which allow the cross-country inequalities to be taken into consideration, in addition to allowing for the transition from a theoretical to an empirical model. The objective of this research is to test whether the economic reality corresponds to the conclusions and to confirm that unequal labour

exchange is the cause of the inequality, determining the perspective and well-being of the country.

This chapter is divided into seven sections. The introduction is followed by the presentation of the model's theoretical framework within the second and third sections. The fourth section is comprised of the empirical model, which uses the data set and the assumptions displayed in the fifth section. Section six presents empirical findings. Section seven is the conclusion.

2.2. The theoretical models' foundation

The economic model is comprised of two coexisting systems. The first one is an intrinsic/invisible value system as the expression of abstract labour, and the second one is the extrinsic/visible price system based on commodity fetishism. Therein, the fetishism of commodities is perceived in a Marxian fashion as the perspective of the capitalist world to reduce social relationships between the capitalists and the workers to nothing more than relationships between things/commodities (Fine and Saad-Filho, 2016, p. 23). The stance adopted within this doctoral dissertation is that, in accordance with Marx, these systems are connected through an underlying physical system which expresses commodity production. The latter is what Marx (1990, p. 133) refers to as “physical bodies of commodities”. Accordingly, the following is assumed:

Conclusion 1 *Price and value systems can be connected via physical surplus, defined as the difference between the total commodities produced and inputs used.*

According to van Schaik (1976, p. 3), a physical surplus is an essential part of the physical system of a productive economy (an economy in which production exceeds productive consumption). In such a model, the physical system is expressed as

$$\mathbf{I}\mathbf{x} - \mathbf{A}\mathbf{x} = \mathbf{s} \quad (1)$$

where \mathbf{I} is the unit matrix, \mathbf{x} is the column vector of production, \mathbf{A} is the input (coefficient) matrix, and \mathbf{s} is the column vector of physical surpluses. In accordance with van Schaik (1976, p. 25), the equation (1) can be rearranged as

$$\mathbf{s} = (\mathbf{I} - \mathbf{A})\mathbf{x} \quad (2)$$

\mathbf{A} consists of technological coefficients expressing the economy's cross-sector production relations. \mathbf{A} is a nontrivial, nonnegative square matrix whose maximum column sum norm is less than one, ensuring the technique (\mathbf{A}, \mathbf{I}) to be productive (on the set of production vectors where the physical surplus is well defined). Therefore, the existence of the physical surplus is a consequence of the technique properties used.

Conclusion 2 *A physical surplus is a bundle of commodities which workers, through production, take from nature.*

Consequentially, the efficiency of this process and the size of the bundle are determined by the technique used.

If a physical surplus is expressed as the quantity of labour consumed through its production, or the value of the commodity within the outcome, the result is new value created (NV). The commodity value (row) vector (\mathbf{w}) equates to the socially necessary abstract labour embodied in the unit of commodity (Marx, 1990, p. 293). One part of that labour consists of consumed inputs (\mathbf{wA}), while the other part consists of labour consumed for the production of the physical surplus (Bródy, 1970; Wolfstatter, 1973). This is formalized, following Bródy (1970), Okishio (1963), Waizsäcker (1973), and Wolfstatter (1973), as:

$$\mathbf{w} = \mathbf{wA} + \mathbf{l} \quad (3)$$

Moreover, the scalar product between the consumed labour (row) vector (\mathbf{l}) and the column production vector is the total labour consumed (L):

$$L = \mathbf{l}\mathbf{x} \quad (4)$$

By using equations (4), (2), and (3), and accounting for a strictly positive Leontief-inverse (van Schaik, 1970, p. 29), the total labour consumed equals the value of the physical surplus (\mathbf{ws}):

$$L = \mathbf{ws} \quad (5)$$

Therefore, it holds that the value of the physical surplus is the quantity of labour consumed through the production of the physical surplus, i.e., new value created:

$$NV = \mathbf{ws} = L \quad (6)$$

If the physical surplus is expressed through the prices of commodities of which it consists, then such an outcome is the national income (NI):

$$NI = \mathbf{ps} \quad (7)$$

where \mathbf{p} is the commodities price (row) vector.

The physical surplus vector can, in addition to the physical system, be computed using the price system, where the price value of the physical surplus is a dual of physical surplus (van Schaik, 1976, p. 33), defined as:

$$\mathbf{v} = \mathbf{p}(\mathbf{I} - \mathbf{A}) \quad (8)$$

where \mathbf{v} denotes a row vector of the physical surplus in the price system, defined as the difference between the physical surplus output (\mathbf{pI}) and input (\mathbf{pA}), both expressed in terms of price.

Applying equation (2) to (7) and combining the result with equation (8) yields the second expression of the NI:

$$\text{NI} = \mathbf{ps} = \mathbf{vx} \quad (9)$$

Accordingly,

Conclusion 3 *New value created is defined as the expression of the physical surplus in the amount of labour spent on its production, while national income is defined as the expression of the surplus in price terms.*

From the combination of equations (3), (4), and (8), assuming equivalence between commodity value vector and price vector ($\mathbf{w} = \mathbf{p}$), it follows that

$$\mathbf{vx} = \text{L} \quad (10)$$

Consequently,

$$\text{NI} = \mathbf{ps} = \mathbf{vx} = \text{L} = \mathbf{ws} = \text{NV} \quad (11)$$

In this case, NI is equal to the total quantity of labour consumed, i.e. the NV. It must be noted that in reality, the equality between \mathbf{w} and \mathbf{p} is non-existent because they express distinct categories (labour quantity and monetary magnitudes). However, \mathbf{w} and \mathbf{p} can be proportionate if the consumed labour is compensated in its entirety by uniform wage rate w , equal to the value of the physical surplus. In that case, the following holds:

$$\mathbf{v} = \mathbf{wl} \quad (12)$$

Then, the price accounting system follows this equation:

$$\mathbf{pI} = \mathbf{pA} + \mathbf{wl} \quad (13)$$

After rearranging, the commodities price vector is obtained as:

$$\mathbf{p} = \mathbf{w}l(\mathbf{I} - \mathbf{A})^{-1} \quad (14)$$

If equations (3) and (14) are combined, it must be the case that:

$$\mathbf{p} = \mathbf{w}\mathbf{w} \quad (15)$$

Equation (15) states that the commodity value vector (\mathbf{w}) is proportionate to the price vector, and that the uniform wage rate (w) is the proportionality factor. Acknowledgement of equations (6) and (7) and the uniform wage rate as a proportionality factor yields the equivalence among NI, NV, and the L, as is established within equation (11).

It is imperative to emphasize that this study does not rest on the assumption that the sum of the production prices of all commodities is equal to their value, nor that the sum of profits is equal to the sum of surplus values, as was common practice among numerous researchers (e.g., Borchardt, 1921; Desai, 1974; Meek, 1956; Schefold, 2014). This research departs from the claim that the physical surplus is reflected in both NV and NI. Accordingly,

Conclusion 4 *If the entire physical surplus equates to the total labour invested in production, it must hold that that surplus, even if it is expressed in price terms (national income), is the result of the labour invested in the physical surplus.*

If equations (12), (4), and (10) hold, since the wage rate is scalar, it follows that the quantity of the labour used by the sector is proportionate to the wages received for that labour by the sector. This implies

Conclusion 5 *National income of the individual sector is proportionate to the new value created of that sector regarding the quantities of consumed labour within the sector.*

2.3. Production prices, labour force exploitation, and the competition

Equation (13) excludes capital and refers to pre-capitalist modes of production. With the industrial revolution and use of machinery, capital emerges, and the capitalist's era takes over, altering the fundamental dynamics of production. Since Marx (1991, p. 126) defined capital as the sum of value invested to produce a profit, it is straightforward to conclude that the structural revolution comes as the result of economic activity developing into profit driven activity. The production's objective becomes the creation of profits accompanied by the settling of the workers' wages. With that in mind, henceforth, the focus is placed on the distribution of the produced physical surplus between wages and

profits (i.e., on the distribution of rewards among respective production factors).

The price of the labour force is established on the market through the interaction of supply and demand (Marx, 1947, p. 24). In accordance with Marxian theory, homogenous (Marx, 1990), competitive, and mobile labour leads to the formation of a unique price of the labour force.

Conclusion 6 *In the long-run equilibrium, the labour force must have an equal price in all sectors of the economy.*

This price is the theoretical benchmark for labour force mobility and its existence results in the workers' indifference regarding the placement of their labour.

Additionally, profit-driven capitalists are moving capital to sectors with high returns. When capital, which is also considered homogenous, competitive, and mobile, reallocates, the increased supply within the high profit rate sectors lowers the profit, while the simultaneous decrease in supply increases profit rates in sectors that were "abandoned". Consequently,

Conclusion 7 *The profit rates tend to equalize with the uniform, inter-sector profit rate.*

This is a sign of a structural matching of supply and demand. Hence, the long-run equilibrium price must ensure equalized prices of the labour force and the average profit rate. The prices of commodities obtained in this way are the prices of production, i.e., the production price is the sum of the cost price and average profit (Marx, 1990; Borchardt, 1921). In order to express the production price as Marx did, one must commence with the explanation of the total capital and profit rate. Marx (1991, p. 266) considered the labour cost as variable capital, whereas total capital used was regarded as the sum of constant and variable capital. He argued that the profit rate is the relationship between surplus value and total capital used (1991, p. 141). Based on this, Okishio (1963, p. 293) expressed production prices as

$$\mathbf{p} = (1 + \pi)(\mathbf{pA} + \mathbf{wl}) \quad (16)$$

where π is profit rate. Production prices can also be derived from the work of Sraffa (1960), whereas the abovementioned relationship is different (Newman, 1962; van Schaik, 1976, p. 40). Formally,

$$\mathbf{p} = (1 + \pi)\mathbf{pA} + \mathbf{wl} \quad (17)$$

In this dissertation, the latter approach was favoured. Consequently, in this analysis, there exists a clear distinction between the market (actual) prices and the prices of production,

which were assumed to be equal in the work of Emmanuel (de Janvry and Kramer, 1979). If equations (7), (9), and (17) are connected in aggregate terms, the following holds:

$$NI = \mathbf{v}\mathbf{x} = \pi\mathbf{p}\mathbf{A}\mathbf{x} + \mathbf{w}\mathbf{l}\mathbf{x} = \mathbf{p}\mathbf{s} \quad (18)$$

Note that NI is the physical surplus expressed through the prices of commodities. By using equation (18), the division of the physical surplus into profits and wages takes place.

The price of the labour force enables workers to obtain a part of the physical surplus:

$$\mathbf{w}\mathbf{l}\mathbf{x} = \mathbf{p}\mathbf{s}_w \quad (19)$$

where \mathbf{s}_w is a column vector denoting a part of the physical surplus appropriated by workers, while the remaining part of the physical surplus goes to profits:

$$\pi\mathbf{p}\mathbf{A}\mathbf{x} = \mathbf{p}\mathbf{s} - \mathbf{p}\mathbf{s}_w \quad (20)$$

If the price of labour is high enough for the workers to appropriate the entire physical surplus, profits are non-existent. Accordingly,

Conclusion 8 *Total profit within the economy is the price category received as the difference between the total physical surplus and its part appropriated by workers.*

If the physical surplus appropriated by the capitalists is compared to the surplus appropriated by the workers (expressed via commodity values), the result is the exploitation rate. The exploitation rate (e), which can, in accordance with Marx (1990, p. 320) and Morishima (1973, p. 46), be expressed as:

$$e = (\mathbf{w}\mathbf{s} - \mathbf{w}\mathbf{s}_w)/\mathbf{w}\mathbf{s}_w \quad (21)$$

e shows how much of the labour workers invest in their reproduction in comparison to how much of their labour is appropriated by capitalists. Where the capitalist appropriation takes the form of profit once the commodity has been realized on the market. Therefore, “a positive rate of exploitation is merely a necessary condition for the existence of positive profit” (Okisio, 1963, p. 293).

The comparison of the prices from equations (13) and (17) indicates that the price vectors would be the same if the vector $\mathbf{p}\mathbf{A}$ were structurally equal to the vector \mathbf{l} . This cannot be expected due to the unequal capital-labour force ratios (K/L) between sectors. Within the Marxian terminology, the capital-labour ratio is known as the organic composition of capital (1990, p. 762), while its implication leads to the:

Conclusion 9 *The sector with an above-average capital-labour force ratio appropriates a higher share of total profits in comparison to other sectors and vice versa. This leads to above-average prices in sectors with above-average capital-labour force ratio, resulting in a higher share of gained physical surplus within the given sector.*

Consequentially,

Conclusion 10 *The sectors with an above-average capital-labour force ratio appropriate a higher share of the national income of the entire economy.*

Since the physical surplus spillover within the sectors is a consequence of technology, the asymmetry arising between sectors is not its outcome. It is the result of the formation of uniform profits influenced by production prices of commodities, constituting physical surplus.

Marx considered two types of competition essential for analysing the importance of market disequilibrium. The first type originates as the outcome of the factor mobility between sectors. Under the influence of this type, average profit and average wage rates are formed. When such rates are implemented in equations (16) and (17), in accordance with conclusions 6 and 7, production prices are formed. Prior to their formation, existing market prices fluctuate around the level of production prices, resulting in the creation of the above-average/below-average profits, and leading to

Conclusion 11 *The existence of a positive deviation between market and production prices, according to Marx (1991, p. 882), begets the monopoly prices.*

This happens since above-average prices within certain sectors lead to below-average prices within other sectors, where it must be stated that the presence of the disequilibrium prices does not alter production prices, nor do they alter the physical surplus from equation (7).

The second type of competition is a consequence of inner-sector dynamics, founded on the motivation to reap extra profit. The category of “extra profit” refers to Marx’s term of *extra-Mehrwert* that occurs in more than one version, some of which are: surplus profit, super profit, extra profit, and extra surplus-value. The second competition type incentivizes the capitalists to apply the profit maximizing technique which, given that the wage rate is fixed, results in the minimization of costs per unit of production (Marx, 1991, p. 273). This competition can be presented as a theoretical case by using the price system from equation (17), in which firms use two factors: technique (A, I) and consumed labour (L). If within sector j , a single firm implements a more productive technique (A', I') and labour (L'), the prices for the sector j , as well as average profit and wage rates, will still hold from the equation (17). The firm using the innovative technique will be rewarded

with extra profit originating from a more productive performance (Abraham-Frois and Berrebi, 1979).

For the firm using the more productive technique, the price equation valid for all other firms within sector j , will not hold

$$\mathbf{p}_j = (1 + \pi) \sum_i \mathbf{p}_i a_{ij} + w l_j \quad (22)$$

where, \mathbf{p}_i is the row vector of production prices of inputs within sector j , a_{ij} is the technical coefficient expressing cross-sector production relations within the economy (the element of \mathbf{A}), and \mathbf{l}_j is the consumed labour (row) vector within sector j . In the case of a more productive firm, the following holds:

$$\mathbf{p}_j = (1 + \pi) \sum_i \mathbf{p}_i a'_{ij} + w l'_j + \Pi_{ex,j} \quad (23)$$

where $\Pi_{ex,j}$ is extra profit within the sector j , and a'_{ij} and l'_j are the technological coefficient and consumed labour (row) vector, respectively, of the more productive firm. The Π_{ex} remains until the dominant technique is implemented within all firms. In such case, the system from equation (17) would experience alteration consisting of the implementation of technology \mathbf{A}' and labour l'_j . Consequently,

Conclusion 12 *The second competition type enhances the position of the firm with above-average productivity by adding extra profit, leading to superior economic performance.*

2.4. Empirical model

Although Marx was limited to inner-country analysis, applying his approach on a cross-country level is reasonable. This is justified since the analysed countries share a common currency and a single market, which should lead to unobstructed factor mobility. In such an example, matrix \mathbf{A} indicates cross-country relationships (instead of cross-sectorial ones). In accordance with equation (2), the characteristics of the technique used (\mathbf{A}, \mathbf{l}) determine the relationship between member states' production, whereas row vector \mathbf{l} becomes an indicator of the quantity of the labour consumed within an individual state. Arising from conclusions 2 and 4, the aggregate euro area's NI is an expression of the labour invested in the production of the physical surplus within the member states. In such a case, equation (7) holds with the notion that the prices within the equation are proportional to the values (equation 15). From conclusion 5, it follows that the NV of an individual state is indirectly part of the euro area's NI, proportional to the quantity of labour consumed, given that the wage rates, as the factors of proportionality, are the same in all countries.

On these foundations, one can calculate the NV of the analysed countries as well as compare the results with the real NI. The deviation between the countries' NI and NV is the indicator of how much of the labour used by the country was recognized through the prices of commodities that were produced within that specific country. The latter is what constitutes the “**Unequal labour exchange type 1**”.

In light of this, if the country's NV is higher than the NI, the country produces more value than it receives once the commodities produced have been realized through the exchange. Therefore, provided that the unequal labour exchange is a *zero-sum game*, the respective country suffers through exchange. Contrarily, this implies that there exists a country whose NI surpasses the NV. Consequently, this country gains through exchange because it receives higher recognition of the labour consumed, i.e., because it receives, in terms of its NI, more value than what its labourers have produced within the national production process. From this it follows that the first type of the unequal labour exchange, within the described theoretical framework, discloses the cross-country value transfer and confirms the existence of the cross-country exploitative dynamics.

Given the specific nature of the euro area, the following tendencies are expected: formation of equilibrium prices of goods, services, and labour (conclusion 6), as well as the formation of equilibrium profit rates (conclusion 7). Furthermore, it is reasonable to expect convergence between prices and production prices from equations (16) or (17).

Production prices give the equilibrium national income (NI_{pc}) based on the average equilibrium profit rate (π_{pc}) and uniform price of the labour force (w_{pc}) within equilibrium (conclusion 3). The equilibrium national income is computed as

$$NI_{pc} = \pi_{pc} * K + w_{pc} * L \quad (24)$$

where K denotes capital. If the sector level is replaced with the cross-country level, the country with an above-average capital-labour ratio realizes, with the production prices on the market, the above-proportional fund of average profits when compared to the countries with a smaller capital-labour ratio (conclusion 9). Since the differences between NI_{pc} and the NV exist due to the various capital-labour ratios among countries, it is only reasonable to compare them (conclusion 10). The presented theory suggests that the countries with higher capital-labour ratios should realize a higher NI_{pc} in relation to the NV and vice versa.

As emphasized by Emmanuel (1972, p. 163), the differentiation of organic composition is inevitable, and it appears even in the model of perfect competition due to the specific technical features used in production. That said, when countries with distinct capital-labour ratios are involved in trade according to their equilibrium positions, they trade commodities with equal production prices, equal wages, and equal profit per capital used,

but with different quantities of consumed labour. This is defined as “**Unequal labour exchange type 2**”, which occurs within the equilibrium and is a consequence of unequal capital-labour ratios between countries. This source of cross-country inequality occurs even if the exchange is conducted on a fair-trade principle.

Given that trade, in practice, deviates from the equilibrium/production prices, market disequilibria need to be investigated. Disequilibria appear as the outcome of the existence of monopolies, imperfect competition, and differentiation of commodities. In trade, countries that achieve above-average profits can use the same production techniques as well as the same quantities of labour as other countries; this constitutes “**Unequal labour exchange type 3**”. Consequentially, these countries receive higher incomes (conclusion 11) and acquire greater wealth by capitalizing on their market positions. To discover the impact of disequilibria on (in)equality, the comparison between the actual NI and NI_{pc} must be made. It is worthy to note that equation (7) holds true in the cases of both national incomes, and that both cases are expressing an underlying, equivalent physical surplus. NI is retrieved and consists of real (probably disequilibrium) prices, while NI_{pc} is calculated using production/equilibrium prices of commodities. Therefore, countries with higher NI than NI_{pc} are taking advantage of the disequilibria, i.e., for an equal quantity of labour used, countries with higher NI than NI_{pc} realize commodities with above-equilibrium prices.

The difference between NI and NI_{pc} can be reflected in higher profits or a higher price of the labour force, which are disequilibria. Which country will be the net winner depends on the matters within the country itself, especially on the development of the national labour force markets (conclusion 8). This can be investigated on a national level by comparing the differences between NI and NI_{pc} , with differences between actual and equilibrium prices of the labour force and profit rate.

Regarding trade, extra profit can be generated within the national economy (conclusion 12). The origin of the extra profit lies in the distinct labour force productivity and capital efficiency in productions that are organized in various competitors’ countries. Prices in this trade reflect the average efficiency and productivity and are, with extra profit, rewarding countries with lower (average) production costs. One part of the NI of the cost-superior sectors reaps extra profit, which enlarges the NI of the country comprised of advanced sectors. A part of the NI of the cost-inferior sectors is lowered by the amount of extra profit from superior sectors, which has a negative effect on the NI of countries with less advanced sectors. This generates “**Unequal labour exchange type 4**”. In this case, prices within equation (7) remain on the price levels from equation (17). However, the technical coefficients within matrix A and the row vector l are altered. Within the cost-superior countries, the consumption of the production factors per unit of NI_{pc} are lower when compared to cost-inferior countries.

The impact of economic efficiency analysed via labour productivity and capital efficiency can be investigated using various methods. This issue is addressed by dividing the profit rates and wage rates into two parts, from which one is used as the measure of economic efficiency. The uniform profit rate can be divided between the share of profits (Π) within the NI (Π/NI) and the relationship between NI and K (e.g., Weisskopf, 1979; Moseley, 1988; Duménil and Lévy, 2002; Wolff, 2003; Caselli and Feyrer, 2007; Ferreira, 2011; Chou, Izyumov, and Vahaly, 2016). Using the same logic, wage rate (W/L) can be divided between the share of wages (W) in NI (W/NI) and the relationship between NI and L. Relations between NI and K and between NI and L are indicators of capital efficiency and labour force productivity. The higher they are, the higher is the economy's efficiency. It's worth noting that, with the purpose of differentiating between extra profits and the effects of market disequilibria, extra profits are derived from equilibrium profit and wage rates.

The euro area's average efficiency and productivity were calculated and used to obtain the efficient profit rate (π_u) and the efficient wage rate (w_u). If such profit and wage rates are used for individual countries, *ceteris paribus*, efficient national incomes (NI_u) that individual countries achieve under the euro area's average productivity and efficiency can be computed. If NI_u is compared to NI_{pc} , the information regarding the loss of countries' NI_{pc} due to the below-average productivity and efficiency is received. In other words, the results show how much of the NI_{pc} is gained by the countries with above-average efficiency.

The difference between NI and quantity of used labour (lx) within the country is determined by the distinct levels of organic composition of capital, disequilibrium prices of commodities, and economic efficiency. Whether these differences are appropriated by workers or capitalists depends on the existing conditions within an individual country's labour market. This appropriation can be investigated through the exploitation rate from equation (21).

Exploitation states that the labour invested by workers in the production of the surplus consists of two parts. The first part is needed for the labour force reproduction and the second is appropriated by the capitalists. If this is investigated through the aspect of labour, the first part represents the necessary labour, while the second part represents the surplus/unpaid labour. This is used to derive the exploitation rate as the ratio between the unpaid and paid labour (Morishima, 1973, pp. 48-49):

$$e = \frac{\text{Unpaid labor}}{\text{Paid labor}} = \frac{\text{Surplus labor}}{\text{Necessary labor}} = \frac{(NV-W)}{W} \quad (25)$$

Given that the total labour invested in production is expressed through a country's NV, and that the paid labour is expressed through non-profit incomes (W), it is straightforward

to derive e as the relationship between paid and unpaid labour. It is important to note that the NV of the individual country is proportionate to the labour used in that country regarding the total labour used in the euro area. Both NV and W are expressed in price terms and their difference represents unpaid labour.

Instead of the real price of the labour force, the exploitation rate can also be computed by using the equilibrium prices. In that case, the category of the exploitation rate in equilibrium (e_{pc}) is received as:

$$e_{pc} = \frac{(NV - W_{pc})}{W_{pc}} \quad (26)$$

where W_{pc} denotes a part of the NV that is appropriated by labour, expressed through the usage of equilibrium prices of the labour force. Countries where $e_{pc} > e$ will suffer from less exploitation due to the higher actual price of the labour force than the price that would be formed in an equilibrium state.

2.5. Methodological and data issues

An undertaking dealing with the notoriously difficult and multidimensional phenomena of economic inequality entails the usage of restrictive assumptions in order to make possible the empirical testing of the advanced arguments. The full extent of the complexity is recognized by Galbraith (2009, p. 190), who writes: *“If science consists in a search for patterns in data, then the study of economic inequality suffers from an original sin”*. On these foundations, this section provides an overview of the used assumptions as well as the data issues.

The empirical analysis covers the euro area, excluding Luxembourg. The sample size is determined by the availability of data and the study’s validity, which is limited to a single market area with a common currency. The research departs from Sraffa’s metaphor of “instantaneous photograph” or “snapshot”, which depicts the economic system as frozen at one point in time (Arena and Blankenburg, 2013, p. 8). This metaphor is taken from Sraffa’s unpublished notes (Sraffa Paper D3/12/13) which are housed at the Wren Library, Trinity College Cambridge. Departing from these grounds, this research investigates economic inequalities of the euro area through an analysis computed using deflated data from 2004 to 2013 in the form of ten-year annual averages.

The analysis of unequal labour exchange rests on the assumption that inequality is generated in trade within the euro area. This assumption imposes a constraint since the analysed countries also trade with countries not included in this work. In order to clarify the full extent of this limitation, the subject matter is quantified through the usage of the

World Integrated Trade Solutions (WITS) dataset published by the World Bank (2017) in addition to Eurostat's (2018) data on countries' economic output.

Table 2: The intra-trade export of goods and services of the chosen euro area member states in 2013

Country	GDP*	Exports (% of GDP)	Total exports*	Intra-trade export (% of total)	Total extra-trade export *
AUT	298529	53.4	159414	50.69	80811
BEL	357520	81.7	292094	55.30	161520
CYP	19389	58.6	11362	26.42	3001
EST	26622	84.3	22442	41.58	9330
FIN	164990	38.8	64016	31.64	20252
FRA	1916268	29.4	563382	46.56	262311
DEU	2679738	45.4	1216601	36.58	444998
GRC	210225	30.4	63908	29.88	19093
IRL	162931	103.5	168634	36.98	62364
ITA	1598763	28.9	462042	39.92	184428
LVA	33527	60.3	20217	49.06	9919
LTU	57927	84.1	48717	35.88	17481
MLT	9725	157	15269	24.25	3703
NLD	607881	79.9	485697	56.34	273660
PRT	214327	39.5	84659	59.31	50211
SVK	110942	93.8	104064	44.64	46453
SVN	45091	74.5	33592	53.02	17809
ESP	1116619	32.2	359551	49.11	176559

*Note: * denotes quantities expressed in current prices, million purchasing power standards.*

Source: Authors' own calculations based on the World Bank (2017) and Eurostat (2018).

The Table 2 shows that across-the-board average intra-group export is 42.61% of the total export. If the analysis is performed by taking into account the countries' economic size, then the total extra-group export amounts to 19.1% of total economic output.

On the other hand, the euro area's intra-trade import of goods and services is presented within the subsequent table. The Table 3 shows that across-the-board average intra-group import is 45.18% of the total export. If the analysis is performed by taking into account the countries' economic size, then the total extra-group import amounts to 17.1% of the total economic output.

Table 3: The intra-trade import of goods and services of the chosen euro area member states in 2013

Country	GDP*	Imports (% of GDP)	Total imports*	Intra-trade import (% of total)	Total extra-trade import*
AUT	298529	50.6	151056	56.56	85439
BEL	357521	80.5	287804	55.51	159758
CYP	19389	57.2	11091	59.03	6547
EST	26622	81.5	21697	41.85	9080
FIN	164991	39.7	65501	33.04	21641
FRA	1916268	30.4	582546	47.67	277680
DEU	2679739	39.4	1055817	38.05	401748
GRC	210225	33.2	69795	36.00	25124
IRL	162932	84.7	138003	24.41	33688
ITA	1598764	26.6	425271	44.13	187681
LVA	33528	63.9	21424	59.64	12777
LTU	57928	82.8	47964	40.79	19564
MLT	9726	150.7	14656	47.20	6918
NLD	607881	69.7	423693	38.72	164037
PRT	214328	38.5	82516	66.10	54540
SVK	110943	89.6	99405	29.30	29125
SVN	45091	69	31113	53.86	16759
ESP	1116619	29	323820	41.44	134196

*Note: * represents quantities expressed in current prices, million purchasing power standards.
Source: Authors' own calculations based on the World Bank (2017) and Eurostat (2018).*

On these grounds, it can be concluded that the majority of the economic activity is effectively the result of intra-group activity. Furthermore, if the analysis is extended to include the entire European Union across-the-board average, 62.3% of the total exports are intra-group exports, and 63.2% of the total imports are intra-group imports. Considering that two-thirds of the euro area's extra-trade occurs with the remaining countries of the European Union, it is obvious that the chosen set of countries are at best a semi-open economy. This makes the closed economy assumption not as restrictive as one might think at first. The closed economy assumption is a frequent point of departure in studies dealing with the monetary policy, while further validity of the stance taken is recognized by Seretis and Tsaliki (2016, p. 445), who performed their investigation by departing from the same assumption. In addition, a crucial notion is that this restriction does not alter key findings because they are based on the evaluation of the relative position of the country within the group regarding the unequal labour exchange.

Profit and non-profit (labour) incomes are derived from the United Nations (2019) National Accounts Statistics Database (UN-NAS) GDP calculated as

$$\text{GDP} = W_{cg} + \Pi_{cg} + VA_{ue} + T_{pm} - S_{pm} \quad (27)$$

where W_{cg} is the remuneration of employees, Π_{cg} is the gross surplus of enterprises, VA_{ue} is the gross value added of private enterprises (mixed income), T_{pm} are indirect taxes, and S_{pm} are subsidies (subscript pm denotes production and import). In order to differentiate between income types, the profit income is computed as the sum of the incomes earned by enterprises, while the labour income is the residual. T_{pm} is considered part of a non-profit income (defined as the labour income). Profit income is computed as

$$\Pi = \Pi_{cg} + VA_c \quad (28)$$

where VA_c denotes part of the mixed income earned by enterprises. While the categories of Π_{cg} and W_{CG} can be connected to a particular income source, the question arising is how to determine which part of VA_{ue} goes to VA_c and which part is earned by employees. Given that the United Nations (2019) National Accounts Statistics Database (UN-NAS) does not differentiate between mixed incomes in accordance with the source of income, Gollin's (2002) approach was used in determining the specific factor shares. This method treats mixed incomes as being comprised of the same mix of labour and capital income as the rest of the economy. The advantage of such an approach, besides the creation of the country-specific anchors, is that it does not omit the labour income of self-employed agents. Received values are divided by the total output to receive the specific income shares.

The theoretical category of a country's national income (NI) from equation (7) is taken from the World Bank's (2019) World Development Indicators Database and is expressed as GDP in 2011 PPP \$. Derived from the same source is the data on investment, expressed in 2011 PPP \$. Conversion to PPP was computed using the World Bank (2019) conversion factors, and the result was later adjusted by the price index ratio of the investment goods to GDP using the Penn World Tables (PWT 9.0) from the University of Groningen (2019). Employment data is retrieved from Eurostat's (2019a) Labour Force Survey Database and consists of information on total employment (20-64). The total amount of labour consumed in each country (L) is treated as homogenous and measured by the number of employed workers. The latter implicitly assumes that all employees, regardless of profession, are engaged in the value creating process, i.e., it assumes that all labour produces value (Harvie, 2005).

The capital variable is estimated using the perpetual-inventory method based on the annual investment data. This method is endorsed by, *inter alia*, Chou, Izyumov, and Vahaly (2016), Fraumeni (1997), and Katz and Herman (1997), resulting in the capital being estimated as

$$K_t = K_0(1 - \delta)^t + \sum_{n=0}^{t-1} I_{t-n}(1 - \delta)^n \quad (29)$$

where capital in each year (K_t) is a function of the initial capital stock (K_0), investment (I), and the depreciation rate (δ). K_0 was calculated according to Harberger (1978), using the “stockcapit” command in Stata (Amadou, 2011). The received capital variable was then compared to the one published by the Penn World Tables (University of Groningen, 2019). Such an exercise confirmed the validity of the computed variable through the employment of an additional level of control which yielded fully comparable results with identical dynamics. Given the minuscule variation amongst the capital variables, the decision to favour the computed version was a straightforward one, since such capital variable is synchronized with the other data sources used within this research.

Before closing this section, a note on the data methodology used in this dissertation bears mentioning. All measures applied in this research are first expressed in constant 2011 local currency units. This is performed to correct for inner-country changes in price levels over time. Thereupon, the data received is further adjusted for the purchasing power differences across countries. Accounting for the deviation in the cross-country living standards was done via the World Bank’s International Comparison Project. The International Comparison Project provides comparable price and volume measures of economic output and its expenditure aggregates among countries through the estimation and publication of the PPPs of the world economies. The usage of the PPP exchange rates is indispensable for adequate cross-country inequality analysis. As argued by Anand and Segal (2008, p. 70), the conversion of national currencies into a common numeraire allows for aggregation of national distributions into a global distribution and reflects purchasing power across countries. Even though such an approach is superior when compared to the market exchange rates, the use of the PPP exchange rates suffers due to several computational problems. This was acknowledged in numerous works (e.g., Deaton, 2005; 2013; Lakner and Milanović, 2016) which have particular focus on the 2011 PPP exchange rates, and this is thoroughly discussed by Deaton and Aten (2017) and Ravallion (2018). Despite the fact that a detailed discussion on the topic of the International Comparison Project’s PPP complexity remains beyond the remit of this research, two issues must be addressed. The problem for which there exists no theoretical solution (Milanović, 2016, p. 16) is that the International Comparison Project’s PPP exchange rates are computed based on the baskets of goods and services that are used to capture the price differences across countries. Since the individual preferences, habits, and consumption patterns are different across countries, the International Comparison

Project's PPP exchange rates will inevitably produce variability in the estimated price levels. This problem represents a severe and well-documented limitation when dealing with the Asian countries and is less troublesome when analysing the countries of a similar "socio-economic circle", such as those of the euro area investigated within this dissertation. Regardless of its lesser degree of importance, this limitation must be recognized. The second issue that affects the euro area's cross-country inequality analysis is that the summary of the prices in each country, relative to the numeraire country, is currently available solely through the use of the international dollar. Given that the relations amongst euro area countries are commonly investigated through the euro, this technical limitation has an impact on the broader understanding of the cross-country dynamics. However, the loss of clarity inflicted by the expression of the euro area dynamics in the international dollar is an unavoidable cost that cannot be bypassed without a severe violation of the adequacy of the international comparison.

2.6. Results and implications

Based on the aforementioned information, the findings within this section are separately discussed for each relevant category displayed within the subsequent tables and figures. However, in order to bring about the highest level of understanding with regards to the discussed matter, prior to the examination of the results, all the indicators encompassed by this analysis are presented within the following table, where it bears mentioning that within the empirical part, a theoretical category national income (NI) is expressed through the World Bank's (2019) GDP.

Table 4: The display of the most relevant indicators of the euro area countries (ten-year average for the period 2004-2013)

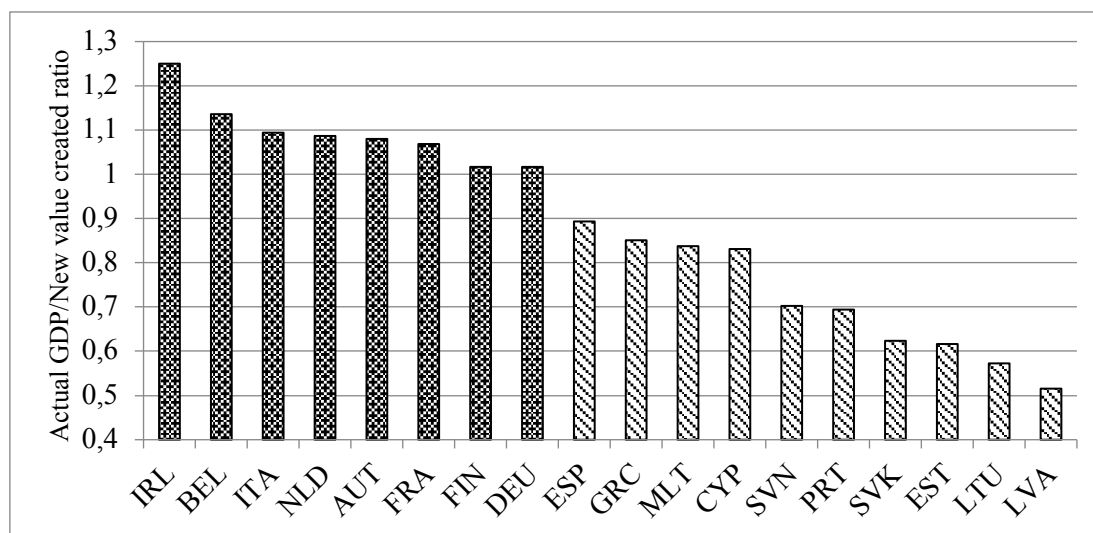
ISO3	$\frac{GDP}{NV}$	e	$\frac{e}{e_{pc}}$	$\frac{W}{W_{pc}}$	$\frac{\Pi}{\Pi_{pc}}$	$\frac{NV}{GDP_{pc}}$	$\frac{K}{L}$	$\frac{GDP}{GDP_{pc}}$	$\frac{GDP_{pc}}{GDP_u}$
LVA	0.52	2.26	0.25	0.48	1.44	1.28	107255	0.66	0.88
LTU	0.57	2.17	0.26	0.49	2.26	1.33	84643	0.76	0.84
EST	0.62	1.61	0.35	0.60	1.23	1.21	140924	0.74	0.93
SVK	0.62	1.88	0.30	0.54	2.23	1.31	92254	0.82	0.85
PRT	0.69	1.16	0.49	0.72	1.06	1.17	162713	0.81	0.95
SVN	0.70	1.05	0.54	0.76	1.03	1.18	154487	0.83	0.95
CYP	0.83	1.02	0.55	0.77	1.64	1.19	152321	0.98	0.94
MLT	0.84	1.00	0.57	0.78	1.73	1.20	145130	1.00	0.93
GRC	0.85	1.01	0.56	0.78	1.19	1.07	221597	0.91	0.99
ESP	0.89	0.73	0.78	0.91	0.89	1.01	262137	0.90	1.00
DEU	1.02	0.53	1.07	1.02	1.09	1.03	246199	1.05	1.00
FIN	1.02	0.56	1.01	1.00	0.99	0.98	281852	1.00	1.00
FRA	1.07	0.37	1.55	1.15	0.76	0.92	329386	0.99	0.99
AUT	1.08	0.46	1.23	1.07	0.95	0.95	308410	1.02	1.00
NLD	1.09	0.43	1.30	1.09	0.94	0.95	307360	1.03	1.00
ITA	1.09	0.54	1.05	1.02	1.17	0.98	282854	1.07	1.00
BEL	1.14	0.37	1.53	1.14	1.01	0.96	299157	1.09	1.00
IRL	1.25	0.49	1.14	1.05	1.16	0.88	371363	1.10	0.97
\bar{x}	0.88	0.98	0.81	0.86	1.27	1.09	219447	0.93	0.96

Note: The absolute values of the most relevant indicators can be found in Appendix 2.

Source: Authors' own calculations.

Regarding the “Unequal labour exchange type 1”, the comparison between the computed NV and GDP of the individual country indicates the social recognition of the consumed labour within the GDP of each country.

Figure 1: The ratio between the actual gross domestic product and new value created in the euro area (ten-year average for the period 2004-2013)

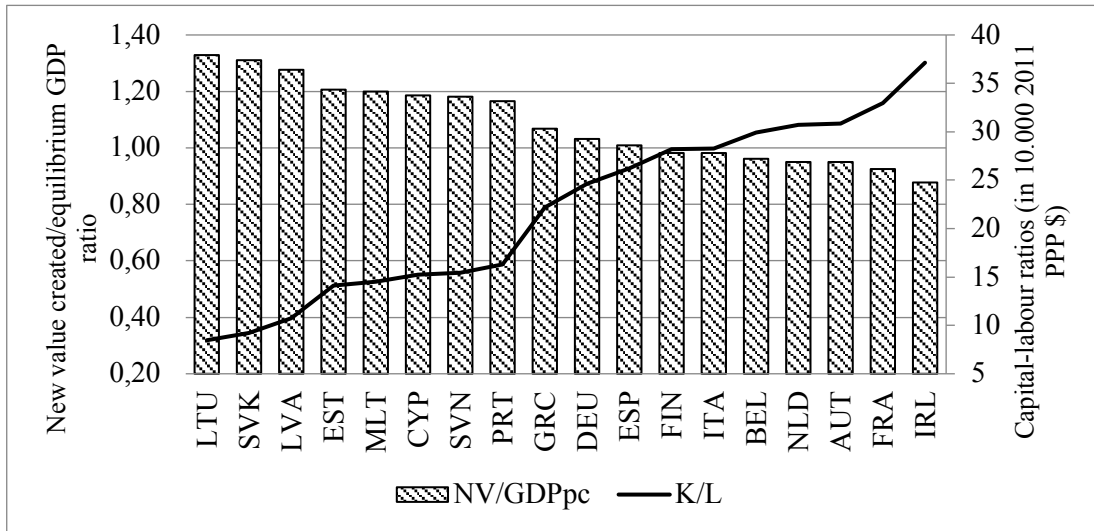


Source: Authors' own calculations.

As depicted, ten out of eighteen countries, in the form of GDP, do not receive the result of labour that was invested in the production of that GDP. The worst outcome is obtained in Latvia (51%) and the best in Ireland (125%). There are, at any given moment, approximately 6.4 million employees from the countries that do not receive recognition of total labour invested in their GDP working for the countries that receive more of the recognized labour in their GDP than they consumed in the production of surplus. During the reference period, approximately 577 billion 2011 PPP \$ in GDP was lost annually by ten countries in the form of the labour invested and not recognized in the GDP.

In accordance with the “Unequal labour exchange type 2”, the countries with higher capital-labour ratio should realize a higher GDP_{pc} in relation to the NV.

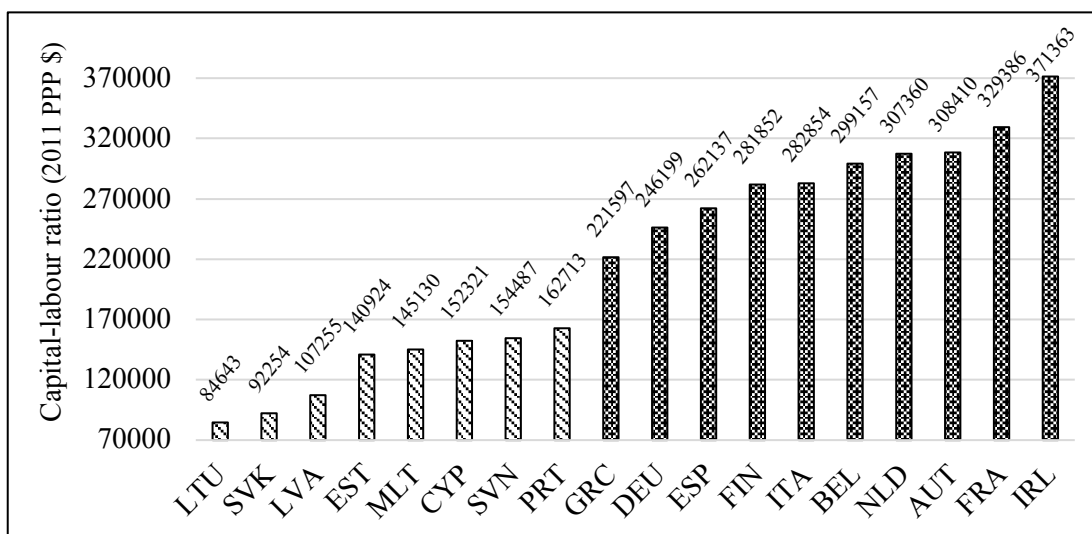
Figure 2: The ratio between new value created and equilibrium gross domestic product in the euro area (ten-year average for the period 2004-2013)



Source: Authors' own calculations.

GDP_{pc} is greater than the NV, i.e., the GDP which countries would appropriate on the basis of used labour in Ireland, France, Austria, the Netherlands, Belgium, Italy, and Finland. When one considers the subsequent figure, these countries also realize above-average capital-labour ratios. In Ireland, the highest capital-labour ratio comes along with the biggest dominance of the GDP_{pc} over the NV. The opposite practice occurs in Lithuania. Therefore, even if there is no market disequilibrium, the capital-labour ratios of individual countries yield different quantities of labour invested per unit of GDP leading to “Unequal labour exchange type 2”. The particular importance of such a conclusion is displayed in the following figure, where the computed values of the capital-labour ratios are presented for each individual member state.

Figure 3: The capital to labour force ratio of the euro area member states (ten-year average for the period 2004-2013)



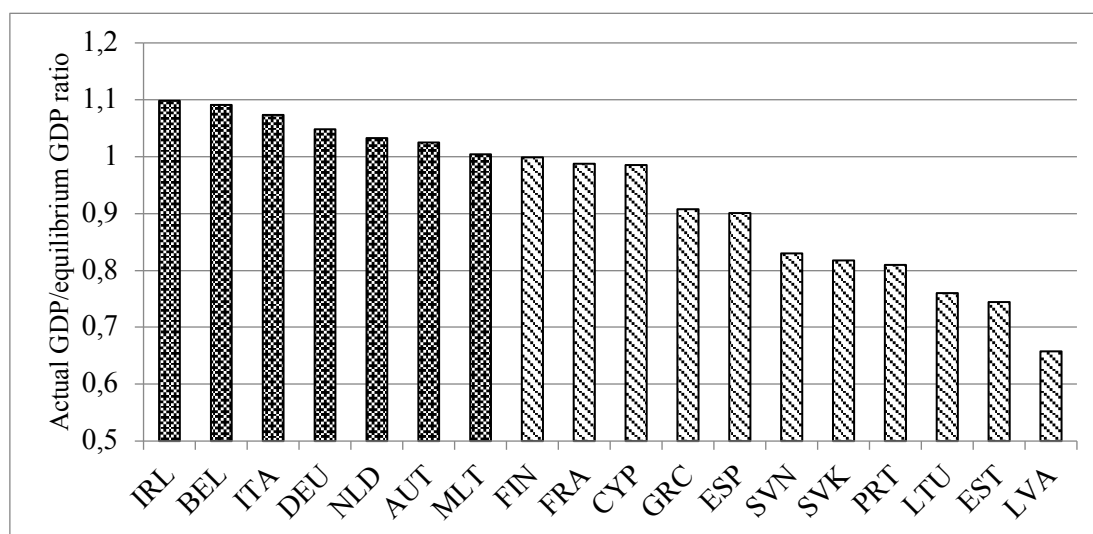
Source: Authors' own calculations.

The significance of the capital-labour ratio with regard to the euro area's trade inequalities, arising from the concept of the unequal labour exchange, is evident when considering the vast cross-country differences. Within the period under examination, the mean capital-labour ratio for the entire sample size was 219,447 2011 PPP \$. When applied to the lower extreme, Lithuania lacks 134,804 2011 PPP \$ of capital stock per worker to achieve the average value of the capital-labour ratio for the entire euro area. Given that, averaged across the same period, its national economy employed 1.3 million workers, Lithuania needed an increase of more than 178 billion 2011 PPP \$ in its capital stock to reach the average capital-labour ratio. Since the current capital stock is calculated to be 111 billion 2011 PPP \$, it can be concluded that achieving the average values is nearly impossible.

That being said, the cross-country capital-labour ratio deviation is, without a doubt, one of the main reasons behind the persisting asymmetrical benefit distribution amongst the euro area member countries that confirms that the arising cross-country inequalities are driven by the forces of the unequal labour exchange.

Once the influence of the organic composition of capital has been thoroughly explained, the focus is placed on the effects of the market disequilibria. Accordingly, the countries with higher GDP than GDP_{pc} are taking advantage of the market disequilibria, which leads to the creation of "Unequal labour exchange type 3".

Figure 4: The ratio between actual gross domestic product and equilibrium gross domestic product in the euro area (ten-year average for the period 2004-2013)



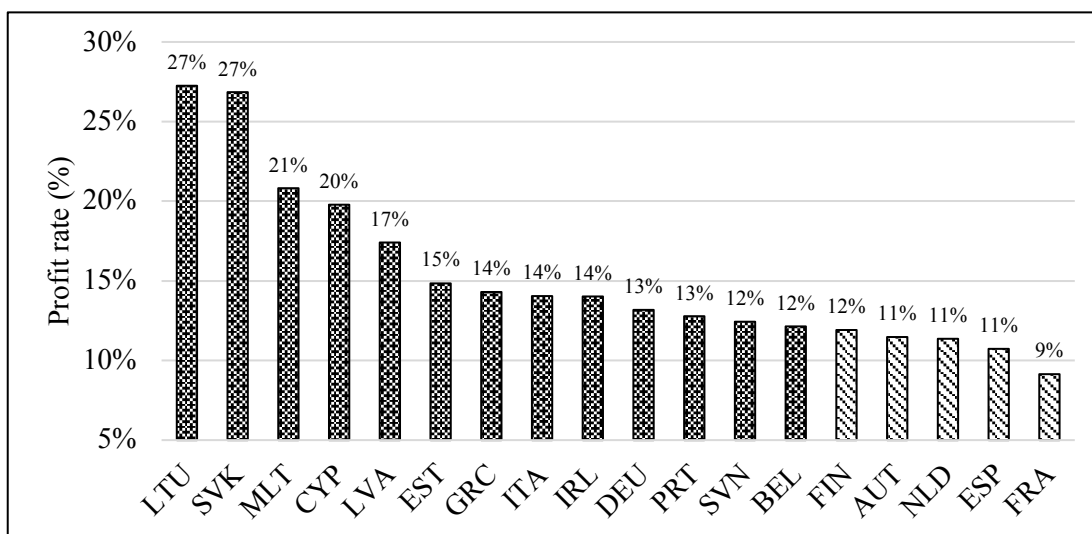
Source: Authors' own calculations.

Figure 4 confirms the existence of the “Unequal labour exchange type 3”. In disequilibrium, the state beneficiaries in higher GDP are Ireland (9.8% of GDP_{pc}), Belgium, Italy, Germany, the Netherlands, Austria, and Malta (0.4% of GDP_{pc}). On the contrary, Latvia’s GDP is only 65% of the GDP_{pc} .

The existence of the “Unequal labour exchange type 3” is reflected through the production factors’ remuneration. Therefore, the difference between the country’s actual GDP and the GDP_{pc} is a source used for financing wage rates and profit rates. The positive difference is a source used for financing higher wage rates, whereas, if the country’s difference is negative, the equilibrium wage rates cannot be obtained. Accordingly, as expressed in the following two figures, the difference between the country’s actual GDP and GDP_{pc} externalizes through wage rates, profit rates, or both.

Around 36% of the cumulative GDP obtained within the analysed dataset is appropriated by the capital owners, in terms of profit. However, given the substantial cross-country variation in the capital stock, influenced by the “Unequal labour exchange type 3”, the profit rates exhibit patterns that deserve special attention.

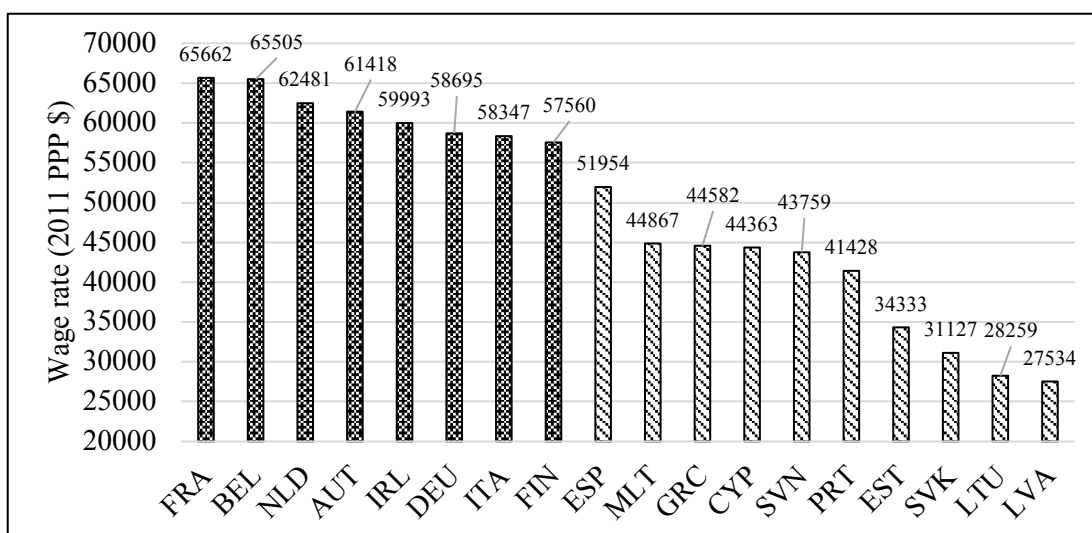
Figure 5: The average annual profit rate of the euro area member states (ten-year average for the period 2004-2013)



Source: Authors' own calculations.

The remainder of the cumulative GDP (64%) consists of the part appropriated by workers and the entire public sector. Given that within the context of this dissertation, the labour income encompasses the entirety of the public sector and by accounting for that, the wage rates are derived and presented below.

Figure 6: The average annual wage rate of the euro area member states (ten-year average for the period 2004-2013)



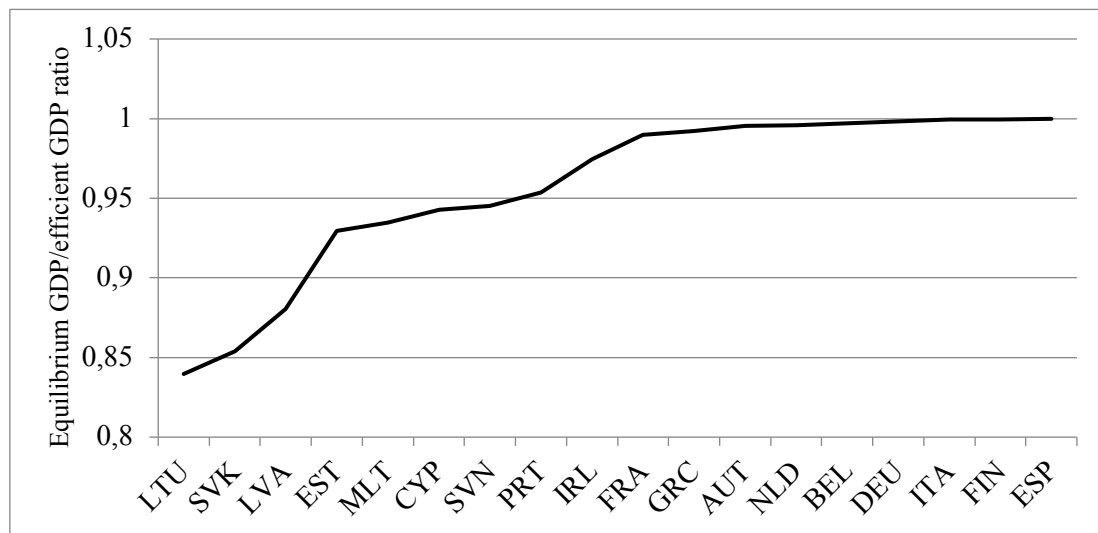
Source: Authors' own calculations.

Within the reference period, the average annual profit rate is calculated to be 12%,

whereas the average annual wage rate was 57,274 2011 PPP \$. Among the countries that have higher GDP than GDP_{pc} , the Netherlands and Austria express this difference in above-average prices of the labour force. Malta expresses this difference in above-average profit rates. Ireland, Italy, Belgium, and Germany express the difference in both an above-average price of the labour force and above-average profit rates. Latvia, Estonia, Lithuania, Slovenia, Portugal, Greece, Slovakia, and Cyprus are losing GDP on markets because their GDP is smaller than the GDP_{pc} . However, the latter countries have above-average profit rates, meaning that the losses on the market are at the expense of the labour force. Spain has a GDP smaller than the GDP_{pc} expressed in below-average prices of the labour force and above-average profit rates. Finland and France have GDP smaller than GDP_{pc} and express these differences in below-average profits and an above-average price of labour. The special case is France with a GDP below the GDP_{pc} , but with the highest prices of the labour force (115% of the equilibrium price) and the lowest profit rates.

The ultimate inequality source is the “Unequal labour exchange type 4”, which prevails since the more efficient countries use fewer production factors for the production of a unit of GDP_{pc} than is the case in cost-inferior countries.

Figure 7: The influence of productivity and efficiency on the economic performance of the euro area (ten-year average for the period 2004-2013)

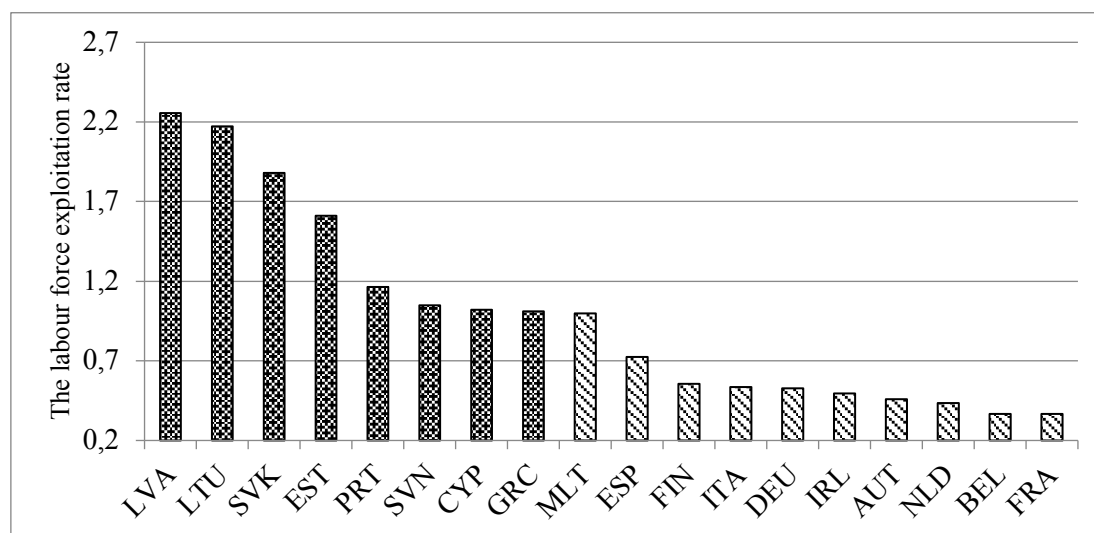


Source: Authors' own calculations.

The influence of productivity and efficiency on economic performance was expressed as the ratio between GDP_{pc} and GDP_u . In Lithuania, Slovakia, Latvia, Estonia, Malta, Cyprus, and Slovenia, the GDP_{pc} is reaching 84-95% effectiveness (GDP_u). The characteristic of these countries is that they, in the same order, have smaller capital-labour ratios.

Finally, the impact of all the factors affecting the unequal labour exchange is expressed through the distinct national labour force exploitation rates.

Figure 8: The euro area's exploitation rate (ten-year average for the period 2004-2013)

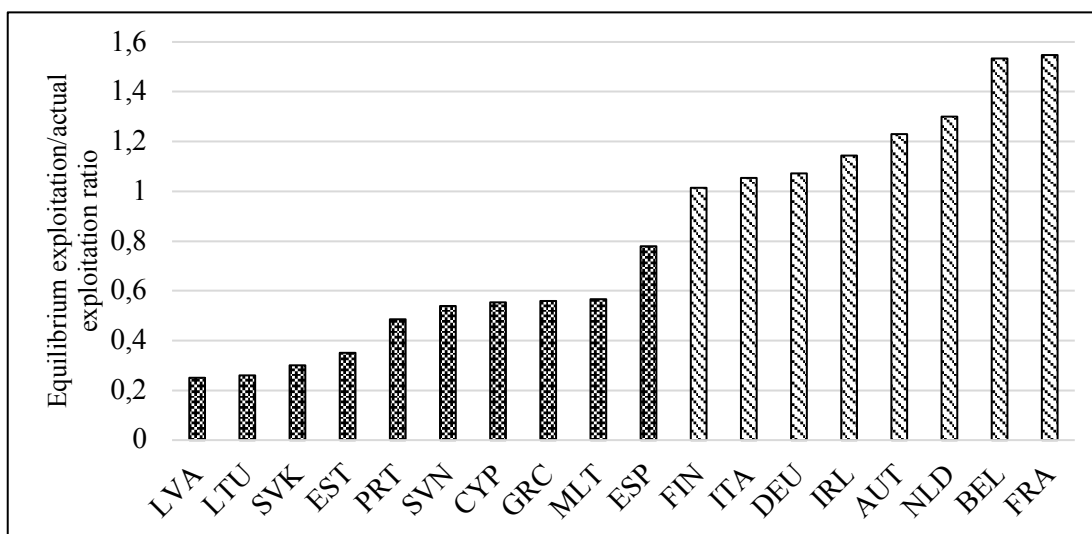


Source: Authors' own calculations.

In France, with the exploitation rate of 0.36, 74% of labour invested in production is used to produce commodities for the reproduction of the labour force. On the other hand, in Latvia, with the exploitation rate of 2.25, workers appropriate only 30%. The euro area's across-the-board average exploitation rate is 0.98, meaning that workers work almost an equal amount of time for themselves as they do for the capitalists. If the analysis is extended to include social labour recognition, the expected pattern emerges. The more developed countries are characterized by high wages, high capital to labour force ratios, and high labour recognition, while the opposite is true for the less developed countries. Hence, if the exploitation rate is clustered according to the labour recognition, the countries that have GDP to NV ratio higher than one have the exploitation rate of 0.46 (averaged across the countries), while the countries with the ratio lower than one have substantially higher labour exploitation rate, which amounts to 1.3. Accordingly, the workers of the affluent euro area countries appropriate 68% of their invested labour, while the workers of the less developed countries appropriate 43% of their invested labour. Under these conditions, in line with Özden Birkan (2015) and Emmanuel (1972), this manifests as a much higher rate of exploitation and a much higher rate of profit within the euro area's periphery.

As previously indicated, the exploitation rate can be utilized as a supplementary category through which the influence of the euro area's market disequilibria can be investigated. This is achieved via the comparison of the exploitation rate in equilibrium (e_{pc}) to the exploitation rate (e) ratio, presented in the subsequent figure.

Figure 9: The ratio between equilibrium exploitation rate and the actual exploitation rate in the euro area (ten-year average for the period 2004-2013)



Source: Authors' own calculations.

The euro area's exploitation rate in equilibrium was calculated to be 0.56, meaning that in the equilibrium state, the average worker spends approximately 64% of their labour time for the production of commodities which are, ultimately, constituting their incomes. This implies that the equilibrium state would lead to a lesser average labour force exploitation. Moreover, the results indicate that higher exploitation, due to the lower price of the labour force than that in an equilibrium state, is affecting the following countries in descending order: Latvia, Lithuania, Slovakia, Estonia, Portugal, Slovenia, Cyprus, Greece, Malta, and Spain. The rest of the countries benefit from this situation since their exploitation rate is lower than what would be the case in the equilibrium state.

2.7. Conclusion

Within the scope of this chapter, the creation of cross-country inequalities within the euro area was investigated. Based on the results of this research, it can be concluded that unequal labour exchange is an essential concept that generates inequality. The fundamental problem that arises from unequal labour exchange is that with one hour of work, workers realize different national incomes within individual countries.

These differences are largely explained by the influence of distinct capital-labour force ratios among countries. In cases where one unit of labour is backed by several units of capital, the formation of a uniform profit demands a higher price, which leads to a higher national income per unit of labour force or per unit of labour. The differences in capital-labour force ratios are crucial in explaining the differences between gross domestic product per unit of labour force among member states. However, they are not significant

in explaining the differences in the prices of the labour force and/or price of capital within the distinct member states.

The influence of the capital-labour force ratios is further enhanced by the unequal labour exchange that arises due to market disequilibria consisting of monopolies, imperfect competition, and differentiation of commodities. Countries that are left off in a worse position because of capital-labour force ratios, in principle, also decline because of market disequilibria. It bears mentioning that the market disequilibria influence is reflected in differences between national incomes and equilibrium national incomes. The deviation of the two abovementioned categories in certain countries can explain the level of prices of the labour force. In some countries, the deviation explains both profit rates and the price of the labour force. A unique position goes to France, which has a national income lower than the equilibrium national income, but simultaneously has the highest price of the labour force and the lowest profit rates in comparison to the data set.

In addition, certain countries are declining due to the lower labour productivity and capital efficiency. In this case, if a country's economic efficiency would be higher, that country would be able to realize higher prices of the labour force and/or higher profit rates.

The combined effects of the unequal labour exchange manifest within the exploitation rate. Within the euro area, there are countries in which workers spend more time working for the capitalists' profits than for themselves and countries where the opposite holds true.

The results indicate that within the euro area, the prices of the labour force are not uniform on a cross-country level. Given that countries share a common currency, theoretical reasoning would argue that labour prices among countries should converge. This does not occur, which indicates underdeveloped labour force mobility. Similar results are received when profit rates are in question. The profit rates among countries are not converging, which means that capital mobility is more of a theoretical construct than an economic reality.

Contemplating on the non-convergence and the cross-country inequalities, one can conclude that the euro area countries are far from an effective single market integration. Therefore, the existing structure of the euro area, influenced by the aforementioned economic forces, brings into question the very values (equality, inclusion, cohesion, and solidarity) upon which it is founded.

Finally, the presented model can serve as a platform for tackling the omitted euro area's challenges related to, among others, migrations/movers, the balance of trade, external debt, etc. Future research should be extended to include the time series analysis, allowing for the inquiry into the inequality dynamics and serving as the foundation upon which the panel investigation can be performed. The ultimate contribution of this would be the

detection of the determinants governing the country's relative position and serving as a basis for redefining current sub-optimal policy decisions.

3. THE INFLUENCE OF THE ECONOMIC CYCLE ON THE EURO AREA'S CROSS-COUNTRY INEQUALITY DYNAMICS

This chapter is based on a scientific paper written in co-authorship with prof. dr. sc. Maks Tajnikar and accepted for publication in the scientific journal *South-Eastern Europe Journal of Economics*. The current article's full citation is: Rubinić, I. and Tajnikar, M. (forthcoming 2019). The Influence of the Economic Cycle on Eurozone Cross-Country Inequality Dynamics. *South-Eastern Europe Journal of Economics*, 17 (2), 267-290.

In addition, the matter discussed within this chapter was presented at the following scientific meetings:

- 87th International Atlantic Economic Conference in Athens, Greece, 27-30 March 2019.
- 6th Centre for Advanced Studies Summer School "Equality and Citizenship" in Rijeka, Croatia, 10-14 July 2019.

3.1. Introduction

The objective of this study is to examine the euro area's cross-country economic inequality dynamics. This is achieved by employing a model founded on the conceptual framework of the Unequal Exchange (Emmanuel, 1972) and common features of works within the Classical/Marxian tradition. In their previous work (Rubinić and Tajnikar, 2019), the authors developed a theoretical model and displayed empirical findings for the claim that inequality is an inevitable consequence inherent to the euro area's structural arrangements.

That having been said, it must be stated that the theoretical groundwork of this study is founded on the synthesis of the Marxist and the heterodox tradition, from which the authors developed their model. The authors concluded that the euro area's persistent inequality stems from international trade, initiated by reinforcing tendencies arising from a country's distinct starting points and their ability to capitalize on their competitive advantages. Such finding is consistent with the circular and cumulative causation principle of Myrdal (1957) and Kaldor (1970). Given that the period for which the conclusions are drawn consists of various cyclical phases, within the present research, the authors have redeveloped the model by accounting for cyclical fluctuations.

This research originates from the hypothesis that the euro area's cross-country inequality is quantitatively and qualitatively (according to the sources) influenced by the cycle, i.e., there exists a relationship between cyclical phases and accompanying inequality trends.

The significance of the cycle is analysed by raising two research questions: the first examines the extent of the cyclical influence, while the second investigates the ways in which the fluctuation occurred. The aim is to determine the cyclically influential patterns that would enable trend-cycle decomposition and clustering of the euro area countries according to similarities in the trends. The matter is subsequently addressed from two aspects: the economic categories through which the influence of cyclical fluctuation on inequality can be observed and the manner in which inequality movements caused by cyclical variation were exhibited.

The questions raised become crucial with the acknowledgement that rising cross-country inequality accounts for the majority of overall inequality (Milanović, 2016). This is paramount for the euro area, the countries of which are, through single monetary policy and fiscal constraints, effectively deprived of their ability to proactively manage economic affairs (Lapavistas et al., 2012; Stiglitz, 2016). Cyclical influence has a diverse effect on the euro area, which is most apparent when the countries are hit by asymmetric shocks. In the absence of adequate structural arrangements, individual countries are forced to find the recourse to internal devaluation process, which disproportionately affects the periphery of the euro area and fosters inequality within it. Thus, the inequality-driven distinct gains/losses enjoyed/suffered by the countries result in the contradictory, asymmetrical capitalization of membership integration that opposes the goals of an effective single market.

The lack of supranational policies that would harmonize economic activity prevents downturns and asymmetric shocks and restores prosperity, interfere with the euro area's ability to provide orderly provisioning for all its members. This creates an environment in which the sources of integrational wellbeing are transmuted, by interaction, into generators of cross-country inequality. On these grounds, the study's theoretical insights will re-question the "One Size Fits All"¹ and the "Single Speed Europe" guidelines, the implementation of which is detrimental to the European project, since they combine countries' absolute/comparative advantages and existing cross-country inequalities. Further approval of such a stance is indirectly recognized by the European Commission (2017) in the "White Paper on the Future of Europe" and within the argument that "*policies enhancing competition and free trade may serve not to eliminate inequality, but to perpetuate it*" (Seretis and Tsaliki, 2012, p. 976).

The remainder of the research is structured as follows. Section two presents the literature overview. The third section displays the theoretical model, while the section four discusses methodological aspects, empirical restrictions, and data sources. The fifth section identifies the economic cycle and presents its impact on euro area inequality dynamics. Finally, the sixth section concludes that euro area countries do not share cycles,

¹ Wortmann and Stahl (2016) asserted that "One Size Fits Some", causing the single monetary policy to exacerbate cross-country inequality.

which is equivalent to saying that cyclical fluctuations are cross-country inequality catalysts.

3.2. Literature overview

The axis of this research evolves around the premise that capitalist development led by commodity exchange laws is unequal. It brings about, in opposition to the orthodox theory of international trade (Ohlin, 1993; Barro, 1997), inherent inequality and widens the gap between the centre and the periphery. The grounds for contradicting the mainstream theory are derived from the notion that unobstructed trade does not consistently return positive effects for all parties, meaning that there is a lack of expected cross-country convergence. This favours countries with an absolute advantage (Weeks, 2001; Shaikh, 2007), intensifies existing inequalities, and serves as an enduring force driving a wedge between the rich and the poor. Equally, uneven distribution of economic gains among trading partners results in the countries' division between a strong core and a dependent periphery. Building on the work of Veneziani and Yoshihara (2017), this unequal benefit distribution is captured by the fundamental axiom called "labour force exploitation", the distinct levels of which among trading countries are the root cause of unequal labour exchange.

The concept of unequal exchange was introduced by Emmanuel (1972, p. 265), who considered it to be an elementary value transferring mechanism that enables advanced countries to grow at the expense of less advanced ones. Regardless of its importance, the detailed overview of the unequal exchange theories (Brolin, 2007; Lichtenstein, 2016; Cope, 2019) will not be discussed within the context of this section. However, it must be emphasised that, under the influence of the underlying forces of unequal exchange, "*the richer country exploits the poorer one, even where the latter gains by the exchange*" (Marx, 1971, p. 106). When countries with distinct labour exploitation trade, with an underlying unequal exchange, the outcome entails that "*the surplus value produced in both regions [countries] is first thrown on a pile and then divided between the capitalists according to the amount of their capital. The capitalists of the more highly developed region [country] thus not only exploit their own workers, but also always appropriate a part of the surplus value that has been produced in the less developed region [country]*" Bauer (2000, p. 200).

This phenomenon is particularly intriguing with regards to the cycle, seen as a manifestation of the discrepancy between the capacity to produce and the capacity to consume (Amin, 1976, p. 92). According to Amin (1974, p. 609), the unequal exchange theory was conceived by Prebisch, who considered the cycle to be a typical form of capitalist growth. This belief is expressed in Prebisch's letter to Gudin from 1948, as noted in Toye and Toye (2003, p. 444). Prebisch asserted that unequal exchange foundations are built on wage and profit differentials (Prebisch, 1950; Floto, 1989) and

that income disparity between the core and the periphery is created during such cyclical movement (ECLAC, 1951, p. 57). This reasoning suggested that, during the upswing, prices in the periphery rose more sharply than those in the core due to sectoral composition differences. Contrarily, during the downswing, peripheral prices experienced a steeper decline relative to those of the core. This was driven by declining demand in the core, inelasticity of demand for peripheral primary products (Singer, 1950), the perishable nature of primary goods as opposed to the core's manufacturing goods, higher rigidity of wages in the core, and monopolistic prices resulting in the core (Love, 1980, p. 59). Given that the core is well adapted to maintaining the values of its products at the desirable level, the downward price pressure moves towards the periphery via trade. Hence, peripheral wages and profits are reduced in exacerbating the terms of trade and purchasing power. This enables the core to derive a section of its wealth from the periphery via value transfer initiated by the unequal exchange.

Although Prebisch differentiated between the core and periphery based on sectoral grounds, his foundation is related to the usage of distinct technology correlated with excess capital. Such rationale is remarkably consistent with the findings of this paper. The dire consequences of the dynamics mentioned enhance capital accumulation by the core and provide the foundations for the recommencement of this vicious cycle, permanently holding the periphery as a hostage of concealed unequal exchange forces.

Harvey (2006, p. 442) stresses that *“processes described allow the geographical production of the surplus value to diverge from its geographical distribution, in much the same way that production and social distribution separate”*. He concludes *“that the basis for crisis formation is broadened and deepened by the processes described”*. His argument, combined with that of Prebisch, makes cyclical influence both the mode of capitalist growth and the origin of its crisis. The emerging spiral thus perpetuates inequalities and raises the need for revision of the flawed structural design that favours affluent members at the expense of the entire integration.

Hitherto, the empirical analysis was performed mainly concerning input-output data. Several works of relevant literature are noteworthy: Baiman (2014) classified Germany as a prosperous unequal exchange economy. Seretis and Tsaliki (2016) concluded that persisting productivity differences gave rise to an uneven playing field where absolute advantages enhance the competitive position of superior countries. Consequently, unequal exchange caused value transfer from Greece and Spain to the Netherlands and Finland. Tsaliki, Paraskevopoulou, and Tsoulfidis (2017) showed that, mostly due to higher capital intensity, asymmetric trade resulted in value transfer from Greece to Germany. Ricci's (2019) findings, consistent with this paper, concluded that the northern euro area and northern Europe have an influx of value transfer, as opposed to eastern Europe and (to an extent) the southern euro area. Lastly, Serrano, Molero-Simmaro, and Buendía (2016) investigated the crisis impact on European inequality and found that the

distinct patterns generated by the recession affected Greece, Italy, Portugal, and Spain more severely than core countries.

By acknowledging the work performed, one can conclude that the cyclical influence on cross-country inequality via unequal exchange remains both relevant and under-researched. Consequently, the aim of this paper is to rectify the former and bring back to focus the topic that, in this age of globalization, deserves special consideration.

3.3. The theoretical model of cross-country inequality

The study of the cyclical influence on inequality dynamics rests on the model founded on the Marxian intellectual landscape, modified through the novel use of linear economic models. The model, formally introduced by Rubinić and Tajnikar (2019), links Marx (1990) with the work of van Schaik (1976), Morishima (1973), and Newman (1962). The point of departure is the economy's material base, or what Marx (1990, p. 133) refers to as "physical bodies of commodities". This physical system is used to explain the genesis of physical surplus, defined as the net output of productive economy. Employing the physical system enables the authors to bypass the well-known deficiency related to Marxian economics, namely, the problem of transformation. This way, the physical surplus can be expressed through the price system by multiplying the elements of physical surplus with prices. This yields the national income. Additionally, given that it is a product of the labour invested, this physical surplus can be expressed through the value system as the quantity of consumed labour. Such a formulation of physical surplus brings about the category of new value created (NV). The introduction of this value enables the investigation of the unequal labour exchange through distributional trade inequalities and sets the groundwork "*...for claim that systemic inequality lies beneath apparently free market relations*" (Dunn, 2017, p. 353). Consequently, the innovated model operates within the environment comprised of three coexisting systems, where the underlying physical system is mirrored through the price and value systems. Such a framework enables the investigation of exploitation phenomena and allows for the comparison between a country's effective labour consumption and social recognition of the labour consumed within the production process.

Initially, the application of Marx-based exploitation initially involves inner-country study. However, through the adoption of specific assumptions, the Marx-based scheme can be extended to include the exploitative cross-country relations where, in line with Emmanuel (1972) and Roemer (1982), the collections of agents are considered as countries. On these grounds, considering the euro area, the aggregate national income of all countries analysed is nothing but a price expression of the physical surplus produced within the euro area. At this point, it must be mentioned that the theoretical category of the national income is quantitatively expressed via the gross domestic product. Relatedly, since the physical surplus is the result of the labour consumed, the price expression of the

euro area's aggregate national income, by definition, equate the sum of money reflecting the euro area's NV (Gibson, 1980, p. 18). If such aggregate national income were to be distributed, via markets and international trade, in proportion to the country's consumed labour, then the country's national income would mirror the country's NV. For this to hold, international trade must be conducted in a way that ensures that the labour consumed in all trading countries is recognized, in its entirety, within the individual national incomes of all parties involved. This necessitates equality among the countries' national incomes and the NVs, and entails that euro area countries, among themselves, exchange commodities and values by following the principle of equal exchange of labour.

The deviation from the outlined pattern comes as a result of the fact that the euro area countries are at advanced stages of the capitalist mode of production, where national income is distributed according to the means of production and labour invested, between the capitalists and the labourers, and not in accordance with the NV. Thus, the country-level distribution of the euro area's output must account for the capital employed in addition to the labour consumed. Due to this, the labour consumed within certain countries is not fully recognized within their national incomes nor within their NVs. Their unrecognized labour content is appropriated by the remaining trading partners and forms a basis for cross-country inequality, defined through the discrepancy between the countries' consumed labour and recognized labour.

To summarize, the actual national income of a given country may lag behind or exceed the country's NV and, therefore, may not reflect the total quantity of the country's labour consumed. According to the model used, this situation can be described as the outcome of three determinants: distinct utilization of market disequilibria, distinct organic composition of capital, and distinct levels of economic efficiency.

3.3.1. The influence of market disequilibria

The 1986 Single European Act (European Commission, 2012) integrated the euro area countries in a single market, guaranteeing the free movement of goods, capital, services, and labour. Such a strategy seeks to create a territory free from regulatory obstacles which would purportedly enhance factor allocation and increase efficiency. The Act's implementation brings about the creation of the free market for each of the "four freedoms" and results in two expected tendencies. The first equalizes factor prices via the creation of uniform cross-country profit and wage rates, while the second establishes long-run equilibrium (production) price as the centre of gravity (Mariña-Flores, 1998). This entails the equivalence of cross-country factor rewards and the elimination of the economic incentive for factor reallocation. Within such equilibrium, the euro area's aggregate gross domestic product (GDP) would be distributed according to the equilibrium (production) prices of commodities and services sold within individual countries. However, due to the (among other factors) monopolies, imperfect competition,

commodity differentiation, and non-price competition, economic reality deviates from the theoretical long-run equilibrium. This necessitates a small digression. When it comes to the state of monopoly, the unequal exchange comes as a result of cross-country profit rate differentials (Amin, 1976), whereas the importance of the commodity differentiation must be investigated by acknowledging the work of Nicolas (2011) alongside the implications made by Schott (2004, p. 647). Accordingly, certain members fail to obtain equilibrium prices, while more successful ones receive above-equilibrium prices for commodities and services sold. Thus, the latter countries obtain above-average profit and/or wage rates, whereas the former ones obtain below-average profit and/or wage rates.

In this sense, unequal exchange as the market disequilibria outcome (Ricci, 2019) leads to divergence and becomes the primary source of the euro area's cross-country inequality. The influence of disequilibrium prices on economic performance is quantitatively investigated through the variation between countries' actual and equilibrium GDPs. The reasoning behind choosing this ratio is straightforward, given that the actual GDP (most likely) consists of disequilibrium prices, while the equilibrium GDP (GDP_{pc}) consists of equilibrium (production) prices computed by distributing the euro area's aggregate GDP among countries according to the equilibrium profit and wage rates. It suffices to mention that, for the countries benefiting from market disequilibria, the rationale used can be seen as an extension of Marx's monopoly (imperialist) rent (1991, p. 910), defined as the difference between the price of production and the market (actual) price (McKeown, 1987, p. 67; Amin, 2011, p. 20).

3.3.2. The influence of capital-labour ratios

With the onset of capitalism, cross-country GDP distribution must reflect returns on capital without which production cannot be realized. Thus, the countries' appropriation of the aggregate GDP, in addition to the labour consumed, must account for the capital employed. Accordingly, even if market prices are aligned with long-run equilibrium, guaranteeing equal factor rewards across countries, because of country-specific capital-labour mix, the GDP appropriated by an individual country will not be proportionate to its consumed labour.

Consequently, countries that, per unit of labour, have less capital than the euro area's average, have a higher NV than the GDP_{pc} and vice versa. A comparably higher NV within countries with less capital occurs because their commodities embody more of the labour consumed than what the countries with abundant capital do. This is what Emmanuel (1972) defines as the unequal exchange in a broad sense, arising from different capital intensities and transferring values towards the countries with high capital-intensive industries. This is how the process is recognized by Fine and Saad-Filho (2010, p. 11): *“outputs do not exchange at their values but at prices of production. These prices of*

production differ from values, as the composition of capital is greater or less than the average for the economy as a whole". Influenced by the unequal value composition of capital, the latter happens even when rates of trading countries' surplus values are equivalent to their average world counterparts (Tsaliki, Paraskevopoulou, and Tsoulfidis, 2017). Therefore, the countries with an average capital-labour ratio yield a GDP_{pc} equivalent to the labour consumed relative to the euro area's total consumed labour. A deviation of the countries' capital-labour ratios from the across-the-board-average causes a deviation of the GDP_{pc} from the NV, and the countries' consumed labour accordingly. This is brought about as a straightforward consequence of the structural arrangements of the capitalist mode of production, in which the division of economic output rests on the class antagonism.

3.3.3. The influence of economic efficiency

Previous categories are based on actual levels of the production factors employed, even though labour productivity and capital efficiency may vary across countries. To capture the distinct efficiency's impact, measured as the cumulative influence of labour productivity and capital efficiency, the authors employ the category of efficient equilibrium GDP (GDP_u). For the calculation of the GDP_u , the authors use the average consumption of labour per unit of GDP and the average consumption of capital per unit of GDP for the entire euro area. Employment of average values allows for the computation of a country's GDP_u received by considering actual wage and profit rates and average consumption of labour and capital per unit of GDP. Crucially, GDP_u omits cross-country differences in market prices, whereas, through the implementation of efficiency influence, the authors eliminate the influence of capital-labour ratios. Finally, the countries' positions with respect to economic efficiency are measured through the GDP_{pc} to GDP_u ratio.

The above-stated determinants are drivers of trade inequalities and generators of the euro area's unequal labour exchange. On these grounds, the euro area's value transfers occur due to cross-country exchange of commodities with vastly different amounts of embodied labour. The resulting unequal labour exchange becomes apparent as the discrepancy between the country's actual GDP and the NV, and is subsequently reflected in cross-country divergence of production factors' remuneration and labour force exploitation.

3.3.4. Formation of wage and profit rates

Equilibrium prices are calculated using equilibrium wage and profit rates. A given country experiences above equilibrium wage rates if its commodities and services reach prices exceeding the equilibrium. For such a country, the actual GDP must surpass the GDP_{pc} , as this positive difference is a source used for financing such above equilibrium wage rates. The same motion holds for above equilibrium profit rates. Conversely, if the

country's difference is negative, because of below equilibrium prices, the country cannot obtain equilibrium rates. Accordingly, this dynamic in a cross-country setting is externalized through lower wage rates, lower profit rates, or in the worst case scenario, both.

The extent to which the countries' failure to reach equilibrium prices is manifested in the wage and profit rates depends entirely upon the inner-country economic circumstances. In this respect, the authors argue that special weight must be assigned to national labour force markets. Relatedly, the countries realizing equilibrium factor prices concurrently with a lower organic composition of capital may suffer a lower actual GDP (sum of capital and labour income). This may be the case even if the countries in question have above-average profit rates if the lower actual GDP is a consequence of the comparably lower cross-country capital stock. Additionally, these countries can also realize a comparably lower GDP per employee.

Lastly, all interactions stated above can be directly measured by implementing the labour force exploitation rate. In this manner, the model applied can connect labour force exploitation with unequal labour exchange and cross-country inequality.

3.3.5. Labour force exploitation

If the aggregate euro area's GDP is distributed by acknowledging the labour used, the individual countries' GDPs would be proportional to the labour consumed within production. The latter represents the price expression of the consumed labour that yields the monetary expression of the NV (Marx, 1990). On this basis, given that all categories are expressed in price terms, the NV can be compared to the total labour income. The labour income share of the NV is a source of two indicators. First, it points to how much of the country's consumed labour is being used for generating labour incomes. Second, it is an indicator of how much of the country's used labour is appropriated by capital in the form of profit. According to Morishima (1973, p. 51), the ratio between the labour time used for the production of profit incomes and the labour time used for the production of labour incomes points out the labour force exploitation rate (e). Formally,

$$e = \frac{\text{Surplus value}}{\text{Value of labour power}} = \frac{\text{Surplus labor}}{\text{Necessary labor}} = \frac{\text{Unpaid labor}}{\text{Paid labor}} \quad (30)$$

By incorporating this reasoning, within the present study, the exploitation rate is calculated as

$$e = \frac{NV-W}{W} \quad (31)$$

Where W denotes total labour income comprised of wage income and the entire public

sector. The higher the e , the more of the workers' labour time is spent on production of profits which are appropriated by capital due to ownership of the means of production.

3.4. Methodological issues, the model's restrictions, and data sources

The useful property of the euro area's unequal labour exchange theoretical model is that it can be straightforwardly quantified. It is worth mentioning that the foundation of the abovementioned model is Marx-based cross-sectoral analysis. However, given that the euro area is comprised of countries integrated via a common currency and a single market, it represents an ideal institutional design that allows for the assumption that the national and the international markets operate in a similar manner. Conditioned upon unrestricted factor mobility, a single monetary system, the development of the credit system, and the shared institutional setting, the inquiry into the euro area's international transfer mechanism can be adequately carried out. Moreover, the approval of such a stance is found in Marx (1991, p. 442), who writes: "*...whatever is true of foreign trade holds also for commerce within a country*". Hence, the empirical study rests on the assumption that inequality is generated within the euro area, whose countries are, in line with Seretis and Tsaliki (2016, p. 445), treated as if they represent the total international market. Further arguments in support of such claim are found in the work of Regan (2015, p. 5), who states that "*...the Eurozone is a semi-closed economy area with less than 10% of trade leaving the Eurozone and predominantly going to the other countries in the EU*". On this basis, the research sample size includes euro area countries apart from Luxembourg (omitted due to data limitations) and covers the period of 2003-2014.

The groundwork of this study is the functional income distribution that results from the formations pf factors, which are, in accordance with the Marxian theory, considered homogeneous, competitive, and mobile. The labour force is expressed as the total number of the employed aged 20 to 64 (Eurostat, 2019a), thus implicitly assuming all labour participates in the value creation process, i.e., it assumes that all labour produces value (Harvie, 2005). The capital is estimated using the standard perpetual-inventory method (Berlemann and Wesselhöft, 2014) as

$$K_t = K_0(1 - \delta)^t + \sum_{n=0}^{t-1} I_{t-n}(1 - \delta)^n \quad (32)$$

where K_t denotes the capital stock in year t , K_0 represents the initial capital stock, δ is the capital depreciation rate, and I_{t-n} denotes the annual investment in year $t - n$. K_0 is calculated, according to Harberger (1978), by using the "stockcapit" command in Stata (Amadou, 2011). Data on investment (GFCF) are derived from the World Bank (2019) and expressed in 2011 Purchasing Power Parity \$ (PPP \$) by using official conversion factors. Given that the conversion factors are GDP-based, investment data are adjusted by the price index ratio of investment goods to GDP, by using the Penn World Tables (PWT 9.0) from the University of Groingen (2019).

To derive specific factor incomes, the authors used the United Nation's (2019) National Accounts Statistics Database (UN-NAS) income approach to GDP.

$$\text{GDP} = \text{COE} + \text{GOS} + \text{GMI} + T_{\text{pm}} - S_{\text{pm}} \quad (33)$$

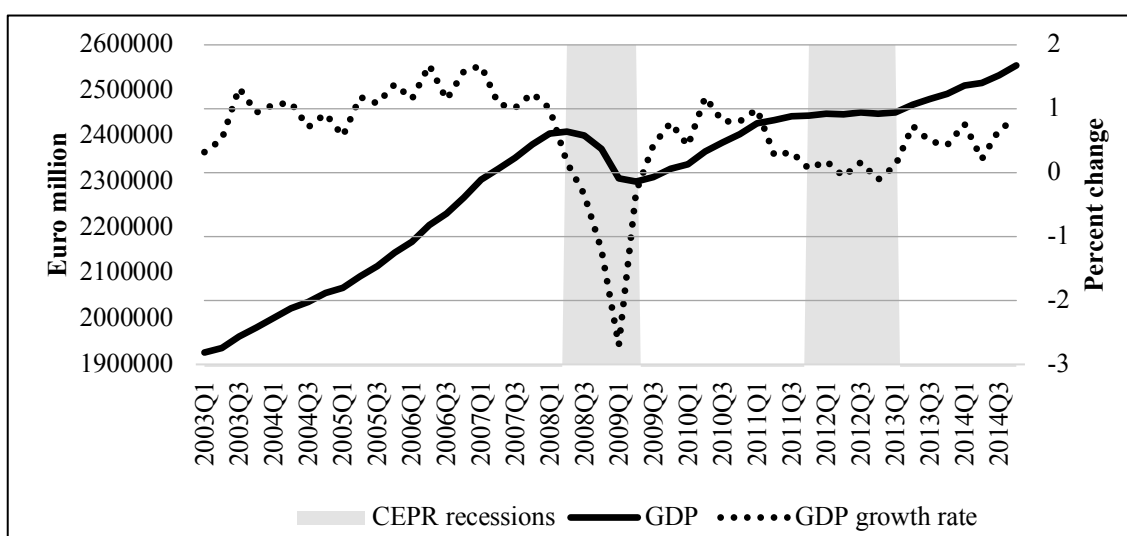
where COE is the compensation of employees, GOS is the gross operating surplus, GMI is the gross mixed income, T_{pm} is taxes, and S_{pm} is subsidies (subscript pm denotes production and import). GDP division, according to specific incomes, was done by computing profit income and taking labour income as residual. Profit income is the sum of GOS (income earned by enterprises) and the share of the GMI produced by private enterprises. Given that the United Nations do not report GMI according to its source, specific shares are obtained assuming that the GMI consists of a capital-labour ratio equivalent to the rest of the economy. At the present time, it is worth noting that other differentiation methods, presented in Guerriero (2012), either underestimate or overestimate income shares. Respectively, total labour income encompasses COE, a part of GMI produced by self-employed agents, and the public sector ($T_{\text{pm}} - S_{\text{pm}}$). This yielded specific GDP income weights. Finally, in order to estimate total profit and labour incomes, the weights obtained were multiplied by the GDP retrieved from the World Bank's (2019) World Development Indicators (WDI) and expressed in 2011 PPP \$.

3.5. Results-based implications and the synthesis of main findings

The euro area countries bound by the shared market, a common institutional setting, and numerous collective economic policies, with disparate levels of development and technology, represent an ideal group for investigating the cyclical influence on cross-country performance. Here, economic cycles are defined as the economy's deviation from its hypothetical steady state, or to paraphrase Burns and Mitchel (1946, p. 3), the fluctuations in aggregate economic activity consisting of expansions, followed by recessions, contractions, and revivals, which merge into the expansion phase of the next cycle.

Consequently, analysis of the cyclical indispensability with regards to inequality determinants departs from the identification of the euro area's economic cycle.

Figure 10: Dating the euro area's economic cycle (2003-2014).



Note: The figure's shaded areas show recession phases.

Source: Authors' own calculations based on Eurostat (2019b) and CEPR (2018).

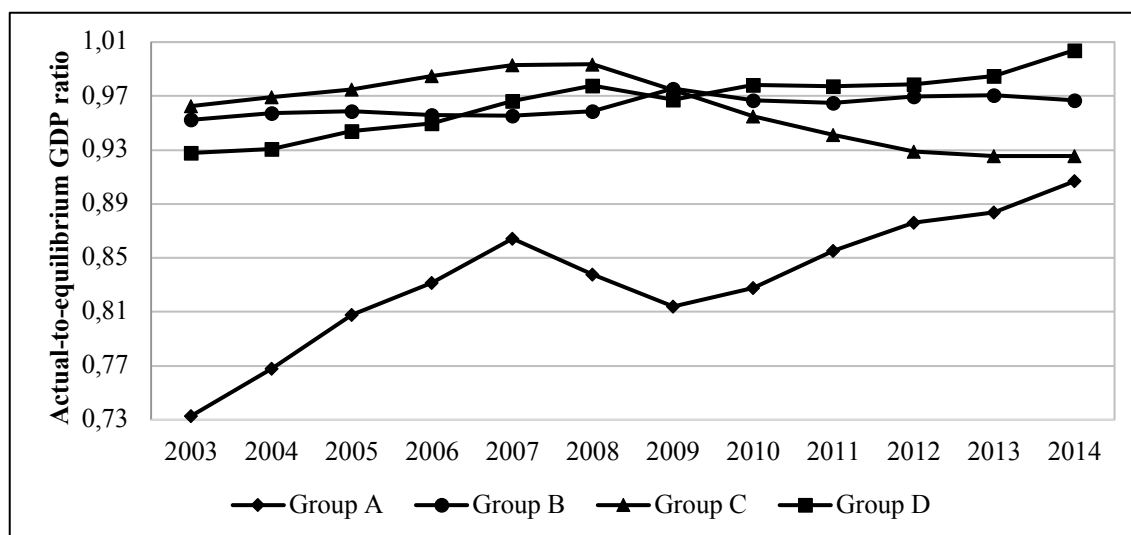
As depicted, the euro area's GDP and GDP growth rate trends follow sequential patterns indicating a cyclical presence. The output surge suggests the occurrence of an expansion predating the recession that began in the 2nd quarter of 2008. Upon reaching the trough observed in the 3rd quarter of 2009, a performance trend commenced with its second rise, present until the end of the period observed. Prosperity re-appeared in three phases underlined by the steady, modest recovery resulting in reaching the pre-recession performance in 2011. The figure's shaded areas show recession phases as reported by the Centre for Economic Policy Research (CEPR). CEPR data suggest that the euro area had two recessions. Regardless of this, throughout this paper, the focus is placed on the effects that the 2008 recession (crisis) had on cross-country inequality. The justification of such a stance is the consequent fact that these results are based on the euro area's aggregate data with significant country-level heterogeneity (see Table 1). A further supportive argument lies in the notion that a third of the countries analysed, accountable for 50% of the average aggregate GDP, did not report negative growth within the period of the second CEPR recession.

The findings presented below are based on the clustering of the euro area member states founded on the pattern similarity criteria. Within the remainder of this section, the figures depict average trends for the previously grouped countries. The trends for the individual member countries used as a clustering criterion can be found within Appendix 3-14.

Having achieved the cycle identification, the analysis moves on to investigating the cyclical influence on **market disequilibria** and its role in creating the euro area's unequal labour exchange. The influence of market disequilibria, investigated as the actual GDP to

GDP_{pc} ratio, results in the euro area's four-group clustering based on pattern similarity criteria.

Figure 11: Cyclical influence on the countries' market position (2003-2014).



Note: Group A: Estonia, Ireland, Latvia, and Lithuania; Group B: Austria, Belgium, France, Portugal, and Spain; Group C: Cyprus, Finland, Greece, Italy, and Slovenia; Group D: Germany, Malta, the Netherlands, and Slovakia; See Appendices 3 and 4.

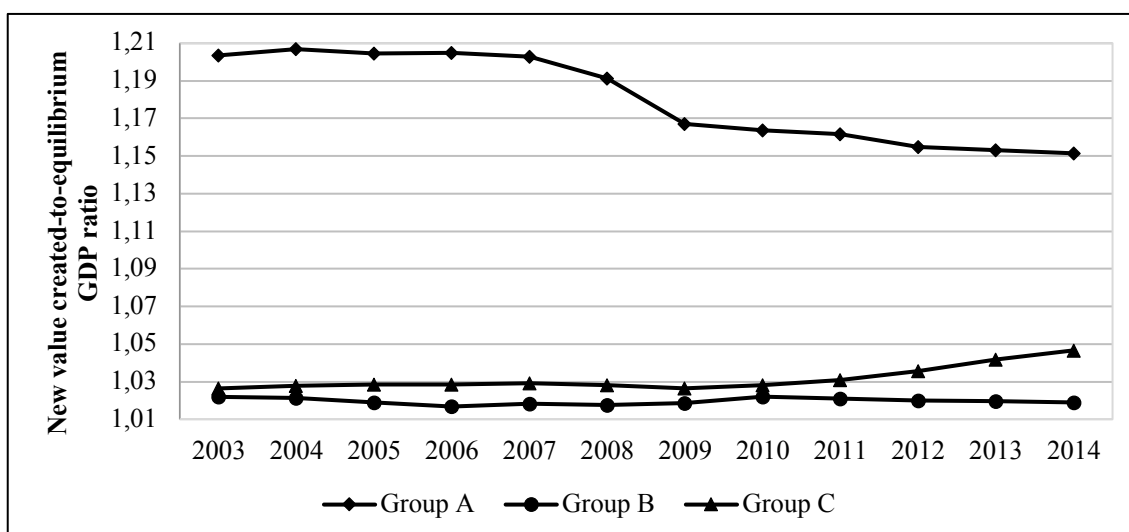
Source: Authors' own calculations.

The cyclical influence via disequilibrium prices is especially observable within countries that were rapidly improving their relative pre-crisis positions (Groups A and C). The post-crisis change initiated the opposite effect and has led to a twofold classification. The first group (Cyprus, Estonia, Greece, Latvia, Lithuania, and Slovenia), with below equilibrium prices, experienced pre-crisis price level convergence leading to the enhancement of its relative position. The second group (Finland, Ireland, and Italy) also enhanced its relative pre-crisis position, but did so by further utilizing its above equilibrium prices. The euro area's pre-crisis cross-country convergence resulted from the fact that the growth of peripheral countries exceeded that of core countries during the cycle expansion phase (Stiglitz, 2016; Matthijs, 2016). Hence, the cross-country inequality started to decline in the early 2000s with a reversing trend inflicted by the crisis. After 2009, Estonia, Ireland, Latvia, and Lithuania (Group A) returned to the positive price effect trajectory. Cyprus, Finland, Greece, Italy, and Slovenia (Group C), failed to recapture their pre-crisis levels and either retained the disequilibrium prices or experienced minor worsening. Group B representatives did not experience considerable market position deviation, while Group D improved its position with marginal cyclical influence.

The cyclical influence on **capital-labour ratios** is investigated through the relationship between the NV and the GDP_{pc}, and highlights the cross-country influence of the organic

composition of capital on the GDP. Because the analysis includes GDP_{pc} , the measurement is unaffected by price fluctuations. Acknowledging distinct capital-labour ratios as the source of inequality leads to the identification of three groups of countries.

Figure 12: Cyclical influence on the countries' capital-labour ratios (2003-2014).



Note: Group A: Estonia, Finland, Greece, Latvia, Lithuania, Slovakia, Slovenia, and Spain; Group B: Austria, Belgium, Cyprus, France, the Netherlands, and Portugal; Group C: Germany, Ireland, Italy, and Malta; See Appendices 5 and 6.

Source: Authors' own calculations.

The crisis impact on capital-labour ratios on GDP appeared in 2007 and stabilized in 2009. The greatest influence measured was within Group A. The crisis has reduced the GDP_{pc} less than it reduced the NV. Therefore, the GDP was reduced simultaneously with the decrease in the amount of consumed labour not recognized in the GDP_{pc} . Given that a higher share of the consumed labour was recognized within the GDP_{pc} , one may conclude that the crisis decreased euro area inequality. However, this is not the case, since the alterations came as a result of the increase in the capital-labour ratio initiated by the crisis-led drop in the number of the employed. The latter is the outcome of the euro area's structure, which constrains its members' ability to cope with the crisis through the adoption of labour market supply-side reforms.

Slovakia and Slovenia diverge from this interpretation. Their capital-labour ratios increased throughout the period, even though the crisis affected the consumed labour recognition. This was possible since, in the case of Slovenia, returns on labour and capital fluctuated following the crisis (Figures 14 and 15), whereas in the case of Slovakia, fluctuation occurred with respect to returns on capital (Figure 15). Special status characterizes Finland, which reported continuous decrease of the labour recognition linked to a steady capital-labour ratio increase. This reduction of labour recognition was

related to a concurrent increase in return on labour and a decrease in return on capital (Figures 14 and 15).

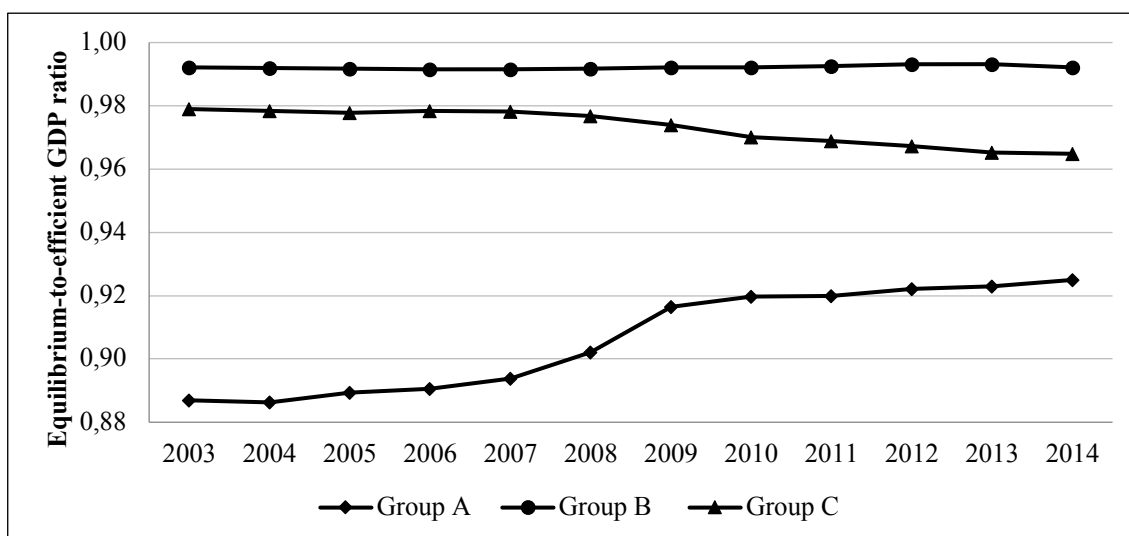
Regarding the recognition of labour used within the GDP_{pc} (Figure 12), Group B (Austria, Belgium, Cyprus, France, the Netherlands, and Portugal) has not been affected by the crisis. This group is characterized by a high capital-labour ratio and a high level of market recognition of labour expended. Austria, Belgium, France, and the Netherlands exhibited stable capital-labour ratio trends. Within these countries, the influence of the crisis was not reflected on either capital-labour ratio or on returns on capital (Figure 15). The crisis manifested itself in the returns on labour (Figure 14), which significantly affected neither the capital-labour ratio nor the market's recognition of labour used.

Cyprus and Portugal diverged from the rest of the group. For this duo, the crisis became apparent through the fluctuation of a considerably lower capital-labour ratio. The stability of the recognition of labour used, as well as its effect on the GDP per employee, was maintained through variations in returns on labour and on capital.

Finally, Group C (Germany, Italy, and Malta) steadily increased its labour recognition during the analysed period and experienced balanced capital-labour ratios. Germany and Italy had significantly influenced the average values of the entire sample size, whereas Malta experienced the crisis influence regarding the recognition of labour through moderate variation in the return on labour.

The cyclical influence on **economic efficiency**, measured as the ratio of GDP_{pc} over GDP_u , trisected euro area countries. This necessitates a digression. Theoretical assumptions restrict the analysis of the overall efficiency level. Thus, efficiency becomes the clustering determinant with respect to cumulative labour productivity and capital efficiency.

Figure 13: Cyclical influence on the countries' economic efficiency (2003-2014).



Note: Group A: Cyprus, Estonia, Greece, Latvia, Lithuania, Slovakia, and Slovenia; Group B: Austria, Belgium, Finland, France, Germany, Italy, the Netherlands, Portugal, and Spain; Group C: Ireland and Malta; See Appendices 6 and 7.

Source: Authors' own calculations.

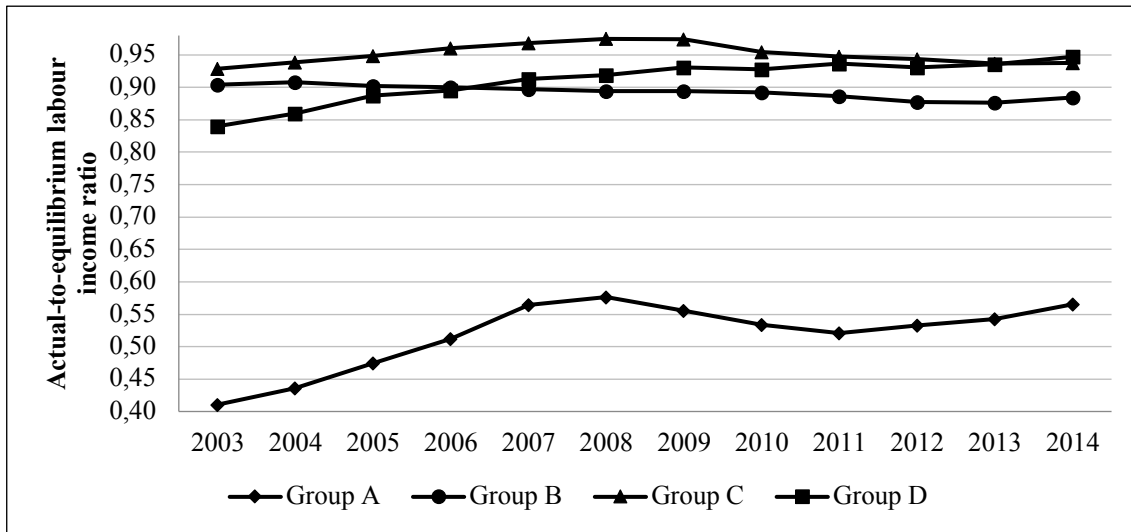
Regarding efficiency, Group B (Austria, Belgium, Finland, France, Germany, Italy, the Netherlands, Portugal, and Spain) performed the best, whereas Group C (Ireland and Malta) reported a declining efficiency trend throughout the period.

The cyclical influence was observed within Group A (Cyprus, Estonia, Greece, Latvia, Lithuania, Slovakia, and Slovenia), which had the lowest efficiency levels. The crisis influence has led to a break in the upward efficiency trend. Group B steadily maintained high efficiency levels, while the lagging countries of Group A had converged within the pre-crisis period. Such convergence lasted throughout the reference period for some countries, while the remaining countries experienced trend slowdown and stabilization on a higher efficiency plane.

The cross-country convergence/divergence presented, caused by the determinants of unequal labour exchange and influenced by the cycle, initiated a direct cross-country spill-over apparent in the deviation of **profit and labour incomes** from their equilibrium levels.

The cyclical influence on the formation and dynamics of the labour incomes (investigated as the sum of gross wages and public sector expenditure) divided the euro area into four groups.

Figure 14: Cyclical influence on labour income formation (2003-2014).



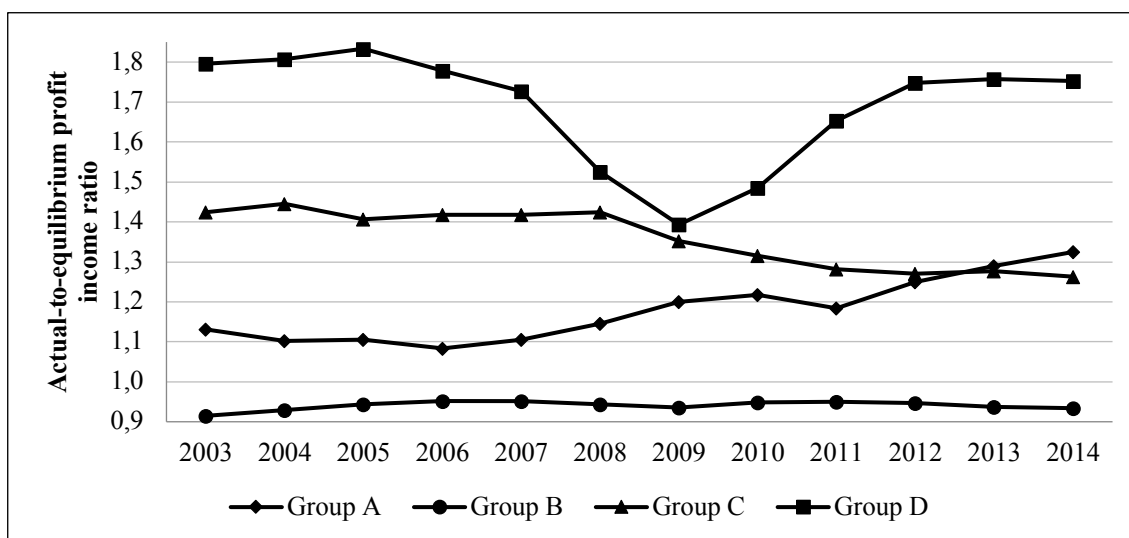
Note: Group A: Estonia, Latvia, and Lithuania; Group B: Germany, Italy, Malta, Portugal, and Spain; Group C: Austria, Belgium, Cyprus, France, Greece, and Slovenia; Group D: Finland, Ireland, the Netherlands, and Slovakia; See Appendices 9 and 10.

Source: Authors' own calculations.

The pattern recorded is similar to that of Matthijs (2016), which indicates that during the upturn of the economic cycle, peripheral labour incomes rose much faster than core labour incomes. On the contrary, during the burst, peripheral countries experienced severe wage cuts. It is worth stressing that the wage cuts observed can be related to the internal devaluation process, initiated by the cyclical asymmetric shocks, which affect the periphery disproportionately, because of its economic dependence, as established within the structuralist theories.

Albeit less differentiable, the cyclical influence on profit income formation also separated the euro area into four groups.

Figure 15: Cyclical influence on profit income formation (2003-2014).



Note: Group A: Malta, Portugal, and Spain; Group B: Austria, Belgium, France, Germany, and the Netherlands; Group C: Cyprus, Finland, Greece, Italy, Slovakia, and Slovenia; Group D: Estonia, Ireland, Latvia, and Lithuania; See Appendices 11 and 12.

Source: Authors' own calculations.

In Estonia, Latvia, and Lithuania, price imbalances were transferred in terms of profit and labour incomes. Their price levels, profit incomes, and labour incomes reached pre-crisis levels in 2014. The unique representative is Ireland, which did not compensate for the burden of crisis by lowering labour incomes (which increased relative to the equilibrium). The Irish crisis became evident with the significant profit income drop. Ireland's pre-crisis profit level was exceeded in 2012 as a result of continuous positive growth initiated in 2008.

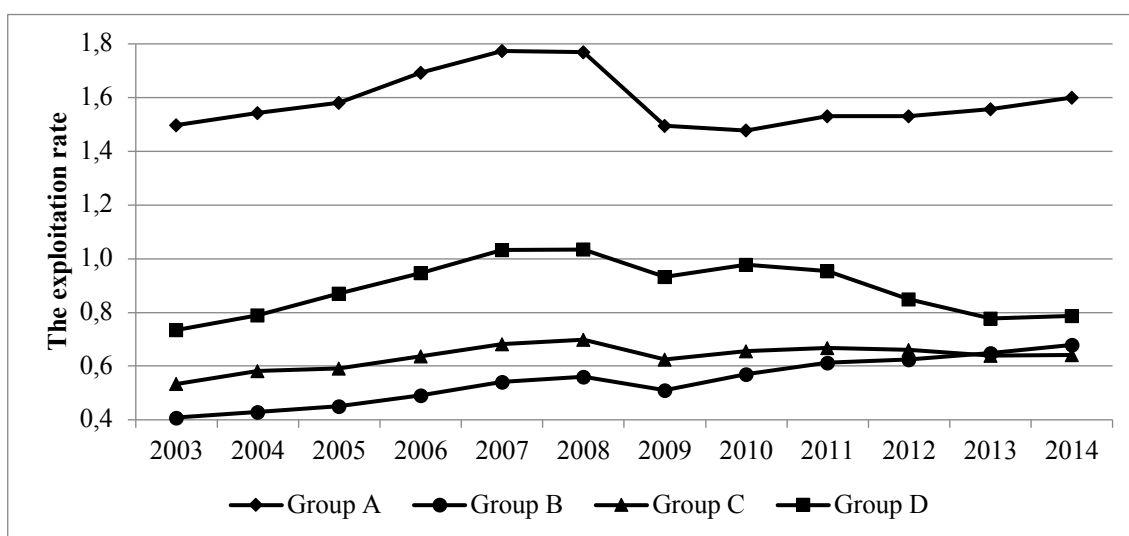
Countries unsuccessful in the post-crisis utilization of relative price disequilibrium positions (Figure 11, Group C: Cyprus, Finland, Greece, Italy, and Slovenia) expressed their failure through both income trends. The exception is Finland, whose labour incomes continuously increased, and whose losses due to disequilibrium prices were expressed through declining profit incomes relative to the equilibrium. Regardless of this exception, the group's significance lies in the fact that the decline of 2008 was less pronounced and that losses occurring due to disequilibrium prices lasted until 2012.

The remaining countries in Figure 11 are distinguishable based on the absence of the cyclical influence on the countries' market position. Group B reported unchanged actual prices relative to the equilibrium. In Austria, Belgium, and France, the crisis was reflected

in disequilibrium labour incomes (Figure 14) with profit incomes remaining stable (Figure 15). Deviation occurred in the case of Portugal and Spain (Figures 14 and 15). This duo reported stable price ratios and unnoticeable cycle effects. However, trends within these neighbouring countries reported that labour incomes declined with the simultaneous rise of profit incomes. Group D is characterized by continuous relative market position improvement, regardless of the recession (Figure 11). Improvement resulted in the rise of labour incomes within the Netherlands and Slovakia. In the latter case, the rise occurred simultaneously with profit income decline (Figures 14 and 15). Malta was the exception since the effects of the crisis manifested themselves in the increase of profit income. Lastly, Germany did not express improvement of its market position (utilization of market price disequilibria) through profit or labour income alteration.

Finally, the overall cyclical influence of all categories affecting unequal labour exchange is indicated through the **labour force exploitation rate**. Calculated via the procedure of equation (30), the exploitation rate divided the euro area into four groups. The peculiarity of this inequality source is that all groups report the crisis effect and subsequent growth revival.

Figure 16: Cyclical influence on the countries' labour exploitation rates (2003-2014).



Note: Group A: Estonia, Ireland, Latvia, Lithuania, Portugal, and Slovakia; Group B: Austria, Belgium, France, Germany, and Malta; Group C: Finland, Italy, the Netherlands, and Slovenia; Group D: Cyprus, Greece, and Spain; See Appendices 13 and 14.

Source: Authors' own calculations.

Group A (Estonia, Ireland, Latvia, Lithuania, Portugal, and Slovakia), comprised of countries with comparably smaller GDPs, stands out with the highest exploitation rate. Here the workers employed worked, on average, worked 1.6 times more to produce profit

incomes than they did to produce labour incomes. Furthermore, in the expansion (2003-2008), the group's exploitation rate experienced a surge, halted by the crisis onset, whereas the subsequent growth revival repeatedly triggered a rise of the exploitation rate. In the case of Group B (Austria, Belgium, France, Germany, and Malta), with comparably larger GDPs and the lowest reported values, the exploitation rate was increasing throughout the entire reference period. The exploitation rate of Group C (Finland, Italy, the Netherlands, and Slovenia) was highly stable with values at the end of the period lower than those of Group B, which had the lowest overall exploitation. Within Group D (Cyprus, Greece, and Spain), the exploitation rate experienced rapid pre-crisis growth as well as a decline in 2008. In this group, the production factors were predominantly equally rewarded, i.e., half of the labour time was spent on producing profit and half on producing labour incomes. As opposed to Group A, Group D did not return to the upward trajectory and remained stable until the end of the observed period.

3.6. Conclusion

Cyclical influence via market disequilibria (utilization of the market disequilibrium position) is not significant for the whole of the euro area. Some members, predominantly those with below equilibrium prices, were severely affected by the cycle. A few others kept their actual-to-equilibrium price ratio unchanged, i.e., the price effect did not indicate the cyclical influence. Major inequality alterations regarding equilibrium prices occurred where the impact of the cyclical fluctuation on the categories investigated was experienced. In countries with below equilibrium prices, inequality with other countries decreased within the expansion phase. On the contrary, the crisis increased inequalities in the market position due to relative worsening within the countries with below equilibrium prices. Accordingly, cross-country inequalities in terms of a country's market position were lowered by the expansion phase and increased by the following crisis.

Fluctuations of actual prices around the equilibrium were a fundamental factor determining functional income distribution variation. These fluctuations manifested themselves through changes in country's labour incomes, profit incomes, or both. Labour income alterations, in particular, reflected a changing pattern in the country's market position. Indeed, results indicate cross-country labour income convergence within the expansion as well as divergence inflicted by the crisis. Such an outcome is the consequence of a market position reversal driven primarily by changes in the position of countries with below equilibrium prices. The market dynamics of these countries was a key driver of inequality even with respect to profit rates, where countries with a worse market position reported above-average profit rates. Cross-country deviation in profit rates was highest within the expansion, while its radical decrease occurred during the contraction.

The crisis has either directly, via capital-labour ratios, or indirectly, through returns on

capital/labour, influenced distinct cross-country recognition of the labour used. Differences were driven mainly by changes within the countries with low recognition of labour used and low capital-labour ratios. The crisis influenced the countries with a higher capital-labour ratio to a lesser degree and led to a reduction in GDP per employee in the countries with low capital-labour ratios. The fluctuations of the capital-labour ratios brought on by the crisis are reflected through the lower market share of the countries' consumed labour recognition. Consequently, the decrease in the part of the labour not recognized within the GDP reduced cross-country inequality measured as the market recognition of the labour used.

Highly efficient countries did not report significant efficiency fluctuations. On the contrary, low efficiency countries (Greece, Cyprus, Slovenia, Estonia, Latvia, Slovakia, and Lithuania) showed trends highly influenced by the cycle and the crisis. These countries reported a radical efficiency rise followed by the outbreak of the crisis in 2008. After 2009, their efficiency stabilized at a higher level. In effect, this led to a substantial crisis-led decrease in cross-country inequality measured via economic efficiency.

The labour exploitation rate unveiled great cyclical influence. Cross-country inequality was primarily driven by exploitation rate alterations within Estonia, Ireland, Latvia, Lithuania, Portugal, and Slovakia. The overall exploitation intensified during the euro area's expansion phase, albeit to a higher degree within these countries. When the crisis emerged, this dynamic shifted, and exploitation decreased. Consequentially, the exploitation rate inequality experienced an expansion-led increase and a crisis-led decrease. This becomes apparent as the outcome of the decrease in the number of employed workers and NV, as well as the reduction of profits within the contraction phase. The joint effects of the above were a drop in the labour of employed workers for profit creation and a consequential downward trend of labour exploitation.

The cycle and the crisis divide the euro area into two groups. The first group (Cyprus, Estonia, Greece, Latvia, Lithuania, Portugal, Slovenia, and Spain) is comprised of severely affected countries. This impacted the countries' relative position and the creation of cross-country inequality, accordingly. Ireland is a special case, which could be assigned to the first group, but indicators do not always favour such a decision. The second group is characterized by the fact that the cycle and the crisis did not have a severe impact on it. However, it may be inferred that the euro area's cross-country inequality was primarily induced by changes within the first group.

This research confirmed that cross-country inequalities concerning profit incomes, recognition of labour used, differences in efficiency levels, and labour force exploitation had been increasing before the crisis. During the crisis and under its influence, the cross-country inequalities decreased. The opposite dynamics occurred regarding cross-country inequality in the market position (distinct utilization of market price disequilibria) and

labour income. Here, the expansion involved decreasing inequality trends, whereas the crisis involved a diametrically opposite pattern. The paramount alterations affecting cross-country inequality took place in the countries exposed to higher pre-crisis inequality. Generally, the crisis had a greater influence on these countries compared to the euro area on average.

It becomes, therefore, evident that the phenomenon of cyclical influence on cross-country inequality has an adverse impact on the euro area's prosperity. Uncoordinated cycles driven by unequal exchange, as well as asymmetric shocks, resulted in cross-country inequality exposing tensions between national and supranational interests. This made the implementation of optimal policies notoriously difficult. Sub-optimal practice is further enhanced by limited policy instruments at the disposal of national governments, which, given the lack of harmonious policies, have acted to protect conflicting national interests. The cumulative effect is seen in the detrimental process of internal devaluation and in the recent invoking of the "exit" clause that has led to the obvious need for change, formally recognized in the Commission's 2017 White Paper. Consequently, in order to avoid the disintegration bias, policy makers must abandon the practice that has turned the euro area's trade into a zero-sum game, rather than a source of integrational wellbeing.

This study's principal contribution is the revival of the topic that should set the groundwork for questions remaining beyond this paper. Forthcoming research must examine the role of the euro area's structural heterogeneity, account for qualitative growth regimes, and encompass the importance of cross-country difference in the amount of abstract labour within labour power as a commodity. The necessity of addressing these issues is a consequence of destructive forces which, if left intact, will result in system collapse. Failure to remedy the euro area's built-in destabilizers will not only foster extreme capital accumulation, but also "brain" centralization induced by the outflux of skilled movers to the core, leaving the periphery sans social fabric and opening the door to new age economic imperialism. Thus, the redefinition of existing policies and the initiation of inclusive policies reinforcing cross-country cohesion become a prerequisite for the protecting of the ideals of equality and solidarity that united euro area countries in the first place.

4. SECTORAL AND TECHNOLOGICAL ANALYSIS INTO THE ORIGINS AND DETERMINANTS OF THE ECONOMIC INEQUALITY WITHIN THE EURO AREA

This chapter is based on a manuscript submitted for publication and written in co-authorship with prof. dr. sc. Maks Tajnikar and prof. dr. sc. Nina Ponikvar (Rubinić, Ponikvar, and Tajnikar, 2019). In addition, the matter discussed within this chapter was presented at the 13th International Conference “Challenges of Europe: Growth, Competitiveness, Innovation and Well-Being” in Bol, Croatia, 22-24 May 2019, and at the AFEP-IIPPE Conference “Envisioning the Economy of the Future, and the Future of Political Economy” in Lille, France, 3-5 July 2019.

In addition, the content of this chapter was accepted for presentation at the International Confederation of Associations for Pluralism in Economics (ICAPE) 2020 Conference which will be held at University of San Diego, USA, 5-6 January 2020.

4.1. Introduction

The admirable achievement of European peace, built upon equality, cohesion, and solidarity amongst countries, faces its biggest challenge thus far. The influx of works on inequality, trending in public debates and academic writings, is a straightforward confirmation that the current state of affairs is drifting apart from the desired one. This contradicts the formal alliance of the European countries in pursuit of their ideals and threatens the very existence of their undertaking. It is apparent that the outlined goals of sustainable development, price stability, competitive markets, and full employment are unlikely to be carried out within the cross-country institutional setting. Such an outcome is linked to the excessive cross-country inequalities being the structural component and the antithesis to economic integration, whose eradication is imperative to achieve long-term prosperity.

The inquiry into the European inequalities departs from the notion that they are exacerbated in two ways. Firstly, the increasing inner-country inequality (Piketty, 2014; Milanović, 2016; World Inequality Lab, 2017) divides rich citizens from the poor ones. Secondly, the growing cross-country inequality, accountable for the majority of the overall inequality (Anand and Segal, 2015), divides the countries between the affluent and the destitute. The cross-country inequality dominance is explained by Galbraith’s (2016) assertion that nationality equates to economic destiny and Milanović’s citizenship premium (2016), determining up to two-thirds of the individuals’ income. Moreover, if this citizenship rent is combined with the parents’ income, these two factors, both of which are given at birth, explain up to 80 percent of the individuals’ lifetime income (Milanović, 2012). On the other hand, the inner-country inequality acknowledges that the *marginalist* theory, prescribing the inequality of rewards as proportional to the

contributions, is inadequate in capturing the shortcomings of the unobstructed competitive model (Galbraith, 2000). The cross-country inequality confirms the mainstream stylized facts regarding international trade as a positive-sum game (e.g., Heckscher, 1919; Ohlin, 1993; Barro, 1997) despite lacking adequate empirical evidence and overlooks the matter in its entirety. Hence, the claim that free trade does not make all parties equally competitive (Shaikh, 2007) is evident in the present-day divergence across European countries (e.g., Hein and Truger, 2005; Dullien and Frische, 2009; Lapavistas et al. 2012; Storm and Naastepad, 2016; Stiglitz, 2016) and within the fact that the countries failed to uniformly share economic cycles, as was shown in the third chapter of this dissertation.

Thus, it remains a puzzle why scholars are persisting in the usage of neoliberal narrative in explaining inequalities which are vastly legitimized within their framework. In order to remedy such inconsistency, this study offers an alternative insight into the European inequality by utilizing the classical/Marxian theory established on the basis of inequality and class antagonism.

For this purpose, the societal inequalities legitimized through the institution of private property, markets, and laws (Rousseau, 1984; Marx, 1990; Wisman, 2014) are investigated. Accordingly, the inner-country inequality is captured with the fundamental theorem of exploitation (Bose, 1980), enabling the capitalists to appropriate a part of the value produced by the workers, whereas the cross-country inequality is studied through the unequal exchange theory, derived from employing exploitative relations on a supranational level (Yoshihara and Veneziani, 2018). The unequal exchange is seen as the secondary phenomena emerging from underdevelopment (Shaikh, 1980), dating back to primitive accumulation (Preobrazhenski, 1967; Harvey, 2005), and driven by the countries' distinct starting points (Kaldor, 1970). It is a value transferring mechanism which, via international trade, enables the capitalists of affluent/dominant countries to exploit their workers and extends this exercise of power over all countries of lesser development (Bauer, 2000), even when the dependent countries gain through the exchange (Dos Santos, 1970; Marx, 1971).

It is apparent that such dynamic collides with the defined guidelines and proves that the forces of the unequal exchange are at the root cause of the turmoil disintegrating the European Union. Thus, by limiting the research to the euro area, the principal focus of this study is to determine to what extent distinct sectoral and technological compositions of national economies modify the international value transfers. In this regard, the cross-country inequality of the euro area is analysed through price effects, efficiency effects, and capital intensity effects influencing the countries' wage rates, profit rates, and national incomes. The significance of these interrelated effects is further considered in two aspects. The first measures the influence through the degree of the country's recognition of the consumed labour within the equilibrium national income. The second

questions whether these effects are altering the proportion of the consumed labour constituting non-profit (labour) incomes.

The general arguments advanced in this study are: (1) that the trade between member countries with distinct endowments results in unequal value transfers within the euro area; (2) that the main drivers of such a state are price effect, efficiency effect, and capital intensity; and (3) that these effects are anchored to the sectoral structure and unequal development of technology across the euro area. This research seeks to advance the literature through a theoretical and empirical confirmation of these arguments. It aims to prove that, in the absence of reforms, the European concept of being “*united in diversity*” will remain a formal postulate behind the oppression of the weak that justifies unity based on an immense diversity in cross-country well-being.

The remainder of the research is organized as follows. Section two provides a literature overview. Section three displays the theoretical foundations. Section four deals with methodological issues and data sources. The fifth section introduces the empirical model. The sixth section presents the results, while section seven concludes.

4.2. Literature overview

Determined by the nature of capital, the unequal development as a hallmark of the European integration project is the inevitable consequence of free trade rooted in the sphere of production and inherent to capitalism (Smith, 2008). The capitalist development is “*asymmetrical in terms of construct and inequitable in terms of outcome*” (Nayyar, 2007, p. 80). Its expansion “*locks countries into further relations of unequal exchange*” (Bieler and Morton, 2014, p. 41), where the cross-country unequal exchange “*arises when spatial production of value is disjointed from its geographical distribution*” (Ricci, 2019, p. 1).

In academic literature, there exists a broad consensus that the euro area countries are integrated into relations of unequal exchange (Boundi Chraki, 2018; Ricci, 2019; Tsaliki, Paraskevopoulou, and Tsoulfidis, 2017; Seretis and Tsaliki, 2016; Baiman, 2014; Bieler and Morton, 2014, *inter alia*). Under the general umbrella of unequal exchange, amongst the several coexisting schools, this study builds upon two paramount intellectual currents. Linked to the classical development theory, the first current is the structuralist unequal exchange theory founded on the work of Prebisch (1950), Singer (1950), and Lewis (1954), while the second current commences with Emmanuel (1972, 1975), who reintroduced and popularized the topic.

The pillar of the dependency theory, the Prebisch-Singer Thesis, states that there exists a long-run trend in deteriorating terms of trade between the centre and the periphery. Resting upon the international specialization in the production of commodities, the

periphery produces primary goods, while the centre is oriented towards the production of the manufacturing commodities. Consequently, the asymmetrical distribution of international trade gains arises due to the wage and profit differentials (Floto, 1989). They are founded on the trade between the raw, low-priced peripheral products and the core's high-priced industrial goods. Accordingly, the unequal exchange occurs due to the low peripheral incomes, the price elasticity of demand for the periphery's commodities, and the core's monopolistic prices combined with the high wage rigidity (Toye and Toye, 2003; Love, 1980). Moreover, that the cross-country unequal exchange is established on the distinct sectoral composition is argued by Lewis, who differentiates between the periphery with traditional sectors and the core with modern sectors (Fields, 2004). In his analytical model, the periphery, having a traditional sector and abundant labour supply, maintains the low wages in contrast to the core, which has a modern sector and high wages. Accordingly, the unequal exchange surfaces from the intersectoral wage differentials, where the peripheral low-priced commodities are exchanged for the core's high-priced goods. This value transfer favouring the core countries is further enhanced by the capitalist expansion and peripheral productivity growth, which worsens the terms of trade by lowering the peripheral export prices. Moreover, an additional division brought about as a result of the core-periphery commodity differentiation can be found in the work of Wallerstein (2004, p. 28). As argued, the competitive products produced by the peripheral countries are in a relatively weaker position when comparing them to the core's quasi-monopolized products. As a consequence, there exist a permanent transfer of surplus values from the periphery to the core, which, by definition, constitutes the unequal labour exchange.

Building upon the structuralists' methods (Bacha, 1978), the second school of economic thought heavily influencing this research evolves around Emmanuel (1972), who coined the term Unequal Exchange. For the general overview of the Unequal Exchange theory, concisely scrutinized within the context of this chapter, the reader is advised to consult the work of Raffer (1987), Brolin (2007), and Lichtenstein (2016). Founded on competitive markets, perfect capital mobility, and relative labour immobility, Emmanuel considers the unequal exchange to be a mechanism transferring the values from underdeveloped to developed countries. This system, he continues (1972, p. 265), "*sets in motion all other mechanisms of exploitation and fully explains the way that wealth is distributed*". His theory departs from the tendential profit rates equalization, the formation of production prices, and the wage rate differentials across the trading countries. Emmanuel recognizes two types of non-equivalence. The unequal exchange in the strict sense is derived from the cross-country differences in the monetary wages. In this scenario, the unequal exchange is facilitated through the significantly lower peripheral real labour costs which, via the international market prices, effectively underestimate the actual amount of labour inputs embodied within the peripheral commodities (Kollmeyer, 2009). The opposite is the case with the core countries. The unequal exchange, in a broad sense, arises from cross-country distinct organic

compositions of capital and transfers the value towards the affluent countries with high capital intensive industries.

From a present-day perspective, the structuralist approach to the unequal exchange, although of crucial importance, overlooks the full extent of the matter and is limited by its outdated outlook on the industrial specialization. This stance is partly corrected by Emmanuel who provides a thorough and comprehensive analysis of the cross-country exploitative relations but falls short by hypothesizing the labour immobility and the uniform technology across countries (Tsaliki, Paraskevopoulou, and Tsoulfidis, 2017). The uniform technology stance is refuted by Elmslie and Milberg (1992) and must be accounted for, given that the technological development reduces the production cost (Callinicos, 2010) to below the cross-country average. Furthermore, Emmanuel does not account for the sectoral composition and captures the technical structure, only indirectly and insufficiently, through the organic capital composition. On these grounds, by advancing the aforementioned contributions, a novel extension of the unequal exchange model is developed. This allows for the quantification and investigation of the importance of both the sectoral and technological compositions within the contemporary framework of international trade with perfect factor mobility.

4.3. Measuring the cross-country economic inequality of the euro area

The quantification of the euro area economic inequality commences with the model of Rubinić and Tajnikar, presented in the second chapter and conceptually founded on the classical/Marxian tradition. The cornerstone of the research is a closed-economy model used to investigate the country's relative position within the cluster regarding the unequal exchange. The attractive feature of this presumption is that it allows for the implementation of the Marxian cross-sectoral model on cross-country dynamics. This implies that the domestic and international markets are ruled by the same laws (Marx, 1990; Schumacher, 2012), and is justified by a unique monetary system, single currency, and single market. Furthermore, it is assumed that within such an environment, production factors are homogenous, competitive, and mobile. While the capital homogeneity is generally accepted by its nature (Emmanuel, 1972), reduction of all labour to homogenous labour deserves a remark. Labour homogeneity is partly justified by the fact that, in the developed stages of capitalism, the differences between the kinds of labour are diminished (Cohen, 1974), or as Marx (1847) writes: "*...as the division of labour increases, labour is simplified. The special skill of the worker becomes worthless. He [on average] becomes transformed into a simple, monotonous productive force that does not have to use intense bodily or intellectual faculties*". Additionally, drawing on the assumption that a unit of labour produces the same value implies that the degree of the workers' ability to produce the value is equally distributed across countries.

If these assumptions are accepted, the total output of the euro area's economy as a result of the labour consumed in the production of commodities can be disaggregated into two systems connected through an underlying physical system, or "*physical bodies of commodities*" (Marx, 1990, p. 25). Respectively, departing from van Schaik (1976), the physical surplus of a productive economy is reflected through both the GDP and the new value created (NV). The GDP is the price expression of the physical surplus, while the NV is its value counterpart received by distributing the aggregate euro area's GDP in accordance with the country's consumed labour. The country-level equivalence between these two magnitudes entails that the total quantity of the labour consumed in the production of commodities is recognized within the country's economic output. Alternatively, the failure to achieve this balance on a cross-country level is straightforward proof of the euro area's unequal exchange.

The implementation of the euro, whose institutional design was laid by the Maastricht Treaty, resulted in a broad set of distributional asymmetries profoundly affecting the future of the European integrational project. These imbalances are, given that the euro area "*functions like a domestic economy*" (Collignon, 2016, p. 65), investigated through a theoretical construct assuming two expected tendencies, founded on the forces of intra-industry and inter-industry competition. According to Marx (1991), competition among firms operating within the same industry forms the "law of one price" (Seretis and Tsaliki, 2016, p. 440), forcing competitors to sell their commodities at the uniform (market) price. Additionally, competition between industries equalizes the profit rates across the sectors in which those firms operate (Marx, 1991). On this basis, governed by the free movement of goods, capital, labour, and services, the first tendency leads to the creation of the cross-country uniform profit and wage rates, equalizing the prices of production factors, while the second tendency establishes the euro area's long-run equilibrium (production) price as the centre of gravity. The equilibrium price formed in this way leads to a market equilibrium that can be quantified by distributing the aggregate GDP across the euro area countries through the application of equilibrium profit and wage rates. This theory, in effect, implies that competitive markets should result in the long-run convergence between the actual and the equilibrium GDP of the euro area member states.

However, the evidence from the euro area's single market suggests a pattern violating the stated assumptions. Consequently, the deviation between the country's actual (most likely disequilibrium) GDP and equilibrium GDP is a confirmation of the market disequilibria that constitute the first and the most powerful determinant of the euro area's cross-country inequality (Ricci, 2019). The state of disequilibria, among others, arises from the monopoly prices founded on profit rate (Amin, 1976) and/or wage rate (Emmanuel, 1972) differentials, from the commodity differentiation (Nicolas, 2011), and from the imperfect competition. The result is that the affluent members are principal beneficiaries of the existing disequilibria by selling their commodities priced above the equilibrium levels,

while the remaining countries obtain below-average profits and/or wages by exchanging their commodities with below-equilibrium prices.

The euro area's conception as a neoliberal project (McNamara, 1998), strengthening the position of the affluent countries vis-à-vis the destitute ones, extends the unequal exchange regardless of the market (dis)equilibrium. Therefore, this value transfer must be further investigated by placing the focus on the two remaining determinants conceived on the countries' distinct factor endowments. The first determinant is the Emmanuellian unequal exchange, in a broad sense, derived from the cross-country differences in the organic composition of capital. Given that the competitive commodities produced under vastly diverse individual conditions are exchanged not at their values but at the prices of production (Fine and Saad-Filho, 2016), the euro area's trade embodies extremely different quantities of labour inputs (Kollmeyer, 2009; Heintz, 2006). Therefore, the commodities of the technically advanced countries, produced with higher capital intensity, will be sold at prices of production higher than their value (Grossman, 1992). Conversely, technically backward countries will exchange their commodities at production prices lower than their value. Accordingly, less-developed countries suffer a disadvantage from the transfer of surplus value towards the technologically advanced countries, determined by the magnitude of functioning capital. Consequently, the countries with more capital per unit of labour than the euro area's average will have lower NV relative to the equilibrium GDP, and they will exchange a given quantity of consumed labour embodied in their commodities for relatively more labour embodied within the commodities of the trading partners with less capital. This effect is expressed via capital-labour ratio and forms a second source of the euro area's economic inequality, whose impact is, within this chapter, measured through the NV-to-equilibrium GDP ratio.

The final source of the euro area inequality inflicted by the unequal exchange is exhibited in the cross-country efficiency variation. As argued by Seretis and Tsaliki (2012, p. 976) the efficiency differences form a transfer of values determining "*not only total amount of value that each capital produces but more importantly its [value] distribution among individual capitals*". The higher efficiency is derived from the capital using state-of-the-art methods, where the commodities produced contain a lesser amount of socially necessary labour and realize more value than they produce (Seretis and Tsaliki, 2016). In addition to capital efficiency, the inequality of exchange reflects cross-country deviations in labour productivity (Amin 1976). Therefore, within the context of this study, the efficiency effects are investigated through the combined influence of capital efficiency and labour productivity. This is measured by computing the individual country's efficient, equilibrium GDP (GDP_u) received as the product of the country's actual wage and profit rates, multiplied by respective (consumed) production factors averaged across the entire euro area, i.e., multiplied with the euro area's average consumption of labour/capital per unit of GDP. The efficiency's role in the creation of the euro area's unequal exchange is quantified through the ratio between the equilibrium GDP and the GDP_u . This method

excludes the market disequilibria effects and cancels out the effect of capital intensity, which becomes largely included in the efficiency effect (excluding Amin's "national potential productivity"). Similar to the previous scenarios, the sources of this unevenness can be tracked in the sectoral and technological composition responsible for the transmission of values from the less efficient to the more efficient countries (Shaikh, 1980). However, the unevenness inflicted by the efficiency effect and mirrored in unequal profit rates and labour rewards can explain the substantial core-periphery gap only to a certain extent (Amin 1976), and it must be used alongside the other discussed forces.

The outcome of the aforementioned elements can be analysed through the cross-country differences in the production factors remuneration. The cross-country disparity in capital rewards is investigated through a profit rate index, where a country's actual profit rate is divided by the country's equilibrium profit rate obtained by dividing the aggregate euro area's profit incomes with the corresponding aggregate capital stock. Accordingly, the countries reporting an above-average index are enjoying higher profits, which is a sign that they are extracting the value from trade inequalities based on the identified inequality determinants. The opposite is the case with the countries reporting below-average values. An analogous motion holds in the case of the wage rate index: the countries with a below-average index have actual non-profit (labour) incomes divided by the respective number of workers lower than their equilibrium counterpart. This implies that these countries are on the losing end of the euro area's unequal exchange. This conclusion differs from that reached by Collignon (2016). He considers the actual-to-equilibrium wage ratio to be the measure of competitiveness and sees a low ratio as a competitive advantage. In the light of findings presented in this dissertation, such a mainstream (managerial) outlook evidently fails to recognize the full extent of the cross-country complexity. Ultimately, the complex interplay between the formation of the production factors rewards externalizes through the difference between the country's actual GDP and equilibrium GDP. The winning countries gain from the positive difference while the less successful ones express the negative outcome through lower profit rates, lower wage rates, or in the worst-case scenario, both.

Lastly, the cumulative effect of the unequal exchange is manifested through the fundamental axiom of the labour force exploitation. The class antagonism that arises from the inner-country exploitation implies that the "*workers give more labour to their employers than they receive through the goods their wages can afford*" (Fleurbaey, 2014, p. 653). Provided that the collection of agents is seen as countries, these exploitative relations are extended to take into account the cross-country dynamics (e.g., Emmanuel 1972, Roemer, 1982), where the more developed countries are taking advantage of the less developed ones. For the purpose of this study, this phenomenon is expressed through the ratio between unpaid and paid labour (Morishima, 1973, Bose, 1980). In the first stage, the exploitation was quantified by dividing the NV , minus the total labour income, by the total labour income. In the second stage, through the usage of equilibrium

categories, the equilibrium exploitation rate is calculated. Ultimately, the ratio between the actual and equilibrium exploitation rates is used to capture the unequal exchange. Accordingly, a ratio below one positions the country in the group gaining from the cross-country inequality, which is comprised of countries with lesser exploitation than would be the case in the equilibrium. Conversely, there are countries with a ratio greater than one, which are suffering from the state of unequal exchange, with workers spending relatively more labour for the production of profits than is the case in the affluent countries.

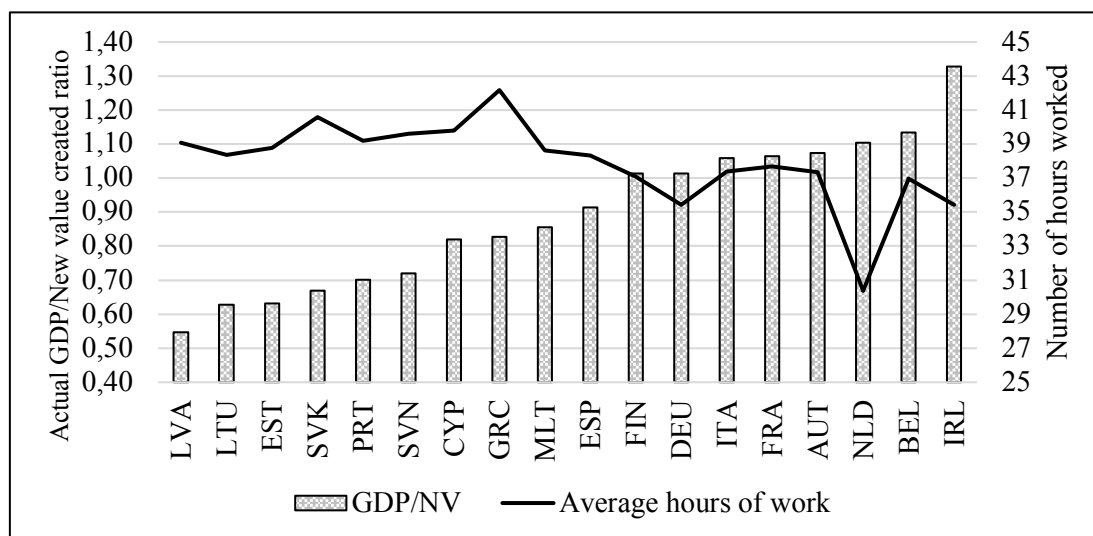
4.4. Methodological considerations and data issues

In a quantitative analysis, variations in sectoral and technological compositions of national economies are measured in an attempt to demonstrate that they are at the root cause of international value transfers and, extending upon this point, are the determinants of the cross-country economic inequality. The impact of the sectoral and technological structure on the cross-country inequality is analysed on the example of the euro area member countries, apart from Luxembourg (excluded due to data insufficiency), for the period between 2003 and 2016.

Before continuing, it bears mentioning that this section is comprised of repetition of similar data sources used throughout this dissertation. As previously indicated, this repetition is required in order to preserve the uniformity of all chapters within this study. Given that this doctoral dissertation is structured as a collection of independent scientific papers, such an approach is not only necessary but compulsory.

The developed model employs a two-factor approach investigating economic activity through the antagonistic relations between labour and capital. The data on labour were retrieved from Eurostat (2019a) and considered as the number of employed workers aged 20 to 64. This necessitates a digression. The quantification of the labour force via the number of employed workers leaves out of consideration the cross-country heterogeneity in the average number of hours worked. In this regard, a supplementary analysis is performed, normalizing the labour by the average number of weekly hours of work retrieved from the same source. This analysis has led to findings that are highly consistent with the arguments drawn by this dissertation and are introduced within the following figure.

Figure 17: The euro area's social labour recognition and the hours worked (nine-year average for the period 2008-2016)



Note: The absolute values of the most relevant indicators can be found in Appendix 15.

Source: Authors' own calculations based on Eurostat (2019a).

The figure displays information on the social recognition of the labour consumed, measured by following the methodology from Figure 1, and the information on the average weekly hours of work across the euro area member countries. The data is expressed through a nine-year average for the period 2008-2016, determined by the availability of the data. Governed by the “Unequal labour exchange type 1”, the countries reporting the actual GDP to NV ratio higher than one have higher labour recognition. These countries, in the form of their actual GDP, receive more of the euro area's total labour consumed than the labour that was actually invested in the production process within these countries. The opposite holds for the countries reporting values below one. Analogous to the case from Figure 1, the worst outcome is obtained in Latvia (54%) and the best in Ireland (132%). There are approximately 6.2 million employees from the countries that do not receive recognition of total labour invested in their GDP working for countries that receive more of the recognized labour in their GDP than they consumed in the production of surplus. During the reference period, approximately 560 billion 2011 PPP \$ in GDP is lost annually by ten countries in the form of the labour invested and not recognized in the GDP. When these results are compared to the average weekly hours of work, as depicted, the workers of net-losing countries, regarding the value transfer, worked more weekly hours than the workers of net-winning countries. Throughout the analysed period, on average, the workers of net-losing countries were (annually) working 181 hours more than the workers of the net-winning countries. In terms of average annual hours worked, the most intensive was the production process within Greece (2002 hours), while the least intensive was that of the Netherlands (1582 hours). This result sheds new light on the motivation of the national working population as the central problem of the

country's comparative disadvantage. This figure debunks all (un)popular claims of national laziness/diligence or the fiscal (in)discipline (see de Freitas, 2017) as the determinant of the euro area's cross-country economic inequalities.

However, when it comes to the adjustment of the labour variable by the average hours worked, the decision to disregard this normalization was conditioned by the time series breaks and other methodological problems resulting in an inability to properly estimate working hours (European Commission, 2018). Regardless of this outcome, the conclusion derived from Figure 17 confirms that, if applied, the labour normalization would not fundamentally alter the nature of the described phenomena; it would merely lead to the further exacerbation of the inequality dynamics described within this dissertation.

The second production factor used in this dissertation is the country's capital, estimated through the perpetual-inventory method endorsed by Berlemann and Wesselhöft (2014). Hence, the capital in period t (K_t) is considered to be the weighted sum of the history of investments:

$$K_t = K_0(1 - \delta)^t + \sum_{n=0}^{t-1} I_{t-n}(1 - \delta)^n \quad (34)$$

The initial capital stock at the beginning of the investment series (K_0) is calculated by following Hardberger's (1978) approach, applied through Stata's "stockcapit" command (Armadaou, 2011). This method requires data on GDP, expressed in 2011 PPP \$, and annual data on investment (gross fixed capital formation), denoted as I . Both aforementioned sources are retrieved from the World Development Indicators Database published by the World Bank (2019). The data on investment is converted to 2011 PPP \$ through the usage of official conversion factors and is adjusted by the price index ratio of the investment goods to GDP included into University of Groingen's (2019) Penn World Tables Database (PWT 9.0). Given that this data set reports values for the period between 1950 and 2014, the information on the two succeeding years was estimated as the average value of the five preceding observations. In addition, the capital stock is computed by assuming the constant geometric depreciation rate (δ) of 5% based on Bosworth and Collins (2003).

The capital and labour income shares are calculated based on the United Nations (2019) National Accounts Statistics Database (UN-NAS) by disaggregating the national income as:

$$GDP = W_{cg} + \Pi_{cg} + VA_{ue} + T_{pm} - S_{pm} \quad (35)$$

where the value added or the gross domestic product (GDP) is the sum of four components: compensation of employees (W_{cg}) comprising of gross (pre-tax) wages,

gross operating surplus (Π_{cg}) indicating gross profits of corporate and government-owned enterprises, gross mixed income (VA_{ue}) or gross value added by the private unincorporated enterprises, and the indirect taxes corrected for subsidies ($T_{pm} - S_{pm}$).

In accordance with Guerriero (2012) as well as Bernanke and Gürkaynak (2001), the specific factor shares are calculated by assuming the equivalence between value added and GDP. The following step is to categorize the individual components by their income sources. While there is no question regarding the placement of the W_{cg} and Π_{cg} , when it comes to incomes of unincorporated enterprises, they cannot be associated with a single source and must be dealt with separately. This is the case since the VA_{ue} , as the income of the self-employed, includes both profit and labour incomes of unincorporated enterprises. Within the relevant literature, various methods were used to overcome this issue. While Kravis (1959) attributed the entire VA_{ue} to the labour income, Johnson (1954), Guscina (2006), and Jayadev (2007), imputed two-thirds of the VA_{ue} to labour and one-third to profit income. Given that these methods either underestimated or overestimated the factor shares, this dissertation breaks down the VA_{ue} by using Gollin's (2002) second adjustment. Besides differentiating and accounting for the self-employed income, this method created country-specific anchors, crucial for the cross-country analysis. Therefore, the VA_{ue} is treated as being comprised of an equivalent capital-labour mix as the rest of the economy. On these grounds, the total profit income share (Π) is calculated as:

$$\Pi = \Pi_{cg} + \left(\frac{\Pi_{cg}}{W_{cg} + \Pi_{cg}} \right) * VA_{ue} \quad (36)$$

Contrarily, the labour share is the residual. Therefore, in effect, it is assumed that the total labour share includes gross wages, a part of the unincorporated income, and the entire public sector (T_{pm}). Finally, the information on the countries' total profit and labour incomes is received by multiplying the World Bank's (2019) 2011 PPP \$ GDP with the respective factor share.

4.5. The specification of euro area unequal exchange empirical model

The cross-country analysis necessitates a high level of abstraction and omits numerous relevant factors. That being said, this research departs from the premise by Robinson (1962, p. 33), stating that *“a model which took account of all the variegation of reality would be of no more use than a map at the scale of one to one”*. Thus, the aim of this study is to disclose the crucial elements constituting the country's advantages, enabling them to benefit from the international value transfers. It bears mentioning that the enrichment of affluent countries, by virtue of the same token, is the function of the impoverishment of the majority of other countries.

On these grounds, this study investigates the euro area's cross-country economic inequality determinants and their manifestations, accounting for the differences in sectoral and technological compositions. The hypothesized effects are modeled as:

Model 1: Price effect

$$PE_{it} = \beta_1 \ln GDP_{it} + \beta_2 \ln GDPPC_{it} + \beta_3 \ln K/L_{it} + \sum_{m=4}^k \beta_m ES_{it} + \sum_{n=k+1} \beta_n dyear + \alpha_i + \varepsilon_{it} \quad (37)$$

Model 2: Labour recognition effect

$$LE_{it} = \beta_1 \ln GDP_{it} + \beta_2 \ln GDPPC_{it} + \beta_3 \ln K/L_{it} + \sum_{m=4}^k \beta_m ES_{it} + \sum_{n=k+1} \beta_m dyear + \alpha_i + \varepsilon_{it} \quad (38)$$

Model 3: Efficiency effect

$$EE_{it} = \beta_1 \ln GDP_{it} + \beta_2 \ln GDPPC_{it} + \beta_3 \ln K/L_{it} + \sum_{m=4}^k \beta_m ES_{it} + \sum_{n=k+1} \beta_m dyear + \alpha_i + \varepsilon_{it} \quad (39)$$

Model 4: Profit rate

$$PR_{it} = \beta_1 \ln GDP_{it} + \beta_2 \ln GDPPC_{it} + \beta_3 \ln UNEMP_{it} + \beta_4 \ln K/L_{it} + \sum_{m=5}^k \beta_m ES_{it} + \sum_{n=k+1} \beta_m dyear + \alpha_i + \varepsilon_{it} \quad (40)$$

Model 5: Wage rate

$$WR_{it} = \beta_1 \ln GDP_{it} + \beta_2 \ln GDPPC_{it} + \beta_3 \ln UNEMP_{it} + \beta_4 \ln K/L_{it} + \sum_{m=5}^k \beta_m ES_{it} + \sum_{n=k+1} \beta_m dyear + \alpha_i + \varepsilon_{it} \quad (41)$$

Model 6: Exploitation rate

$$ER_{it} = \beta_1 \ln GDP_{it} + \beta_2 \ln GDPPC_{it} + \beta_3 \ln UNEMP_{it} + \beta_4 \ln K/L_{it} + \sum_{m=5}^k \beta_m ES_{it} + \sum_{n=k+1} \beta_m dyear + \alpha_i + \varepsilon_{it} \quad (42)$$

where i denotes country ($i = 1, \dots, N$), t denotes year ($t = 1, \dots, T$), and \ln is the natural logarithm.

The models' dependent variables are either the euro area's cross-country inequality determinants or their consequences. The following components are the determinants: PE_{it} denotes the price effect (market disequilibria influence) measured through the actual to

equilibrium GDP ratio; LE_{it} denotes the labour recognition effect (capital intensity influence) measured as NV to equilibrium GDP ratio; EE_{it} denotes the efficiency effect measured via the equilibrium GDP to GDP_u ratio. The remaining variables are the outcomes of the euro area's inequality: PR_{it} denotes the profit rate measured as the actual to equilibrium profit ratio; WR_{it} denotes the wage rate measured as the actual to equilibrium wage ratio; ER_{it} denotes the exploitation rate measured as the actual to equilibrium exploitation rate ratio.

These dependent variables are studied through the explanatory variables clustered into two groups. The first set is comprised of control variables, and includes: economic output (World Bank, 2019) denoted as $\ln GDP_{it}$, used as the proxy of the country's economic size; economic output *per capita* (World Bank, 2019) denoted as $\ln GDPPC_{it}$, used to account for the country's development level; capital-labour ratio denoted as $\ln K/L_{it}$, used to control for the capital intensity of a country's production process; and the unemployment rate (Eurostat, 2019a) denoted as $\ln UNEMP_{it}$, used to investigate the impact of the national labour markets.

The second explanatory set is the economic structure (ES_{it}), consisting of two major segments expressed as the share of the gross value added. The sectoral composition encompasses the shares of agricultural, manufacturing, construction, service, and public sectors, while the technological composition is measured through the country's industry-level development. The gross value added decompositions are presented in the following table.

Table 5: The sectoral and technological compositions as the share of the gross value added

Variable	Description of Sectors	NACE
<i>Economy's Sectoral Structure</i>		
Agriculture	Agriculture, forestry, and fishing activities	A
Manufacturing	Manufacturing activities	C
Construction	Construction activities	F
Services	Professional, scientific, technical, administrative, support, financial, insurance, real estate, wholesale, retail trade, transport, accommodation, and food service activities	G, H, I, K, L, M, & N
Public sector	Public administration, defence, education, human health, and social work activities	O, P, & Q
<i>Economy's Technological Structure</i>		
High-tech	High technology	21, 26
Medium-tech	Medium technology	19-20, 22-25, 27-30, & 33
Low-tech	Low technology	10-17, 18, 31, & 32

Note: NACE codes represent sections in the case of sectors and 2-digit level codes for technologies.

Source: Eurostat (2019b).

In addition, the time-specific individual-invariant effect is captured with the set of time dummies (d_{year} ; $t = 1, \dots, T - 1$), while α_i denotes the unobserved, time-invariant individual effect. Lastly, the error term (ε_{it}) represents the sum of the disturbance term (v_{it}) and the unobserved, individual-specific, time-invariant effect (μ_{it}), which allows for heterogeneity across individual countries.

4.6. The results

The presented analytical models were tested using various statistical approaches: the pooled model, the fixed-effects model, the random-effects model, and the dynamic panel model. Among the models used, the fixed-effect (without lags) one proved to be best suited for the task. An attractive feature of the fixed-effect model is that it makes the use of within-panel variation over time by employing the country-specific intercepts to control for heterogeneity bias (Kollmeyer, 2009). The implementation of the country fixed effects allows the problems dealing with the unobservable country heterogeneity to be overcome. This implies that the models control for the institutional factors, which are not directly addressed within the present analysis. Furthermore, given that the data set is comprised of a non-random sample with a moderate number of observations, it comes as no surprise that the Hausman test (without exception) favoured the fixed effect approach by rejecting the null hypothesis stating that the unmeasured country-specific effects are

uncorrelated with the models' regressor variables. On these grounds, the adoption of the fixed-effect analysis has led to conclusions structured in the following two tables and subsequently elaborated upon within the mutually connected and exhaustive findings.

Table 6: The influence of the sectoral composition on the cross-country inequality dynamics of the euro area (2003-2016)

Dependent variable	Model 1 Price effect	Model 2 Labour recognition effect	Model 3 Efficiency effect	Model 4 Profit rate	Model 5 Wage rate	Model 6 Exploitation rate
lnGDP	0.458***	-0.0389***	-0.0230*	0.677***	0.0735	3.322***
lnGDPPC	0.0655	0.0730***	0.0255**	0.716***	0.202***	-2.235***
UNEMP				0.022***	-0.00132	-0.0264***
lnK/L	0.0877***	-0.262***	0.139***	-1.594***	0.229***	-0.544***
Agriculture	-0.000155	-0.00253**	-0.00158	0.0462**	0.00434	-0.0453**
Manufacturing	0.0082***	0.000353	0.000923***	0.0196***	-0.0049***	-0.0272***
Construction	-0.0035**	0.000802***	0.00104***	-0.00257	-0.00109	-0.0164***
Services	0.000313	0.000800**	0.000187	-0.00115	-0.000730	-0.0116*
Public sector	-0.010***	-0.000579	-0.000737	-0.045***	0.00891***	0.00237
dyear 2004	-0.00540	0.00249**	-0.00192	-0.0187	-0.000455	-0.0241
dyear 2005	-0.00964	0.00101	-0.00237*	-0.0231	0.00146	-0.0383
dyear 2006	-0.024***	-0.000923	-0.00352**	-0.0573**	9.94e-05	-0.0330
dyear 2007	-0.039***	0.000452	-0.00441***	-0.097***	-0.00104	-0.0465
dyear 2008	-0.037***	0.00441***	-0.00542***	-0.0381	-0.0128	-0.0316
dyear 2009	0.00508	0.0183***	-0.00752***	0.167***	-0.0325***	-0.0609*
dyear 2010	-0.0198**	0.0274***	-0.0113***	0.149***	-0.0487***	-0.00611
dyear 2011	-0.034***	0.0301***	-0.0137***	0.154***	-0.0580***	0.0430
dyear 2012	-0.030***	0.0350***	-0.0160***	0.215***	-0.0662***	0.0922**
dyear 2013	-0.027***	0.0396***	-0.0174***	0.244***	-0.0706***	0.0936**
dyear 2014	-0.034***	0.0398***	-0.0178***	0.202***	-0.0600***	0.102***
dyear 2015	-0.046***	0.0413***	-0.0200***	0.174***	-0.0607***	0.0988**
dyear 2016	-0.055***	0.0398***	-0.0200***	0.153***	-0.0604***	0.117***
Constant	-12.69***	4.477***	-0.392*	-4.339	-5.937***	-54.01***
R-squared	0.873	0.969	0.920	0.827	0.794	0.898
Hausman test	56.79***	67.21***	19.16**	27.06***	18.66**	136.16***

Note: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$; Extended version is presented in Appendix 16.

Source: Authors' own calculations.

Table 7: The influence of the technological composition on the cross-country inequality dynamics of the euro area (2003-2016)

Dependent variable	Model 1 Price effect	Model 2 Labour recognition effect	Model 3 Efficiency effect	Model 4 Profit rate	Model 5 Wage rate	Model 6 Exploitation rate
lnGDP	0.575***	-0.0414***	-0.0217	0.334	0.0903	3.789***
lnGDPPC	0.0355	0.0817***	0.0441***	1.762***	0.0631	-3.283***
UNEMP				0.0342***	-0.002***	-0.0348***
lnK/L	0.105***	-0.264***	0.124***	-2.073***	0.283***	-0.0883
High-tech	-0.00222	0.00134***	0.00205***	-0.0190*	-0.010***	0.0410***
Medium-tech	-0.00103	-0.000182	0.000866*	0.00585	0.00139	9.84e-06
Low-tech	0.0296***	-0.000343	-0.000346	0.0614***	-0.0077**	-0.0395***
dyear 2004	-0.00539	0.00286**	-0.00233*	-0.0358	-0.000436	-0.00335
dyear 2005	-0.00536	0.00221	-0.00310**	-0.0492	0.000888	-0.00935
dyear 2006	-0.0175*	0.00113	-0.0043***	-0.091***	-0.00204	0.00634
dyear 2007	-0.028***	0.00285*	-0.0057***	-0.125***	-0.00457	-0.00526
dyear 2008	-0.0272**	0.00685***	-0.0067***	-0.0739*	-0.0140	0.00769
dyear 2009	-0.00611	0.0197***	-0.0082***	0.0900**	-0.0196**	-0.0110
dyear 2010	-0.0226*	0.0284***	-0.0124***	0.0956**	-0.037***	0.0258
dyear 2011	-0.0299**	0.0312***	-0.0148***	0.128***	-0.051***	0.0588*
dyear 2012	-0.0254*	0.0365***	-0.0164***	0.194***	-0.062***	0.109***
dyear 2013	-0.0257*	0.0410***	-0.0179***	0.223***	-0.065***	0.110***
dyear 2014	-0.0340**	0.0414***	-0.0184***	0.190***	-0.057***	0.119***
dyear 2015	-0.0353**	0.0431***	-0.0203***	0.183***	-0.064***	0.1000***
dyear 2016	-0.042***	0.0416***	-0.0205***	0.158***	-0.059***	0.105***
Constant	-15.98***	4.513***	-0.438	-1.355	-5.496***	-62.45***
R-squared	0.774	0.964	0.913	0.710	0.743	0.886
Hausman test	45.46***	63.88***	19.56***	14.88**	16.14**	138.57***

Note: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$; Extended version is presented in Appendix 17.

Source: Authors' own calculations.

The models are executed on a strongly balanced panel data set structured into two general forms. The first is the sectoral case with 252 observations ($n = 18$, $t = 14$), while the second is the technological case containing 238 observations ($n = 17$, $t = 14$). The difference in the number of observations comes as a consequence of the fact that, due to a lack of data, the technological analysis omits Malta. Regarding the economic structure, averaged across countries and over time, the sectoral activities cover 88% of the euro area's gross value added, while regarding the technological composition, this scope is substantially smaller and amounts to 16%. Additionally, prior to further discussion, a note on the coefficient of determination bears mentioning. The fixed effects dummy variable regression often yields a high R-squared (Wooldridge, 2009). When this typical feature is considered alongside the limited sample size and the number/nature of the regressors, it comes as no surprise that the displayed models capture substantial variation in the data.

Consequently, this must be approached with a great deal of caution and considered as a structural characteristic of the method used.

Model 1 confirmed the previous finding of the disequilibrium prices as the main source of the cross-country economic inequality within the euro area. This study proved that the countries' general characteristics are a crucial determinant of the existing market disequilibria utilization. The countries expressed differentiability with respect to their price positions and resulting effects. The countries which are bigger in size (measured by $\ln GDP$) and those with higher capital intensity exhibited their capability in obtaining higher prices for their commodities, i.e., their actual to equilibrium GDP ratio was positive. This, in turn, placed them in an above-average position regarding the reaping of the benefits arising from the euro area's market disequilibria. The analysis exhibited a strong deteriorating bias of the euro area's overall price position starting from 2006. A partial exception to this rule was the outbreak of the global economic downturn in 2009, which improved the euro area's price position.

Regarding the sectoral composition's influence, the first model managed to explain as much as 87.3% of the price position variation. The increase in the economy's manufacturing share had a positive effect, whereas the increase in the shares of construction and public sector activities had a negative effect on the respective country's price position. The influence of the two remaining sectors was unidentified.

Furthermore, high explanatory power with respect to the price position variability is obtained in the technological composition's case. However, the result was rather unexpected given that the analysis showed that a higher low-technology share advances the country's price position.

The cross-country differences, particularly the ones connected to the economy's sectoral composition and the firm's technological development, must be reflected within the factors expressing the inequality in international value transfers. One such factor, quantified as the ratio between the NV and the equilibrium national income, indicates the extent of the consumed labour recognition within the national income. The relationship between the NV and the equilibrium national income is functionally defined through the capital intensity or the organic composition of capital. The importance of this relationship is empirically confirmed within **Model 2**. Accordingly, the higher the capital intensity, less work is required to produce the equilibrium national income. Expanding on the conclusions made thus far, such a state of affairs is defined as an unequal exchange and works in favour of bigger countries. In contrast, a rise in development (measured by $\ln GDP_{PC}$) produces a negative effect and results in the NV surpassing the equilibrium GDP. At first glance, this means that more developed countries would experience a loss of value recognition in the euro area's equilibrium state. However, the proper interpretation of such a result must take into account that the countries' development

levels, unlike in the case of NV, have an impact on the equilibrium GDP. Derived from Model 2, higher development is connected to higher capital-labour ratio. This, in turn, increases the equilibrium GDP and lowers the NV to equilibrium GDP ratio. Consistent with the un-equivalent labour exchange thesis, this brings about the conclusion that the more developed countries appropriate a higher aliquot share of the euro area's aggregate GDP regarding the labour consumed. This proves that the existing unequal labour exchange of the euro area favours the more developed countries at the expense of the less developed ones.

The rising share of construction and service activities within the national income decreases the quantities of consumed labour recognized within the equilibrium GDP. The opposite is the case for the agricultural sector. These movements are consistent with the technological influence, where the employment of high-technology results in a lesser amount of labour recognized within the equilibrium GDP.

The results exhibited statistically significant time effects. The amount of labour whose consumption is necessary for achieving the euro area's equilibrium national income has been on a continuous increase since 2008. This conclusion is not trivial, especially considering that the countries showed substantial heterogeneity with respect to the consumed labour recognition.

Throughout the examined period, **Model 3**, presenting the influence of the economic efficiency encompassing labour productivity and capital efficiency, proved to be of special importance. It is undoubtedly confirmed that the more efficient countries are those with higher capital-labour ratios. This implies that the increase in the capital intensity is a prerequisite of high efficiency. Additionally, as expected, country's economic development exhibited a positive influence on efficiency, whereas the efficiency trend reported a continuous decline over the analysed period, regardless of the Great Recession.

The economic efficiency was significantly and positively influenced by the shares of the manufacturing and construction sectors. The influence of technological composition on the economic efficiency disclosed expected outcomes. The findings suggest that a country's efficiency is positively influenced by the development of the employed technology, which was of special relevance pertaining to the state-of-the-art technology.

The fact that the profit rates are the factors enhancing the cross-country inequality polarization is confirmed by the results displayed in **Model 4**. The profit rates reported significant cross-country variation with a negative capital intensity influence. This means that higher capital-labour ratios lower the actual to equilibrium profit rates ratio. The bigger and more developed countries reported higher profit rates. Furthermore, the profit rates of the entire euro area reported a continuous rise followed by the onset of the Great Recession in 2008/09.

In line with classical economics, the analysis pointed out that the labour market is the main mechanism distributing economic rewards among production factors. This becomes apparent once it is acknowledged that the wage and the profit rates are significantly influenced by the unemployment rate. Therefore, as expected, the increase in the unemployment rate initiates an upward profit rate trend simultaneously with a downward wage rate movement.

A higher share of agricultural and manufacturing activities positively influences the profit rates. The latter sector does so while concurrently enhancing the country's efficiency and price position. Conversely, the profit rates are negatively influenced by the public sector share, which is justifiable given that this sector is comprised of activities whose primary focus is not the maximization of profit. Moreover, when it comes to the technology, a higher share of less developed technology has a positive effect and increases the profit rates, in contrast with the influence of the highly developed technologies, whose increasing share decreases the profit rates.

The empirical research presented in **Model 5** confirmed the assumption that the price and efficiency effects are additionally reflected through the wage rates. Given that the benefits of price disequilibria and distinct efficiencies are disproportionately distributed across the euro area, the wage rates must mirror the equivalent pattern. Therefore, higher wage rates are reported within the more developed countries and countries with higher capital intensity. In line with the deterioration of the price position and efficiency trends, and by opposing the profit rate pattern, the wage rates experienced a decline from 2009 onwards.

The fact that the wage rates are influenced by unemployment is evident in Table 7, where a higher unemployment rate begets a decline in wages and increases the economic inequality of the euro area. The results indicated that a higher unemployment rate initiates the downward pressure to the actual to equilibrium wage rate ratio. However, unlike in the case of sectoral composition with insignificant findings, the strong significance amongst wages and unemployment was detected in the case of technological composition.

The wage rates analysis indicated a negative impact of the manufacturing sector as well as a positive impact of the public sector. The public sector clearly forms higher wage rates, even though it reduces the countries' price positions. On the other hand, a higher share of manufacturing activities increases the country's efficiency and enhances its price position, but this positive effect does not spill over on the wage rates.

Moreover, the increase in the share of high-technology reported a negative effect on wage rates. Such a result indicates that the majority of the euro area member countries, from the viewpoints of prices, efficiency, and technological development, are in a position which, regarding international competition, does not allow for an increase in wages. In

addition, the results indicated the significant and negative relationship between the shares of low-technology and accompanying wage rates. Unlike the first finding, this one is consistent with the standard skill-biased wage inequality that plays an important role in the cross-country dynamics.

Model 6, analysing the exploitation rates, reported cross-country heterogeneity and an overall rising trend followed by the year 2011. The results suggested that the countries which are bigger in size have a higher exploitation rates ratio, i.e., that the increase in GDP increases the exploitation rate relative to the equilibrium state. Such a result is predetermined by the nature of the data and becomes apparent when one is reminded that the lower tail of the euro area's country-level GDP distribution is exclusively reserved for the countries with a comparably lower position and admitted to the European Union in 2004. These countries are Slovakia, Lithuania, Slovenia, Latvia, Estonia, Cyprus, and Malta. The second conclusion suggests that the increase in a country's development will decrease the exploitation rate. This, in effect, means that within the more developed countries, workers spend more time working for themselves than they do for the production of a part of the income that is ultimately appropriated by the capitalists. The analysis showed that the rise in the unemployment rate will decrease the exploitation and that the same motion will hold in the case of rising capital intensity. This is reasonable since the unemployment rate inevitably assumes a decline in the labour that needs to be exploited, whereas the influence of capital intensity on the exploitation indicates that the workers who remained employed experienced, on average, a rise in their wages. However, the exploitation rate decline can be misleading regarding the conclusion that the workers' relative position improved. This is not necessarily the case since such an improvement can come at the expense of laying off numerous workers and, consequentially, increasing overall inequality.

The sectoral structure of national economies had a significant effect on the exploitation rate. Higher shares of agricultural, manufacturing, construction, and service activities result in lesser exploitation and suggest that within the countries comprised of rising shares of these sectors, workers tend to work less for profits and more for themselves.

A similar motion holds in the technological case, where a rise in the share of low-technology lowers the exploitation and increases the time spent on the production of the labour incomes. Conversely, a rise in the high-technology share increases the amount of surplus labour and entails that the workers spend more time on the production of profits than their own subsistence.

4.7. Conclusions and discussion

This study has indisputably positioned the unequal exchange at the root cause of the euro area's cross-country economic inequality. It has identified three countervailing forces

deepening the systemic inequalities which exist underneath the free trade relations of the euro area.

The first determinant of the trade inequalities is linked to the price effect. The disequilibrium prices are improving the position of bigger countries with higher capital intensity. An increase in manufacturing and low-technology sectors, as well as a decrease in construction and public sectors, enhances the country's relative price position.

The euro area member countries spend vastly different (and increasing) amounts of labour on the production of the equilibrium gross domestic product. Rising shares of construction, services, and high-technology decrease the countries' consumed labour recognition within the equilibrium gross domestic product. The opposite holds with agriculture. This inequality source is positively influenced by the country's size and capital intensity. More importantly, this source undeniably confirms the main research hypothesis that the euro area's economic activity is permeated by unequal labour exchange in favour of more developed countries, and at the expense of the remaining ones.

The persisting inequalities are the result of the cross-country efficiency differences. This scenario favours smaller and more developed countries with high capital intensity. As expected, the findings suggest that the employment of the high capital intensive, state-of-the-art technologies is more important in determining countries' relative positions than the type of sectors in which they appear. However, the country's improvement is achievable through the expansion of the manufacturing and construction sectors.

The price and efficiency effects are reflected through the wage rates experiencing post-crisis negative trajectory across the euro area. The countries with rising capital intensity are improving their efficiency, increasing the prices of their commodities, and raising their workers' wages. It is worth stressing that the sectoral influence on the prices and efficiency effects was not expressed in accordance with the influence on the wage rates. Consequently, the wage rates proved dependent on the national labour market relations, where higher unemployment lowers the wages. As opposed to the public sector, the study confirmed that within the manufacturing sector and high-technology activities, obtaining higher wages is rather difficult.

The profits are positively correlated with the development and inversely correlated with the wages. This relationship is evident within the labour markets, where the unemployment growth increases the profits. The rising manufacturing and low-technology sectors increase, while the higher public sector share (via the rising wages) lowers the country's profit rates.

From 2011 onwards, the employees have been working less and less for the part of the gross domestic product that they appropriate in the form of non-profit income. The exploitation rate is inversely influenced by a rise in the country's development, unemployment, and capital intensity. A rise in public sector share and high-technologies are connected to an increase in the exploitation rate, as opposed to the sectors employing low-technology.

The abovementioned inequality determinants and their consequences set in motion cross-country exploitative mechanisms and confirm arguments put forth by this study. In addition to the initial factor endowments, these inequalities proved to be anchored to the distinct sectoral structure and uneven technological development. This novel extension of the unequal exchange phenomena exhibited the importance of Prebisch, Singer, Lewis, and Emmanuel for the investigation of contemporary systems, and it showed that the existing structure of the euro area perpetuates economic inequalities instead of eliminating them.

The complexity of the previously mentioned interactions implicitly emphasizes the necessity of their deliberate interpretation. The latter holds especially if they are used as the groundwork for national policy recommendations. The policymakers, determined to enhance the relative position of a less-developed country vis-à-vis the affluent one and accordingly lower the overall inequality, as a starting point, must acknowledge the cross-country development differences. The less-developed countries will find it easier to advance their market position and increase their economic profitability through the expansion of low-technology sectors. On the other hand, if these countries opt for the development of the high-technology sectors, they will find themselves in a subordinate position regarding the international labour exchange. As the outcome, these countries will experience declining wages and rising labour force exploitation. National policymakers must consider the fact that a higher and rising share of the construction and service sectors with lesser capital intensity lowers the amount of the country's consumed labour recognition within the gross domestic product. The findings indicate that the development of high-technology and manufacturing sectors enhance the country's efficiency. They are mostly reflected through the profit rates and prevailing within the affluent countries. The final focus must be placed on the national labour markets responsible for the inner-country income distribution. The relations within this segment are governed by the country's macroeconomic policy design and its ability to deliver on the desirable aggregate (un)employment objectives.

Once diagnosed, it becomes obvious that the aforementioned strategies advocate particular aspirations ahead of integrational objectives. They are a straightforward recognition that the uncontrolled imperatives of international markets will overwhelm national decisions, efforts, and policies. What is more important, they are a confirmation that the lacking authority over the forces of unequal exchange is a political choice retained

beyond the national control. Such a decision negates the euro area's purpose and makes the integration intrinsically unstable. Considering that the national governments retain some degree of control, the question that remains is: why are the less-developed countries participating in an exchange that, *a priori*, puts them in an exploited position? The answer to this question is that they are integrated into the relations of unequal exchange lacking a viable alternative.

In light of these findings, further research must prioritize this study as a platform for future investigation into the trade inequality phenomena. The theoretical and empirical analysis should be extended to include the European Union and must focus on the compulsory pursuit of the solutions that will straighten the European backbone, founded on cross-country solidarity. These solutions range from amending the Union's social funds and collective wage bargaining to the fiscal harmonization/consolidation and higher levels of cross-country redistribution policies. The implementation of such methods would not only act against the current disintegration bias and restore the sustainability of the social project but would also entail improved allocation of resources and a higher level of welfare. However, the choice of method, as well as the European future, remains unclear given that it largely depends on political discourse; that is, ultimately, it is responsible for and financed by national interests.

5. GENERAL DISCUSSION AND CONCLUSIONS

The purpose of this chapter is to summarize the main findings of this doctoral dissertation. In the part that follows, this will be achieved by referring to the research goals which were formed in the introduction section. Moreover, after hypothesising on the theoretical and empirical arguments raised within this study, the remainder of this chapter will focus on the broad discussion of the research's implications, limitations, and future prospects.

5.1. Summary of main findings

Within this doctoral dissertation we have confirmed the claim that the euro area's economic inequalities are a structural consequence of the existing integrational design. For this purpose, we have used the newly developed analytical framework. Through the employed theoretical model relying on Marxian economic thought, we have shown that the euro area's overall economic inequality can be explained through the cumulative influence of the inner-country and the cross-country economic inequalities. Accordingly, the inner-country inequality was the outcome of the labour force exploitation, whereas the cross-country inequality was linked to the concept of the unequal labour force exchange. Once theoretically established, these hypothesized arrangements were tested through the three-stage procedure. Supported by the quantitative analysis, we have proven, in addition to the main argument, that the euro area's economic inequalities are heavily influenced by the economic cycles and determined by the country-specific

economic structures. In what follows, we thoroughly discuss the abovementioned arguments by drawing on the research goals outlined within the introduction of this doctoral dissertation.

Research Goal 1: To develop a Marx-based theoretical model that will be able to explain the existing euro area economic inequalities and provide an adequate solution to the so-called “transformation problem”.

By developing a Marx-based theoretical model, heavily influenced by van Schaik (1976), which investigates the euro area’s economic inequalities as the function of the cross-country unequal labour exchange derived from the inner-country labour force exploitation, we have accomplished the first goal. Provided that the inquiry into the unequal labour exchange requires property anterior to price (Brolin, 2007), the starting point of this model, in line with Dunn (2017, p. 353), considers the category of value as a ground “...for claim that systemic inequality lies beneath apparently free market relations”. Consequently, modelled based on the set of conclusions (1-5), within the second chapter, we have applied the developed model on a theoretical setting comprised of a dual-system. This brought to the surface the so-called “transformation problem”. Extremely controversial among the proponents and opponents of the labour theory of value alike, the “transformation problem” had indicated the difficulty in finding the rule with which values would become transferable into prices.

There exists a long-standing debate on the transformation issue involving two opposing viewpoints. Even though the full extent of the matter will remain outside the context of this study, a small remark bears mentioning. Some authors were of the opinion that the “transformation problem” is irrelevant for the validity of the labour theory of value (e.g., Gibson, 1980), whereas numerous others argued that the “transformation problem” has no solution (e.g., von Böhm-Bawerk, 1949; von Bortkiewicz, 1906; Samuelson, 1971). On the opposite end of the spectrum, many authors presented the case against the latter group (e.g., Mohun and Veneziani, 2017; Bryer, 2014; Kliman, 2007; Saad-Filho, 2002; Gheverghese Joseph and Tomlinson, 1991; Szumski, 1989; Garcia, 1978) and proved that the dual-system approach can be logically consistent and used for the economic analysis. Within this doctoral dissertation, we have adopted the approach of the second group. On these grounds, as stated in conclusion 1, the basis for solving the so-called “transformation problem” was acknowledgment that price and value systems can be connected through the underlying physical surplus (physical bodies of commodities). If this holds, the new value created as the category of value accounting system can be defined as the expression of the physical surplus in the amount of labour spent on its production, while the national income as the category of price accounting system can be defined as the expression of the surplus in price terms (conclusion 3). This is reasonable since, given that the entire physical surplus equates to the total labour invested in

production, it must hold that that surplus, even if it is expressed in price terms (national income), is the result of the labour invested in the physical surplus (conclusion 4).

Thus, the new value created is “*measured as a sum of money reflecting the socially necessary labour time [quantity of labour consumed through the production of the physical surplus] required to produce the commodity*” (Choonara, 2007). Further support of this stance is found in Gibson (1980, p. 16), who writes: “...to every exchange of commodities there corresponds not only an equivalent exchange of money value, but also an exchange of labour values”. Gibson (1980, p. 18) concludes: “*The reformulation in price terms does not obscure real issues which had surfaced in the earlier discussions of the unequal exchange and possesses the additional advantage of identifying some important problems buried in the transformation approach*”. In this way we have furnished an adequate solution to the so-called “transformation problem” and provided the basis upon which the theoretical model was built. By accounting for the tendency towards long-run equilibrium, the tendency towards equalization of profit and wage rates, competition, and the labour force exploitation (conclusions 6-12), through the innovated theoretical model we have set the groundwork for the investigation of the cross-country value transferring mechanism and, accordingly, for the investigation of economic inequalities as a function of the market’s recognition of the labour consumed.

Research Goal 2: To explain how the unequal labour exchange creates, perpetuates, and maintains the euro area’s cross-country and inner-country economic inequalities. To empirically confirm and quantify the extent of the euro area’s unequal labour exchange through a country’s social recognition of the consumed labour.

The described theoretical model was, through the acknowledgement of work performed by Prebisch (1950), Singer (1950), Emmanuel (1972), Amin (1976), Grossmann (1992), and Bauer (2000), used for the investigation of the euro area’s economic inequalities inflicted by the phenomena of the unequal labour exchange. This was achieved through the empirical model established within the second section of this doctoral dissertation. Accordingly, the creation of the euro area’s economic inequalities was connected to the cross-country un-equivalent value transfers. This implies that the euro area member countries exchange commodities with different amounts of labour embodied within them. Accordingly, the more successful countries exchange less of their labour embodied within their commodities for more of the labour embodied within the commodities of the less successful countries, which, by definition, generates economic inequalities. Assuming homogenous, competitive, and mobile factors of production, the institutional setting of the euro area provided an ideal environment for the empirical confirmation of the abovementioned dynamics. This was the case since the single market and the common currency allowed for a straightforward cross-country extension of the Marxian cross-sectoral analysis. On these grounds, we have empirically validated the existence of the

euro area's unequal labour exchange through the unequal cross-country social recognition of consumed labour. This was carried out using the static analysis performed on the ten-year annual average data for the period between 2004 and 2013. The latter constitutes the "Unequal labour exchange type 1", depicted within Figure 1, and quantified as the ratio between the country's actual gross domestic product and new value created. In this way, we have confirmed that the underlying forces of the unequal labour exchange, through channelling of the value transfers, create, perpetuate, and maintain the euro area's cross-country economic inequalities. Consequently, the same motion, via the (under)development, the lower/higher exploitation rate, and lower/higher factor rewards, causes the spill-over effect and, in addition, governs the inner-country economic inequality.

Research Goal 3: To identify the fundamental economic forces that are drivers of the existing unequal labour exchange, which is the root cause of the euro area's economic inequality. To empirically establish how, and quantify to what extent, these determinants influence the euro area's cross-country economic performance.

Once we have empirically established the existence of the "Unequal labour exchange 1", within the remainder of section 2.4 we have focused on the identification of the fundamental economic forces driving the economic inequalities. Consequently, we have confirmed that there exist three main determinants of the unequal labour exchange. The first one, "Unequal labour exchange 2", comes as the consequence of the cross-country deviations in the capital to labour force ratio. Hence, the countries with more capital per unit of labour reap the benefit by trading their commodities with equal production prices, equal wages, and equal profits, but with a lesser amount of embodied labour for the commodities produced by the other countries with more labour-intensive productions. The second determinant is labelled "Unequal labour exchange 3" and comes as the result of the existing market disequilibria. Based on the monopolistic positions, imperfect competition, and differentiation of commodities, more successful countries sell their commodities at higher prices, thus capitalizing on their market positions. Accordingly, they obtain above-average profit and/or wage rates, which, by definition, lead to the creation of the cross-country unequal labour exchange. The final determinant, "Unequal labour exchange 4", accounts for the cross-country differences in the level of economic efficiency. The countries comprised of highly efficient (advanced) sectors are, as opposed to the less developed countries, rewarded with the extra profit which enlarges the respective country's economic output. The effects of unequal labour exchange determinants described were linked to the variation in the formation of the cross-country wage rates, profit rates, and exploitation rates, where the less successful countries, in most cases, suffer from smaller wages, higher profits, and higher labour force exploitation. The quantification of the extent of the abovementioned euro area's trade inequalities was performed in the subsequent section of the second chapter. For this purpose, we have

assigned the unequal labour exchange determinants and their effects with the custom-built ratio that allowed for their in-depth investigation, backed by supportive results (section 2.6.), and proved the hypothesized relations.

Research Goal 4: To investigate and empirically validate the country-specific dynamics, cross-country similarities, and core-periphery division with regards to the influence of the economic cycle and the crisis on the euro area's cross-country unequal labour exchange and economic inequality.

Whereas the object of the second chapter was to theoretically establish and empirically validate the existence of the euro area's economic inequalities, the object of the third chapter was to differentiate the euro area member states based on the individual country's economic net-performance with respect to the economic inequality. In this sense, the object of the third chapter was to explain the existence of the euro area's core-periphery division. The influence of the economic cycle on the euro area's unequal labour exchange dynamics was empirically investigated through the time series analysis executed for the period between 2003 and 2014. The cross-country cyclical significance was analysed through recognition of the work by Singer (1950) and Prebisch (1950), through the trend-cycle clustering of the euro area member countries. We have found that the euro area countries failed to tendentially share economic cycles and confirmed that the cycle and the crisis divide the euro area countries into two groups. The first group is comprised of severely affected countries, while the second group is characterized by the fact that the cycle and the crisis did not indicate a severe impact. Moreover, we have concluded that cross-country inequality was primarily induced by the changes occurring within the first group, while the second group remained mostly unaffected. The expansion phase of the economic cycle has caused economic convergence and decreased the euro area's economic inequalities. However, a diametrically opposite pattern occurred within the contraction phase, where the euro area member states exhibited a strong diverging bias. Generally speaking, the crucial alterations in the cross-country inequality dynamics were affected by the member countries which were exposed to higher pre-crisis inequality and on which the crisis had a greater influence. Accordingly, within the third chapter of the doctoral dissertation, we have confirmed that the distinct cross-country utilization of advantages arising from the cyclical influence and driven by the unequal labour exchange, through the uncoordinated economic cycles, resulted in the enhancement of the euro area's core-periphery division which had severely influenced the overall economic inequality.

Research Goal 5: To empirically exhibit how the cycle and the crisis affect the determinants of the unequal labour exchange, their manifestations, and the euro area's core-periphery division.

The fifth research goal was completed as the extension/combination of all previously mentioned goals. This was accomplished through the employment of the unequal labour exchange determinants and their effects, which were explained as a part of the third research goal. Furthermore, executed for the period between 2003 and 2014, the analysis was backed by the clustering of the euro area member countries in accordance with the similarities in reported trends, thus capturing the cyclical influence on the euro area's core-periphery dynamics. The trend cycle decomposition of the euro area's member states was performed through a cluster analysis based on the inequality determinants and their effects (six factors). At this point, it bears mentioning that we have carried out the clustering analysis independently for each individual inequality factor. This is because the euro area economic inequality factors exhibited their specific influence on the process of the cross-country market's labour force recognition. Provided that these specific influences of individual factors are theoretically modelled independent from one another, the creation of the euro area clusters had to reflect this rationale and be performed independently as well. This explains why there exists a significant difference in the countries' grouping across different inequality factors. The explanation of the full extent of the matter is, due to its length, preserved within sections 3.5 and 3.6. Within these sections, the euro area's clustered results regarding the determinants of the unequal labour exchange, as well as their effects, are exhibited through the countries' respective ratios which are theoretically established within the second chapter. These include the cyclical influence on the countries' market position (market disequilibria price effect), the cyclical influence on the countries' capital to labour force ratios, the cyclical influence on the countries' economic efficiency, the cyclical influence on the formation of the countries' wage and profit rates, and the cyclical influence on the countries' labour force exploitation rates. In addition, the patterns of the mentioned categories for the individual euro area member countries, which served as the basis of the clustering criteria, are displayed within the appendix of this doctoral dissertation. The findings have served as the basis of the conclusions drawn by the fourth research goal. Based on the chosen set of categories, our findings supported the reasoning of the Singer (1950), Prebisch (1950), Lewis (1954), and Emmanuel (1972, 1975), and they confirmed that the forces of the unequal labour exchange, enhanced by the cyclical fluctuations, divide the euro area member states into the affluent (net-winning) core and the less developed (net-losing) periphery.

Research Goal 6: To theoretically and empirically investigate the significance of the country-specific economic structure (sectoral and technological composition), size and level of development, the organic composition of capital, and unemployment on the euro area's unequal labour exchange and cross-country inequality.

The sixth research goal was accomplished within the fourth chapter through the panel data analysis of the euro area member countries for the period between 2003 and 2016.

The theoretical backbone of this chapter was retrieved from the second and third chapters with some minor modifications and extended data coverage. The empirical inquiry into the significance of the economic structure, size and level of development, the organic composition of capital, and unemployment for the euro area's unequal labour exchange and cross-country inequality was carried out through the six-panel data models. It must be noted that each of the six models (presented in section 4.5) had two versions based on whether the analysed influence of the economic structure was measured through the sectoral or through the technological composition of the countries' gross value added. The models' dependent variables were either the determinants of the euro area's unequal labour exchange or their manifestations, whereas the independent variables were countries' economic structure, various control variables (countries' sizes, levels of development...), and the year dummies which allowed for the analysis of the change occurring over time. In line with the theory of Singer (1950), Prebisch (1950), Lewis (1954), and Emmanuel (1972, 1975), all models have exhibited significant results with respect to the models' independent variables. Consequently, we have confirmed that the cross-country deviations in the economic structure (both sectoral and technological), size and development, capital intensity, and unemployment are the crucial components of the euro area's cross-country asymmetrical benefit distribution. Effectively, via the cross-country value transfers, the latter initiates the forces of the unequal labour exchange and results in maintaining existing and perpetuating new euro area inequalities.

Research Goal 7: To quantify to what extent the country-specific economic structure (sectoral and technological composition), size and level of development, organic composition of capital, and unemployment are influencing a country's relative position (gain/loss) inflicted by the euro area's unequal labour exchange.

As was the case with the fifth research goal, the lengthy explanation of the models' results is displayed within section 4.6 and remains out of the scope of the current section. The results received are quantitatively displayed within tables 5 and 6 through the fixed effect panel data models. On this ground, we have confirmed the claims raised by the seventh research question and solidified the overall arguments advanced by this doctoral dissertation. Our findings have confirmed that the specific mix of the countries' sizes, levels of development, unemployment, the organic composition of capital, and sectoral and technological structures is the precondition for reaping the benefits or suffering the losses arising from the international value transfers. A special focus within this chapter was placed on the measurement of the cross-country influence of the distinct economic structure on the unequal labour exchange. Consequently, measured through both sectoral and technological compositions, the economic structure of national economies exhibited significant influence regarding the euro area's unequal labour exchange. This was observed within all six models, thus confirming the claim that the countries' structure is one of the key factors determining the countries' relative position within the euro area.

Research Goal 8: To explain the arising policy implications with respect to what national policymakers can do to enhance the relative position of their country within the integration and lower the euro area's overall economic inequality.

The complexity of interactions arising from the unequal labour exchange must be interpreted on two independent, yet mutually connected grounds. Within the presented research we have confirmed that the national policymakers, determined to enhance the relative position of a less-developed country within the euro area, as a starting point, must acknowledge the cross-country development differences. As previously stated in the conclusion of the fourth chapter, we have found that the euro area's less-developed countries will find it easier to advance their market position and increase their economic profitability through the expansion of low-technology sectors. Alternatively, if these countries decide to rely on the development of high-technology, they will find themselves in a subordinate position regarding the international labour exchange. As a consequence, these countries will experience declining wages and rising labour force exploitation.

Additionally, the policymakers must consider that a higher and rising share of the construction and service sectors with lesser capital intensity lowers the amount of the country's consumed labour recognition. They have to account for the national labour markets and for the fact that the development of high-technology and manufacturing sectors, which enhance the country's efficiency, is mostly reflected through the affluent countries' profit rates. Furthermore, our results suggest that, from the viewpoints of the markets (price disequilibria) and economic efficiency, a less developed country should not necessarily rely on the development of high-technology sectors. Contrarily, from the viewpoints of the labour recognition and the profits' volumes (not rates), due to its connectedness to the high capital to labour ratio, the high-technology becomes an essential link in enhancing the national economy.

We have confirmed that the national policy designers must employ strategic governance over the sectoral and technological compositions of national economies in order to achieve the targeted goals, regardless of their nature. The adoption of the abovementioned recommendations, based on the findings of this doctoral dissertation, can be used as adequate groundwork for making national policy decisions. If implemented, they would act as a partial countervailing force affecting the euro area's unequal labour exchange and, accordingly, would lower the overall economic inequality. However, these strategies, based on the enhancement of the country's relative position, advocate particular aspirations ahead of integrational objectives. This brings about the second aspect of the policy recommendations, becoming apparent with the recognition that the existing euro area's structure not only exposes a tension between the national and the

supranational interests but also contradicts its goals founded on the promotion of the cross-country solidarity and equality.

Hence, the presented findings implicitly indicate that the future and the sustainability of the European integrational project must rely on the joint efforts to overcome or at least remedy the negative effects of the euro area's unequal labour exchange. For this purpose, the potential solutions for decreasing the cross-country exploitative relations are further discussed within the remainder of this study. Contrarily, failure to collectively restrain the detrimental forces of the unequal labour exchange would encourage the existing disintegration bias and bring into question the very purpose of the European social project.

5.2. Summary of main implications

The complex issue of the euro area's economic inequalities addressed within this doctoral dissertation, due to its nature and the nature of methods used for its investigation, has brought to the surface numerous implications which we must explicitly emphasise. Through the acknowledgment of their differences, the relevant implications resulting from this doctoral dissertation are divided into three mutually dependent parts which are thoroughly discussed in the sections that follow.

5.2.1. Theoretical implications

Within this research we have presented confirmation of the claim that mainstream economics falls short in providing a satisfactory explanation of the question of overall economic inequality. Given that the *marginal* theory legitimizes the inequality based on the marginal contribution and considers cross-country inequality through the extension of such logic nested in the presupposition that international trade brings benefits to all, this theory does not offer an adequate analytical framework for the study of inequality. In order to remedy this shortcoming, within this doctoral dissertation, we have abandoned the abovementioned rationale and furnished an alternative viewpoint of how economic inequalities should be conceptualized.

The main theoretical contribution of this doctoral dissertation arises from the development of the innovated Marx-based model conceived on the redistributive roots of the economic inequalities. When it comes to the economic inequalities, the supremacy of the Marxian theoretical legacy, founded on the labour theory of value, comes as a consequence of the fact that this theory is intrinsically connected to and founded upon class antagonism. Therefore, the competence of the Marxian economic thought is derived from its ability to deliver high explanatory power with respect to inequalities, investigated through the fundamental theorem of the labour force exploitation (Bose, 1980). This brings the focus back to the refuted and officially disregarded stance that the capitalists,

based on the ownership over the means of production, are able to appropriate a part of the value produced by the workers, thus leading to economic inequality. On these foundations, within the realm of this dissertation, we have anchored the inquiry into the economic inequalities to the concept of surplus, which brings about the usage of the dual-system as both necessary and indispensable. As stated by Desai (1974, p. 55): *“We need value theory to make sense of why prices and profits are what they are and thereby to understand why capitalist societies are ridden by inequality and class divisions”*. Accordingly, the usage of the labour theory of value, in addition to the price, introduces the value category as a fundamental link between the unequal distribution of economic output and economic inequalities (Brolin, 2007; Dunn, 2017). While the justification of the use of the value system is well established within the famous passage of Marx’s letter to Kugelmann (1868): *“The nonsense about the necessity of proving the concept of value arises from complete ignorance of both of the subject dealt with and of the method of science.”* (see Meek, 1956, p. 153), the question of how to express the values monetarily became highly controversial (e.g., von Böhm-Bawerk, 1949; von Bortkiewicz, 1906; Samuelson, 1971).

With this in mind, in order to adapt the Marx-based theoretical model for the purpose of investigating economic inequalities, we had to solve certain issues. For this purpose, we have developed a novel model of the capitalist mode of production. The main feature of the developed model is that it finds a solution to bypass the so-called “transformation problem”. As was thoroughly elaborated within the second chapter and the first research goal, this is achieved through van Schaik’s (1976) cross-sectoral model of the productive economy supported by the works of Bródy (1970), Wolfstatter (1973), Newman (1962), Sraffa (1960), and Morishima (1973). The transferability of values into prices was carried out through the physical surplus of an underlying physical system which expresses the commodity production. Apart from offering a solution to the so-called “transformation problem”, the developed scheme enabled the theoretical formalization of the concepts of commodity value and new value created. This breakthrough enabled the authentic modelling of the labour force exploitation, factorial shares of income, extra profit, production prices, and other relevant elements crucial for the Marxian analytical setting.

Considering all the above, the theoretical implications of the developed model are immense, not only due to the proof that the value and the price systems can be connected, but more importantly, because of the confirmation that the Marx-based approach can be consistent if used adequately. The proposed pragmatic solutions to the long-standing criticisms about the consistency and coherency of the Marxian theory and its application to the fundamental Marxian categories, to our knowledge, represent a unique outlook on the matter that has not been previously used. Therefore, our original theoretical model contributes to science and advances the theory of both Marxian political economy and the theory of economic inequality, accordingly.

5.2.2. Methodological implications

The methodological implications of this doctoral dissertation are the result of the modification of the developed theoretical model for the purpose of investigating economic inequalities. That being said, the important contribution to the theory occurred through our efforts to apply the innovated theoretical model on the euro area member countries. This methodological approach, relying on Merton's (1967) middle range theory, allowed for the investigation of the euro area's economic inequalities based on the theoretical foundations provided by the Marxist economic tradition.

On these foundations, we analysed the euro area inner-country inequalities as the function of the labour force exploitation, whereas the cross-country inequalities are seen as the result of the unequal labour exchange. As recognized by Reich (2007), the concept of unequal labour exchange is still at its infant stage, ignored by textbooks and statistics alike. This comes as a consequence of the fact that the trade inequalities and the unequal labour exchange are, in accordance with subjective theory of value, non-existent and undefined. However, there exists an alternative body of literature arguing against the claim that the unequal labour exchange is an empty concept. Principally, this intellectual school is theoretically founded on the works of structuralist unequal exchange theories (e.g., Prebisch, 1950; Singer, 1950; Lewis, 1954), unequal exchange theory of Emmanuel (1972), and Amin's (1976) unequal development and monopoly theories. Recent empirical research directly or indirectly connected to the unequal labour exchange, predominantly conducted through the input-output tables, confirmed that the euro area trade facilitates the unequal labour exchange and trade-based inequalities (Boundi Chraki, 2018; Ricci, 2019; Tsaliki, Paraskevopoulou, and Tsoulfidis, 2017; Seretis and Tsaliki, 2016; Baiman, 2014; Bieler and Morton, 2014, *inter alia*). However, regardless of their notable contributions, none of the existing works presented a framework which would enable an extensive, multi-level, year-to-year analysis of the euro area's unequal labour exchange. The latter is precisely what we have achieved by this doctoral research and is what constitutes this dissertation's contribution to the fields of unequal exchange and economic inequality.

That being said, from this point forward, an emphasis is placed on the explanation of the key methodological procedures that enabled the transition from the theoretical to the empirical model, as well as other analytical upgrades which improved the existing work and contributed to the science through both theoretical and empirical viewpoints.

The principal methodological modification that made possible the analysis of the euro area trade inequalities through the Marx-based model is connected to the sample size comprised of the single market and the common currency. This allowed for a unique empirical implementation of the developed Marx-based, cross-sectoral model in the cross-country analysis, thus enabling the investigation of the cross-country exploitative

relations inflicted by the unequal labour exchange. The significance of this geographical restriction is crucial because it allows for the assumption that the law of value operates in the euro area the same way as it does in a single country. The limitation of the analysis of the euro area countries represents a key element of this study for multiple reasons. First, it bypasses Bettelheim's (1972) critique of Emmanuel's unequal exchange by exclusively focusing on the countries with the capitalist mode of production and by encompassing all productive economies, as opposed to Emmanuel's simple commodity mode of production. Second, the choice of countries enables the refutation of Emmanuel's assumption of labour immobility. Third, given the recent enlargement that integrated countries of lesser development and enhanced the cross-country heterogeneity (see Table 1), the euro area represents an ideal setting for the investigation of economic inequalities. The latter is especially important considering the expansion of the euro area member states, mainly driven by the capital's needs for larger markets. They have been gradually integrating the countries of the "European South", which has led to the enhancement of the "North-South" trade responsible for an unequal exchange of labour inputs (Kollmeyer, 2009). Fourth, through the analysis of countries with a shared currency, numerous issues related to the cross-country terms of trade are omitted from this research. This enables a more precise and explicit distinction of the investigated cross-country relations than what would be the case if the analysis were extended to include the non-euro area countries which, at their disposal, have multiple currency-managing mechanisms.

In addition to the benefits arising from the sample size, the methodological contributions of this doctoral dissertation are connected to the underlying model. The theoretical model abandons Emmanuel's assumption of equality between market prices and prices of production and solves Bettelheim's (1972) objection that the incomes received by the producers cannot constitute value. The empirical model accounts for the criticism of Bettelheim (1972), Evans (1976), and Amin (1977), and effectively disregards Emmanuel's wage exogeneity. In line with Gibson (1980), the theoretical model refutes objection by de Janvry and Kramer (1979), stating that the unequal labour exchange cannot occur when the traded goods are country non-specific, while its empirical implementation debunks de Janvry's and Kramer's (1979) misconception that the capital mobility is a significant mechanism that corrects the unequal transfers of values.

In comparison to the mentioned empirical investigations of the euro area unequal labour exchange, displaying findings highly consistent with the ones presented within this thesis, the theoretical and empirical approach innovated within this study exhibits a notable advancement of the existing body of literature. This doctoral dissertation contributes to the science through the systemic validation of the euro area's unequal labour exchange phenomena by thoroughly explaining the mechanisms determining the euro area's trade inequalities and their manifestations, which lock countries into the relations of unequal exchange. An essential distinction generating the comparative advantage of this study

relative to all other works is connected to the time of writing, where the present-day euro area analysis is expanded not only in the countries' numbers and heterogeneity, but also in the number of available observations. This results in the most extensive year-to-year investigation of the euro area's unequal labour exchange which, given that the coverage period encompasses the entire economic cycle, additionally allows for the in-depth investigation of the cyclical influence on the euro area's cross-country value transfers. Finally, this unique theoretical setting supported by the original methodological approach creates a platform enabling the multidimensional empirical examinations of the matter discussed, some of which constitute integral parts of this doctoral dissertation.

By taking into account all the above mentioned, it is safe to conclude that within this doctoral dissertation we have undeniably presented the most extensive research of the euro area's unequal labour exchange. Given the original theoretical model and its in-depth empirical application, enabled by the unique methodological approach, we have contributed to the field of economic science and established the necessity for the acknowledgement of the unequal labour exchange as the paramount concept for the investigation of the economic inequalities in the age of globalisation.

5.2.3. Practical implications

The confirmation of the euro area's unequal labour exchange generates tremendous practical implementations once we acknowledge that the existence of the euro area cross-country economic inequalities defies the logical argument used to integrate the countries in the first place. Provided that the euro area is conceived on the ideas of increasing economic efficiency, competitiveness, and citizens' well-being, and is founded on promoting equality, cohesion, and solidarity amongst countries, the unequal labour exchange represents an antithesis to effective single market integration.

The root cause of this problem is intrinsically connected to the existing euro area's structure which effectively prevents active management of the national economic policies (Lapavitsas et al., 2012; Stiglitz, 2016, *inter alia*). The integration into a single market with "four freedoms" prevents the national policymakers from using protectionist trade arrangements (subsidies, customs, tariffs, quotas, etc.) for improving the competitiveness of their industries and balancing out the differences in development through price adjustments. The common currency prevents national policymakers from using monetary policy for boosting national exports and incentivizing domestic investments. Finally, the Stability and Growth pact, through the convergence of debt and deficit criteria, effectively disables the government's ability to employ adequate taxation and budget policies, thus eliminating the fiscal policy from instruments for proactive management of the country's affairs. Accordingly, the current structure forces the national decisionmakers to use wages as leverage for advancing the external competitiveness of their economies. Hence, the less developed euro area countries are using the downward pressure on their wages to

attract investments, initiating a vicious cycle by stimulating an environment in which the forces of the unequal labour exchange can thrive. At this point, it must be emphasised that, in contrast with Emmanuel (1972, p. 61), the wage differentials are the consequence and not the source of the euro area's unequal labour exchange. If the wage differentials were the cause, the peripheral policymakers could simply increase minimum wages and eliminate their disadvantages (Raffer, 1987; Dunn, 2017). On these grounds, the countries of the euro area with a distinct organic composition of capital, distinct productivities and efficiencies, distinct sizes and development levels, and distinct labour exploitation rates, realize a vastly different recognition of the consumed labour. Consequently, with the admission into the euro area, the new member states are effectively integrated into the relations of unequal labour exchange and are permanently locked into the cross-country exploitative-exploited dynamics.

In light of these findings, it is evident that the scenario described is not delivering the expected outcomes and results in an asymmetrical benefit distribution, cross-country divergence and, ultimately, unequal recognition of the work invested by formally equal citizens. Therefore, this complex state inevitably raises a doubt about the future of the euro area imposed through the question of whether the member countries are in a dire need for more or less Europe? Addressing this dilemma from the economic viewpoint is relatively straightforward given that, through the synergic effect of economics of scale, the overall integrational benefits outweigh the cumulative losses that would occur otherwise. Accordingly, the pragmatic solution to the existing problem will not be achieved through the disintegration of the underperforming euro area. Contrarily, the adequate remedy will be applied by approaching the euro area's challenges through a constructive set of reforms aimed to decrease the detrimental economic inequalities.

The urgent need for a change has been recognized by the European Commission (2017) in its "White Paper on the Future of Europe". This document offers five scenarios out of which, when the unequal labour exchange is accounted for, only one is aligned with the integrational goals. "Carrying On", "Nothing but the Single Market", "Those who Want More do More", and "Doing Less More Efficiently" scenarios do not offer satisfactory solutions for tackling the existing inequalities and should be omitted from future consideration. The remaining scenario, "Doing Much More Together", represents a move in the right direction by advocating for greater cross-country coordination with respect to the supervision of financial services, fiscal and taxation policies, and social issues.

The inability of the euro area's institutional structure to resolve the conflict between the integrational goals and the integrational design must be dealt with through the employment of the adequate mechanisms, which would, instead of forestalling, accelerate the overall integrational well-being. These practical implementations must be specially crafted to re-question the "One Size Fits All" and the "Single Speed Europe" guidelines and to offer a set of institutes which would act as countervailing forces to the unequal

labour exchange phenomena. At this point, it is worthy to mention that the policy recommendation from Emmanuel's (1972, p. 267) pioneering work on unequal exchange fails to offer satisfactory instruments which would be applicable in the euro area's case. Emmanuel's suggestions are that the periphery should impose taxes on exports and diversify its commodities to avoid the imports from the core, all with the purpose of diminishing the international trade and lowering the trade inequalities accordingly. By obeying the single market regulations, these measures are not only impossible to implement but are also in violation of the euro area's purpose by advancing particular interests at the expense of the entire integration. However, regardless of the latter, there exists a cluster of potential solutions with the capacity to improve the current euro area's sub-optimal practice. Their overview is presented in the remainder of this section.

Numerous individuals with diverse economic backgrounds are proposing constructive upgrades which would act against the unequal labour exchange and put an end to the evident tyranny of the "Status quo bias". These recommendations are based on the institutionalized solidarity and are clustered into three groups ranging from moderate interventions designed to ease the trade-based inequalities to the fundamental alterations of the existing mode of production advocated by Peet (1975) and de Freitas (2017).

Amongst the moderate interventions, special attention must be paid to the revision of the European structural and investment funds. With this in mind, the proposal must be directed towards a renewal of the European Social Fund (László, 2018), Cohesion Fund, and European Regional Development Fund, which should not only increase their capacities but also ensure that the funds will be primarily distributed to the countries suffering from the unequal labour exchange. When it comes to the European Investment Fund, the resources should be allocated by accounting for the differences in development and the net gain/loss from the unequal labour exchange. One way to achieve this would be to favour business activities planned to be organized in less developed countries. The second group of advancements should consider a national unemployment-benefit reinsurance scheme at the euro area level (Vandenbroucke, 2019) which would serve as a stabilizing institute especially relevant for balancing out the euro area's cross-country cyclical inequalities.

Moreover, when it comes to the wages, a more severe set of measures must be considered. Stockhammer (2011) emphasises that the euro area needs a policy setting which would prevent current account imbalances. He sees the solution in the coordination of the euro area wage policies founded on the active role of the labour unions. By allowing the wages of the affluent countries to grow (in excess of productivity growth) at substantially higher rates than in the deficit countries, the value of euro would decrease concurrently with the rise in competitiveness of the less developed countries (Stiglitz, 2016). Brancaccio (2012) considers that the solution would be the so-called European wage standard. A collective wage bargaining at the euro area level, through the standard linking the growth of the

nominal wages to the labour productivity and balance of trade, would raise the labour share of income and balance out the differences between countries with trade surpluses and those with deficits. An additional positive outcome of the latter proposal is that it would prevent the excessive “brain” centralization caused by the influx of skilled peripheral workers in the core. On these grounds, Bieler, Jordan, and Morton (2019, p. 4) argue that the European future is anchored to the “*federalist solution with a common economic and wage coordination policy*”. On the other hand, within the second group, there exist other proposals which make the case for equilibrium outside of the wage-led recovery. For example, Valentini (2019) emphasises that the structural crisis requires more Europe and offers an institute of a unique common public debt in the euro area as a whole, which could be used to fund public investments and deficit spending in depressed regions.

The final group that we consider within this concise overview departs from the standpoint that fiscal policy coordination is necessary to maximize social welfare in the euro area (e.g., Beetsma and Jensen, 2005; Ferrero, 2008) and that greater cooperation leads to an overall better outcome (Neck and Blueschke, 2019). This group is comprised of authors willing to apply the fundamental alterations to the existing euro area’s modus operandi. These policies disable the cross-country tax competitiveness through tax harmonization (e.g., Pîrvu, 2012; Bénassy-Quéré, Trannoy, and Wolff, 2014). These policies advocate for a banking union (Stiglitz, 2016) and call for a redesign of the Keynes International Clearing Union (see Whyman, 2014) to account for the euro area’s unequal labour exchange and the unequal social recognition of labour. Ultimately, a more radical set of direct redistributive policies, which would reverse the unequal value transfer via the compensation packages from the affluent to the peripheral euro area countries, should not be ruled out completely.

On these grounds, we can conclude that there exists an abundance of technical solutions whose implementation must become a matter of the euro area’s common concern. Moreover, these solutions are to a large extent approved by the polls (see Vandenbroucke et al., 2018; Cruz Santos, 2019, *inter alia*) showing that the European citizens understand the necessity of the mentioned arrangements. Through the acknowledgment of the euro area’s values and democratic foundations, the citizens’ want for a stronger commitment in tackling social issues must therefore be adequately answered through the appropriate consideration of the necessary reforms, which must be addressed within future research.

However, regardless of their relevance, the practical implementation of the mechanisms which should correct the unequal labour exchange largely depends on the will of the affluent countries which have “...a vested interest in preserving social inequality” (Peet, 1975, p. 564). Accordingly, the euro area’s deadlock is conditioned upon the fact that the feasibility for the eradication of excessive inequalities is resting in the hands of powerholders which are drawing benefits from the unequal state of affairs. This brings

the focus back to the quotes cited in the introductory section. The first states that “...*the problem itself arises only when the material conditions necessary for its solution already exist...*” (Marx, 1904, pp. 12-13), and the second concludes that “*the problem of inequality is not so much a matter of technical economics. It’s really a problem of practical politics*” (Stiglitz, 2015, p. 302). Therefore, the possibility to make a positive difference can be achieved exclusively if all stakeholders appropriate the logic of self-interest properly understood. Then the existing euro area inequalities will be regarded not as a question of morality but as a waste of economic resources that causes damage to all participants. Only then will the euro area’s core values of the cross-country equality, solidarity, and collective well-being be considered as the pillars paramount to restoring the purpose and ensuring the sustainability of the estimable European social project.

5.3. Summary of limitations and future research projects

The recognition of the analytical limitations displayed in this doctoral dissertation represents a prerequisite for the advancement of the scientific field related to economic inequalities. With this in mind, the closing section of this study is reserved for discussion about the potential corrective mechanisms and possible extensions which would overcome the existing shortcomings and create grounds for future research projects.

Given that the theoretical model developed within this doctoral dissertation is constrained by the appropriateness of its assumptions, re-questioning them represents the starting point of this overview. That being said, the first revision must address the labour homogeneity assumption. As previously mentioned, the empirical improvement in this aspect will be achievable when Eurostat improves and extends its dataset. Thereupon, the labour force, which is currently expressed through the number of employed workers, will become a variable that can be normalized by the average number of weekly hours of work. However, once obtained, the corrected labour variable would still assume an equivalent cross-country distribution of workers’ skills. Regardless of the latter, this would allow for the relaxation, or even abandonment, of the labour homogeneity assumption by accounting for the cross-country differences in abstract value of the labour power as a commodity. The latter would be achievable through the human development index or through an index based on the years of schooling / education attainment. Such a modification would upgrade the model by making it suitable for the investigation of the present-day, cross-country human capital concentration inflicted by globalisation.

On the other hand, the empirical implementation of the outlined theoretical model merely represents a tool used to investigate the euro area economic inequalities and, like all other tools, it is an imperfect one. The first notable alteration of the presented empirical analysis would be to increase the number of countries included in this study. With that in mind, covering the entire European Union would make the closed economy assumption less restrictive. However, given that it would imply leaving the optimum currency area, this

scenario would be faced with the problem of the exchange rate influence and would be restricted by the existing data coverage for extra-euro area member countries. Once the data sources used are improved/extended, this study should be revised by considering a broader scope of countries, such as the missing countries from the Organisation for Economic Co-operation and Development (OECD), maybe even as broad as the entire world. At this point it must be explicitly noted that a tendency towards the global theory of unequal labour exchange would bring about an additional set of computational and methodological challenges (e.g., PPP issues, currency exchange effect problematics, insufficient sources and lack of data, issues with the law of value) for which, at the moment, there exists no adequate solution.

An additional upgrade, whose implementation is conditioned by the enlargement of the current data coverage, is worthy of mentioning. The panel data analysis exhibited in the fourth chapter is highly limited by the number of available observations (252 observations, $n = 18$, $t = 14$). This restriction disallows adding new explanatory variables, adding lagged explanatory variables, and performing dynamic panel data models. Consequently, the possibilities to build upon the existing work will be feasible as time goes by and new observations become available. Moreover, it suffices to mention that this research could be performed through the acknowledgement of the cross-sectoral data. In this regard, the study could be supplemented with the input-output (price) analysis, which implies that the investigation could account for the alterations in the input prices as opposed to the current placement of the focus on the changes affecting the output prices exclusively.

Further research, both theoretical and empirical, is required in order to extend the existing knowledge on the overall distributive implications of the trade inequalities. The presented model can serve as the platform for the interdisciplinary study of the recently observed patterns related to migrants and movers. Such an inquiry should analyse whether the cross-country influx/outflux of workers/migrants follows the logic imposed by the social recognition of the labour consumed. Another dimension that is worth considering is the role that the imports and exports play with respect to the unequal labour exchange and the asymmetrical benefit distribution. Moreover, the forthcoming research must account for the cross-country variation in the qualitative growth regimes (export-led vs. demand-led models) and examine the effects of the unequal labour exchange on the cross-country direct foreign investments and debt dynamics (general government and private sector debt). In this sense, the results must be compared to the ones that are theoretically grounded within the varieties of capitalism theories. Finally, the highest importance must be assigned to the development of models with the potential to remedy the negative effects of the euro area's trade inequalities. With this in mind, the re-examination of the effectiveness of the European structural and investment funds must take place. The research needs to examine whether the resources spent by the regional development fund, the social fund, and the cohesion fund support the cross-country convergence and act as

corrective mechanisms against the unequal labour exchange transfers. Thus, future research must prioritize the investigation of the euro area's collective wage bargaining and must re-question the effectiveness of the fiscal harmonization/consolidation, banking union, and the cross-country redistribution policies.

The abovementioned recommendations constitute a small fraction of the limitless research potential generated by this study. Accordingly, this doctoral dissertation should be employed both as a platform for the further theoretical advancement of the fields of Marxian political economy and economic inequalities and as a base for a compulsory pursuit of the solutions which will cancel out the excessive trade inequalities and straighten the backbone of the European social project.

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APPENDICES

Appendix 1: Extended Summary in the Slovenian language

DALJŠI POVZETEK DOKTORSKE DISERTACIJE V SLOVENSKEM JEZIKU

Namen doktorske disertacije z naslovom Dinamika ekonomske neenakosti v državah evro območja na temelju marksistične teorije izkoriščanja je v izoblikovanju celovitega prikaza narave in dinamike ekonomske neenakosti med državami območja evra, in sicer s pomočjo originalne znanstvene analize, ki konceptualno temelji na delovni teoriji vrednosti in razlagah pojma izkoriščanja (eksploatacije) delovne sile. Na ta način v študiji analiziramo neenakost za države območja evra s pomočjo inovativnega teoretičnega modela in z originalno empirično uporabo tega modela. Krajši prikaz osnovnih elementov doktorske disertacije je predstavljen v nadaljevanju tega povzetka. Prikaz obsega dispozicijo z raziskovalnim vprašanjem, ozadje, ki nas je motiviralo pri raziskovanju, cilje raziskovanja in uporabljene metode, glavna spoznanja ter zaključke in končno razpravo, pa tudi oceno prispevka k znanosti.

Opis raziskovalnega problema

Ozadje, ki nas je spodbudilo k raziskovanju omenjene tematike, izhaja iz našega razumevanja vsebinskih slabosti modernega pristopa k neenakosti in želje, da se ponudi teoretični okvir, s pomočjo katerega je mogoče adekvatno razmišljati o ekonomskih neenakostih. Pri analiziranju neenakosti v območju evra je potrebno izpostaviti, da je integracija članic v to območje zgrajena na načelih enakosti, solidarnosti in upoštevanja socialne komponente. Temeljni kamen te doktorske disertacije predstavlja zavračanje neoliberalnega pogleda na neenakost, ki temelji na domnevi, da so neenakosti znotraj države nujne za nastanek ekonomskih spodbud (Lucas, 2004; Goldin & Kadz, 2008) in da meddržavna trgovina daje koristi vsem ekonomskim partnerjem (Ohlin, 1993; Barro, 1997). Temelj za zavračanje takega marginalističnega pristopa k ekonomski neenakosti izhaja iz spoznanja, da ta teorija utemeljuje, kako so proizvodni faktorji nagrajeni v skladu s svojimi donosi (Wicksell, 1954), kar daje teoretsko podlago, ki omogoča opravičevanje obstoječih neenakosti.

Da bi lahko razrešili raziskovalni problem, ki izhaja iz omenjenega uvoda, v doktorski disertaciji uporabljamo delovno teorijo vrednosti, ki skupaj z ustreznim fizičnim, cenovnim in vrednostnim sistemom v modelu gospodarstva lahko služi kot osnova za analiziranje distributivnih neenakosti, ki nastajajo v ozadju navidezne enakosti svobodnega trga (Desai, 1974; Dunn, 2017). Na teh podlagah neenakost raziskujemo s pomočjo ekonomske teorije Karla Marxa. Ekonomska neenakost tako postane neizogibna posledica zasebne lastnine nad produkcijskimi sredstvi, ki omogoča lastnikom prisvajanje dela presežka, ki nastane v proizvodnji, čeprav je ta presežek v celoti proizveden z delom delavcev (Dragičević, 1979; Rousseau, 1984; Marx, 1990). Posledica takšnega stanja so razmere, v katerih znotraj posameznih držav razredni antagonizem, ki temelji na prvotni

akumulaciji kapitala in eksploataciji delovne sile, konstantno reproducira ekonomske neenakosti in hkrati ustvarja nove neenakosti.

S pojavom mednarodne trgovine in zlasti z nastankom globalizacije opisani družbeni odnosi znotraj posameznih držav dobivajo novo podobo v obliki meddržavnih odnosov neenakosti in izkoriščanja (Marx, 1963; Wallerstein, 1974; Preobrazhensky 1965). V razmerah, v katerih države z različnimi stopnjami eksploatacije delovne sile, različnimi količinami proizvodnih dejavnikov in različno stopnjo razvitosti med sabo menjajo blago, nastaja poseben mehanizem ne-ekvivalentne menjave dela (Emmanuel, 1972), ki prenaša vrednosti, ustvarjene z delom, iz manj razvitih držav v bolj razvite trgovinske partnerje. Na ta način mednarodna trgovina povzroča meddržavno ne-ekvivalentno menjavo dela, ki je mogoča, če je proizvodnja vrednosti dislocirana z geografsko distribucijo (Ricci, 2018). Z drugimi besedami, ne-ekvivalentna menjava dela nastane, kadar manj razvita država menja blago z visoko količino opredmetenega dela za blago iz razvitih trgovinskih partnerjev, ki vsebuje manjše količine opredmetenega dela (Kollmeyer, 2009). Skladno s tem kapitalisti iz razvitih držav ne izkoriščajo zgolj domače delovne sile, pač pa izkoriščajo tudi svoje trgovinske partnerje na način, da si prisvajajo del vrednosti, proizvedene z delom v manj razvitih državah (Prebisch, 1950; Singer, 1950; Emmanuel, 1972; Amin, 1976; Grossmann, 1992; Bauer, 2000).

Na teh temeljih v doktorski disertaciji analiziramo celokupno ekonomsko neenakost območja evra s pomočjo interakcije med seboj povezane neenakosti znotraj posameznih držav. Pri tem predpostavljamo, da se neenakosti znotraj posamezne države lahko pojasnijo z eksploatacijo delovne sile, medtem ko se neenakosti med državami lahko analizirajo s pomočjo pojava ne-ekvivalentne menjave dela. Ob takšni iztočnici pri proučevanju ekonomske neenakosti območja evra posebej izpostavljam dejstvo, da se ne-ekvivalentna menjava dela ne sklada s temeljnimi načeli evropskega integracijskega projekta.

Prav zaradi tega v doktorski disertaciji dajemo tudi vpogled v možne institucionalne prilagoditve in rešitve, s pomočjo katerih bi se učinki ekonomske neenakosti v območju evra lahko zmanjšali. Zdi se nam pomembno izpostaviti, da se na ta način problematika ekonomske neenakosti območja evra - v skladu z razlagami Varoufakisa (1998) - ne analizira na temeljih morale in pravičnosti, pač pa na temelju uporabe virov (Piketty, 2015) in nedoseganja optimalne ravni blaginje na območju evro integracije.

Cilji doktorske disertacije

Na podlagi ugotovitve in domneve, da so sodobni načini proučevanja ekonomske neenakosti pomanjkljivi in da je neenakost zelo kompleksen raziskovalni problem, je osnovni cilj te doktorske disertacije prispevek k teoretičnemu in empiričnemu razvoju znanstvene discipline marksistične politične ekonomije in ekonomike neenakosti. Ta cilj

naj bi dosegli z njegovo razčlemba v več med sabo povezanih raziskovalnih nalog, ki so izoblikovane zato, da bi dobili odgovor na temeljna vprašanja, ki so povezana z genezo, vzroki, posledicami in dinamiko ekonomske neenakosti med državami območja evra. Tako v doktorski disertaciji želimo doseči naslednje raziskovalne cilje:

1. Razviti teoretični model na temelju marksistične ekonomske tradicije, ki bo omogočal ustrezno rešitev tako imenovanega transformacijskega problema in omogočil pojasnjevanje ekonomske neenakosti.
2. Pojasniti vlogo ne-ekvivalentne menjave dela v oblikovanju in ohranjanju meddržavnih in znotraj državnih neenakosti s pomočjo empirične metode in kvantificiranjem količin dela, ki je bilo potrošeno v proizvodnih procesih in družbeno priznано v dohodkih v posameznih državah območja evra.
3. Identificirati temeljne ekonomske sile, ki povzročajo ne-ekvivalentno menjavo dela in ekonomsko neenakost med državami, in ugotoviti, v koliki meri determinante ne-ekvivalentne menjave dela vplivajo na ekonomske značilnosti članic območja evra.
4. Raziskati in potrditi specifičnosti posameznih držav z vidika meddržavne podobnosti in tudi delitve na center ter periferijo, ki se pokažejo ob vplivu ekonomskega cikla in kriz preko ne-ekvivalentne menjave dela in ekonomske neenakosti znotraj območja evra.
5. Empirično ugotoviti učinke, preko katerih ekonomski cikel in krize vplivajo na determinante in posledice ne-ekvivalentne menjave dela, pa tudi na ekonomsko delitev držav območja evra na center ter periferijo.
6. Teoretično in empirično raziskati značilnosti meddržavnih razlik v ekonomski strukturi, velikosti, razvitosti, sestavi kapitala in zaposlenosti, ki so posledica ne-ekvivalentne menjave dela in ekonomske neenakosti znotraj območja evra.
7. Kvantificirati vpliv meddržavnih razlik v ekonomski strukturi, velikosti, razvitosti, kapitalski sestavi in zaposlenosti na ekonomski položaj posamezne države znotraj območja evra kot posledica ne-ekvivalentne menjave dela.
8. Pojasniti posledice spoznanj v doktorski disertaciji na možnosti, da kreatorji nacionalnih politik izboljšajo relativni položaj posameznih držav in zmanjšajo neenakost znotraj območja evra.

Raziskovalna metodologija

V skladu z raziskovalnimi problemi in cilji v doktorski disertaciji uporabljamo originalno metodologijo. Ta metodologija je uporabljena v vseh delih doktorske disertacije, ki imajo tako skupne metodološke temelje. V vseh (treh) delih pa je potem tudi prilagojena tako, da je mogoče dosegi posamezne raziskovalne cilje.

V celotni analizi ekonomske neenakosti zajemamo osemnajst članic območja evra, razen Luksemburga, ki ni vključen zaradi omejene dostopnosti do podatkov. Vsi podatki, uporabljeni v doktorski disertaciji, so prevzeti iz dostopnih baz podatkov Evrostata,

Združenih narodov in Svetovne banke. Pri oblikovanju posameznih spremenljivk pa uporabljamo splošno sprejete metode, kot so Hardbergerova (1987) metoda izračuna kapitala in Gollinovovega (2002) izračuna deležev dela. Metodologija domneva zaprta gospodarstva in homogene proizvodne faktorje. Pri izračunu uporabljamo standardne softverske programe, kot so Stata in Microsoft Office. Vsi podatki so zaradi mednarodne primerljivosti izraženi v 2011 PPP \$. V posameznih delih, ki sestavljajo doktorsko disertacijo, so metodološke posebnosti posebej opisane.

Prvi del doktorske disertacije je članek, ki je posvečen analizi ekonomske neenakosti območja evra s pomočjo statične analize z uporabo desetletnega povprečja podatkov za obdobje od leta 2004 do leta 2013. Raziskovanje temelji na Sraffovi »metodi fotografije« (Arena & Blankenburg, 2013), ki analizira ekonomske dogodke kot zamrznjenje v določenem časovnem trenutku. Takšna analiza omogoča neposredno empirično uporabo in preverjanje teoretskega modela ne-ekvivalentne menjave dela znotraj območja evra in s tem daje podlago za nadaljnjo raziskovanje. Drugi del doktorske disertacije je sestavljen iz članka, v katerem izhajamo iz teoretičnega modela, razvitega v prvem članku, in se nanaša na raziskovanje dinamike neenakosti v obdobju od leta 2003 do leta 2014. Znotraj tega dela je posebej izpostavljen vpliv ekonomskega cikla in kriz na ne-ekvivalentno menjavo dela in delitev članic območja evra na center ter periferijo. Pri tem je uporabljena klastrska analiza, s katero ugotavljamo podobnost trendov med državami, razvrščanje držav v klastre pa je narejeno na podlagi vseh determinant in učinkov ne-ekvivalentne menjave dela znotraj območja evra. Tretji del doktorske disertacije pa je članek, posvečen analizi vpliva ekonomske strukture gospodarstev na ne-ekvivalentno menjavo dela znotraj območja evra za obdobje med letom 2003 in letom 2016. Analiza je izpeljana s pomočjo dvanajstih regresijskih modelov s fiksnim učinkom. S pomočjo teh modelov proučujemo vpliv ekonomske strukture v obliki sektorske in tehnološke strukture gospodarstva na determinante in učinke ne-ekvivalentne menjave dela znotraj področja evra.

Opis vsebine doktorske disertacije

V doktorski disertaciji raziskujemo problem neenakosti, ki nastaja na meddržavni ravni. Pri tem izhajamo iz domneve, da je neenakost na meddržavni ravni problem, ki zasluži vsaj enako pozornost kakor neenakost, ki se pojavlja znotraj posamezne države. V resnici poizkušamo neenakost med državami pojasniti z neenakostjo, ki nastaja znotraj posameznih držav.

Za ta namen smo sestavili teoretični model, ki po eni strani temelji na tradiciji Marxovega ekonomskega modela, po drugi strani pa uporablja sodoben pristop tako imenovanih linearnih ekonomskih modelov. Ta ekonomski model temelji na fizičnem modelu produkcijskega procesa, v katerem nastane tako imenovani fizični presežek, ki ni nič drugega kakor neto proizvodnja, ustvarjanja v določenem časovnem obdobju znotraj neke

države. Uporaba fizičnega sistema v doktorski disertaciji omogoča premostitev dobro znanega problema iz Marxovih ekonomskih modelov, to je transformacijskega problema. V doktorski disertaciji domnevamo, da lahko fizični presežek izrazimo bodisi v cenovni obliki, tako da elemente fizičnega presežka pomnožimo s cenami, kar daje družbeni dohodek. Prav tako pa domnevamo, da lahko fizični presežek izrazimo tudi v količinah dela, ki ga v družbi potrošijo zato, da proizvedejo določeno količino fizičnega presežka. Na ta način je fizični presežek po eni strani povezan s cenovnim sistemom, po drugi strani pa z vrednostnim sistemom, tako da model, ki ga uporabljamo v doktorski disertaciji, obsega tri sisteme: fizični sistem, cenovni sistem in vrednostni sistem. To omogoča raziskovanje eksploatacije v Marxovem smislu besede in povezovanje porabljenega dela s tržnim priznavanjem porabljenega dela v produkcijskem procesu.

Tak model omogoča raziskovanje eksploatacije na ravni posamezne države, lahko pa ga ob upoštevanju določenih predpostavk uporabimo tudi kot model, ki pojasnjuje eksploatacijo na ravni skupine držav. Prav v taki obliki ta model uporabljamo v tej doktorski disertaciji.

Model omogoča opredelitev dolgoročnih ravnotežnih cen oziroma produkcijskih cen ter izračun ustreznega družbenega dohodka, ki upošteva te cene. Primerjava takšnega ravnotežnega družbenega dohodka z dejanskim družbenim dohodkom daje potem razlago vpliva neravnotežnih cen na družbeni dohodek v posamezni državi. Prav tako model omogoča izračun družbenega proizvoda ob domnevi, da države dosegajo maksimalno produktivnost dela in maksimalno učinkovitost uporabe kapitala. Primerjava med ravnotežnim družbenim dohodkom in takšnim učinkovitim družbenim dohodkom daje odgovor na vprašanje, v koliki meri ekonomska učinkovitost, kot skupni učinek produktivnosti dela in učinkovitost gospodarjenja s kapitalom, vpliva na dejanski družbeni dohodek. Ravnotežni družbeni dohodek lahko izračunamo tudi ob domnevi dejanskega odnosa med kapitalom in delom oziroma dejanske organske sestave kapitala po posameznih državah. Lahko pa ga izračunamo tudi ob domnevi, da države dosegajo enako raven organske sestave kapitala. Primerjava ravnotežnega narodnega dohodka z ravnotežnim narodnim dohodkom ob enaki organski sestavi kapitala daje vpliv organske sestave kapitala na družbeni dohodek, ki se kaže predvsem v različnem obsegu profitnih dohodkov znotraj družbenega dohodka.

Dejanski družbeni dohodek v posamezni državi lahko tako zaostaja ali pa presega družbene dohodke v drugih državah zaradi vpliva neravnotežnih cen, organske sestave kapitala in ekonomske učinkovitosti. Razlike pa se morajo potem izkazati bodisi v različnih delovnih dohodkih bodisi v različnih kapitalskih dohodkih. Ker domnevamo, da je fizični presežek rezultat porabljenega dela v določenem gospodarstvu in da lahko v okviru modela družbeni dohodek ocenimo tudi skladno s porabljenim delom v določenem gospodarstvu, so potem razlike med družbenim dohodkom, ki je sorazmeren porabljenemu delu v nekem gospodarstvu in ga lahko imenujemo novo ustvarjena

vrednost (izražena v cenah), ter različnimi družbenimi dohodki, ki izražajo učinke neravnotežnih cen, organske sestave kapitala in ekonomske učinkovitosti, tudi izraz različnega priznavanja porabljenega dela v posamezni državi v družbenem dohodku oziroma v tako imenovanem družbeno priznanem delu. Prav te razlike pa povzročajo, da med posameznimi državami, tudi v razmerah popolne konkurence, v še večji meri pa v razmerah nepopolne konkurence, prihaja ob ekvivalentni menjavi blaga do ne-ekvivalentne menjave dela, opredmetenega v blagu.

Neenakost med državami je tako posledica pretvarjanje porabljenega dela v posamezni državi v družbeno priznano delo. To pretvarjanje pa neposredno meri stopnja eksploatacije delovne sile v posamezni državi. Na ta način model stopnje eksploatacije povezuje z ne-ekvivalentno menjavo dela in neenakostjo med posameznimi državami.

Te lastnosti in uporabnost teoretičnega modela smo v doktorski disertaciji testirali na empiričnih podatkih držav območja evra za obdobje od leta 2004 do leta 2013. Empirični podatki držav območja evra za to obdobje, uporabljeni v njihovih povprečnih vrednostih, kažejo, da nastajajo med državami izrazite razlike zaradi neravnotežnih cen, neenake ekonomske učinkovitosti in zlasti neenake organske sestave kapitala. Razlike, ki izhajajo iz različne učinkovitosti in cenovnega položaja posameznih držav, se neposredno izražajo v različnih delovnih dohodkih po državah. Razlike v organski sestavi kapitala pa se izražajo v različnih profitnih dohodkih in s tem tudi v različnih družbenih dohodkih po enoti zaposlenega. Pri tem je značilno, da nizka organska sestava kapitala pomeni tudi malo kapitala in profitov po zaposlenem ter nižji družbeni dohodek po zaposlenem, čeprav so v državah s takšnim stanjem profitne stopnje načeloma višje kot v državah z ugodnejšim položajem v mednarodni menjavi. Neravnotežne cene in manjša učinkovitost se torej v celoti izkažejo v razlikah v delovnih dohodkih po zaposlenem. Razlike v organski sestavi pa zgolj v obsegu profitov, ne pa tudi v razlikah v profitni stopnji. Empirična analiza tako jasno pokaže, da lahko države znotraj območja evra razdelimo v skupino z izrazito podravnotežnimi delovnimi dohodki in delno nadravnotežnimi profitnimi stopnjami glede na to, da takšne države dosegajo podravnotežne cene in zaostajajo v ekonomski učinkovitosti. Na drugi strani pa obstaja nabor držav, v katerih nadravnotežne cene in višja ekonomska učinkovitost omogočajo nadpovprečne delovne dohodke ob ravnotežnih ali delno podravnotežnih profitnih stopnjah.

Z vidika porabljenega dela takšna formiranja družbenega dohodka izrazito kažejo, da v prvi skupini držav bistveno več dela porabijo v proizvodnji, kot se jim ga prizna na trgu, v drugi skupini držav pa potrošijo bistveno manj dela, kot ga skozi družbeni dohodek prizna trg. Tako lahko govorimo o ne-ekvivalentni menjavi dela ob blagovnih tokovih, ki nastajajo med temi državami.

Takšna razdelitev držav v dve skupini postane še bolj izrazita, če ne-ekvivalentno menjavo dela in neenakost med državami opazujemo v daljšem časovnem obdobju, ko

lahko zajamemo vpliv ekonomskega cikla. Tudi v tem primeru ugotovimo, da obstajata dve skupini držav. Države z večjim priznavanjem dela so glede na cikel bistveno bolj stabilne kot države, v katerih se njihovo delo v manjši meri prizna kot družbeno priznано delo. Tudi s tega vidika lahko govorimo o razdelitvi držav območja evra na razviti center in nerazvito periferijo. Pri tem pa so razlike z vidika neenakosti in ne-ekvivalentne menjave dela med obema skupinama držav odvisne predvsem od spreminjanja razmer v nerazviti periferiji.

Podrobnejša analiza jasno pokaže, da se je v kriznih razmerah s tega vidika neenakosti med obema skupinama držav zmanjševala, če opazujemo učinke profitnih dohodkov, priznanja porabljenega dela, ekonomske učinkovitosti in izkoriščanja delovne. V kriznih razmerah se je učinkovitosti v državah periferije povečevala in zmanjševala zaostanek v učinkovitosti za državami centra. Glede na to, da je kriza v državah periferije povečala brezposelnosti in zmanjšala zaposlenost, je bila v državah periferije porabljena tudi manjša količina dela, kar se je izkazalo kot povečanje družbeno priznanega dela oziroma tistega dela, ki je bilo priznано v družbenem dohodku držav periferije. S takšnim povečanjem produktivnosti dela pa se je v državah periferije povečevala tudi ekonomska učinkovitost. Prav zaradi tega so tudi stopnje eksploatacije v tej skupini držav bile manjše v fazah krize in večje v fazah prosperitete.

Ob tem so se v fazi povečevanja gospodarske rasti razlike v neravnotežnih cenah med državami povečevale, in sicer na način, da so pridobivale države centra, v fazah upadanja gospodarske rasti pa so se razlike v cenah zmanjševale, in sicer tako, da so pridobivale države periferije. V fazi prosperitete so države periferije izgubljale položaj na trgu, kar je vodilo do zaostajanja delovnih dohodkov in do povečevanja neenakosti z vidika delovnih dohodkov med državami centra in periferije. drugačni učinki pa so nastajali z vidika profitnih dohodkov, ki so naraščali v fazi prosperitete, pri tem pa so bili višji v državah periferije.

Glede na to, da neenakost med državami izvajamo iz tržnega položaja držav, njihove ekonomske učinkovitosti in organske sestave kapitala ter da so te značilnosti povezane s sektorsko strukturo gospodarstva, v doktorski disertaciji analiziramo tudi vpliv sektorske strukture gospodarstva na neenakost med državami. Pri tem izpostavljamo po eni strani tip sektorja, po drugi strani pa tehnologijo, ki jo zaposlujejo v posameznih sektorjih. V doktorski disertaciji tako opozarjamo, da nadržavnotežne cene dosegajo države s sektorji z večjo kapitalno intenzivnostjo. Vendar to ne pomeni, da so ti sektorji vedno sektorji z zahtevnejšo tehnologijo. Očitno nekatere države znotraj območja evra dosegajo cenovne prednosti na ta način, da svoje cenovne priložnosti iščejo v sektorjih z manj zahtevno tehnologijo, kar pomeni, da svojih prednosti ne morejo uresničiti v sektorjih z zahtevnejšo tehnologijo. Vendar je ob tem potrebno opozoriti, da sektorji z manj zahtevno tehnologijo povzročajo, da se manjši del porabljenega dela prizna kot družbeno priznано delo v družbenem dohodku. Skladno s temi ugotovitvami so tudi ugotovitve, da je mogoče

pozitivne učinke večje ekonomske učinkovitosti doseči s sektorji, ki so kapitalno bolj intenzivni in imajo zahtevnejšo tehnologijo.

Kot izhaja že iz osnovnega empiričnega modela, se neravnotežne cene in ekonomska učinkovitost izražajo v višini plač. Vendar je treba pri tem opozoriti, da se mezdne stopnje oblikujejo v veliki meri tudi glede na razmere na trgu dela. Tako v številnih državah razmere na trgu dela v večji meri pojasnjujejo razlike v mezdni stopnjah med državami, kot pa sektorska in tehnološka struktura gospodarstva. Trg dela z vplivom na mezde seveda vpliva tudi na profitne stopnje. V čim večji meri trg dela podcenjuje mezdne stopnje, tem bolj to omogoča doseganje nadravnotežnih profitnih stopenj. Zato je razumljivo, da dosegajo visoke profitne stopnje tudi države z manj zahtevno tehnologijo.

Ta vpogled v vpliv sektorske in tehnološke strukture na ne-ekvivalentno menjavo dela in neenakost med državami vodi tudi do ustreznih iztočnic za oblikovanje gospodarske politike, ki omogoča zmanjševanje meddržavne neenakosti vsaj na območju evra, ki ga analiziramo v tej doktorski disertaciji.

Doseganje raziskovalnih ciljev

Ugotovitve raziskovanja v doktorski disertaciji so povezane z raziskovalnimi cilji, lahko pa jih zaokrožimo v osem med seboj povezanih zaključkov.

V skladu s prvim ciljem doktorske disertacije tako razvijemo v doktorski disertaciji originalni teoretski model raziskovanja ekonomske neenakosti, ki temelji na marksistični ekonomski tradiciji. Teoretski model upošteva van Schaikovo (1976) definicijo produktivne ekonomije in ustrezne prispevke Marxa (1990), Morshime (1973) in Newmana (1962). Pri tem model izhaja iz domneve, da je mogoče povezati cenovni in vrednostni del ekonomskega modela, ki izhaja iz Marxove teorije, s pomočjo fizičnega sistema, ki predstavlja naturalni (fizični) vidik blagovne proizvodnje v določeni državi. Ta predpostavka omogoča medsebojno povezovanje cenovnega sistema in vrednostnega sistema, ki prikazujeta gospodarstvo, in daje ustrezno rešitev transformacijskega problema. V skladu s takšno rešitvijo v središče postavljamo tako imenovani fizični presežek, ki ga lahko izrazimo s pomočjo tržnih cen, kar daje kategorijo družbenega proizvoda. Prav tako pa lahko fizični presežek izražamo v obliki količine porabljenega dela v njegovi proizvodnji, kar daje kategorijo novo ustvarjene vrednosti. Takšen pristop je inovativen, presega probleme, ki so v Marxovem ekonomskem modelu povezani s tako imenovanim transformacijskim problemom in daje teoretično osnovo za analize ekonomske neenakosti, saj omogoča medsebojno primerjavo novo ustvarjene vrednosti in družbenega proizvoda. Hkrati pa omogoča, da razlike med novo ustvarjeno vrednostjo in družbenim proizvodom v posamezni državi pojasnujemo z različnimi stopnjami eksploatacije delovne sile znotraj držav.

V skladu s prispevki Prebischa (1950), Singerja (1950), Emmanuela (1972), Amina (1976), Grossmanna (1992) in Bauerja (2002) drugi cilj doktorske disertacije uresničujemo na način, da obstoječo neenakost med državami območja evra pripišemo meddržavni ne-ekvivalentni menjavi dela. Z neposredno uporabo empiričnih podatkov in teoretičnega modela kvantificiramo ne-ekvivalentno menjavo dela s pomočjo kategorije družbeno priznanega dela, ki ga merimo v obliki odnosa med bruto družbenim proizvodom (BDP) in novo ustvarjeno vrednostjo (NV) v posameznih državah območja evra. Rezultati takšnega ugotavljanja ne-ekvivalentne menjave dela so prikazane v Tabeli 1, in sicer za obdobje od leta 2004 do leta 2013, temeljijo pa na desetletnem povprečju. Ti rezultati potrjujejo teoretsko pričakovane učinke in obstoj ne-ekvivalentne menjave dela med državami območja evra. Deset od osemnajstih držav območja evra tako preko BDP ne realizira rezultata dela, ki je vloženo v ustvarjanje tega proizvoda. V vsakem trenutku 6,4 milijona delavcev iz držav, ki ne dosega priznavanja skupno porabljenega dela, delajo za države, ki zaradi mednarodne menjave in ne-ekvivalentne menjave dela realizirajo več dela, kot so ga vložili v proizvodnjo fizičnega presežka. Izraženo v denarnih kategorijah, deset manj razvitih držav letno izgubi 577 milijard 2011 PPP \$ dela, ki je vložen, a ni družbeno priznan na trgu. Ker se to delo izrazi v družbenem proizvodu bolj razvitih držav, ti empirični podatki potrjujejo, da se neenakost znotraj območja evra izraža skozi ne-ekvivalentno menjavo dela.

Potem ko v skladu s drugim ciljem identificiramo asimetrične koristi mednarodne menjave, v skladu s tretjim ciljem doktorske disertacije identificiramo osnovne ekonomske sile, ki determinirajo ne-ekvivalentno menjavo dela znotraj območja evra in načine, kako se te determinante izkažejo v ekonomskih značilnostih posameznih držav. Tako ugotavljamo, da je ne-ekvivalentna menjava dela znotraj območja evra teoretično in empirično določena s tremi determinantami. Prva determinanta so meddržavne razlike v organski sestavi kapitala, tj. je v odnosu med kapitalom in delovno silo. Ta determinanta je merjena z odnosom med novo ustvarjeno vrednostjo in ravnotežnim družbenim proizvodom (NV/BDP_{pc}). Druga determinanta je posledica neravnotežnih cen, ki izhajajo iz monopolnih položajev, nepopolne konkurence in diferenciacije blaga med posameznimi državami. Kaže pa se ta determinanta v cenah, ki so višje od ravnotežnih cen. Ekonomske koristi, ki iz tega izhajajo, so torej posledica tržnih neravnotežij. Ta determinanta se kaže v odnosu med bruto domačim proizvodom in ravnotežnim bruto domačim proizvodom (BDP/BDP_{pc}). Tretja determinanta ne-ekvivalentne menjave dela med državami znotraj območja evra izhaja iz meddržavnih razlik v ekonomski učinkovitosti posameznih gospodarstev, ki izraža učinek produktivnosti dela in učinkovitosti kapitala. Ta determinanta je merjena v obliki odnosa med ravnotežnim bruto domačim proizvodom in učinkovitim ravnotežnim bruto domačim proizvodom (BDP_{pc}/BDP_u). Učinki omenjenih treh determinant ne-ekvivalentne menjave dela med državami znotraj območja evra se potem izražajo v meddržavnih razlikah v dohodkih iz dela (odnos med dejanskimi plačami in ravnotežnimi plačami – W/W_{pc}) in dohodki iz kapitala (odnos dejanskih profitov glede na ravnotežne profite – Π/Π_{pc}), pokažejo pa se

tudi v meddržavnih razlikah v stopnjah eksploatacije delovne sile (e). Količinski vidik vplivov determinant in posledic tega vpliva je prikazan v Tabeli 1.

Tabela 1: Prikaz ključnih kategorij ne-ekvivalentne menjave med državami območja evra s pomočjo desetletnega povprečja za obdobje od leta 2004 do leta 2013

ISO3	$\frac{BDP}{NV}$	$\frac{NV}{BDP_{pc}}$	$\frac{BDP}{BDP_{pc}}$	$\frac{BDP_{pc}}{BDP_u}$	$\frac{\Pi}{\Pi_{pc}}$	$\frac{W}{W_{pc}}$	e
LVA	0.52	1.28	0.66	0.88	1.44	0.48	2.26
LTU	0.57	1.33	0.76	0.84	2.26	0.49	2.17
EST	0.62	1.21	0.74	0.93	1.23	0.60	1.61
SVK	0.62	1.31	0.82	0.85	2.23	0.54	1.88
PRT	0.69	1.17	0.81	0.95	1.06	0.72	1.16
SVN	0.70	1.18	0.83	0.95	1.03	0.76	1.05
CYP	0.83	1.19	0.98	0.94	1.64	0.77	1.02
MLT	0.84	1.20	1.00	0.93	1.73	0.78	1.00
GRC	0.85	1.07	0.91	0.99	1.19	0.78	1.01
ESP	0.89	1.01	0.90	1.00	0.89	0.91	0.73
DEU	1.02	1.03	1.05	1.00	1.09	1.02	0.53
FIN	1.02	0.98	1.00	1.00	0.99	1.00	0.56
FRA	1.07	0.92	0.99	0.99	0.76	1.15	0.37
AUT	1.08	0.95	1.02	1.00	0.95	1.07	0.46
NLD	1.09	0.95	1.03	1.00	0.94	1.09	0.43
ITA	1.09	0.98	1.07	1.00	1.17	1.02	0.54
BEL	1.14	0.96	1.09	1.00	1.01	1.14	0.37
IRL	1.25	0.88	1.10	0.97	1.16	1.05	0.49
\bar{x}	0.88	1.09	0.93	0.96	1.27	0.86	0.98

Vir: avtorji

Navedeni rezultati kažejo, da ekonomska neenakost med državami območja evra nastaja z mednarodno trgovino, v kateri se menja blago z bistveno različnimi količinami opredmetenega dela. S tem nastaja meddržavni transfer vrednosti, ki se pokaže tudi v ne-ekvivalentni menjavi dela. Države, ki imajo višjo organsko sestavo kapitala, monopolno pozicijo na mednarodnem trgu in večjo raven ekonomske učinkovitosti, nasploh ustvarjajo višje dohodke iz dela in višje dohodke iz kapitala in imajo nižje stopnje eksploatacije delovne sile.

Do sedaj omenjeni cilji doktorske disertacije so povezani z izgradnjo teoretičnega modela in njegovo empirično uporabo. Četrty in peti cilj pa izpostavlja vprašanje dinamike odnosov med državami, ki nastanejo z ne-ekvivalentno menjavo dela. Obdobje, ki ga v doktorski disertaciji analiziramo, tj. čas od leta 2003 do leta 2014, omogoča, poleg analize dinamike same po sebi, tudi proučevanje vpliva ekonomskega cikla in kriznih obdobj na

ne-ekvivalentno menjavo dela in neenakost znotraj območja evra. Pri tem se v disertaciji zgledujemo po delih Prebisha (1950), Singerja (1950), Lewisa (1954) in Emmanuela (1972). Vpliv ciklov na ne-ekvivalentno menjavo dela je tako znotraj omenjenega obdobja možno raziskovati z vidika vseh determinant ne-ekvivalentne menjave dela, pa tudi z vidika vplivov ciklov na posamezne države, razporejene v center in periferijo, s tem pa tudi v države neto zmagovalke in neto izgubaše. Te rezultate v doktorski disertaciji dosegamo s klasterskim razporejanjem držav glede na podobnosti in različnosti v neenakosti, ki nastaja s trgovinskimi odnosi med njimi. Raziskovanje potrjuje, da ekonomski cikli in krize na heterogeni način vplivajo na posamezne države, s tem pa potrjujemo tezo, da države območja evra v nasprotju s pričakovanji ne kažejo tendence k podobnosti v različnih fazah ekonomskega cikla. Prav tako ugotavljamo, da je vpliv ciklov pomemben za analiziranje razlik med centrom in periferijo območja evra. Države, ki so neto zmagovalke in sestavljajo center območja evra, so pokazale bolj uravnotežene trende glede na pojav kriz. Države, ki sestavljajo periferijo in so neto izgubaši v ne-ekvivalentni menjavi dela, pa so se izkazale kot bistveno bolj odvisne od ekonomskega cikla in kriz. Razlike med centrom in periferijo so tako v prvi vrsti nastajale s spremembami v perifernih državah.

Zato, da bi dosegli šesti in sedmi cilj doktorske disertacije, smo uporabili regresijski model s fiksnim učinkom, pri čemer smo uporabljali podatke za držav območja evra v obdobju od leta 2003 do leta 2016. Empirična analiza odkriva značilnost vpliva ekonomske strukture, velikosti države, razvitosti države, organske sestave kapitala in brezposelnosti na ne-ekvivalentno menjavo dela in ekonomsko neenakost med državami območja evra. V tej analizi smo posebno pozornost namenili vplivu ekonomske strukture v obliki sektorske strukture in tehnološke strukture posameznih gospodarstev znotraj območja evra. V analizo smo prav tako zajeli vse determinante ne-ekvivalentne menjave dela in njihove učinke. Pri analizi pa smo upoštevali dela Prebisha (1950), Singerja (1950), Lewisa (1954) in Emmanuela (1972). Tako smo predvsem analizirali vpliv sektorske in tehnološke strukture na procese ustvarjanja vrednosti in transfer vrednosti med državami evro območja, ki nastane z mednarodno trgovino. Analiza potrjuje obstoj vpliva sektorske in tehnološke strukture ter tehnološke razvitosti države in njenega gospodarstva na položaj posamezne države znotraj območja evra, kaže pa tudi na asimetrično razporeditev koristi, ki izhajajo iz evropske integracije, ki jo opredeljuje evro.

Z zadnjem ciljem smo si zadali nalogo, da pokažemo implikacije ugotovitev v okviru doktorske disertacije za oblikovanje nacionalnih gospodarskih politik, ki naj bi izboljšale relativni položaj posameznih držav in zmanjšale na ta način neenakosti znotraj območja evra. Pri tem smo ugotovili, da morajo kreatorji nacionalnih gospodarskih politik v manj razvitih državah analiziranega območja upoštevati razlike v stopnji razvoja posameznih držav. Manj razvite države morajo izboljšati svojo tržno pozicijo, in sicer z ekspanzijo sektorjev, ki so sicer povezani z manj razvito tehnologijo, a imajo ugoden položaj na trgu glede na konkurente. Prav tako morajo manj razvite države upoštevati sklep, da večji

delež gradbeništva in storitvenega sektorja z manjšo kapitalno intenzivnostjo zmanjšuje količino družbeno priznanega dela, vloženega v proizvodni proces. Manj razvite države morajo prav tako uravnotežiti nacionalne trge delovne sile in upoštevati dejstvo, da razvoj naprednejše tehnologije in proizvodnih sektorjev, ki povečujejo ekonomsko učinkovitost, vpliva na povečanje profita predvsem v uspešnih državah z vidika ne-ekvivalentne menjave dela znotraj območja evra. Vsi navedeni sklepi potrjujejo stališče, da morajo kreatorji gospodarskih politik, če želijo izboljšati relativni položaj posameznih gospodarstev znotraj območja evra, razviti strateško in aktivno upravljanje ter vodenje na področju sektorske strukture in tehnološke politike. Zato je implementacija ustreznih gospodarskih politik predpogoj za borbo proti ne-ekvivalentni menjavi dela in za zmanjševanje ekonomske neenakosti med državami znotraj območja evra.

Doktorska disertacija omogoča jasen zaključek, da je obstoj ne-ekvivalentne menjave dela znotraj evro območja v neposrednem konfliktu s cilji meddržavne solidarnosti, enakosti in promoviranja integracijske blaginje vseh državljanov na tem območju. Ta sklep tudi jasno kaže na strukturne nekonsistentnosti tega območja, ki jih ni mogoče rešiti zgolj z nacionalnimi gospodarskimi politikami, saj te postavljajo nacionalne interese pred integracijske cilje. Rezultati doktorske disertacije tako kažejo, da je bodočnost in obstojnost evropskega integracijskega projekta možno zgolj ob skupnih naporih, s pomočjo katerih je mogoče obvladati ali pa vsaj ublažiti sedanje negativne učinke ne-ekvivalentne menjave dela. V nasprotnem primeru bo neuspeh kolektivnega obvladovanja negativnih učinkov ne-ekvivalentne menjave dela sprožal nove procese dezintegracije in s tem izzival obstoj samega evropskega socialnega projekta.

Prispevki k znanosti in zaključna diskusija

Doktorsko disertacijo lahko ocenjujemo z teoretičnega, metodološkega in praktičnega vidika.

S teoretičnega vidika je v doktorski disertaciji originalni prispevek k znanosti zagotovo dosežen z razvojem originalnega ekonomskega modela, ki temelji na delovni teoriji vrednosti. Inovativno in pragmatično rešitev transformacijskega problema omogoča – preko fizičnega sistema - povezovanje cenovnega in vrednostnega sistema v enotnem ekonomskem modelu, kar omogoča izpeljavo originalnega ekonomskega modela, ki je baziran na marksistični ekonomski tradiciji. Tako oblikovan ekonomski model omogoča proučevanje ekonomske neenakosti, in sicer z izpostavljanjem medsektorskih odnosov ter uporabo koncepta eksploatacije delovne sile v razrednem antagonizmu (Bose, 1980; Veneziani & Yoshihara, 2017). Model vključuje možnost, da monopol nad produkcijskimi sredstvi omogoča lastnikom kapitala eksploatacije delovne sile (Marx, 1990) in s tem daje tudi teoretsko osnovo za poglobljeno analizo ekonomskih neenakosti.

Z metodološkega vidika je zagotovo pomembno, da je tako razvit ekonomski model omogočil analizo medsektorskih odnosov na način, da je ta razširjena na analizo meddržavnih odnosov, pri čemer pa odnosi eksploatacije med razredi znotraj države dobivajo svojo podobo tudi v neenakosti med državami (Marx, 1971). Gre torej za uporabo originalnega teoretičnega modela v empirični analizi. S tega vidika je pomembno, da je empirična analiza fokusirana na države območja evra, ki zaradi enotnega trga ene valute, visokega deleža medsebojne trgovine in sorodnega institucionalnega okvira omogoča uporabo teoretičnega modela tudi za proučevanje odnosov med državami, ki pa se obnašajo kot zaprta integracija. Posamezne države pa po zgledu van Schaikovega modela (1976) prevzemajo vlogo posameznih sektorjev. V takšni empirični analizi nastaja neenakost zato, ker kapitalistično prisvajanje omogoča prisvajanje presežne vrednosti znotraj posamezne države, hkrati pa je ta proces podlaga za prisvajanje presežne vrednosti med državami, in sicer od manj razvitih k bolj razvitim državam (Bauer, 2000). Ekonomske neenakosti v taki analizi postanejo logična posledica mednarodne trgovine, v kateri prihaja do transferja vrednosti, ki omogoči, zaradi ne-ekvivalentne menjave dela, da so manj razvite države izkoriščane s strani visoko razvitih trgovinskih partnerjev (Emmanuel, 1972). Omejitev analize na države s skupnim evrom je omogočila tudi odpravo večjega števila kritiziranih vidikov teorije ne-ekvivalentne menjave dela (Bettelheim, 1972; Evans, 1976; Amin, 1977; Janvry & Kramer, 1979). Takšna analiza namreč omogoča raziskovalno podlago, v kateri je smiselno domnevati, da zakon vrednosti deluje na enak način in hkrati na ravni posameznih držav in v meddržavni trgovini. Prav tako je mogoče domnevati, da so proizvodni faktorji znotraj območja evra konkurenčni in mobilni, in da odnosi med državami z vidika delovanja trgov niso modificirani zaradi različnih denarnih politik. Zelo pomembno je tudi dejstvo, da med članicami območja evro prihaja do ukinjanja trgovinskih ovir, s paktom za stabilnost in rast pa se vzpostavlja tudi svobodno delovanje trga z minimalnim vplivom držav na ekonomsko dejavnost.

Zaradi vsega navedenega je empirična analiza, izvedena na omenjenem teoretskem modelu in prikazana v disertaciji, najobsežnejše raziskovanje pojava ne-ekvivalentne menjave dela znotraj območja evra. Ta analiza tudi z empiričnega vidika potrjuje, da je ekonomska neenakost povezana z ne-ekvivalentno menjavo dela. V doktorski disertaciji tako predstavljamo determinante eksploatacijskih meddržavnih odnosov in načine, kako se ta pojavlja, pa tudi reproducira znotraj evro območja ter s tem povzroča neenakost tega območja kot trajno značilnost. Delo se tako uvršča med raziskave, ki ugotavljajo eksploatacijske odnose znotraj območja evra (Boundi Chraki, 2018; Ricci, 2019; Seretis & Tsaliki, 2016; Baiman, 2014; Bieler & Morton, 2014). Originalnost doktorske disertacije glede na navedena dela pa je v tem, da nihče ni analiziral celotnega območja in pojava eksploatacije skozi čas. Zagotovo je originalni prispevek te disertacije tudi analiza vpliva ekonomskega cikla in kriz ter ekonomske strukture na ne-ekvivalentno menjavo dela znotraj evro območja. Vse to utemeljuje sklep, da tako teoretične rešitve kot njihova empirična uporaba predstavljajo originalni znanstveni prispevek teoriji

marksistične ekonomije, teoriji ne-ekvivalentne menjave dela in teoriji ekonomske neenakosti.

Utemeljitev ne-ekvivalentne menjave dela je zato tudi antiteza ciljem integracije na območju evra, kar daje številne praktične implikacije. Glede na to, da ekonomske integracije na tem področju zaradi sinergičnih učinkov ekonomije obsega daje članicam te integracije večjo raven blaginje, kot bi jo dosegale, če bi delovale samostojno, je potrebno v bodoče večjo pozornost nameniti zmanjševanju pojava ne-ekvivalentne menjave dela in s tem tudi zaščititi temeljnih vrednosti območja evra. To je možno narediti na različne načine, zagotovo pa je potrebno izpostaviti, da je mogoče evropsko neenakost manjšati skozi novo definicijo socialnih in investicijskih skladov (László, 2018), in sicer na način, da se s temi sredstvi disproporcionalno pomaga državam, ki izgubljajo v trgovinski menjavi. Prav tako je potrebno, da kreatorji gospodarske politike uvajajo določene oblike podpore nezaposlenim na ravni same integracije (Vanderbroucke, 2019) in da se uveljavlja meddržavna koordinacija plačne politike, podprte tudi z aktivnim delovanjem delavskih sindikatov (Stockhammer, 2011; Brancaccio, 2012). Prav tako ni odveč analizirati možnosti federalne integracije (Bieler, Jordan & Morton, 2019), koordinacije davčnih politik in davčne harmonizacije (Beetsma & Jensen, 2005), bančne unije (Stiglitz, 2016) in ustanovitve fonda za financiranje javnih dolgov članic na periferiji (Valentini, 2019). Prav tako doktorska disertacija izziva potrebo po analizi preoblikovanja klirinške unije (Whyman, 2014), da bi se na ta način zmanjšali ali odpravili negativni učinki transferov med državami ali pa vsaj uvedli ukrepi direktne kompenzacije držav periferije s strani držav centra. Vse navedene reforme bi zmanjšale ekonomsko neenakost, povrnile zaupanje v integracijo, zaščitile temeljna načela solidarnosti, socialne vključenosti in enakosti vseh prebivalcev ter povečale blaginjo celotnega območja. Doktorska disertacija nesporno vodi k pozivom, da je potrebno tudi v bodoče z znanstvenimi raziskovanji posebno pozornost nameniti iskanju optimalnih rešitev, ki bi omogočale ohranitev enotnih in zelo pomembnih elementov socio-ekonomskih vrednosti na območju evra in s tem ustvarjanje temeljev za dolgoročno vzdržnost evropskega socialnega modela.

Appendix 2: The absolute values of the euro area's relevant indicators (ten-year average for the period 2004-2013)

ISO	GDP	GDP _{pc}	GDP _u	NV	W	W _{pc}	Π	Π _{pc}	K	L
AUT	3586.02	3498.77	3514.79	3320.76	2275.16	2121.67	1310.86	1377.10	11424.74	3704400
BEL	4395.85	4029.31	4040.46	3870.00	2827.90	2472.59	1567.96	1556.72	12914.93	4317100
CYP	267.59	271.68	288.17	322.00	159.35	205.73	108.24	65.95	547.14	359200
EST	325.57	437.62	470.84	528.27	202.33	337.52	123.25	100.10	830.47	589300
FIN	2140.18	2142.68	2143.85	2105.01	1351.63	1344.92	788.55	797.76	6618.44	2348200
FRA	23896.35	24196.94	24441.79	22367.07	16383.48	14290.58	7512.86	9906.35	82185.49	24951100
DEU	32931.44	31418.01	31471.35	32391.20	21208.26	20695.12	11723.17	10722.89	88959.68	36133300
GRC	3175.55	3496.71	3524.80	3732.31	1856.18	2384.62	1319.37	1112.09	9226.19	4163500
IRL	2083.17	1896.87	1946.39	1666.47	1115.26	1064.73	967.91	832.14	6903.64	1859000
ITA	21625.25	20146.87	20159.58	19766.51	12865.54	12629.05	8759.71	7517.82	62369.64	22050100
LVA	417.65	634.56	720.67	810.29	248.88	517.70	168.77	116.86	969.48	903900
LTU	678.51	892.05	1062.38	1185.09	373.58	757.17	304.93	134.88	1118.98	1322000
MLT	114.50	114.02	122.01	136.71	68.42	87.34	46.08	26.68	221.32	152500
NDL	7469.06	7232.64	7264.13	6873.87	4791.04	4391.80	2678.01	2840.85	23568.34	7668000
PRT	2815.18	3478.61	3648.03	4055.75	1874.32	2591.26	940.86	887.34	7361.61	4524300
SVK	1280.70	1567.05	1834.70	2053.91	713.18	1312.27	567.52	254.78	2113.73	2291200
SVN	576.98	695.43	735.81	821.40	400.96	524.80	176.02	170.63	1415.56	916300
ESP	14851.75	16481.48	16483.68	16624.68	9635.10	10621.70	5216.65	5859.77	48614.09	18545300

Note: All indicators are expressed in millions of 2011 PPP \$ besides the L which denotes total number of employed.

Source: The data sources are discussed within the second chapter.

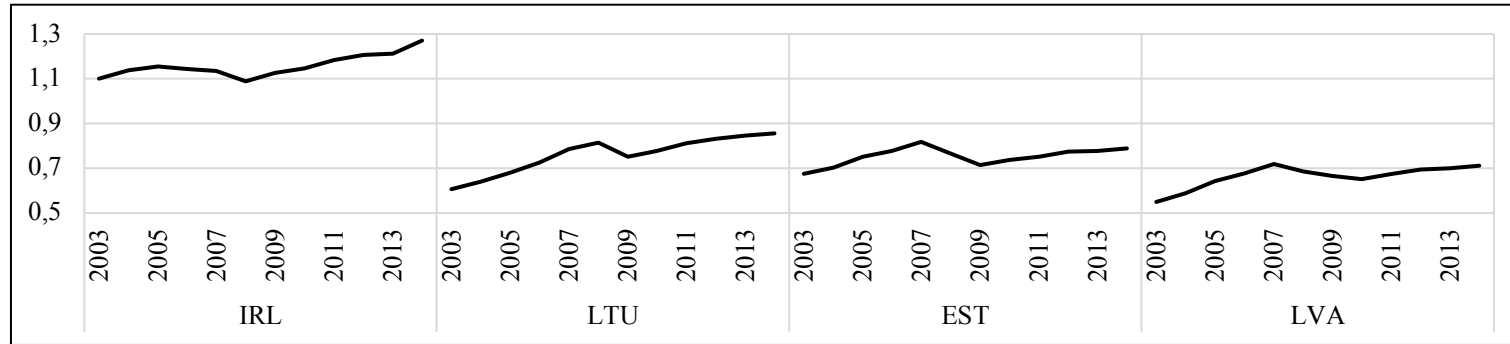
Appendix 3: Cyclical influence on the countries' market position (Actual GDP / equilibrium GDP ratio, 2003-2014).

ISO3	Period												
	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	Ø
AUT	0.99	1.01	1.01	1.01	1.02	1.02	1.03	1.01	1.02	1.02	1.01	1.01	1.01
BEL	1.09	1.10	1.10	1.10	1.09	1.09	1.11	1.10	1.10	1.10	1.10	1.10	1.10
CYP	0.98	0.98	0.99	0.99	0.98	1.01	1.01	0.97	0.95	0.94	0.92	0.91	0.97
EST	0.68	0.70	0.75	0.78	0.82	0.76	0.71	0.74	0.75	0.77	0.78	0.79	0.75
FIN	0.99	1.01	1.02	1.02	1.04	1.04	0.99	1.00	1.00	0.99	0.98	0.97	1.00
FRA	0.98	0.98	0.99	0.99	0.98	0.98	0.99	0.98	0.99	1.00	1.00	0.98	0.99
DEU	1.04	1.04	1.03	1.04	1.04	1.04	1.02	1.04	1.04	1.04	1.04	1.04	1.04
GRC	0.94	0.96	0.95	0.97	0.98	0.97	0.96	0.91	0.86	0.86	0.86	0.87	0.92
IRL	1.10	1.14	1.15	1.14	1.14	1.09	1.13	1.15	1.18	1.21	1.21	1.27	1.16
ITA	1.12	1.11	1.11	1.10	1.10	1.08	1.08	1.07	1.06	1.04	1.04	1.04	1.08
LVA	0.55	0.59	0.64	0.68	0.72	0.68	0.66	0.65	0.67	0.69	0.70	0.71	0.66
LTU	0.61	0.64	0.68	0.72	0.79	0.81	0.75	0.78	0.81	0.83	0.85	0.86	0.76
MLT	0.97	0.96	0.98	0.97	0.98	0.99	0.99	0.99	0.97	0.98	1.00	1.05	0.98
NLD	1.01	1.01	1.03	1.03	1.03	1.04	1.04	1.04	1.04	1.04	1.04	1.05	1.03
PRT	0.79	0.79	0.80	0.79	0.80	0.80	0.82	0.83	0.82	0.81	0.82	0.82	0.81
SVK	0.69	0.71	0.74	0.77	0.82	0.84	0.82	0.85	0.86	0.86	0.87	0.87	0.81
SVN	0.79	0.79	0.81	0.83	0.86	0.87	0.83	0.83	0.84	0.82	0.82	0.84	0.83
ESP	0.91	0.90	0.89	0.89	0.88	0.89	0.93	0.92	0.91	0.91	0.92	0.92	0.91

Source: Authors' own calculations.

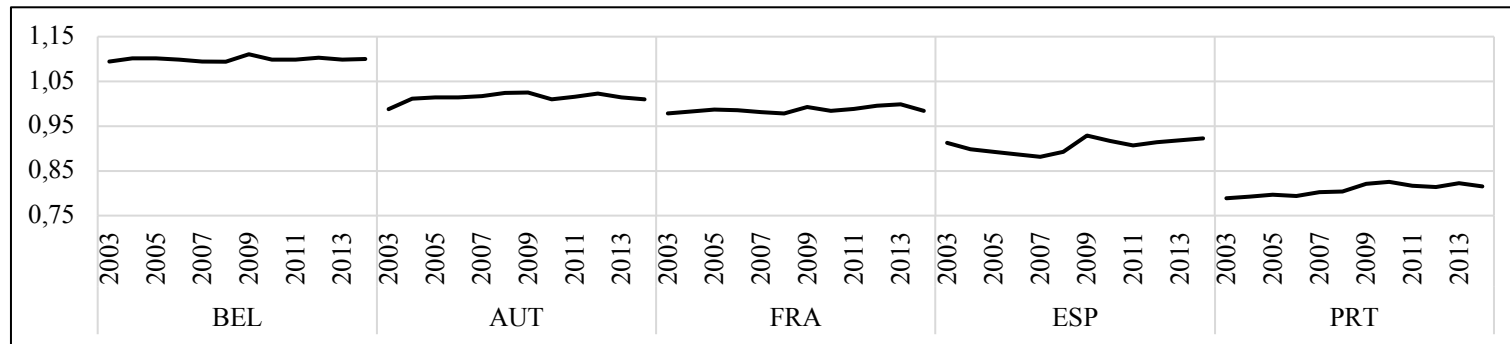
Appendix 4: Clustering of the euro area member countries: Cyclical influence on the countries' market position (2003-2014).

1. Actual GDP / equilibrium GDP ratio - Group A



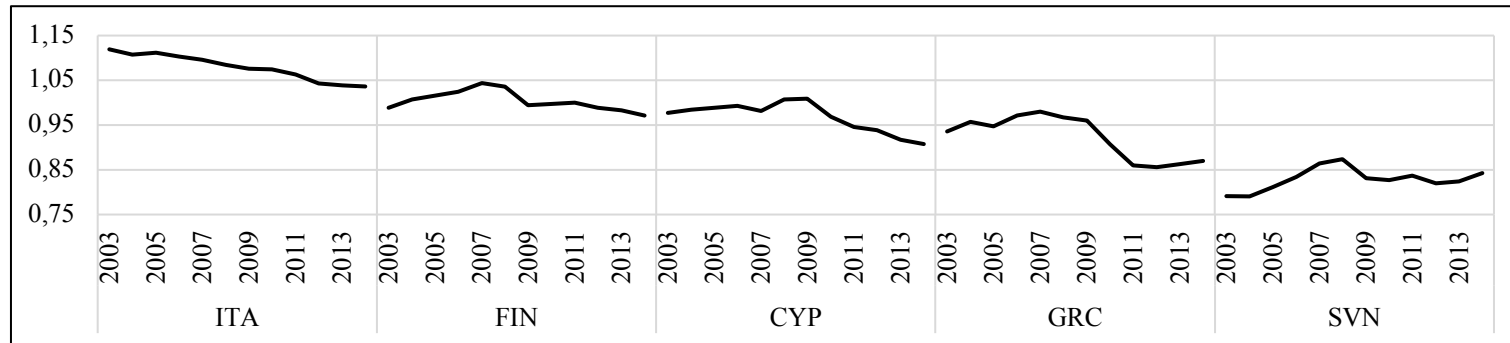
Source: Authors' own calculations.

2. Actual GDP / equilibrium GDP ratio - Group B



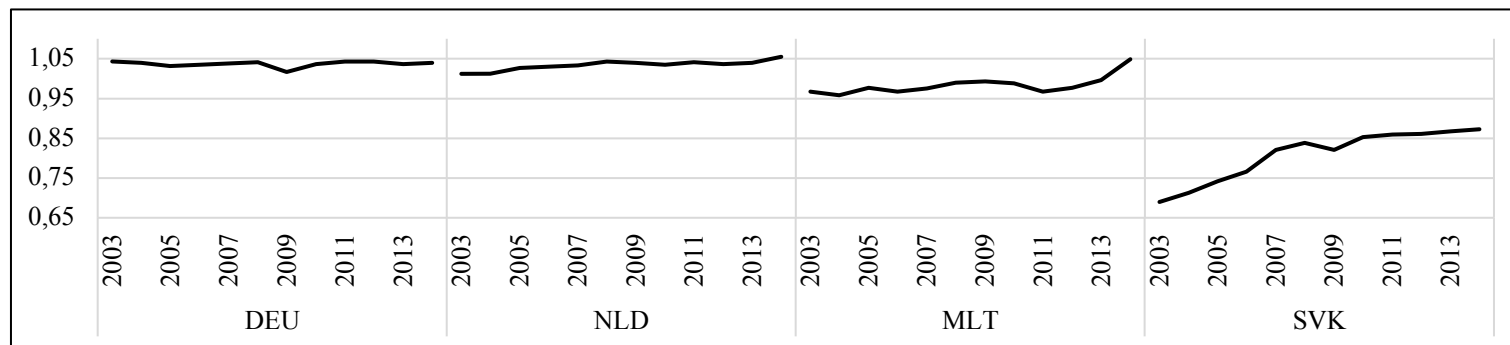
Source: Authors' own calculations.

3. Actual GDP / equilibrium GDP ratio - Group C



Source: Authors' own calculations.

4. Actual GDP / equilibrium GDP ratio - Group D



Source: Authors' own calculations.

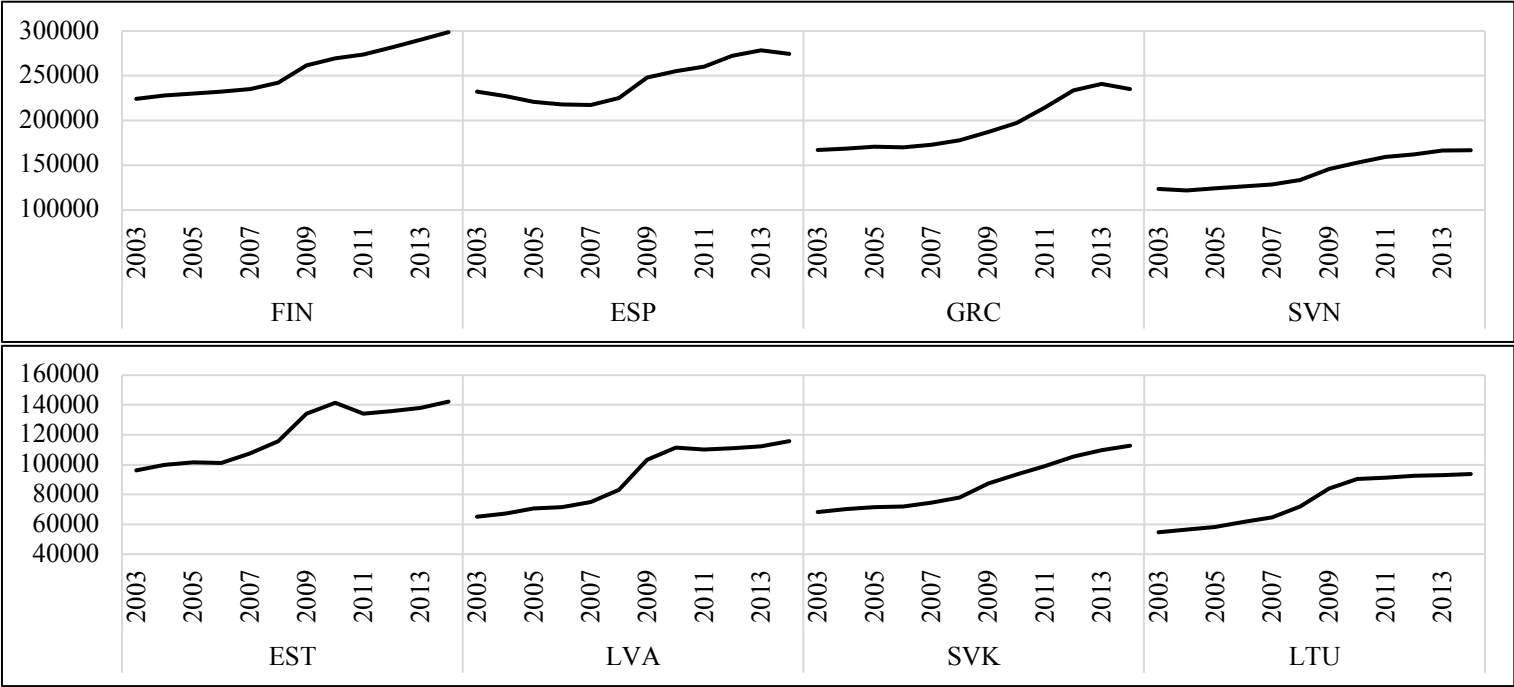
Appendix 5: Cyclical influence on the countries' capital-labour ratios (New value created/equilibrium GDP ratio, 2003-2014)

ISO3	Period												
	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	Ø
AUT	0.95	0.94	0.93	0.93	0.93	0.93	0.94	0.94	0.94	0.95	0.95	0.95	0.94
BEL	0.96	0.97	0.97	0.96	0.96	0.96	0.97	0.97	0.97	0.97	0.98	0.97	0.97
CYP	1.16	1.17	1.17	1.18	1.18	1.17	1.16	1.17	1.17	1.16	1.15	1.15	1.17
EST	1.26	1.26	1.26	1.26	1.25	1.23	1.20	1.19	1.21	1.21	1.21	1.21	1.23
FIN	1.01	1.01	1.01	1.00	1.00	0.99	0.99	0.98	0.98	0.98	0.98	0.97	0.99
FRA	0.93	0.93	0.92	0.92	0.92	0.92	0.93	0.93	0.93	0.93	0.93	0.93	0.93
DEU	1.01	1.01	1.01	1.01	1.01	1.02	1.02	1.02	1.03	1.03	1.03	1.02	1.02
GRC	1.11	1.11	1.11	1.11	1.11	1.10	1.10	1.09	1.07	1.05	1.04	1.05	1.09
IRL	0.97	0.96	0.97	0.96	0.96	0.95	0.94	0.93	0.93	0.94	0.95	0.96	0.95
ITA	0.98	0.98	0.98	0.98	0.98	0.98	0.99	0.99	0.99	1.00	1.00	1.00	0.99
LVA	1.34	1.34	1.34	1.34	1.34	1.31	1.26	1.26	1.26	1.26	1.27	1.26	1.30
LTU	1.37	1.38	1.37	1.37	1.37	1.35	1.31	1.31	1.31	1.30	1.31	1.31	1.34
MLT	1.15	1.15	1.16	1.16	1.16	1.16	1.16	1.17	1.18	1.18	1.20	1.20	1.17
NLD	0.96	0.96	0.95	0.95	0.95	0.95	0.96	0.95	0.94	0.95	0.95	0.95	0.95
PRT	1.17	1.17	1.17	1.17	1.17	1.17	1.16	1.17	1.16	1.15	1.15	1.16	1.16
SVK	1.33	1.34	1.33	1.34	1.34	1.33	1.30	1.30	1.29	1.27	1.27	1.26	1.31
SVN	1.20	1.21	1.20	1.20	1.20	1.19	1.17	1.17	1.16	1.16	1.16	1.16	1.18
ESP	1.00	1.00	1.02	1.03	1.03	1.02	1.00	1.00	1.00	0.99	0.99	1.00	1.01

Source: Authors' own calculations.

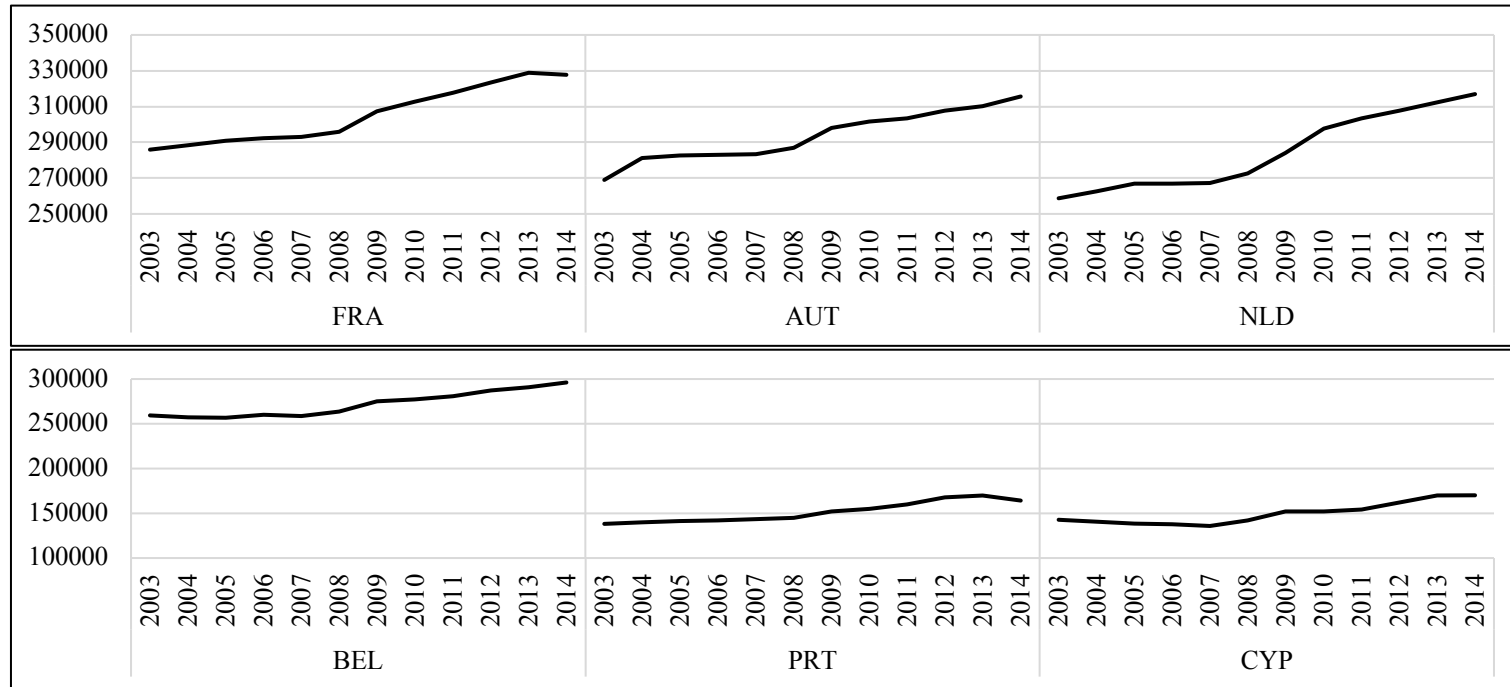
Appendix 6: Clustering of the euro area member countries: Cyclical influence on the countries' capital-labour ratios (2003-2014)

1. New value created / equilibrium GDP ratio – Group A



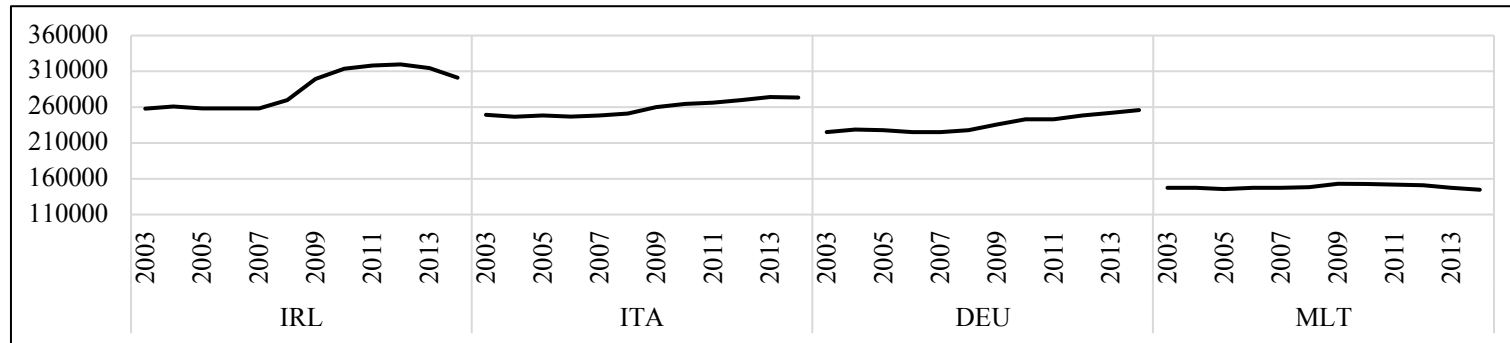
Source: Authors' own calculations.

2. New value created / equilibrium GDP ratio – Group B



Source: Authors' own calculations.

3. New value created / equilibrium GDP ratio – Group C



Source: Authors' own calculations.

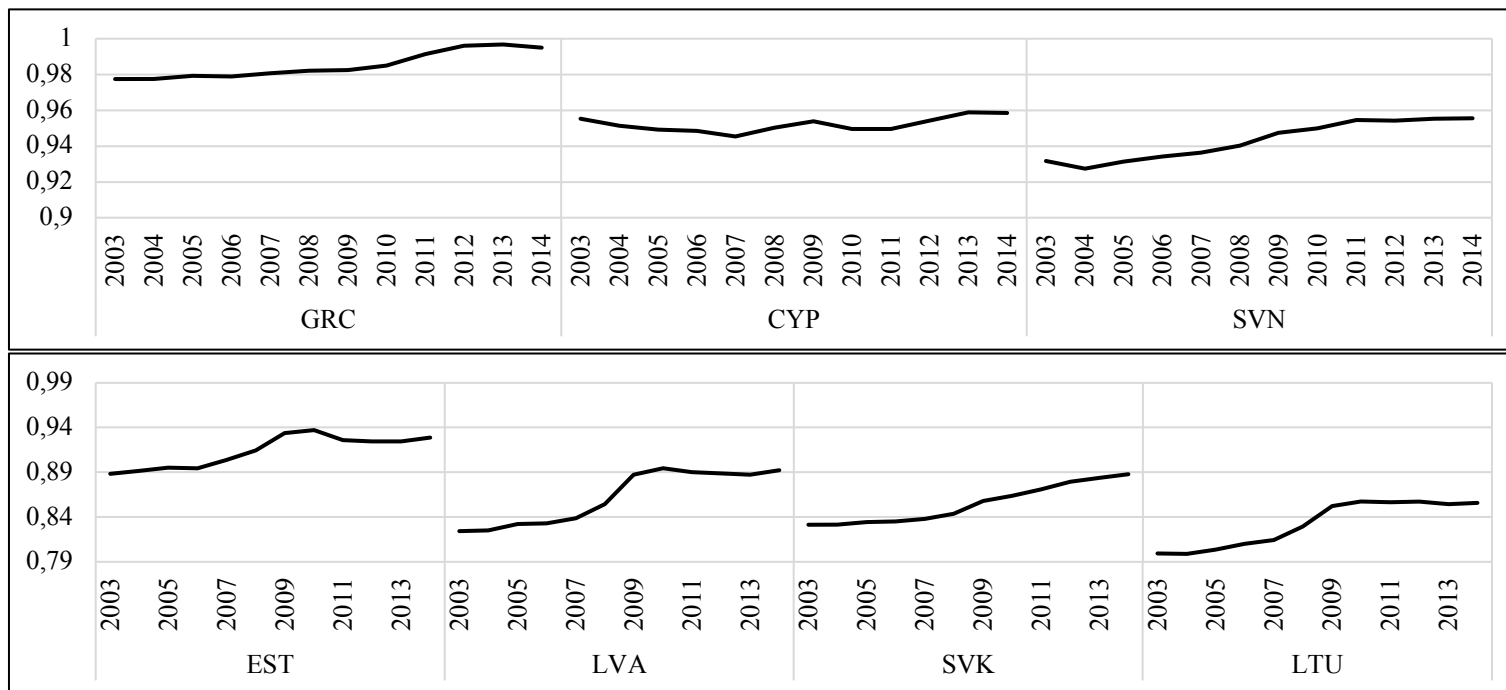
Appendix 7: Cyclical influence on the countries' economic efficiency (Equilibrium GDP / efficient GDP ratio, 2003-2014)

ISO3	Period												
	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	Ø
AUT	0.995	0.993	0.992	0.991	0.991	0.992	0.993	0.994	0.995	0.995	0.996	0.995	0.993
BEL	0.997	0.998	0.998	0.997	0.998	0.998	0.998	0.999	0.999	0.999	0.999	0.998	0.998
CYP	0.955	0.951	0.949	0.949	0.945	0.950	0.954	0.950	0.950	0.954	0.959	0.959	0.952
EST	0.888	0.892	0.896	0.895	0.904	0.915	0.934	0.937	0.926	0.924	0.924	0.929	0.914
FIN	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.999	0.999	0.999	0.998	1.000
FRA	0.990	0.990	0.989	0.988	0.988	0.989	0.990	0.991	0.991	0.991	0.991	0.992	0.990
DEU	1.000	1.000	1.000	1.000	1.000	1.000	0.999	0.999	0.999	0.999	0.999	0.999	0.999
GRC	0.978	0.978	0.979	0.979	0.981	0.982	0.982	0.985	0.992	0.996	0.997	0.995	0.985
IRL	0.998	0.998	0.998	0.998	0.998	0.996	0.993	0.991	0.991	0.992	0.995	0.998	0.995
ITA	0.999	0.999	0.999	0.999	0.999	0.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000
LVA	0.824	0.825	0.833	0.833	0.839	0.854	0.887	0.895	0.890	0.889	0.887	0.893	0.862
LTU	0.800	0.799	0.804	0.810	0.814	0.830	0.852	0.857	0.857	0.857	0.855	0.856	0.832
MLT	0.960	0.959	0.958	0.959	0.959	0.957	0.955	0.950	0.947	0.942	0.936	0.932	0.951
NLD	0.998	0.997	0.996	0.996	0.996	0.996	0.996	0.995	0.995	0.995	0.995	0.995	0.996
PRT	0.951	0.950	0.953	0.954	0.954	0.953	0.954	0.953	0.955	0.959	0.959	0.953	0.954
SVK	0.831	0.832	0.834	0.835	0.838	0.843	0.858	0.864	0.871	0.880	0.884	0.888	0.855
SVN	0.932	0.927	0.931	0.934	0.936	0.940	0.947	0.950	0.954	0.954	0.955	0.956	0.943
ESP	1.000	1.000	0.999	0.999	0.999	0.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000

Source: Authors' own calculations.

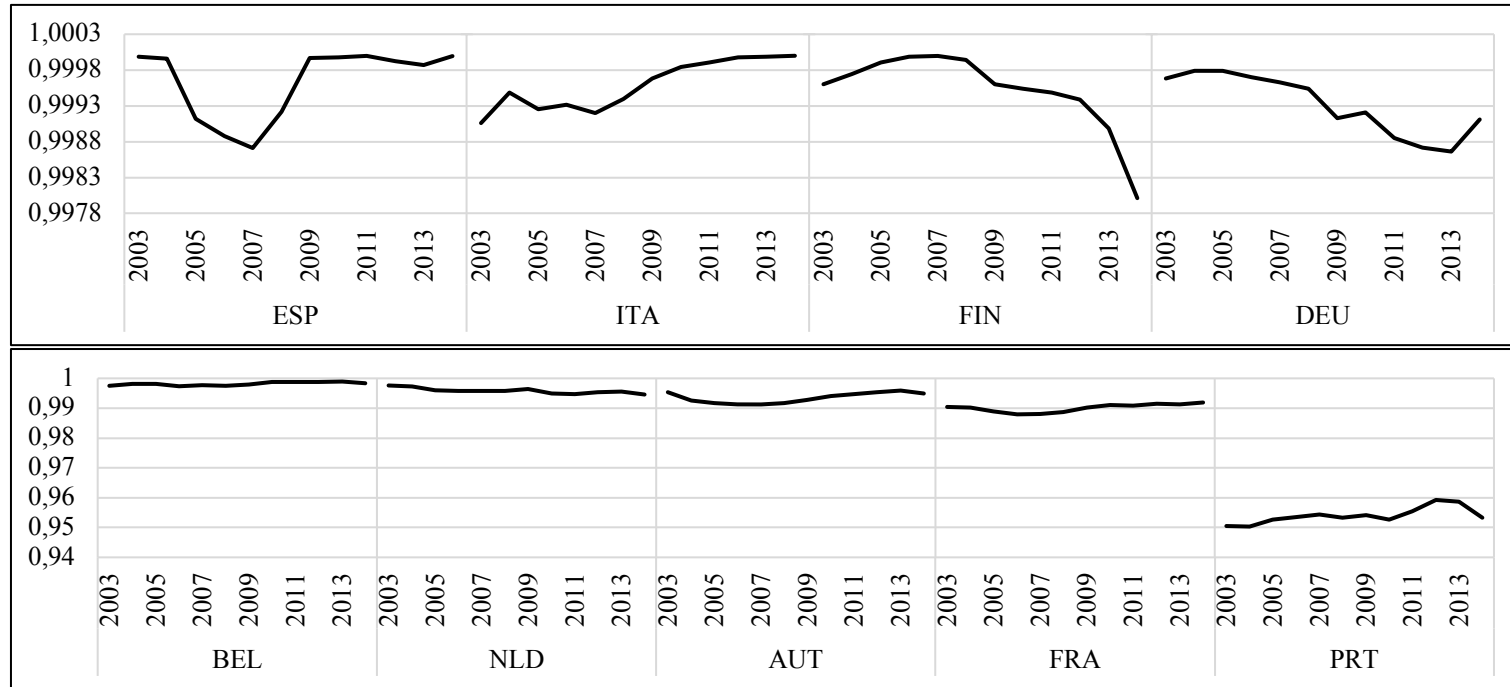
Appendix 8: Clustering of the euro area member countries: Cyclical influence on the countries' economic efficiency (2003-2014)

1. Equilibrium GDP / efficient GDP ratio – Group A



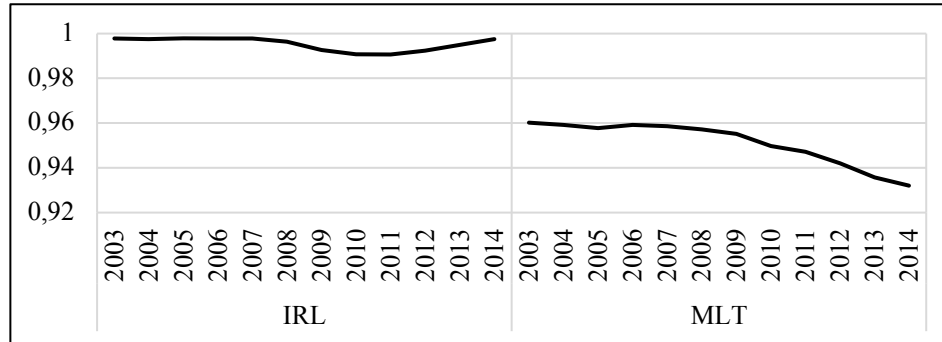
Source: Authors' own calculations.

2. Equilibrium GDP / efficient GDP ratio – Group B



Source: Authors' own calculations.

3. Equilibrium GDP / efficient GDP ratio – Group C



Source: Authors' own calculations.

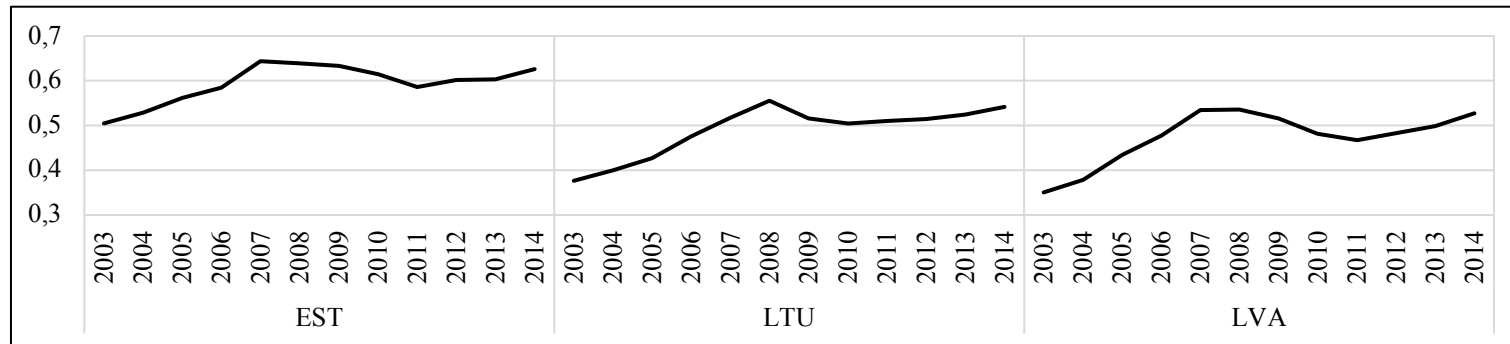
Appendix 9: Cyclical influence on labour income formation (Actual labour income / equilibrium labour income ratio, 2003-2014).

ISO3	Period												
	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	Ø
AUT	1.04	1.07	1.06	1.06	1.07	1.09	1.09	1.07	1.07	1.08	1.08	1.08	1.07
BEL	1.16	1.15	1.14	1.15	1.14	1.16	1.16	1.12	1.13	1.14	1.14	1.14	1.14
CYP	0.78	0.79	0.81	0.83	0.84	0.86	0.88	0.84	0.82	0.81	0.76	0.76	0.81
EST	0.50	0.53	0.56	0.58	0.64	0.64	0.63	0.61	0.59	0.60	0.60	0.63	0.59
FIN	0.93	0.95	0.98	0.99	1.00	1.01	1.01	1.01	1.03	1.03	1.03	1.02	1.00
FRA	1.12	1.13	1.15	1.16	1.15	1.14	1.15	1.13	1.15	1.15	1.16	1.14	1.14
DEU	1.05	1.04	1.02	1.01	1.01	1.03	1.01	1.02	1.03	1.04	1.03	1.04	1.03
GRC	0.77	0.78	0.79	0.81	0.83	0.82	0.81	0.78	0.74	0.72	0.71	0.73	0.77
IRL	0.89	0.95	0.99	1.02	1.03	1.03	1.05	1.03	1.03	1.02	1.02	1.03	1.01
ITA	1.03	1.02	1.04	1.05	1.05	1.03	1.01	1.02	1.00	0.99	0.98	0.97	1.02
LVA	0.35	0.38	0.43	0.48	0.53	0.54	0.52	0.48	0.47	0.48	0.50	0.53	0.47
LTU	0.38	0.40	0.43	0.48	0.52	0.56	0.52	0.51	0.51	0.51	0.52	0.54	0.49
MLT	0.76	0.78	0.79	0.79	0.80	0.79	0.81	0.77	0.78	0.77	0.77	0.82	0.79
NLD	1.08	1.08	1.08	1.07	1.09	1.10	1.10	1.09	1.11	1.09	1.10	1.13	1.09
PRT	0.73	0.72	0.74	0.73	0.73	0.73	0.73	0.73	0.72	0.70	0.70	0.69	0.72
SVK	0.46	0.46	0.49	0.49	0.53	0.54	0.56	0.57	0.59	0.59	0.60	0.61	0.54
SVN	0.71	0.71	0.74	0.75	0.78	0.79	0.76	0.77	0.79	0.77	0.77	0.78	0.76
ESP	0.95	0.97	0.92	0.91	0.90	0.89	0.91	0.92	0.90	0.89	0.90	0.90	0.91

Source: Authors' own calculations.

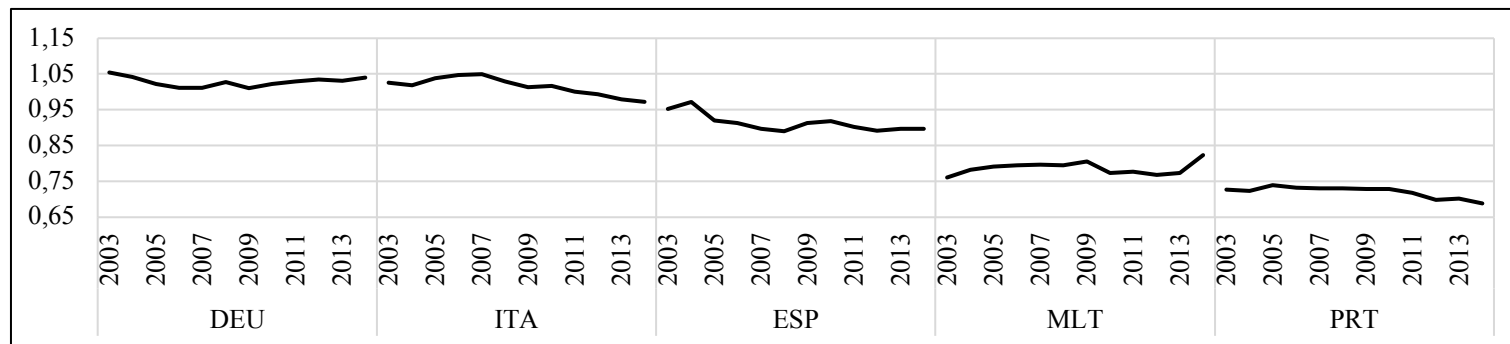
Appendix 10: Clustering of the euro area member countries: Cyclical influence on labour income formation (2003-2014).

1. Actual labour income / equilibrium labour income ratio – Group A



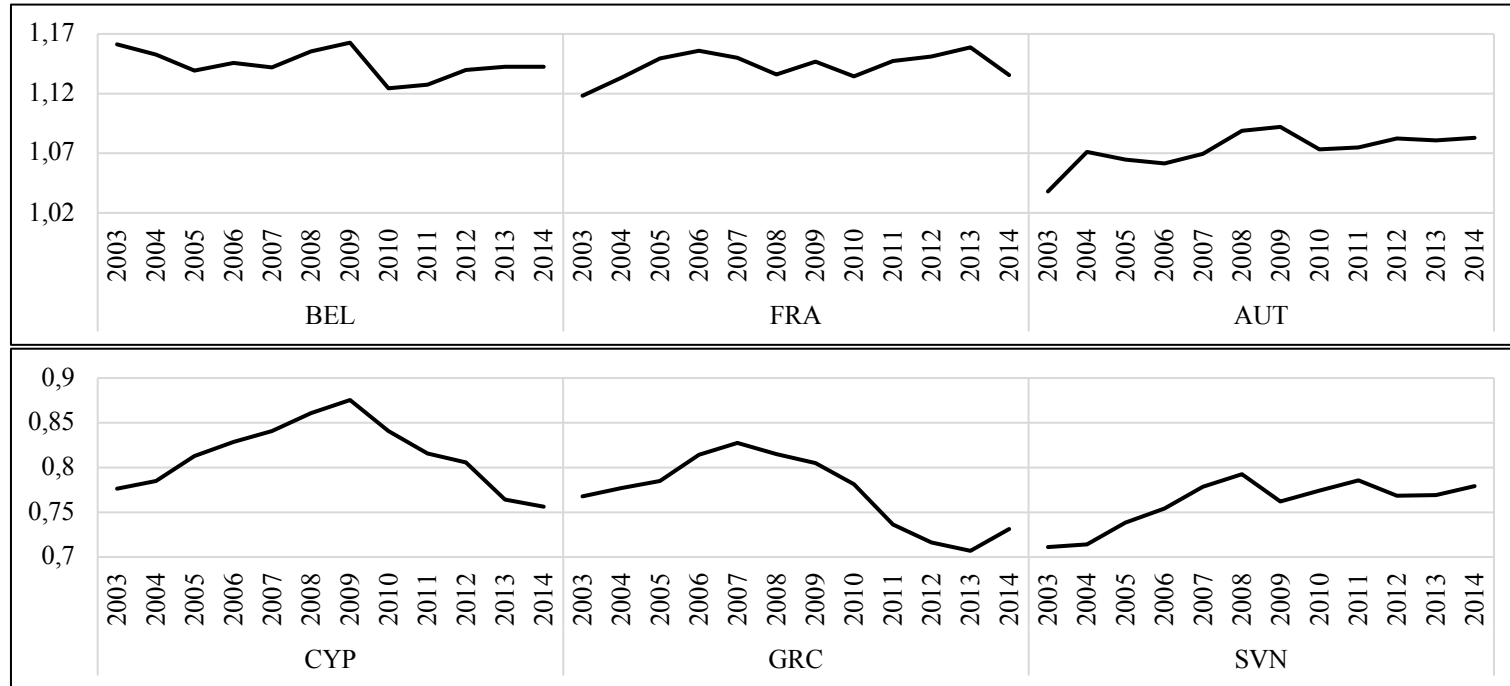
Source: Authors' own calculations.

2. Actual labour income / equilibrium labour income ratio – Group B



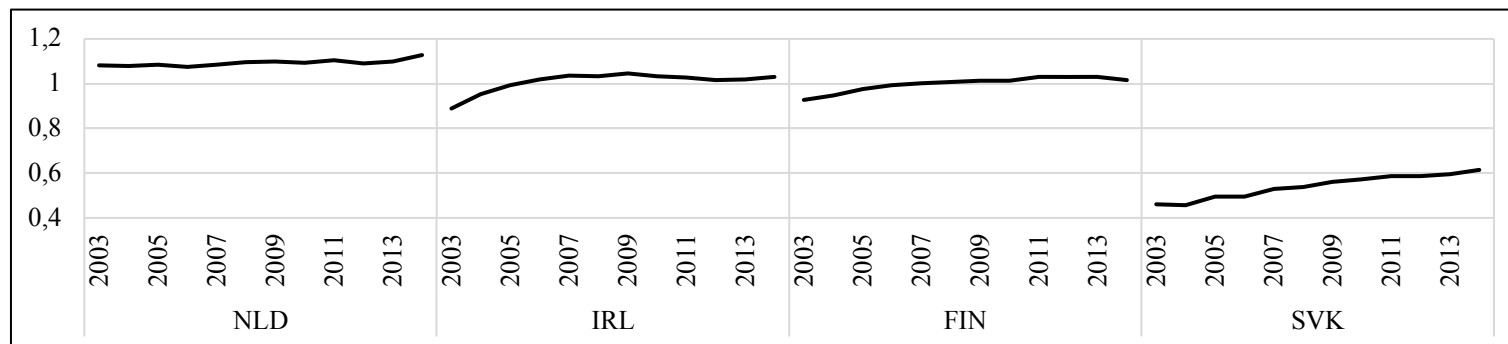
Source: Authors' own calculations.

3. Actual labour income / equilibrium labour income ratio – Group C



Source: Authors' own calculations.

4. Actual labour income / equilibrium labour income ratio – Group D



Source: Authors' own calculations.

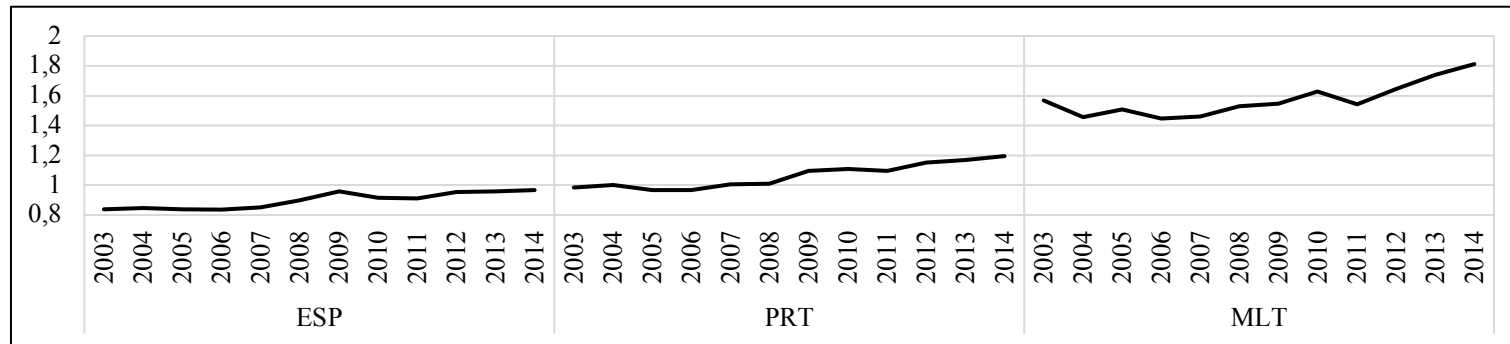
Appendix 11: Cyclical influence on profit income formation (Actual profit income / equilibrium profit income ratio, 2003-2014).

ISO3	Period												
	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	Ø
AUT	0.91	0.92	0.94	0.95	0.94	0.93	0.92	0.91	0.93	0.93	0.91	0.90	0.92
BEL	0.98	1.02	1.04	1.03	1.02	1.00	1.02	1.05	1.05	1.04	1.02	1.03	1.03
CYP	1.58	1.58	1.52	1.48	1.39	1.43	1.41	1.35	1.34	1.34	1.36	1.34	1.43
EST	1.44	1.44	1.53	1.56	1.46	1.21	0.99	1.14	1.32	1.39	1.39	1.35	1.35
FIN	1.11	1.12	1.09	1.08	1.11	1.08	0.96	0.97	0.95	0.92	0.91	0.90	1.02
FRA	0.77	0.76	0.75	0.75	0.75	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76
DEU	1.02	1.04	1.05	1.08	1.08	1.07	1.03	1.06	1.07	1.06	1.05	1.04	1.05
GRC	1.37	1.41	1.34	1.35	1.33	1.32	1.34	1.20	1.13	1.14	1.18	1.16	1.27
IRL	1.45	1.43	1.41	1.35	1.29	1.17	1.25	1.31	1.41	1.50	1.52	1.66	1.40
ITA	1.28	1.26	1.23	1.19	1.17	1.17	1.19	1.17	1.17	1.13	1.15	1.15	1.19
LVA	1.87	1.91	1.89	1.82	1.70	1.42	1.32	1.34	1.54	1.62	1.58	1.50	1.63
LTU	2.42	2.44	2.50	2.38	2.45	2.29	2.01	2.15	2.34	2.49	2.55	2.50	2.38
MLT	1.57	1.46	1.51	1.45	1.46	1.53	1.55	1.63	1.54	1.64	1.74	1.81	1.57
NLD	0.89	0.91	0.94	0.96	0.95	0.96	0.94	0.95	0.95	0.95	0.95	0.94	0.94
PRT	0.98	1.00	0.97	0.97	1.00	1.01	1.10	1.11	1.10	1.15	1.17	1.20	1.06
SVK	2.13	2.25	2.20	2.31	2.37	2.42	2.17	2.21	2.12	2.12	2.08	2.00	2.20
SVN	1.07	1.06	1.06	1.10	1.13	1.12	1.05	0.99	0.98	0.97	0.99	1.03	1.04
ESP	0.84	0.85	0.84	0.84	0.85	0.90	0.96	0.92	0.91	0.95	0.96	0.97	0.90

Source: Authors' own calculations.

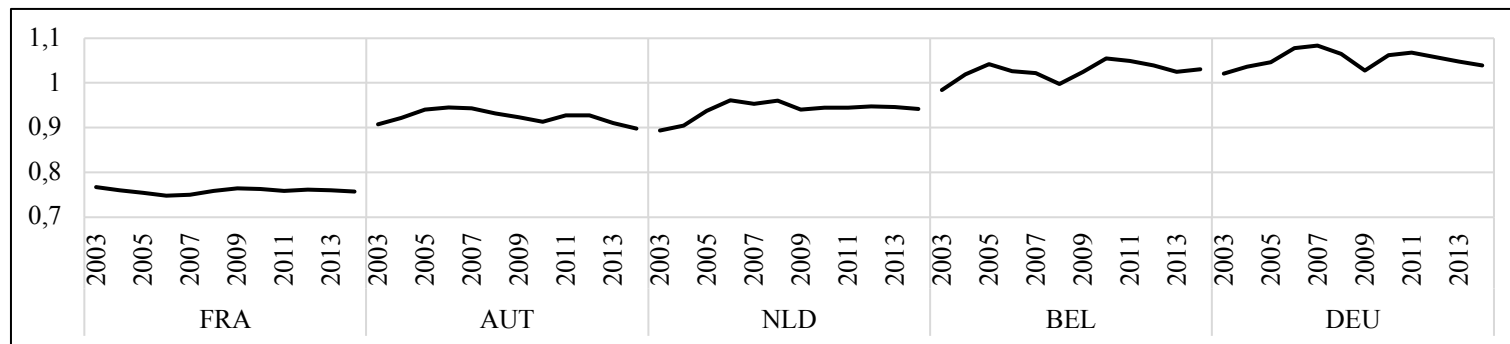
Appendix 12: Clustering of the euro area member countries: Cyclical influence on profit income formation (2003-2014).

1. Actual profit income / equilibrium profit income ratio – Group A



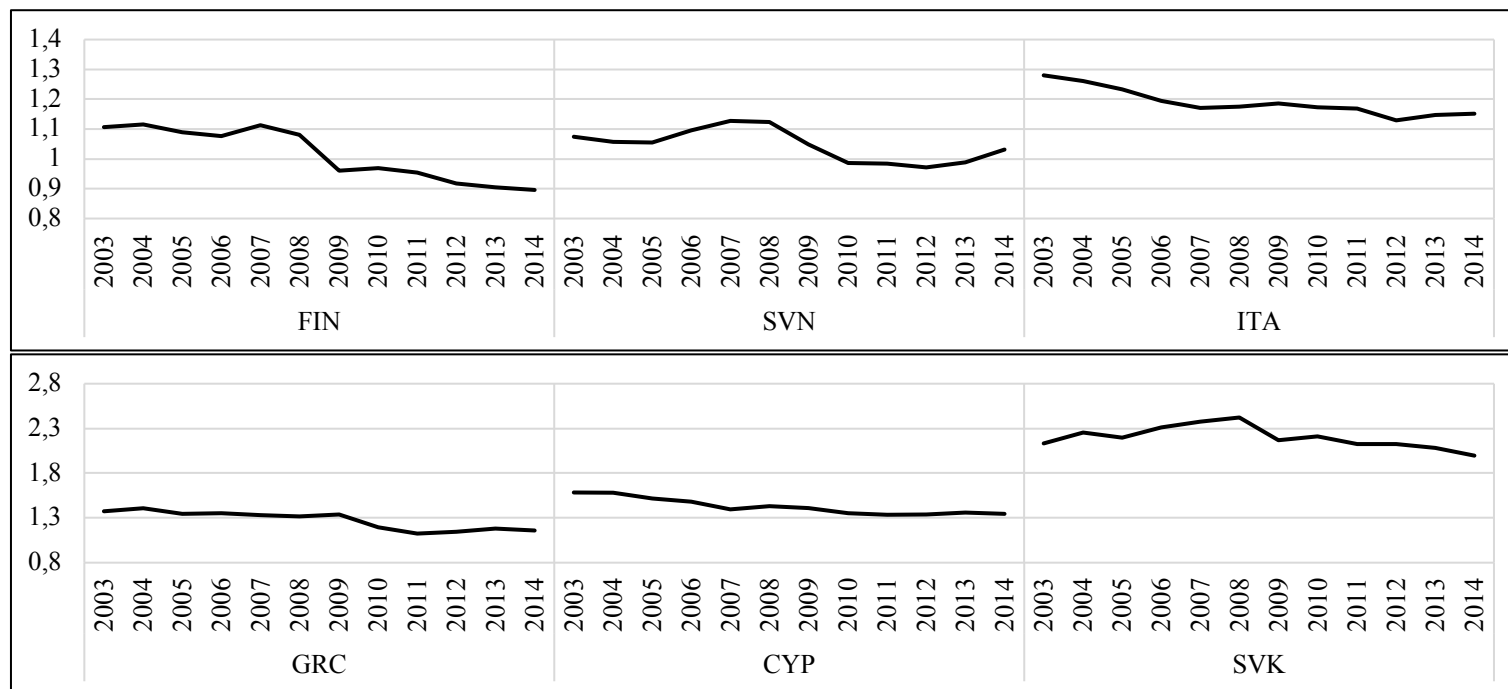
Source: Authors' own calculations.

2. Actual profit income / equilibrium profit income ratio – Group B



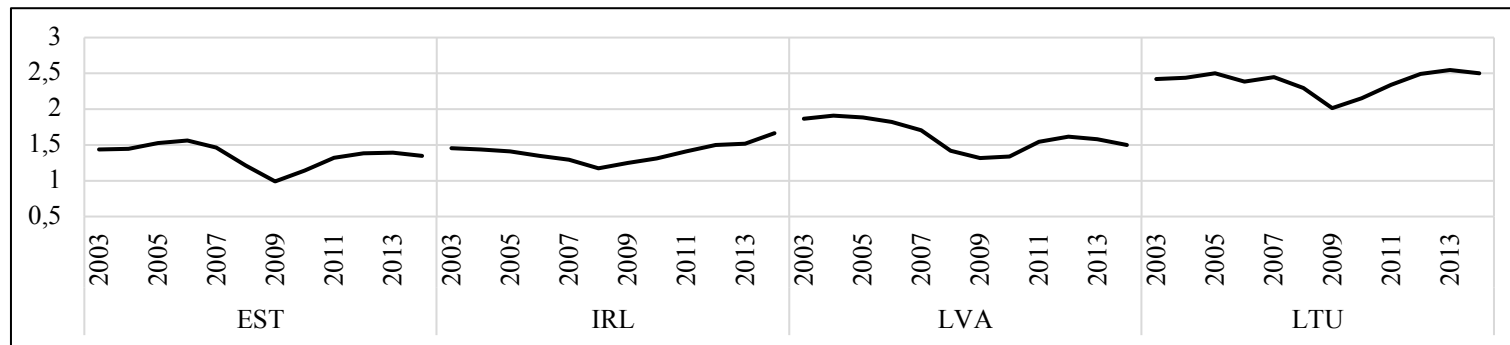
Source: Authors' own calculations.

3. Actual profit income / equilibrium profit income ratio – Group C



Source: Authors' own calculations.

4. Actual profit income / equilibrium profit income ratio – Group D



Source: Authors' own calculations.

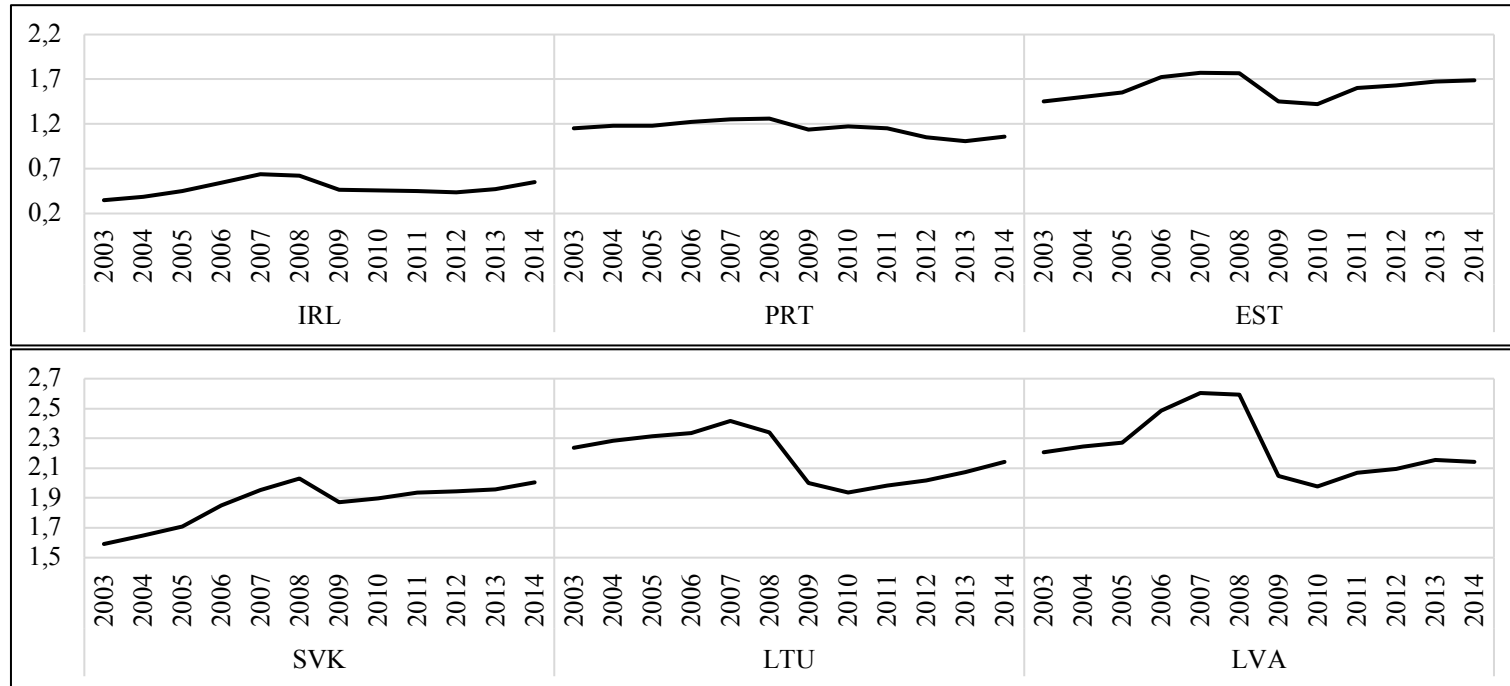
Appendix 13: Cyclical influence on the countries' labour exploitation rates (The exploitation rate, 2003-2014)

ISO3	Period												
	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	Ø
AUT	0.369	0.352	0.372	0.415	0.459	0.475	0.429	0.487	0.524	0.533	0.550	0.560	0.452
BEL	0.226	0.269	0.295	0.322	0.375	0.387	0.341	0.403	0.428	0.428	0.437	0.446	0.356
CYP	0.707	0.786	0.852	0.931	1.063	1.069	1.010	1.139	1.198	1.129	1.033	1.028	0.979
EST	1.453	1.500	1.555	1.725	1.772	1.766	1.455	1.422	1.602	1.634	1.674	1.692	1.596
FIN	0.459	0.485	0.505	0.547	0.590	0.607	0.521	0.560	0.593	0.588	0.575	0.569	0.545
FRA	0.278	0.306	0.313	0.340	0.378	0.389	0.339	0.381	0.402	0.400	0.402	0.440	0.360
DEU	0.398	0.415	0.437	0.488	0.536	0.549	0.506	0.536	0.590	0.599	0.617	0.635	0.517
GRC	0.966	1.023	1.049	1.114	1.157	1.170	1.085	1.074	0.946	0.774	0.694	0.709	0.983
IRL	0.349	0.389	0.454	0.545	0.639	0.625	0.468	0.456	0.452	0.437	0.472	0.549	0.479
ITA	0.443	0.489	0.494	0.537	0.565	0.570	0.504	0.539	0.567	0.558	0.537	0.547	0.526
LVA	2.205	2.246	2.270	2.484	2.604	2.591	2.048	1.977	2.068	2.095	2.157	2.141	2.241
LTU	2.239	2.285	2.315	2.336	2.416	2.337	2.000	1.937	1.982	2.019	2.073	2.144	2.182
MLT	0.772	0.803	0.841	0.891	0.954	0.996	0.939	1.037	1.120	1.167	1.240	1.315	0.990
NLD	0.354	0.376	0.376	0.417	0.465	0.475	0.431	0.444	0.455	0.456	0.449	0.440	0.424
PRT	1.151	1.184	1.181	1.225	1.256	1.261	1.136	1.173	1.149	1.050	1.009	1.063	1.155
SVK	1.591	1.648	1.709	1.851	1.954	2.030	1.870	1.898	1.937	1.944	1.955	2.005	1.849
SVN	0.877	0.978	0.994	1.045	1.111	1.142	1.044	1.077	1.052	1.037	0.998	1.011	1.026
ESP	0.531	0.558	0.708	0.797	0.879	0.863	0.699	0.719	0.718	0.642	0.603	0.628	0.685

Source: Authors' own calculations.

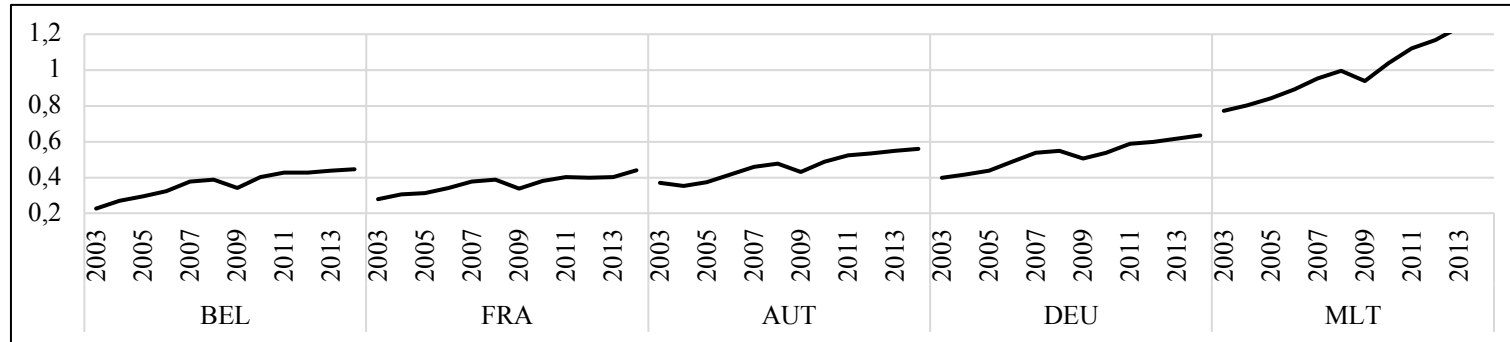
Appendix 14: Clustering of the euro area member countries: Cyclical influence on the countries' labour exploitation rates (2003-2014)

1. The exploitation rate – Group A



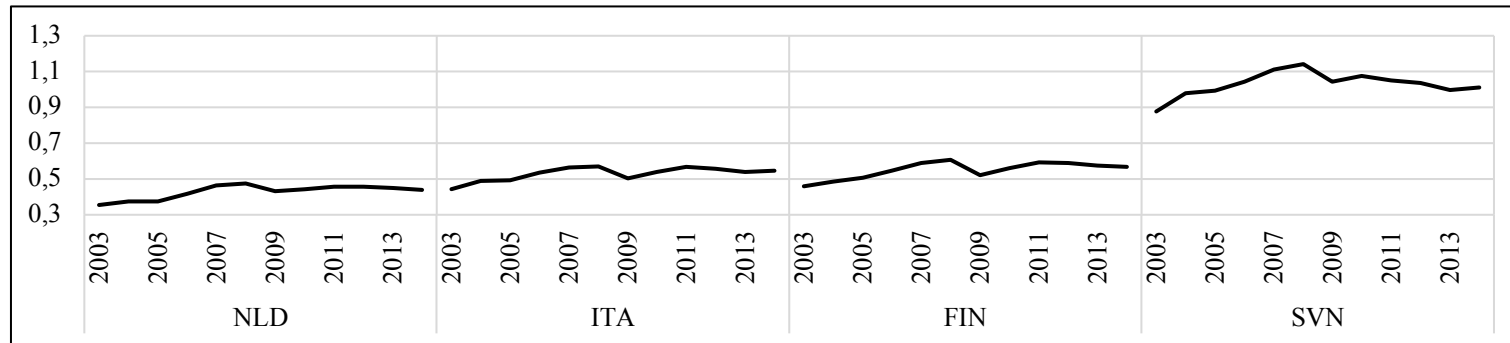
Source: Authors' own calculations.

2. The exploitation rate – Group B



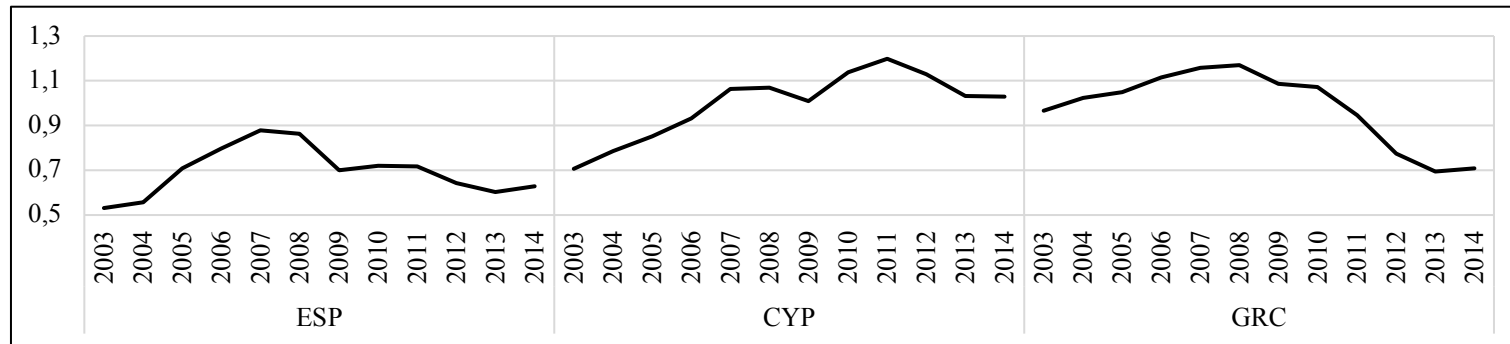
Source: Authors' own calculations.

3. The exploitation rate – Group C



Source: Authors' own calculations.

4. The exploitation rate – Group D



Source: Authors' own calculations.

Appendix 15: The absolute values of the euro area's relevant indicators (ten-year average for the period 2003-2016)

ISO3	GDP	GDP _{pc}	GDP _u	NV	W	W _{pc}	Π	Π _{pc}	K	L
AUT	362410.1	357692.87	359821.93	336983.36	231567.69	215576.82	130842.41	142116.05	1108207.99	3745214
BEL	442827.6	403237.66	404059.67	389574.96	285051.07	249220.99	157776.51	154016.67	1201007.95	4329714
CYP	26331.20	27331.25	28670.30	31871.16	15876.95	20388.79	10454.25	6942.46	54136.70	354214
EST	32942.44	43414.15	47312.06	53176.44	20639.98	34018.32	12302.46	9395.83	73267.85	591000
FIN	212622.1	213230.29	213311.07	210115.71	134733.93	134416.36	77888.17	78813.93	614583.83	2335214
FRA	2403028	2440497.29	2465115.13	2256553.93	1648763.13	1443574.87	754264.77	996922.43	7773910.19	25079214
DEU	3339930	3223972.23	3225821.65	3281919.63	2164869.21	2099527.35	1175060.92	1124444.87	8768318.60	36475071
GRC	304828.2	333424.15	338011.84	362774.65	178114.74	232076.16	126713.51	101348.00	790302.44	4031857
IRL	215090.5	176334.98	177009.95	168147.84	107724.92	107568.45	107365.63	68766.54	536235.18	1868786
ITA	2142771	1997516.62	1997864.27	1977740.73	1275298.89	1265210.98	867472.48	732305.64	5710452.59	21980500
LVA	41928.23	62338.47	71784.23	80548.75	25183.17	51529.08	16745.06	10809.39	84290.61	895214
LTU	69151.95	89336.88	106743.81	118930.39	38137.93	76082.79	31014.02	13254.09	103354.20	1321786
MLT	12133.55	12088.14	12765.58	14235.66	7182.23	9106.91	4951.32	2981.23	23247.33	158214
NLD	750933.4	723631.12	726795.52	687720.36	483283.89	439952.19	267649.50	283678.93	2212102.46	7643286
PRT	279556.1	345417.20	362577.20	403193.63	184923.07	257933.20	94632.99	87483.99	682192.20	4481071
SVK	131176.6	159576.07	184838.37	207223.59	73999.35	132566.20	57177.30	27009.87	210620.53	2303071
SVN	57642.21	69169.81	73138.00	81602.77	39945.21	52203.36	17696.99	16966.45	132302.85	906929
ESP	1478063	1625157.37	1625433.44	1641053.01	955480.76	1049823.29	522582.17	575334.08	4486402.71	18238571

Note: All indicators are expressed in millions of 2011 PPP \$, except for the L, which denotes the total number of employed workers.

Source: The data sources are discussed within the second chapter.

Appendix 16: The influence of the sectoral composition on the cross-country inequality dynamics of the euro area (2003-2016)

Dependent variable	Model 1a Price effect	Model 2a Labour recognition effect	Model 3a Efficiency effect	Model 4a Profit rate	Model 5a Wage rate	Model 6a Exploitation rate
lnGDP	0.458*** (0.0607)	-0.0389*** (0.0114)	-0.0230* (0.0117)	0.677*** (0.217)	0.0735 (0.0578)	3.322*** (0.229)
lnGDPPC	0.0655 (0.0633)	0.0730*** (0.0119)	0.0255** (0.0122)	0.716*** (0.262)	0.202*** (0.0701)	-2.235*** (0.278)
UNEMP				0.0229*** (0.00333)	-0.00132 (0.000890)	-0.0264*** (0.00353)
lnK/L	0.0877*** (0.0269)	-0.262*** (0.00504)	0.139*** (0.00520)	-1.594*** (0.116)	0.229*** (0.0310)	-0.544*** (0.123)
Agriculture	-0.000155 (0.00534)	-0.00253** (0.00100)	-0.00158 (0.00103)	0.0462** (0.0187)	0.00434 (0.00500)	-0.0453** (0.0198)
Manufacturing	0.00821*** (0.00146)	0.000353 (0.000274)	0.000923*** (0.000282)	0.0196*** (0.00503)	-0.0049*** (0.00134)	-0.0272*** (0.00533)
Construction	-0.00358** (0.00146)	0.000802*** (0.000273)	0.00104*** (0.000282)	-0.00257 (0.00562)	-0.00109 (0.00150)	-0.0164*** (0.00596)
Services	0.000313 (0.00171)	0.000800** (0.000320)	0.000187 (0.000330)	-0.00115 (0.00588)	-0.000730 (0.00157)	-0.0116* (0.00623)
Public sector	-0.0105*** (0.00236)	-0.000579 (0.000443)	-0.000737 (0.000457)	-0.045*** (0.00842)	0.00891*** (0.00225)	0.00237 (0.00892)
Year 2004	-0.00540 (0.00645)	0.00249** (0.00121)	-0.00192 (0.00125)	-0.0187 (0.0223)	-0.000455 (0.00596)	-0.0241 (0.0237)
Year 2005	-0.00964 (0.00680)	0.00101 (0.00127)	-0.00237* (0.00131)	-0.0231 (0.0235)	0.00146 (0.00628)	-0.0383 (0.0249)
Year 2006	-0.0242*** (0.00741)	-0.000923 (0.00139)	-0.00352** (0.00143)	-0.0573** (0.0256)	9.94e-05 (0.00685)	-0.0330 (0.0249)
Year 2007	-0.0392*** (0.00795)	0.000452 (0.00149)	-0.00441*** (0.00154)	-0.097*** (0.0274)	-0.00104 (0.00733)	-0.0465 (0.0291)
Year 2008	-0.0371*** (0.00846)	0.00441*** (0.00159)	-0.00542*** (0.00163)	-0.0381 (0.0291)	-0.0128 (0.00778)	-0.0316 (0.0308)
Year 2009	0.00508 (0.00929)	0.0183*** (0.00174)	-0.00752*** (0.00180)	0.167*** (0.0320)	-0.0325*** (0.00854)	-0.0609* (0.0339)
Year 2010	-0.0198** (0.00935)	0.0274*** (0.00175)	-0.0113*** (0.00181)	0.149*** (0.0322)	-0.0487*** (0.00859)	-0.00611 (0.0341)
Year 2011	-0.0341*** (0.00950)	0.0301*** (0.00178)	-0.0137*** (0.00184)	0.154*** (0.0327)	-0.0580*** (0.00873)	0.0430 (0.0346)
Year 2012	-0.0302*** (0.00993)	0.0350*** (0.00186)	-0.0160*** (0.00192)	0.215*** (0.0342)	-0.0662*** (0.00912)	0.0922** (0.0362)
Year 2013	-0.0276*** (0.0103)	0.0396*** (0.00192)	-0.0174*** (0.00198)	0.244*** (0.0353)	-0.0706*** (0.00944)	0.0936** (0.0374)
Year 2014	-0.0348*** (0.0105)	0.0398*** (0.00197)	-0.0178*** (0.00203)	0.202*** (0.0362)	-0.0600*** (0.00967)	0.102*** (0.0384)
Year 2015	-0.0469*** (0.0107)	0.0413*** (0.00201)	-0.0200*** (0.00208)	0.174*** (0.0372)	-0.0607*** (0.00994)	0.0988** (0.0394)
Year 2016	-0.0557*** (0.0110)	0.0398*** (0.00207)	-0.0200*** (0.00213)	0.153*** (0.0384)	-0.0604*** (0.0102)	0.117*** (0.0406)
Constant	-12.69*** (1.220)	4.477*** (0.229)	-0.392* (0.236)	-4.339 (4.265)	-5.937*** (0.0102)	-54.01*** (4.518)
Observations	252	252	252	252	252	252
Countries no.	18	18	18	18	18	18
R-squared	0.873	0.969	0.920	0.827	0.794	0.898
Hausman test	56.79***	67.21***	19.16**	27.06***	18.66**	136.16***

Note: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$; Standard errors in parentheses.

Source: Authors' own calculations.

Appendix 17: The influence of the technological composition on the cross-country inequality dynamics of the euro area (2003-2016)

Dependent variable	Model 1b Price effect	Model 2b Labour recognition effect	Model 3b Efficiency effect	Model 4b Profit rate	Model 5b Wage rate	Model 6b Exploitation rate
lnGDP	0.575*** (0.0887)	-0.0414*** (0.0132)	-0.0217 (0.0133)	0.334 (0.314)	0.0903 (0.0761)	3.789*** (0.245)
lnGDPPC	0.0355 (0.0837)	0.0817*** (0.0125)	0.0441*** (0.0125)	1.762*** (0.364)	0.0631 (0.0881)	-3.283*** (0.284)
UNEMP				0.0342*** (0.00364)	-0.00282*** (0.000884)	-0.0348*** (0.00285)
lnK/L	0.105*** (0.0362)	-0.264*** (0.00540)	0.124*** (0.00542)	-2.073*** (0.165)	0.283*** (0.0400)	-0.0883 (0.129)
High-tech	-0.00222 (0.00312)	0.00134*** (0.000466)	0.00205*** (0.000467)	-0.0190* (0.0103)	-0.0101*** (0.00250)	0.0410*** (0.00803)
Medium-tech	-0.00103 (0.00347)	-0.000182 (0.000518)	0.000866* (0.000520)	0.00585 (0.0112)	0.00139 (0.00272)	9.84e-06 (0.00874)
Low-tech	0.0296*** (0.00418)	-0.000343 (0.000624)	-0.000346 (0.000627)	0.0614*** (0.0150)	-0.00778** (0.00364)	-0.0395*** (0.0117)
Year 2004	-0.00539 (0.00890)	0.00286** (0.00133)	-0.00233* (0.00133)	-0.0358 (0.0290)	-0.000436 (0.00704)	-0.00335 (0.0227)
Year 2005	-0.00536 (0.00930)	0.00221 (0.00139)	-0.00310** (0.00139)	-0.0492 (0.0310)	0.000888 (0.00751)	-0.00935 (0.0242)
Year 2006	-0.0175* (0.0100)	0.00113 (0.00150)	-0.00435*** (0.00150)	-0.0914*** (0.0339)	-0.00204 (0.00823)	0.00634 (0.0265)
Year 2007	-0.028*** (0.0110)	0.00285* (0.00164)	-0.00575*** (0.00164)	-0.125*** (0.0375)	-0.00457 (0.00910)	-0.00526 (0.0293)
Year 2008	-0.0272** (0.0116)	0.00685*** (0.00174)	-0.00676*** (0.00174)	-0.0739* (0.0390)	-0.0140 (0.00946)	0.00769 (0.0305)
Year 2009	-0.00611 (0.0125)	0.0197*** (0.00186)	-0.00823*** (0.00187)	0.0900** (0.0403)	-0.0196** (0.00977)	-0.0110 (0.0315)
Year 2010	-0.0226* (0.0126)	0.0284*** (0.00188)	-0.0124*** (0.00189)	0.0956** (0.0409)	-0.0376*** (0.00993)	0.0258 (0.0320)
Year 2011	-0.0299** (0.0129)	0.0312*** (0.00193)	-0.0148*** (0.00193)	0.128*** (0.0419)	-0.0519*** (0.0102)	0.0588* (0.0327)
Year 2012	-0.0254* (0.0135)	0.0365*** (0.00202)	-0.0164*** (0.00203)	0.194*** (0.0439)	-0.0625*** (0.0106)	0.109*** (0.0343)
Year 2013	-0.0257* (0.0139)	0.0410*** (0.00208)	-0.0179*** (0.00209)	0.223*** (0.0450)	-0.0650*** (0.0109)	0.110*** (0.0351)
Year 2014	-0.0340** (0.0140)	0.0414*** (0.00209)	-0.0184*** (0.00210)	0.190*** (0.0452)	-0.0575*** (0.0110)	0.119*** (0.0353)
Year 2015	-0.0353** (0.0143)	0.0431*** (0.00214)	-0.0203*** (0.00215)	0.183*** (0.0462)	-0.0643*** (0.0112)	0.1000*** (0.0361)
Year 2016	-0.042*** (0.0146)	0.0416*** (0.00218)	-0.0205*** (0.00218)	0.158*** (0.0469)	-0.0597*** (0.0114)	0.105*** (0.0366)
Constant	-15.98*** (1.789)	4.513*** (0.267)	-0.438 (0.268)	-1.355 (6.211)	-5.496*** (1.506)	-62.45*** (4.849)
Observations	238	238	238	238	238	238
Countries no.	17	17	17	17	17	17
R-squared	0.774	0.964	0.913	0.710	0.743	0.886
Hausman test	45.46***	63.88***	19.56***	14.88**	16.14**	138.57***

Note: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$; Standard errors in parentheses.

Source: Authors' own calculations.