International Balkan University - Skopje
Faculty of Economics and Administrative Sciences

INCOME INEQUALITY DETERMINANTS: DEVELOPED VS. DEVELOPING EUROPEAN COUNTRIES

- DOCTORAL DISSERTATION -

Author
MS. Kristina Velichkovska

Supervisor
Prof. Dr. Violeta Madzova

A dissertation submitted in partial fulfillment of the requirements the degree of Ph.D. in Economics

Skopje, 2024

WWW.IBU.EDU.MK

Skopje, 2024

Mentor: **Prof. Dr. Violeta Madzova**
International Balkan University - Skopje
Faculty of Economics and Administrative Sciences

Committee members: **Prof. Dr. Snezana Bilic**
International Balkan University - Skopje
Faculty of Economics and Administrative Sciences

Assoc. Prof. Dr. Luljeta Sadiku
International Balkan University - Skopje
Faculty of Economics and Administrative Sciences

Assoc. Prof. Dr. Liza Alili Sulejmani
International Balkan University - Skopje
Faculty of Economics and Administrative Sciences

Assoc. Prof. Dr. Besime Ziberi
AAB College - Kosovo
Faculty of Economics

Date of defense: ___________________

Scientific field: Economics

To my parents

For their unconditional love and support.

Declaration Statement

I hereby declare that the doctoral dissertation entitled "Income Inequality Determinants: Developed vs. Developing European Countries", submitted for the degree of Doctor of Philosophy (Ph.D.) in Economics, represents the result of my independent and authentic research efforts. This work has not been submitted for any other degree or professional qualification. All sources used in this dissertation have been duly acknowledged and referenced. I affirm that it does not infringe upon anyone's copyright or other rights.

Furthermore, I attest that neither the entire dissertation nor any parts of it have been previously reported, defended, or published under the same or another title in the country or abroad.

I confirm that the standards prescribed by the International Balkan University for the preparation of the dissertation have been rigorously adhered to, and that any deviations or exceptions have been duly justified and approved.

Additionally, I certify that there are no conflicts of interest that could compromise the integrity or impartiality of the research presented in this dissertation.

Finally, I consent to the University's publication of the text of the doctoral dissertation on its website and its utilization for internal teaching and scientific purposes.

Date: ____________________

M.Sc. Kristina Velichkovska

Acknowledgements

I would like to express my deepest gratitude to my supervisor, Prof. Dr. Violeta Madzova, for her invaluable guidance, support, and encouragement throughout the process of completing this dissertation. Her expertise, insights, and constructive feedback have been instrumental in shaping the direction and quality of this research.

I am also thankful to Prof. Dr. Snezana Bilic, Assoc. Prof. Dr. Luljeta Sadiku, Assoc. Prof. Dr. Liza Alili Sulejmani and Assoc. Prof. Dr. Besime Ziberi, for their valuable input and feedback during the development of this dissertation.

Finally, I would like to thank my family for standing by me all along and unequivocally believing in me with their patience and understanding. Their encouragement has been a constant source of motivation all the way.

This work would not have been possible without the contributions and support of all those mentioned above. Thank you.

Abstract

Income inequality has become a serious issue in Europe, particularly after the period of ongoing economic crisis in the last 15 years. This dissertation analyzes the determinants of income inequality across 40 European countries for the period 2007-2021, covering the global financial crisis, the European sovereign debt crisis, and the COVID 19 pandemic. Extending on the basis of a literature review of 46 factors affecting income inequality, the study empirically analyzes 18 specifically chosen macroeconomic, demographic and political variables using a panel data analysis.

The research endeavors to explore three fundamental inquiries: it seeks to identify the principal determinants of income inequality in Europe during the 21st-century crisis periods, examine variations in the relationship patterns between income inequality and its determinants across European countries based on their development level, and investigate differences in the relationship between income inequality and its determinants during the global financial crisis compared to the sovereign debt crisis in Europe. Using the fixed and random effects panel data regression models and the Least Squares Dummy Variable (LSDV) regression models, together with the advanced methods, such as System GMM estimation, the analysis considers macroeconomic, demographic and political factors. Dummy variables are employed to capture the effects of the development level of the countries and the different crisis periods.

The findings reveal several insights into the determinants of income inequality in Europe. Economic globalization has been proved to be correlated with a decrease in income inequality, thus strengthening economic integration may favor the equal income distribution. Meanwhile, unemployment is positively connected with income inequality which once again reveals how society is affected by joblessness. Additionally, regulatory quality, government effectiveness, and control of corruption, as governance indicators, have negative correlations with income inequality and thus highlighting the role of good governance in fostering the equitable growth. Findings further show a conditional relationship between economic development and income inequality with the effect of GDP per-capita varying across different crisis contexts. Moreover, the findings provide support for the Kuznets inverted U curve theory in the European context, emphasizing the greater influence of economic development on income inequality in developing nations. The results of this research contribute to the ongoing discussions on reducing income inequality and promoting equitable economic growth in Europe. Such information can be used by decision makers to develop policies and provide targeted interventions that alleviate income disparities and build an inclusive economy in the region.

Keywords: *income distribution, Gini coefficient, Europe, LSDV, crisis periods*

Contents

List of Figures

List of Tables

List of Abbreviations

ARDL Autoregressive Distributed Lag

CEO Chief Executive Officer

COV19 COVID 19 crisis

DEV – Development Country Level

EU European Union

EUSDC – European Sovereign Debt Crisis

FDI Foreign Direct Investment

FMOLS Fully-modified Ordinary Least Squares

GDP Gross Domestic Product

GFC - Global Financial Crisis

GMM Generalized Method of Moments

HDI Human Development Index

HICP Harmonized Index of Consumer Prices

ICT Information and Communications Technology

IMF International Monetary Fund

LSDV Least Squares Dummy Variables

OECD Organisation for Economic Co-operation and Development

OLS Ordinary Least Squares

SBTC Skill-Biased Technological Change

UNCTAD United Nations Conference on Trade and Development

UNDP United Nations Development Programme

US United States

VAT Value-Added Tax

1. INTRODUCTION

"Inequality is not an inevitable consequence of economic growth, but rather a choice we make as a society."

- Simon Kuznets

1.1. Background of the Study

For over 30 years, income inequality kept rising in many countries worldwide. This fact has compelled numerous scholars to explore the phenomenon, its causes and its consequences. The potential impact on society as a whole is another reason why people are interested in the degree and trajectory of income inequality. According to Pickett and Wilkinson (2009), there is evidence to support the claim that a number of social issues, including drug usage, crime, and poor health, are positively correlated with rising income inequality. Therefore, it's critical to learn more about the factors contributing to the rise in income disparity. At the 2011 world Economic Forum in Davos, the problem of wealth inequality was referred to as the "most serious challenge for the world." (Eklil, 2011), which just once again confirms that further research into the determinants of income inequality is necessary in order to develop policies that will impact the level and course of inequality.

Income inequality is a global long-lasting problem which goes beyond social, political, and economic realms. The last two decades have seen an expanding rhetoric about inequality, which has been spurred by increasing fears about its effects on societal conditions and the economy. While Europe, a continent often known for its social welfare system, and egalitarian ethics with an attractive social infrastructure, income inequality is still a topic of consideration, and the gap varies between developed and developing countries. Over the last twenty years, this has not improved much, if not even worsen by the events marking the periods of economic stagnation.

European countries have suffered from severe economic instabilities such as the global financial crisis followed by European sovereign debt crises, and soon after that the global Covid-19 pandemic crisis, have just aggravated the situation of income gap. It has thus raised the interest of many policy makers, scholars and the public on what factors contribute to income inequality. This attention further implies the necessity of understanding the determinants of income inequality.

Research on income inequalities has mostly been done on national level and looking at the relationships within the countries. However, the income inequality dimension across Europe should be looked at separately due to the fact that the region's economic map is filled with different colors. The European continent is a snapshot of different economic dimensions, including a set of countries at varying levels of economic development, systems of governance, and social welfare. From well developed economies of Western Europe to the developing economies of Central and Eastern Europe, the continent provides a variety of socio-economic dynamics which influence the income distribution.

In developed European countries, such as in Western Europe, the expression of income inequality takes place in a multifaceted way led by globalization, technological innovation and changes in the labor markets. The information technology revolution has created new opportunities for high-skilled workers, while lower-skilled jobs have faced outsourcing and automation. The implementation of social security systems and progressive taxation systems may not be able to completely eradicate income inequality which affects not only a person's economic prospects but also their social status and intergenerational mobility. Alternatively, in developing countries of Europe, in particular, the group of Eastern Europe and the Balkans, the income inequality gap is driven by totally different forces. A mix of factors like transition from centrally planned to market oriented economies, geopolitical issues, and structural reforms have created a number of unique challenges associated with tackling income inequalities. Moreover, factors such as corruption, and unequal resource distribution are further contributing to these ongoing inequalities. Chronic poverty, irregular employment, and inequalities in education and health care have raised this problem to a higher level, making the task of sustainable development and social progress more difficult.

Identifying the causes of income inequality in both the developed and developing European countries is necessary for framing the right interventions that are context-specific. With that in mind, revealing the triggers and mechanisms causing income inequality may enable policy makers to form policies which will foster equitable economic results and therefore prevent social tensions. This study concentrates on discovering income inequality across these different settings to help in exposing intricate dynamics and underlying factors for inequality distribution. In addition, the study intends to examine whether the link between income inequality and its determinants remains stable during various crisis periods. The global financial crisis, following by the sovereign debt crises and the pandemic crisis, have multi-dimensional effects on European economies, influencing different socio-economic variables. Through contrasting income inequality trends during varied crisis types, this research tries to understand how different economic shocks and policy responses affect the shape of the inequality pattern.

1.2. Problem Statement

Despite the observed success to a great extent of economic development and various policy implementations, widespread income inequality is still a supreme problem for the whole European continent. The issue of income inequality is complicated, involving economic, social, and political dimensions, and the consequences of these inequalities often exceed the income gap. Unequal distribution of income is eroding social cohesion, fueling poverty and social exclusion, as well as stunting economic development across the country. Therefore, in order to solve this problem, a substantial focus should be given to finding the main determinants of income inequality.

The fact is income inequity is widely researched, but several gaps and difficulties still need extra focus. On the one hand, European countries differ in their level of economic development, institutional arrangements as well as social-political context giving rise to differences in the forces behind the income inequality between countries. Therefore, this diversity should be included as a factor in an integrated analysis.

On the other hand, in Europe the relationship of economic crises on income inequality is still underdiscussed. Comprehending how various crises periods, such as the global financial crisis, the sovereign debt crises, and the Covid-19 pandemic crisis, affect the manner in which income is distributed is fundamental in the development of focused policy reactions that can help in the reduction of inequality.

Moreover, dealing with income inequality determinants involves methodological difficulties, especially data limitations, endogeneity and national-specific factors. Solving these problems implies application of advanced econometric models and impactful empirical approaches to ensure accuracy and trustworthiness of findings.

Recognizing the causes of income inequalities is just the first step. Transferring research findings into actually workable policies is what matters more. Policymakers have to obtain and interpret unambiguous and well-founded research data so that they can develop and implement the most efficient interventions for decreasing the income gaps and creating a more equal society within the European Union.

1.3. Research Aim and Objective

The main aim of this doctoral dissertation is to provide empirical evidence concerning the relationship between income inequality and the determinants of income inequality in the European region, based on their development level. The objective of the dissertation is to try to determine which determinants were more significant in influencing the distribution of income in the developed vs. the developing countries during the observed period (2007-2021). This relation will be principally observed when economic crisis strikes and when the recession periods following them occur, with the research illustrating how the income inequality dynamics are different in the case of the global financial crisis and sovereign debt crises. The analysis includes different economic, demographic, and political factors that are potential determinants of high-income inequality, considering cross-country variation and the dynamics of the crisis periods. In other words, the research gives tangible evidence and policy suggestions for easing the process of decreasing income inequalities and facilitating fair economic growth in Europe.

The dissertation seeks to provide answers to **three main research questions**.

1. *Which are the most significant determinants of income inequality in Europe in the period of crisis in the 21st century?*

This question is addressed to identify the most important determinants which are causing further growth of income inequalities during the crisis, as the earlier researches indicate the crisis can exacerbate income inequalities (Atkinson, 2015; Stiglitz, 2012). Identification of such determinants can make policymakers design targeted interventions to mitigate the effects of inequality while promoting inclusive growth.

2. *Is there a difference in the relationship patterns of the income inequality and its determinants in European countries based on their development level?*

This question is based on literature which suggests that income inequality patterns differ between developing and developed countries (Milanovic, 2016) and brings to light the importance of a more in-depth analysis which considers the specific contexts of each country.

3. *Is there a difference in the relationship between income inequality and its determinants in the period of global financial crisis vs the period of the European sovereign debt crisis?*

This question is driven by the need to know the impact of crisis contexts on income inequality and policy effectiveness in dealing with the disparities, which provide useful insights for policymakers, who have to face economic disturbances (Sala-i-Martin, 2006; Alesina & Perotti, 1996; Atkinson, & Morelli, 2014).

Consequently, from the given questions, the research will add to the understanding of the income inequality issues in Europe and propose policy and decision-making models based on evidence that drive equal economic development.

Based on the research questions and the specific variables chosen in the empirical analysis, twenty research hypotheses are developed which aim is to investigate the relationships between various economic, demographic, and political factors and income inequality, explore potential differences in income inequality determinants between developed and developing European countries, and assess the impact of policy interventions on income distribution undertaken during the global financial crisis vs the European sovereign debt crisis.

From these research questions appropriately, the research hypotheses are set.

For the first research question:

H1: Economic development has no significant impact on income inequality.
H2: Economic globalization has no significant impact on income inequality.
H3: Remittances have no significant impact on income inequality.
H4: Unemployment has no significant impact on income inequality.
H5: Value-added taxes have no significant impact on income inequality.
H6: Domestic savings have no significant impact on income inequality.
H7: Domestic consumption has no significant impact on income inequality.
H8: Inflation has no significant impact on income inequality.
H9: Trade has no significant impact on income inequality.
H10: Investments have no significant impact on income inequality.

H11: Population growth has no significant impact on income inequality.

H12: Education has no significant impact on income inequality.

H13: Political stability has no significant impact on income inequality.

H14: Control of corruption has no significant impact on income inequality.

H15: Rule of law has no significant impact on income inequality.

H16: Government effectiveness has no significant impact on income inequality.

H17: Regulatory control has no significant impact on income inequality.

H18: Voice and accountability has no significant impact on income inequality.

For the second research question:

H19: There is no difference between the European developed and the developing countries in the relationship patterns between income inequality and its determinants.

For the third research question:

H20: There is no difference between the period of global financial crisis vs the period of the sovereign debt crisis in the relationship between income inequality and its determinants.

1.4. Significance of the Study

Understanding the determinants of income inequality in Europe holds profound significance for policymakers, scholars, and society at large.

This study contributes to the academic literature by advancing theoretical understanding and empirical knowledge through rigorous research methods and analysis of panel data from multiple European countries. These contributions enrich academic debates and inform future research in the field of income inequality studies.

Income inequality has far-reaching implications for economic development, social cohesion, and political stability. Policymakers can use the findings to design targeted interventions aimed at addressing root causes and promoting equitable outcomes, thereby fostering inclusive growth in Europe. By providing policymakers with robust empirical evidence through comprehensive data analysis and advanced econometric techniques, this study aids in prioritizing policy interventions and effectively allocating resources to address income disparities.

Furthermore, by uncovering the factors contributing to income inequalities, this research contributes to broader discussions about social justice and fairness, thus catalyzing efforts to promote social equity and inclusion in European societies.

Finally, by examining income inequality across developed and developing European countries, this study offers valuable insights into the heterogeneity of income distribution dynamics, essential for designing tailored policy responses that address specific challenges faced by different European nations.

1.5. Contribution to the Existing Literature

Understanding the determinants of income inequality in Europe holds profound significance for policymakers, scholars, and society at large. This study contributes to the academic literature by advancing theoretical understanding and empirical knowledge through rigorous research methods and analysis of panel data from the European countries. The comprehensive literature review of this study covers nearly fifty determinants of income inequality, while the extensive empirical contribution of this doctoral dissertation covers the analysis of eighteen carefully selected determinants in one model with four dummy variables utilizing sophisticated regression techniques and methods, ensuring the reliability and validity of the empirical findings. Combining all these variables in one model and observing the differences of their impact on the income inequality during different types of crises, positions this study as a unique one and confirms its valuable contribution to the existing literature.

What further underscores the novelty and originality of the research is the fact that this study comprehensively investigates a particularly large pool of income inequality determinants across all the European countries, a scope not previously covered in existing literature, to the best of the author's knowledge. Although there is literature about the factors of income inequality, no complex theory comprising all the hypothetical factors of income inequality can be found. Most of the articles in this field concentrate on either a single factor or a few factors. Indeed, there are also studies examining more factors (e.g., Nielsen (1994), Gustafsson and Johansson (1999), Nielsen and Alderson (1997), Xu and Zou (2000), Clarke, Xu and Zou (2003), etc.), but they are not intended to cover all the factors of income inequality discussed in the pertinent literature. This study incorporates a plethora of factors that will give a more holistic view.

Moreover, few articles undertake analyses across a large set of countries. The present study distinguishes itself by examining income inequality across all European countries (with the exceptions of the micro states). This approach not only broadens the scope of investigation but also contributes to addressing the gap in the literature, as many studies tend to overlook the interconnectedness of various factors influencing income distribution, especially on a wide geographical scale. The rarity of research endeavors that simultaneously explore a multitude of determinants across diverse nations underscores the unique contribution and significance of the current study in advancing our understanding of income inequality dynamics.

These contributions enrich academic debates and inform future research in the field of income inequality studies. Policymakers can use the findings to design targeted interventions aimed at addressing root causes and promoting equitable outcomes, thereby fostering inclusive growth in Europe. By providing policymakers with robust empirical evidence through comprehensive data analysis and advanced econometric techniques, this study aids in prioritizing policy interventions and effectively allocating resources to address income inequalities. Furthermore, by uncovering the income inequalities determinants, this research contributes to broader discussions about social justice and fairness, thus catalyzing efforts to promote social equity and inclusion in European societies. Finally, by examining income inequality across developed and developing European countries, this study offers valuable insights into the heterogeneity of income distribution dynamics, essential for designing tailored policy responses that address specific challenges faced by different European countries.

1.6. Limitations of the Study

The objective of this research is to give relevant information on factors which contribute to income equality in Europe. Nevertheless, it is necessary to admit that these conclusions can be criticized by some aspects which influence the interpretation and generalization of these findings.

As a starting point, the scope of the analysis is impacted by the scarcity as well as the quality of data. The study provides comparisons based on the secondary data from the World

Bank with concerns over those, such as the gaps in coverage, truth, and comparability across countries. The level of variation associated with data and the quality of the same can undermine the strength of the empirical analysis and may limit the generalizability of the findings.

Consequently, similar to any empirical study, this study implies methodological limitations and assumptions. Selection of econometric techniques, choice of variables and model specifications might introduce bias and limitations that affect the robustness of findings. However, even when taking measures to control for confounding variables and to account for endogeneity, the problem of omitted variable bias or reverse causality cannot entirely be avoided. These methodological challenges may restrict the causal inference that can be inferred from the empirical analysis, thus, requiring a careful interpretation of the results.

Another possible limitation is the model complexity. The presence of many interdependent variables in the regression models can lead to multicollinearity and overfitting. Though measures are put in places to correct this problem, model robustness checks, and diagnostic models still pose challenges to the models, such as interpretability and stability.

In addition, it is obvious that this study determines just the connection between the income inequality and its determinants whereas causal relationships' identification is complex by its nature. The cross-sectional nature of data and the existence of possible unobserved confounding variables may limit a precise causal inference from the empirical analysis.

Furthermore, the study's observed period (2007-2021) may not grasp well long-lasting trends and structural shifts in the income distribution motion. Besides that, the emphasis on certain crisis episodes (such as the global financial crisis and sovereign debt crisis) could decrease the value of the study findings for some other economic contexts or historical periods.

Evaluation of income inequality across European countries enables us to draw useful lessons, but, at the same time it is impacted significantly by economic, social, and political factors peculiar if each country. With differences in the institutional structures, policy environments and cultural settings, the effect of income inequality on its determinants can be different.

Moreover, the generalization of these results to other countries outside Europe could be limited due to external validity. Following the analyzing of income inequality dynamics in

Europe, however, the identified determinants may not be applicable to other regions or global contexts.

Last but not the least, one should keep in mind that overcoming income inequality needs multitude solutions beyond the scope of this research. This study, aimed at finding the main determinants of income inequality, would be only a first step in the process of creating effective policy responses. These responses would also have to consider the broader socio-economic, political, and institutional factors that affect income distribution. Thus, the present work should be seen as a single piece of the bigger puzzle rather than a full solution to the multi-faced problem of income inequality.

By acknowledging and addressing these limitations, the aim is to ensure the rigor and integrity of the research findings while also providing a transparent assessment of its scope and implications.

1.7. Organization of the Study

This dissertation is organized into six chapters to facilitate a comprehensive exploration of income inequality determinants in developed and developing European countries.

The first chapter, *Introduction*, sets the stage for the study by providing an overview of the background of the study, problem statement, research objectives, research questions and research hypotheses, significance of the study, contribution to the existing literature, limitations of the study, and the organizational structure of the dissertation.

The second chapter, *Understanding Income Inequality - Concepts, Metrics, and Implications*, explores the concept of income inequality. Various types of inequalities are discussed, focusing particularly on economic inequality and its manifestations. Income inequality as one of the economic inequality types is closely observed by distinguishing this phenomenon from the concepts of wealth inequality and from poverty. Different metrics used to measure income inequality are introduced, starting from the Gini index and the Lorenz curve, to other indices and ratios used to measure income inequality. A historical overview of the phenomenon of income inequality and its development through the years is introduced. The current need to put the focus back on the distributional question is pointed out, following by the crises in the 21st century and their impact on making the issue of income inequality more severe. The focused analysis of the crises explores the direct economic effects of these crises, the efficacy of crisis-resolution policies in mitigating income disparities, and the key characteristics of these crises, to provide a comprehensive understanding of their impact on income distribution. Finally, the chapter concludes by addressing income inequality as a global issue, pointing out the global concerns and the diverse consequences it has on different economic, social, political, and global aspects.

The third chapter, *Theoretical Foundations and Empirical Literature Review of Income Inequality Determinants* explores the theoretical foundations of income inequality, delving into prominent theories such as Kuznets's inverted U-shaped curve, as well as contributions from scholars like Piketty and Milanovic. This chapter aims to assess the relevance of these theories in the contemporary European context, particularly in comparing income inequality dynamics between developed and developing European countries. Additionally, the chapter conducts an extensive literature review on income inequality determinants. It categorizes these determinants into economic development, demographic, political, cultural, environmental, and macroeconomic factors, providing a comprehensive framework for empirical analysis. By synthesizing insights from prior research, the chapter establishes a conceptual foundation for understanding the multifaceted nature of income inequality and its underlying determinants.

The fourth chapter, *Data Analysis and Research Methodology on Income Inequality Determinants*, outlines the research methodology employed in the study. It describes the research design, research questions, hypotheses, data sources, sampling techniques, and data analysis methods. Special emphasis is placed on the specification of the econometric model and estimation techniques used to analyze income inequality determinants.

The fifth chapter, *Empirical Results of Income Inequality Determinants*, presents the results of the empirical analysis of income inequality determinants. The chapter offers a comprehensive examination of income inequality determinants through empirical analysis. It encompasses a range of analytical methods, including descriptive analysis, trend analysis, and correlation matrices, to uncover patterns and relationships within the data. Additionally, the chapter conducts baseline regression analyses using fixed and random effects models, as well the Least Squares Dummy Variables models with dummy variables to capture unobserved heterogeneity, which is then augmented with the advanced regression analysis using dynamic models like the two-step system Generalized Method of Moments. These methods enable a thorough investigation into the factors influencing income inequality. Finally, the chapter concludes by offering a discussion of the results section which interprets the empirical findings in light of the research objectives, theoretical framework, and existing literature. Furthermore, it answers the research questions and research hypotheses of the study.

The final chapter, *Conclusion and Recommendations*, summarizes the key findings of the study, discusses its implications for theory and practice, and reflects on the research process. It reiterates the significance of the research, addresses research questions and hypotheses, and suggests directions for future research in the field of income inequality studies. Furthermore, it offers practical recommendations aimed at addressing income inequality in Europe. These recommendations are tailored for policymakers, researchers, and stakeholders, emphasizing collaborative efforts and innovative approaches to effectively mitigate income disparities.

By organizing the study into these chapters, this research aims to provide a systematic and cohesive exploration of income inequality determinants in developed and developing European countries, providing valuable insights for both academic research and policymaking.

2. UNDERSTANDING INCOME INEQUALITY - CONCEPTS, METRICS, AND IMPLICATIONS

Understanding income inequality is not only an academic matter, rather, it is an important investigation of the social and economic structure of our societies. This chapter explores the types, the metrics, and the implications of income inequality, providing a framework to facilitate decision making by policy and society.

The building concern over inequality and its wide-reaching impacts on the economy and society are becoming a growing issue all over the world among politicians, economists and global community. Many scholars like Deaton (2013), and Stiglitz (2012) have demonstrated the moral infeasibility, economically negative and politically corrosive nature of the current level of inequality. This rising attention to measure the impact of determinants of income inequality reflects the fact that it is more than just a matter of economic development; it is also a threat to social harmony and peace. As Brinkman et al. (2013) puts it, frustration associated with inequalities in the provision of public goods or social services, and institutional or societal exclusion can, in turn, lead to hostility, conflict, and violence. Moreover, human rights like civil and political rights, race, ethnicity, language, religion or legal and political freedom will remain unjust which will further increase the inequality UNCTAD (2013, 2014).

Integrating this notion of inequality in the larger discussions show that it has gained a great prominence at both political and academic forums. Scholars such as J. K. Galbraith, John Rawls, Joseph Stiglitz, and Thomas Piketty who have worked on dissecting the society implications of income inequality (Butler, 2022) are notable contributors to the narrative. Though there is an imposed consensus on the detrimental effects of inequality, there are opposing objections that challenge the efficiency and consequences of the policies that tackle inequality.

Shocking facts and figures show clearly the income and wealth inequalities across different regions around the world. In Europe this phenomenon is going even further, for example the income for the top 10 percent of earners is nearly ten times that of the bottom 50 percent, and the same phenomenon apply to wealth distribution, in which the richest 10 percent own over 60 percent of total wealth (Butler, 2022). These numbers signify the amount of inequality present in today's societies and they raise the concerns about the principles of fairness and social justice. This further indicates the gravity of the inequality in modern societies, which is a reason to be alarmed – no matter what perspective we happen to be coming from.

Along with the wealthiest individuals' income rising, the existing problems are further aggravated. Indeed, throughout the last half century, income inequality in developed countries has risen to levels undreamed of with the top 1 percent owning disproportionate amounts of wealth (Butler, 2022). This trend not only solidifies existing disparities but also expands the gap between the rich and the poor in the society.

Critics of inequality point out that such imbalances are fundamentally unjust and serve to uphold social stratification. An advantage from inherited wealth and privilege builds the path of children of the wealthy that will continue intergenerational inequality (Butler, 2022). In addition, the accumulation of wealth is the means by which the wealthiest are able to sway political decisions to their advantage, which further secures their privileged positions in society. The consequences of inequality go far beyond economic disparities and numerous studies have demonstrated that it is directly related to the many social problems like lower life expectancy, reduced educational attainment, and increased rates of mental illness and crime (Butler, 2022).

Calls for income redistribution measures are becoming louder as people confront this growing gap. Advocates put forward arguments for strengthening the progressive taxation policy, expansion of welfare provisions, minimum wage rates and anti-discrimination laws as the crucial ingredients of poverty alleviation, giving people a chance of a better life (Butler, 2022). Moreover, certain advocates call for more drastic measures considering that inequality is a part of capitalism and the way to tackle it is through a systematic change.

This intriguing landscape is thus the backdrop for a comprehensive exploration of inequality dynamics in this study. Moving ahead, the following chapters go deeper into the quantitative and qualitative dimensions of inequality by analyzing the complexities and repercussions of different manifestations of inequality. Through an analysis of different types of inequality, the distinction between poverty and inequality, the metrics of economic inequality, and a history of income disparity, the chapter gets ready to address the topic of its determinants and implications.

2.1. Types of Inequality

Inequality encompasses a wide range of disparities that go beyond simple economic distinctions. It is a complex idea that can take on many different shapes, impacting many sides of people's life and influencing a range of social systems. It is crucial to acknowledge the complexity of inequality in order to formulate sophisticated approaches to tackle its diverse aspects. The following important categories of inequality best illustrate the variety of this idea:

Social scientists and geographers have made a lot of research around inequality, and they have been trying to understand its multifaceted nature and the implication, as well as looking for ways to counter the effect (Koh, 2020). Broadly, the term "inequality" refers to the unequal distribution of resources and opportunities in a given society, perceptions and interpretations being dependent on context and point of view. It is a complex idea that can take on many different shapes, impacting many sides of people's life and influencing a range of social systems. It is crucial to acknowledge the complexity of inequality in order to formulate sophisticated approaches to tackle its diverse aspects. This concept entails economic, social and spatial aspects, all of which contribute to complex topography of inequalities. Following are explained each of these types of inequality separately to illustrate their variety:

1. **Economic inequality** refers to the differentiation in the income and wealth distribution which results from the gaps in the household income, assets, and economic resources (Koh, 2020). It is encompassed with both vertical and vertical inequalities. The differentiation in income or wealth between individuals or groups is referred to as a vertical inequality, while horizontal inequalities represent those where there are disparities within social groups. Factors including employment status, educational attainment, and occupational sector contribute to preserving economic disparities, thus influencing forms of social stratification and mobility.
2. **Social inequality**, however, consists of concepts of social justice, rights, and opportunities focused on race, ethnicity, age, gender, sexuality, disablement, citizenship, or residency. (Koh, 2020). This type of inequality is reflective in not only education and job market, but also healthcare and political participation, thereby continuously reinforcing social stratification and marginalization. As it aggravates social disparities, discrimination and prejudice tend to strengthen power relationships and thus limit the progress of marginalized individuals in society.

3. **Spatial inequality** is a geographically defined inequality when it comes to allocation of resources, the development processes and provision of services and opportunities that lead to regional and rural-urban divisions (Koh, 2020). It ranges from inadequate infrastructure to housing, transport, and environmental aspects that ultimately shape how the economy flourishes and the social inclusion of an area takes place. Urban centers usually attract economic opportunities and concentrate capitalistic resources, resulting in spatial concentrations of wealth and affluence, whilst often rural regions endure deficiencies of essential services and employment opportunities.

Following the study looks more closely into economic inequality, and the types of economic inequality. One of those is income inequality, which is the topic of discussion in this dissertation.

2.1.1. Economic Inequality

Economic inequality, widely defined as variations in income and wealth distribution, is a multi-dimensional concept, addressing the disproportionate access to economic resources by individuals and households (Koh, 2020). The disparity is shown in differences in income, assets, and overall economic condition, and it affects the different aspects of the lives of people, and thus, it contributes to social ranking and patterns of social mobility. The aspect of economic inequality has many dimensions, which are shining light on various angles of the issue of inequality. The three types of economic inequality are explained below:

1. **Income inequality** refers to situation wherein the disposable income of one group is different from that of the rest in terms of amount. Income, covering wages, salaries, rewards, dividends, government help, pensions, and rent, is a significant evidence of economic prosperity. It can be derived on the individual and household level by considering the total income from all sources inside a particular household. Gross income refers to the total household income before taxes inclusive of salaries or contracts and other benefits from the social security system, while net income refers to the take-home cash in a household after taxes and benefits are considered (The Equality Trust[1], n.d.)
2. **Pay inequality**, on the other hand, is a distinct dimension of economic inequality, and it questions the level of remuneration from employee’s labor. Such disparities are taken account of by wage, salary, bonuses and other remuneration, distributed across various jobs, industries and demographic groups. Disparity in remuneration could present itself

at workplace level in some commensurate posts as well as in the larger societal setting where certain professions or sectors are known to demand for higher salaries and other generated benefits compared to the others.

3. **Wealth inequality** is another one of the key parameters of economic inequality which encompasses the differences in the total assets and net worth of individuals or households. Wealth consists of both physical assets like stocks, bonds, real estate, cars and jewelry, as well as intangible assets such as intellectual property and pension rights. Unequal distribution of wealth highlights the different ways people are able to collect wealth, inheritance patterns, and structural obstacles that hinder asset accumulation of some demographic groups (The Equality Trust[1], n.d.)

These dimensions of economic inequality influence the various socioeconomic factors, including unemployment, level of education and occupational sector, which go on to determine the patterns of inequality and social mobility. Moreover, these economic inequalities overlap with more complex social inequalities based on gender, ethnicity, race, age, and disability, thus adding to the imbalances and the systemic injustices.

In order to go deeper into the understanding of the phenomenon of income inequality, the study follows with a short definition of the matter, and then a distinction between income inequality and wealth inequality, as well as between income inequality and poverty.

2.2. Income Inequality – Definition and Comparison

Income inequality is certainly the most commonly researched type of inequality. Income inequality is an insidious and intricate social condition that emphasizes how finances are unfairly shared within a given society among persons or households. When resources and opportunities are not distributed in a fair manner among members of a society it leads to inequality. It is an all-encompassing notion that goes beyond mere differences in wages and extends to unequal access to opportunities, assets and general living standards.

2.2.1. Income Inequality vs. Wealth Inequality

Income inequality and wealth inequality, while related, are distinct concepts that illuminate different facets of economic disparity within societies. Income inequality refers to the uneven distribution of income among individuals or households, encompassing variations in wages, salaries, bonuses, investments, state benefits, pensions, and other sources of revenue. This disparity highlights how financial resources are allocated and accessed within a population, impacting living standards, opportunities, and overall socio-economic well-being.

On the other hand, wealth inequality explores the uneven distribution of assets among individuals or households, encompassing financial holdings such as bonds, stocks, real estate properties, and private pension rights. Unlike income inequality, which focuses on the flow of resources over time, wealth inequality examines the accumulated stock of assets that individuals or households possess. Consequently, wealth inequality reflects disparities in net worth and financial security, exerting significant influence on long-term economic stability, intergenerational mobility, and economic opportunities available to future generations.

While income inequality highlights immediate disparities in earnings and financial resources, wealth inequality underscores deeper structural inequalities in asset ownership and wealth accumulation. Addressing both forms of inequality is essential for promoting a more equitable and inclusive society, as they contribute to entrenched disparities in socio-economic outcomes and opportunities. By understanding and addressing the complexities of both income and wealth inequality, societies can work towards fostering greater economic mobility, social cohesion, and shared prosperity for all members.

2.2.2. Income Inequality vs. Poverty

Income inequality and poverty are two factors greatly affect the social economy of the societies which have a lot of similarities and at the same time many distinctions. Income inequality is a term used to describe the unequal distribution of income among individual or household, highlighting the differences in earnings, wages, and access to economic resources. Such inequality also comprises variations in income levels which causes the separation of people living in different standards, opportunities and social mobility.

Contrarily, poverty stand for a state of deprivation where individuals experience lack of basic necessities and essential facilities, such as food, shelter, health care and education. On the one hand, income inequality demonstrates unequal distribution of income across the income spectrum and, on the other hand, poverty shows the inability of individuals or households to make the minimum living level because they don't possess enough financial resources. Therefore, poverty is commonly considered to be a result of income inequality and income difference, with pervasive income differences leading to housing condition and social and economic result disparities among different classes in various societal strata.

Poverty means a situation where people or their families have levels of deprivation that are considerably below what others in the same society have. This lack is usually assessed in terms of absolute or relative figures. Absolute poverty refers to an unchanging constant level of deprivation while relative poverty refers to a household that earns less than a certain percentage (usually 60%) of the median income, as defined by the European Union. Absolute poverty, on the contrary of being just a constant level of material need, perceptions of what is considered deprivation change over time — today's essentials could have been once considered a luxury. However, for relative poverty, one should be careful in its assessment, as an individual under relative poverty line in developed countries may have a high standard living but an above the line in developing nations may still have to experience deprivation.

The opposite is true in income inequality which covers the broader range of differences in the distribution of incomes across all aspects of the economy. It shows how unevenly financial resources are distributed among individuals and groups irrespective of whether they are poor or not. Income inequality is a relative concept anchored on comparing one group's economic position with another.

Table .1 Poverty vs. Inequality

	POVERTY	INEQUALITY
DEFINITION	People who are considerably worse-off than the majority of the population.	The difference between levels of living standards across the whole economic distribution.
TERM	In absolute term: a level of deprivation that does not change over time in relative term: having a household income which is less than 60% of median income. (EU definition)	Always a relative term
CONCEPT	Narrower	Broader
POPULATION	Just the portion below a certain poverty threshold	Entire population

Source: The Equality Trust[1], compiled by the author

Income inequality and poverty are two distinct concepts that share a common thread of socio-income inequality. Income inequality measures the uneven distribution of money in society, highlighting the distance between the rich and the poor. It can be measured as an absolute or relative measure, depending on the level of deprivation experienced by individuals or households. Poverty, on the other hand, focuses on deprived conditions below a certain standard of living, either as an absolute or relative term.

Income inequality covers a wide range of disparities in income, wealth, employment, and other economic factors, while poverty mainly focuses on people falling below a particular level of income. In terms of population coverage, income inequality considers the differences between various income groups, while poverty often zeroes on a single stratum living below a certain income level. Policy implications for income inequality include structural issues like progressive taxation, social safety nets, and labor market reforms, aiming to ensure a more balanced distribution of resources within society. On the other hand, poverty policies focus on easing the situation of those living below a certain income level through social assistance programs, educational initiatives, and improved healthcare access.

In practice, poverty and inequality tend to correlate, however they are not identical. A highly unequal society does not necessarily have a high level of poverty because there is a big gap between the top and middle-income earner only. This case occurs when there is a significant difference between the upper- and middle-income classes within the population. As such, it becomes clear that income inequality encompasses a broader concept of economic differences off the perimeters of poverty.

2.3. Income Inequality Metrics

Economic inequality can be measured in many different ways. The Gini index, Theil index, the Hoover index, are only some of the most used metrics when measuring income inequality. Every one of these metrics has unique characteristics that make it possible to use it to measure the inequality.

One nice feature of an inequality metric is being "decomposable" which means that inequality within sub-regions of the economy can be investigated and then summed up to give the overall level of inequality for the economy. The only index among the above-mentioned ones which follows this rule is the Theil index.

These income inequality metrics can be viewed as summary statistics, which as single indices summarize the entirety of the complex income distributions. Such simplification of informational complexity, therefore, helps to highlight the entire picture of inequality. A not-so-much complexity reduction take place when income inequalities are categorized based on quintile or percentile divisions of the population with respect to the entire income of their nation. Every segment pertains to a separate section of income receivers, with the variations in the overall distribution of income across the segments reflecting the degree of inequality.

In reality, inequality indices are more likely to be calculated from segment data without looking into disparities within the segments themselves. In order to obtain a more informed level of income distribution, increasing the number of segments, say deciles instead of quintiles, may be essential, therefore, narrowing the existing measured inequalities. Nevertheless, only inequality measures with the decomposability property can precisely represent inequality within members of each segment.

Quintile-based inequality indices follow the transfer principle in a less exact way - their central focus is inequality in income distribution between the highest and lowest income categories, while segregation in the middle class is neglected.

However, it is important to recognize that the choice of inequality metric does not greatly influence the picture of inequality as observed by a specific society. On the other hand, different measures of inequality used over time within a country may result in different levels of inequality exhibited.

The similarity in the perception of inequality among the different measures shows the dependability of these metrics as indicators of the overall disparities within a population. Regardless of the particular approach used, inequality as a phenomenon is consistent in the basic understanding, hence providing invaluable insights into how resources and opportunities are distributed within a community.

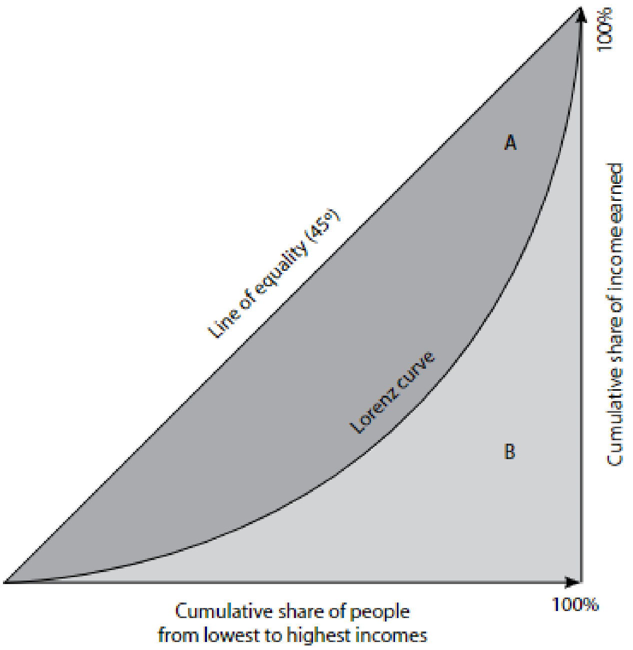
Conversely, when observing changes in inequality throughout the chosen country over time, the selection of a particular inequality metric becomes more essential. A variety of measures can give you a better picture of inequality by putting more weight on particular aspects or being more sensitive to specific changes in income distribution or the nature of the economy. Therefore, inequality measure selection will affect the interpretation of inequality trends over time, highlighting the need for reflection while building a longitudinal analysis.

The following sections cover most of these measures briefly.

2.3.1. Gini Coefficient and the Lorenz Curve

Traditionally, the approach to assessing the level of income inequality begins with the Lorenz curve, invented by US economist Max Lorenz (Figure 1). On the horizontal axis appear the cumulative number of earners, from poorest to richest, and on the vertical axis is the cumulative percentage of income received. In case of complete equality, where there is each x percentile of the population getting the same x percentile of wages, this will make a vertical 45-degree line on the graph. The greater the inequality the more the curve moves away from the 45-degree line and moves down towards the bottom (Butler, 2022).

Figure 1. The Lorenz Curve



Source: Butler (2022)

Thereby the Gini's coefficient is defined as the ratio of the area between the curve and the 45° line (A) to the total area under the 45° line (B). The higher is the ratio, the more will the inequality (Butler, 2022). A Gini coefficient of 0 would represent the perfect equality, whereas a Gini coefficient of 1 would indicate the perfect inequality which means that all the income can be monopolized by a single person only.

The Gini coefficient which was developed by an Italian statistician Corrado Gini is one of the key tools employed in the analysis of income distribution within societies. It is a research tool used to study various aspects of science. In the economics field, the Gini coefficient stands for the distribution of income in a country and as such is also recognized as the primary measure for income inequality.

Being based on the Lorenz curve, which was invented by a renowned economist called Max Lorenz, the Gini coefficient allows one to calculate and then compare differences in income distribution in a society at a given point in time. This offers policymakers and researchers a numerical technique for tracking inequality changes in a country's society (Butler, 2022).

A Gini Coefficient still being one of the most commonly used metrics, provides a picture of inequality across society, rather than a comparison between different income groups. This can be done by incorporating income distribution after or before taxes or housing costs. The highest degree of inequality (Gini = 1) is reached when all income is in the possession of one person, whereas the lowest degree of inequality (Gini = 0) is achieved when all income is dispersed across the whole population.

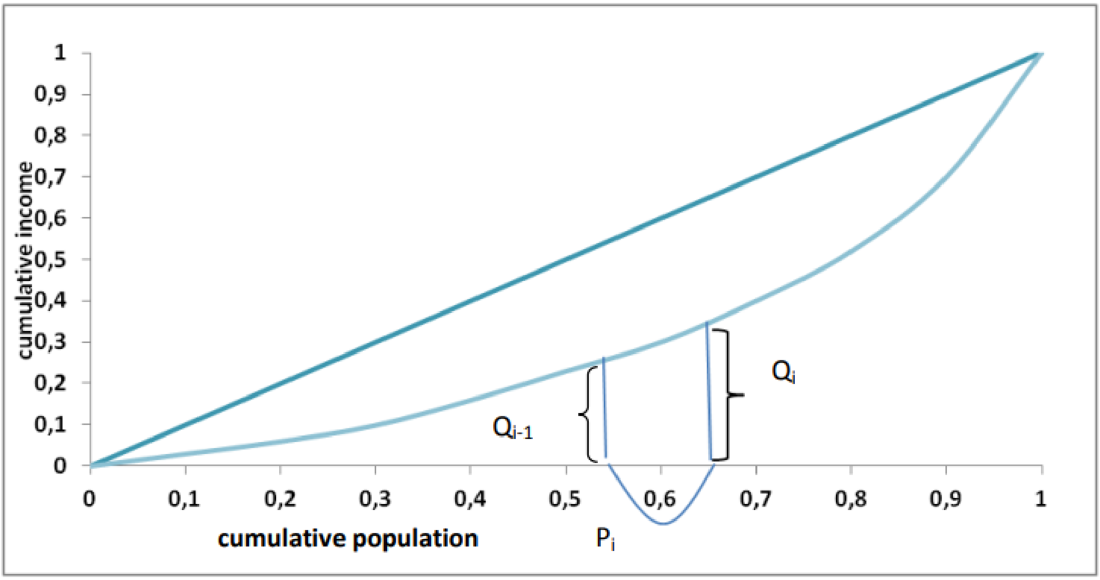
The accumulation of the Gini coefficient is the most suitable to explain it with the help of cumulative graph – see Figure 1. Calculating the Gini coefficient involves two elements, the size of population (i.e. the number of households) and the income on the other side. At first, a country sorts its population by income which starts with households with the lowest earnings on the left and ends with the households with the highest earnings on the right. Therefore, a rank is set upon household income. The following step should now be to slice the ranked line into ten equal parts – i.e segments. The households are collected in groups for the ease of the calculation (Eklil, 2011).

In the given case in Figure 2, each section (quintile) contains 10 percent of the total number of households for the country. This implies that the group of the least earners is in the first quintile on the scale from low to high (in incomes) and the group of richest households in a tenth one. Equality means that everyone has the same amount of income regardless of what they earn while inequality indicates that some people have more income while others have less income. Full equality of earnings can be defined as that situation in a country in which each of the quintiles receives a similar part of the total wage – for our example it would be 10%. From this data, the information is then plotted on a cumulative graph, whereby the horizontal axis represents the size of the population and the vertical axis denotes the amount of income earned.

If there is absolute equality, the cumulative 20% of the population (the first 20%) earns 20% of total income and 40% earns 40% and so on.

The curve of progressing income share to different household groups (quintiles) is called Lorenz curve. The Lorenz curve for the perfect equality is expressed as a straight line which extends from the lower left corner to the upper right corner at a 45° angle. Almost never do individual sections of the society earn the same amount of income. Even so, as indicated beforehand, it constitutes a point of reference when calculating the Gini ratio. The real Lorenz curve will rest underneath the straight line. The deviation between the real Lorenz curve and the one of complete equality is used as a basis for the Gini coefficient calculation. This disparity is not only visible, but also determines the inequality of income distribution in a country, given that the greater the area between the two Lorenz curve lines the higher degree of inequality within a country (Eklil, 2011).

Figure 2. The Gini coefficient using the Lorenz Curve



Source: Eklil (2011)

For the Gini coefficient we simply divide the area between the curves by the total area under the perfect equality line (=0.5). Eklil (2011) in their study, nominate the letter “B” to indicate the area between the lines, and the letter “T” to show the area of the line under the perfect equality line.

Therefore,

$$GINI = \frac{B}{0.5} = 2B \qquad (1)$$

Furthermore, the following formula is used to determine the value of the Gini coefficient is

$$GINI = 1 - \sum Pi\ (Qi + Qi\text{-}1) \qquad (2)$$

Where, Pi is the cumulative population share, while Qi is the cumulative income share.

On the other hand, another way of defining perfect income equality would be when the perfect equality line and the actual income distribution line are the exact same. If this were the case, the Gini coefficient would be zero because the difference between those two lines is zero. Another example when the Gini coefficient equals one is when one quintile of the population earns all the income while everybody from another four quintiles has no income. Here, the region between the curves encompasses the entire area (=0,5) below the perfect equality Lorenz curve.

In the study of Lagerlöf (2021) several studies are mentioned that use the quantiles as measures of income inequality. For example, Persson and Tabellini (1994) estimate the size of the middle class by using the middle quintile and Q3 from the income distribution. According to the authors it is the quintile that takes the middle position in the coverage of the median income. The increasing of this quintile indicates that the middle class has higher income level (Persson & Tabellini, 1994). From this observation, the paper presents a different approach of the measurement of inequality unlike previously done. Another such study is Barro (2000), a study that uses the five percentile (Q1 to Q5) manner to present data on income distribution. But the insertion of quintiles does not change the interpretation of using the Gini-coefficient in his study. Also, the relationship between growth and income inequality is indirect and it seems to be positive for developed countries and negative for less developed countries (Barro, 2000). In this regard, on the basis of different quintiles, Barro (2000) thus argues the significance of different income groups in comparison to Persson and Tabellini (1994). Nevertheless, neither of these studies succeeds in tracking inequalities between specific groups of people. In addition, the works of Barro (2000) and Persson and Tabellini (1994) do not employ ratios or similar measures that define income variation among classes.

Overall, how one can grasp the Gini value implications is not only a matter of a pure statistics; this measure has deep social-economic implications as well. Extreme income disparities worsen the social problems, hinder economic development, and negatively affect social welfare. Therefore, Gini coefficient is widely used as a metric for measuring relative inequality while one can compare current populations, regions, and historical periods. The use of Gini coefficient gives researchers ability to spot the change trends, evaluate the success of the policy tools, and apply that knowledge into evidence-based decision-making processes.

A. Gini Coefficient Limitations

Even though widely used index of income inequality, the Gini coefficient has its own shortcomings that one must necessarily consider. One noticeable shortcoming is sensitivity to outliers, mostly to those who are highly influential in terms of an extremely wealthy few within a larger population. These outliers may distort the Gini coefficient value significantly much to the extent that the conclusion will be misleading. Alternative metrics, such as the Palma ratio has the possibility to reduce the sensitivity to the outliers which is the weakness of Gini coefficient.

In addition, the reliability of Gini coefficient depends on data availability and accuracy of income. The use of different data gathering methods and standards in reporting between countries makes international comparisons a difficult task accompanied by uncertainties. Even though various international organizations try to standardize the data collection mechanism, these issues do not necessarily disappear, resulting in cross-country analyses being difficult.

Furthermore, income inequality calculations are influenced by those factors as taxes and benefits that subsequently can change income distribution, hence completely destroy the existing pattern. Different tax regulations change the perceived level of inequality, as compared to the gap between before-tax and after-tax income distributions. What happens sometimes, taxes and means-tested benefits actually make income inequality less, which draws us to the conclusion that when we interpret broad inequality metrics, we should keep the broader socio-economic context in mind.

The quality of public benefits is probably another factor playing a role in the assessment of income inequality, as the educational and healthcare aid provided by the government, which substantially affects people's lives, are much wider than just cash. In addition, the shadow economy, denoted by the nonreported income and informal activity, brings even more challenges to the precise measurement of income distribution.

Along with these disadvantages, it needs to be understood that income inequality metrics do not present the complete picture of one's well-being. Social standing associated with simple access to necessary goods and services, from technology to healthcare, is just as impactful as recognized income measurements and should not be neglected.

2.3.2. The Hoover Index

The Hoover index, which some refer to as the Robin Hood index or the Schutz index, is a tool used to measure income inequality within a population. It calculates the percentage of the income that should be taken from a given population to achieve an equal distribution of income. Computation of Hoover index is rather simple concept, because it only shows the amount of income that needs to be redistributed to achieve the perfect equality.

If there is a perfect equality, absolutely no reallocation (of resources) will be needed, and so the Hoover's index will be zero. On the other hand, if all family income was consumed by only one family, then 100% of that income would need to go to other families before income equality could be achieved. So, the Hoover index scores from 0 to 1 in which, a value of 0 means perfect equality whereas a value of 1 (or 100%) implies maximum inequality (Hoover, 1984).

2.3.3. The Theil Index

The Theil index, which comes from the general entropy (GE) measures family, is derived from ratios of incomes to the mean. The Theil's L index, which is the mean log deviation, and the Theil's T index, which is the Theil index, are the most known national inequality among the GE index. [Cowell, 2000.]. Such indices possess zero values in a case of perfect equality and the higher it gets as the inequality within the distribution worsens. As opposed to the Gini coefficient, they do not have the upper limit of 1. On the other hand, however, Lee's L is the most responsive to changes in low incomes, whereas Theil's T is sensitive to changes in the higher end of the spectrum. Consequently, it is possible to contrast both indices and it can reveal which the segments of distribution are the ones playing a major role in the movement of the shift.

The Theil index, although lacking straightforward interpretation, remains a popular tool in empirical studies because of its decomposition feature. This enables us to separate income inequality into components associated with the within and between group differences within a given population, for example, those represented by age, education or geographic areas. As such, this skill is of tremendous importance to policy makers which should allow them to detect the root causes of inequality. For instance, by decomposing global inequality into between-country and within-country components using the Theil T index, it has been shown that a considerable portion of global inequality is attributed to between-country differences (Anand, and Segal, 2015).

While rankings of countries based on different inequality indicators tend to coincide, the selection of the indicator becomes essential when evaluating policies that might influence the lives of different groups of people differently along the income distribution. In addition, the level of inequality in a country over time looks differently depending on what measure is chosen (Smeeding et al., 2015).

2.3.4. The Atkinson Index

The Atkinson index, which is known as Atkinson measure or Atkinson inequality measure is a useful multi-purpose tool for determining who are the main causes of visible disparities.

The Atkinson ε parameter which is referred to as the "inequality sensitivity parameter" lies at the heart of the implied social welfare losses triggered by income inequality, as measured by the corresponding generalized entropy index. The Atkinson index is formulated in terms of a comparable social welfare function, in which the welfare-equivalent income that would arise from an ideal income distribution is obtained by multiplying the mean income by one less than the Atkinson index.

In order to convert the index into a normative measure, the weighting of earnings must be adjusted by adding a coefficient ε. If ε, the degree of "inequality aversion," is chosen suitably, then changes within particular income distribution segments might be given more weight.

With a rise in ε, which indicates a greater aversion to inequality, the Atkinson index becomes more sensitive to shifts in the lower income range. On the other hand, when ε gets closer to 0, the degree of inequality aversion decreases, which means that the Atkinson index is less sensitive to changes in the lower bounds of the distribution. It's crucial to remember that the Atkinson index does not show strong sensitivity to top incomes for any value of ε because of the requirement that ε must be nonnegative.

2.3.5. The Galt Score

The Galt score got its name from the fictional character John Galt from Ayn Rand's novel Atlas Shrugged. It is a simple metric showing how much the CEO of a company earns compared to the median pay of the company's workforce. Companies that have a wide gap between the CEO's salary and the median worker salary tend to score high on the Galt index. The Galt score is calculated by considering a compensation package consisting of the CEO's salary and bonuses, the monetary value of his stock awards and employee stock options, as well as his non-equity incentive plan compensation and nonqualified deferred compensation.

2.3.6. The Coefficient of Covariance

The Coefficient of Variation, which is used to measure income inequality is calculated by dividing the standard deviation of income (which is the square root of the variance of incomes) by the mean income. As a result, the coefficient of variation is lower in countries where the standard deviation is smaller, indicating a more even income distribution.

It has the advantage of mathematical tractability; the square of it decomposes into subgroups. On the other hand, it has no upper bound like the Gini coefficient, so it is difficult to interpret and compare them. Similarly, due to the fact that the mean and standard deviation may be heavily influenced by the values at the margins, the coefficient may not be an apt measure of income inequality for cases with unusual data distributions.

In fact, with respect to the Gini coefficient, the coefficient of variation gives more weight to the right tail of the income scale, therefore, the rich part of population may well affect it. Hence, the coefficient of variation would be the appropriate measure of variation that would analyze wealth concentration at the upper end of the distribution (Renaud, et al. (1975); Ris, et al. (1975).

The coefficient of variation is a measure that is independent of the income scale and is obtained by dividing the standard deviation by the average income. Similarly, in the case of the coefficient of variation of log income, we will also observe the scale invariance. Both indices indicate ranking with the Gini coefficient when Lorenz curves don't intersect, but they may give different results in case of such intersections.

The Gini coefficient is sensitive to the middle of the income distribution while the Coefficient of Variation is particularly sensitive to the wealthy class in the society. On the other hand, the variance of log income tends more so to the lower end of the distribution, where households may have less financial security. The type of the measure depends on the particular goals of the research. Take, for example, poverty levels. The variance of the log of income would be more appropriate than describing individuals with lower incomes. However, when evaluating the share of wealth at the top end of the distribution the coefficient of variation is considered as a better alternative.

2.3.7. The Variance of the Natural Logarithm of Income

The Variance of the Natural Logarithm of Income is defined as the variance of the distribution of log incomes (Foster and Ok, 1999). This scale invariant way of measuring inequality is especially sensitive to the left tail of income distribution. This implies that it is the most appropriate tool for probing the varying levels of poverty among the lowest-income percentage of the population (Trapeznikova, 2019).

In fact, estimated variance of log income differs from the values of more popular inequality measures, such as the Gini index, which are mostly based on the US representative household survey data. Notably, these measures demonstrate distinct patterns of evolution over time: although the shape of Gini progressively moves up from late 1960s up to the early 2000s, the log variance of household income hits maximum at around 1994 and thereafter drops. Another issue is that the degree of inequality may be affected by the indicator used. When the government benefits are included to the household income, the inequality will be lower, especially by the ratio of the fame of the logarithm of income. This realization is in accordance with the fact that public transfers constitute an effective means of reducing poverty, while exerting the least possible influence on the elite segments of society.

2.3.8. Ratios

Comparing the incomes of two different groups—usually the "higher over lower" segments—is another common type of metrics. Instead of analyzing the income distribution as a whole, this method concentrates on comparing certain income distribution segments. A ratio of 1:1 denotes equality between these segments, while larger ratios are indicative of bigger inequality. Because these measurements are relative (e.g., this population earns twice as much as that population), they are easy to understand and communicate. On the other hand, they do not provide a complete picture of inequality because they do not have an absolute scale.

Voitchovsky (2005) has emphasized the significance of ratios. The author argues that this endeavor addresses whether, when accounting for changes in various segments of the income distribution, income inequality may have distinct effects on growth. Apart from the Gini coefficient, Voitchovsky (2005) also employed the ratios between the income distribution's 90th and 75th percentiles and the 50th and 10th percentiles. According to Voitchovsky's (2005) findings, income inequality at the top of the distribution is positively correlated with economic growth, but income inequality at the bottom of the distribution is negatively correlated with growth. This would imply that disparities in income distribution across various segments would have varying effects on the growth rate, as the author discusses. According to this perspective, Voitchovsky's (2005) findings expand on our knowledge of the possible relationship between income inequality and economic growth by demonstrating that it depends on a variety of inequality metrics.

A. Ratio of Percentiles

Comparing the income of a specific percentile to the median is a particularly popular practice. This measure, which is comparable to the idea of a seven-number summary, describes a distribution using specific percentiles, by comparing particular percentiles against the median income. These ratios provide information about the structure of the income distribution, even though they do not accurately reflect the amount of inequality in the population as a whole. For example, the income ratio in the United States between the median and the 10th and 20th percentiles stayed very steady between 1967 and 2003. Nonetheless, there was a rise in the ratio between the median and the 90th, 95th, and 80th percentiles. This pattern suggests that income gains among persons with higher incomes in relation to the median, rather than income losses among those with lower incomes relative to the median, are responsible for the increase in the Gini coefficient in the United States over this period.

B. Share of income

The analysis of income distribution, specifically the share received by certain population segments, is sometimes conducted using ratios referred to as "income shares." This measure represents the portion of the national income allotted to specific percentile groups within the population that are either the wealthiest or the poorest.

The top 1%, top 0.1%, and top 0.01% of earners are only a few of the groups for which income shares are typically reported. The Lorenz Curve, on the other hand, offers a holistic view by graphing the cumulative income obtained by the lowest X% of the population, ranging from 0% to 100%, while income shares concentrate on the highest-earning sectors. The ability of the Lorenz curve to depict differences in wealth distribution between different countries is one of its key features. If country A shows a higher cumulative national income share for the poorest 1% of the population than country B, it means that the poorest X% of the population in country A have a larger proportion of the national income than those in country B across all percentiles from 0% to 100%.

When two countries' Lorenz curves meet, country A's curve will likely be higher on the less developed side of the intersection. This means that for percentiles up to the crossing point, the poorest segments of the population in country A receive a larger share of the national income.

When there are issues with income inequality, the people with lower incomes are typically the ones that are most affected. Across all percentiles X or, if the Lorenz curves intersect, specifically on the poorer side of the crossing point, a higher cumulative national income share for the poorest 1% of a nation corresponds to a higher percentage of the equal-share (the national mean income) received by the poorest X% of the population.

Data points representing cumulative national income shares up to different percentiles along the Lorenz curve are provided by some sources. Additionally, one can learn more about the mean income in relation to the national average by comparing income share ratios to subpopulation sizes.

Ratios to mean income are generally lower than those to median due to the positive skewness of the income distribution, where the mean exceeds the median. This method is frequently employed to evaluate the portion of revenue that goes to the highest earners, including the top 10%, 1%, 0.1%, and 0.01%, among others. For example, in the United States in 2007, the top decile of earners received roughly 49.7% of total wages, while the top 0.01% received around 6% of total income.

2.3.9. The Palma Ratio

The Palma ratio, as coined by Chilean economist Gabriel Palma, proposes a distinct take on income inequality, deviating from the classic measures such as Gini index. It defines the share of gross national income held by the top 10% of earners compared to the share held by the bottom 40% of the population (Cobham and Sumner, 2013). The research undertaken by Palma (2011) showed a consistently occurring trend, whereby half of the gross national income is more or less divided among the middle class, with the remaining half getting shared between the upper 10% and the lower 40%, though with major variations from one particular country to another.

While the Gini index may be excessively influenced by changes in the center class and ignore the extreme ends, the Palma ratio is more versatile in revealing the subtleties of income distribution dynamics and their wider economic repercussions (Atkinson, 1970). This issue of distributional politics, according to Palma himself, revolves around a struggle between the rich and the poor with the middle class being more inclined to support one side or the other (Palma, 2011).

The Palma ratio's value is enhanced further by the proposed introduction of the carbon Palma ratio which is intended to illustrate the differences in carbon emission distribution among individual (Pan et al., 2019). Originating from the income Palma ratio, this index numerically estimates the ratio of total emissions generated by the top 10% of emitters to those produced by the bottom 40%. Its computation, which is both within and across countries, applies an elastic relationship between individual emissions and income levels.

On the other hand, the studies reveal that the carbon Palma ratio tends to be higher among the developing countries implying the need for concerted efforts towards addressing both the disparities in regions and income while also prioritizing reduction in emissions among high emitters. In contrast, developed countries may experience relatively high carbon footprints notwithstanding that relatively low Palma ratios, and they should therefore take significant actions that will aim to reduce emissions across all the income groups which would in turn enhance both environmental and income equity. The carbon Palma ratio goes beyond the national borders implying that the ratio of individual emissions is highly uneven across the globe. This underlines the need for the coordinated international actions aimed at climate change mitigation but which at the same time promote social justice and equity.

2.3.10. The 20:20 Ratio

The 20:20 ratio, also known as the 20/20 ratio, offers a comparative scale to measure the wealth gap between the top 20% and lower 20% of a population. This measure enables a refined perspective on inequalities, which is concentrated on the ends of the income spectrum, that overcomes the influence of the outliers at the two ends and excludes the middle 60% from statistical dominance.

Utilized in frameworks such as the United Nations Development Programme Human Development Indicators, the 20:20-1 ratio is an indicator for inequality identification among societies (The Equality Trust[2], n.d.). For instance, analysis based on the 20:20 ratio indicates that countries such as Japan and Sweden have rather small inequality gaps that would allow the most well-off 20% to earn only four times more than the poorest 20%. Nevertheless, the UK and the US have the widest gap in their Gini coefficients at seven and eight times, respectively.

Advocates of the 20:20 ratio suggests this measure has a comprehensive understanding of social standards and stability because it has an excellent correlation with factors such as human development and social welfare indicators. Some examples of these indices are child well-being, problems due to health and social factors, incarceration rates, physical health, mental health, and many others (The Equality Trust[3], n.d.). By spotlighting the disparities between the most affluent and the most disadvantaged segments of the population, the 20:20 ratio offers a more comprehensive look not only at inequality itself but its subsequent implications in various spheres of human activity.

2.4. Historical Development of Income Inequality

This section focusing on the historical development of income inequality is a derivation from the monumental work,"Capital in the Twenty-first Century" by Thomas Piketty (2014), which is an indisputable revelation and innovative exploration in scholarly world of the income inequality's historical background. Alongside the whole body of the economic literature, the magnum opus of Piketty can be noted as a towering achievement for the deep understanding it has given of the complexity of the forces which have basically governed wealth distributions over time. Following historical evidence and the theories informing his approach, Piketty brings to light the mechanisms operating under the surface to explain income inequality in the contemporary society, opening the way to greater understanding of what is wrong with the modern society.

Piketty's book is more than a description regarding income inequalities of the past. It is rather, a sophisticated assessment of its consequences on modern societies. By following the evolution of wealth distribution in the nineteenth century up to today, Piketty illuminates the lasting traits and directions that characterize economic inequality throughout various eras. By means of his precise analysis of historical facts and theoretical findings, Piketty reveals the complicated pattern of causes which leads to the creation of a relatively small class of exceptionally rich people who succeed to control society's wealth while, at the same time, overthrowing the existing mainstream economics principles suggesting the fair accumulation and distribution of wealth.

At the foundation of Piketty's analysis is the critical questioning of the economic theories and ideological assumptions that the contemporary debates about income inequality are based on. By referencing renowned economists like Karl Marx, David Ricardo, and Simon Kuznets among others, Piketty undertakes a discourse with historical perspectives for the purpose of learning vital lessons and drawing invaluable insights concerning the structural determinants of wealth inequality. Through integrating various intellectual streams of thought and empirical data, Piketty builds an analytical frame that surpasses disciplinary boundaries, providing a comprehensive view of income inequality taking into account its economic, social, and political dimensions.

Through tracking changes in wealth and income that date back to the 19th century, Piketty lights up the ramifications for the present day. Following, the storyline shifts towards exploring those who were considered as influential figures at their time including Malthus, Young, Ricardo, and Marx whose theories and analysis were fundamental in determining how the discourse of income inequality evolved during their time.

The deep mechanisms of capitalism and inequality have not changed, at least not as much as was anticipated in the hopeful years after World War II, despite the fact that modern economic growth and the spread of knowledge have prevented the Marxist apocalypse. Capitalism automatically produces arbitrary and unsustainable inequalities that fundamentally undermine the meritocratic values upon which democratic societies are founded, as it did in the nineteenth century and appears likely to do again in the twenty-first. This is because capital gains an advantage over the rate of growth of output and income. However, there are methods for democracy to retake control over capitalism, maintain economic openness, and prevent protectionist and nationalist tendencies while guaranteeing that the public interest supersedes private interests. This is the general direction of the policy suggestions that are made by Piketty (2014) in his *Capital in the Twenty-First Century* study. According to him, they are founded on historical experience-derived lessons.

2.4.1. Malthus, Young, and the French Revolution

When classical political economy arose in England and France in the late eighteenth - early nineteenth century, the question of distribution was already one of the main ones. Thus, everyone understood that the major changes occurred then, stimulated by the rapidly growing population— the previously unknown phenomenon— as well as by rural exodus and the Industrial Revolution. What would the redistribution of wealth, social strata, and political balance of the European society look like in the face of all these changes?

As early as 1798, in the "Essay on the Principle of Population," Thomas Malthus referred to overpopulation as the main danger[1]. Malthus used a limited source of information, which was the travel diary of Arthur Young, an Englishman who toured France in 1787–1788, immediately before the revolution took place. Young described the poverty in the French countryside very vividly offering significant insights of the real situation. France, as the most populated country in Europe at the time, saw its population reach nearly 30 million in 1780

[1] Along with David Ricardo (1772–1823) and Adam Smith (1723–1790), the English economist Thomas Malthus (1766–1834) is regarded as one of the most important representatives of the "classical" school of economics.

and went through fast demographic developments in the eighteenth century. The French Revolution was not entirely caused by this rise, but it did play a role in driving dissatisfaction towards the aristocracy and the ruling political system by raising inland rents and stagnating agricultural earnings.

Although Young's insights were significant, his narrative also revealed subjective biases and nationalist prejudices. He was concerned that political unrest could be sparked by extreme poverty and argued in favor of an English-style political system that would guarantee peaceful growth. In a comparable way, Malthus made extreme suggestions in his Essay, motivated by concerns about revolutionary philosophies coming out of France. Malthus recommended stopping welfare support to the poor and closely examining reproduction among the poorest to prevent chaos and misery brought on by overpopulation in order to calm fears of unrest in Great Britain. These gloomy prognoses by Malthus and Young reflected the wide spread panic that was spreading among European elite during the turbulent times of 1790s.

2.4.2. Ricardo and the Principle of Scarcity

The gloomy forecasts of economists in the late eighteenth and early nineteenth century are tempting to be ridiculed when one looks back. However, at the same time, it is important to acknowledge the significant social and economic transformations that occurred throughout this time. Not only Malthus and Young, but also their successors, David Ricardo and Karl Marx - two of the most important economists of their day, had similar pessimistic views on how class structure and wealth distribution would ultimately change over time. For Ricardo it was the landowners, while for Marx it was the industrial capitalists who would unavoidably claim a continuously rising percentage of income and output[2].

Published in 1817, Ricardo's "Principles of Political Economy and Taxation," a key work, concentrated on the changing dynamics of land prices and rents. Inspired by the Malthusian paradigm, Ricardo explored the dilemma of land scarcity in the face of rapidly increasing output and population. He proposed that land would become scarcer in relation to other things as population and output increased, which would cause land prices and rents to continuously climb. Landlords would thus be entitled to an increasing portion of the national

[2] There is, of course, a more optimistic school of liberals, to which Adam Smith appears to belong. In truth, he never really gave the idea that income distribution could become increasingly unequal over time much thought. This also applies to Jean-Baptiste Say (1767–1832), a proponent of natural harmony.

revenue, which would exacerbate social inequality. As the only practical way to deal with this, Ricardo argued for a progressive tax on land rents. This gloomy warning proved to be inaccurate: land rents did stay high for a while, but as agriculture's part of the national revenue shrank, farmland's worth steadily reduced in relation to other types of wealth. Having in mind that his prediction was based on the situation of the early nineteenth century, Ricardo could not have predicted in any way the significance that the technological progress or the industrial revolution would have in the years to come. This would completely shift the focus from the alimentary imperative to other aspects which would become the new necessity.

Although Ricardo's forecasts did not come to pass, his understanding of the scarcity principle is still relevant today. His prediction that the land prices would increase to very high levels over the next decades is not far from reality. In the modern global economy, the price system is crucial to coordinating the actions of millions, if not billions of individuals. The pricing system's ignorance of boundaries and morals is the root of the issue. Ignoring the significance of the scarcity principle in figuring out how wealth is distributed globally in the twenty-first century would be a grave mistake. It is sufficient to substitute the price of oil, or alternatively, the price of urban real estate in major global cities, for the price of farmland in Ricardo's model to persuade oneself of this. Extrapolating historical patterns to the present day highlights the potential for significant political, social, and economic disequilibrium, similar to what Ricardo referred to as the "Ricardian apocalypse."

Indeed, the law of supply and demand is a fairly basic economic mechanism that, in theory, should bring the process back to equilibrium. Any good whose price is too high and its supply is inadequate should see a fall in demand, which will lower the good's price. Putting it in another way, individuals should relocate to the country or start riding bicycles if real estate and energy prices increase (or both). Never mind that these changes could be difficult or complicated; they could also take decades, during which time oil well and landlord owners could build up such substantial claims against the rest of society that they could eventually become the owners of everything[3].

Ricardo's scarcity principle, put simply, emphasizes the complex relationship that exists between economic forces and society consequences. Even though his predictions might

[3] The alternative is to expand the supply of the limited item, which presents additional challenges. Examples of this include discovering new oil supplies or, if feasible, cleaner energy sources than oil, or by creating high-rise housing or other urban infrastructure that leads to a denser environment. Either way, it may take decades to do this as well.

not have come to pass, his observations serve as a sobering reminder of the economic concepts' continuing applicability in comprehending the problems with resource allocation and income distribution that face society today.

2.4.3. Marx and the Principle of Infinite Accumulation

By the time Marx published the first volume of "Capital" in 1867, the social and economic scene had changed significantly. The emphasis changed from worries about land prices and agricultural output to comprehending the workings of industrial capitalism, which was now thriving. The widespread suffering of the industrial proletariat was a harsh fact of the era. In spite of economic expansion, urbanization, and improvements in agricultural yield, workers had to settle to urban impoverished areas where they had to put in long hours and receive little pay. Literary masterpieces such as "Oliver Twist," "Les Misérables," and "Germinal," which clearly portray this metropolitan predicament, mirror the grim reality of industrial life. Legislative initiatives to combat labor exploitation, such prohibitions on child labor, also highlighted how serious the situation was.

Based on historical data, it appears that the latter part of the nineteenth century saw the biggest increases in the purchasing power of wages. Despite faster economic growth in the early decades of the century, worker incomes remained at levels similar to or even lower than those of the previous centuries. In the meantime, industrial profits and rents contributed significantly to the capital part of the national income, which exacerbated income inequality. Even if in the later decades of the century incomes started to somewhat keep up with economic expansion, structural inequality remained until World War I. Between 1870 and 1914, there was a stabilization of inequality at very high levels, accompanied by an increase in the concentration of wealth. It is difficult to determine the direction of inequality in the absence of the major political and economic upheavals caused by the war. Nonetheless, the data points to a persistent pattern of inequality that was supported by the historical economic systems and laws.

Thanks to historical research and a wider viewpoint, we can now identify big shocks—like the ones that occurred during the Industrial Revolution—as crucial factors that can affect income disparity. The 1840s saw a boom in capital and industrial earnings, but labor salaries stagnated. This was a reality that many people saw, even if there were no national statistics available at the time. The first socialist and communist movements arose in this setting, motivated by the following central question: Why did the people still suffer in spite of economic and technological breakthroughs, leading legislators to simply outlaw child labor rather than deal with underlying problems? Marx accepted the challenge of considering the long-term evolution of the existing political and economic structures in light of their growing flaws.

In the midst of the European uprisings known as the "spring of nations," in 1848, Marx released "The Communist Manifesto," a brief but influential document that famously stated, "A specter is haunting Europe—the specter of communism.[4]" The manifesto ended with a revolutionary prophecy, predicting that the rise of modern industry will inevitably lead to the bourgeoisie's demise and the proletariat's victory.

Marx devoted the following decades to writing the comprehensive work that would support these claims and offer a methodical examination of capitalism and its final demise. But Marx's contributions remained unfinished; although the first book of "Capital" was released in 1867, he died in 1883 before completing the other volumes. These books were published posthumously by Marx's close friend Engels, who assembled the disjointed manuscripts that Marx had left behind. Like Ricardo, Marx based his theory on a study of the contradictions that are intrinsic to the capitalist system. Marx aimed to set his method apart from that of bourgeois economists, who viewed the market as an autonomous entity (Adam Smith's image of "the invisible hand"), and utopian socialists, who, in his opinion, did not provide a rigorously scientific explanation of the economic processes that sustain the suffering of the working class.

Marx essentially built on Ricardo's economic framework, which concentrated on the pricing of capital and the concept of scarcity, to provide a more thorough examination of capitalism in a time when industrial capital—such as factories and machinery—rather than land ownership—ruled the economy. Within the industrial setting, Marx proposed what can be called the "principle of infinite accumulation," implying that capital has a natural tendency to grow indefinitely and to concentrate in a smaller number of hands with no inherent boundaries to this process. Marx predicted that this unregulated accumulation would eventually result in a crisis for capitalism: either declining returns on capital would stifle accumulation and cause

[4] The opening passage continues: "All the powers of old Europe have entered into a holy alliance to exorcise this specter: Pope and Tsar, Metternich and Guizot, French Radicals and German police- spies." Marx's enormous influence is undoubtedly partially due to his writing prowess.

conflict among capitalists, or capital's share of the national income would rise forever and cause a working-class uprising. Marx contended that a stable political or economic equilibrium would be impossible to achieve in either case.

However, like Ricardo, Marx's catastrophic forecasts came to nothing. The socioeconomic environment began to change dramatically by the late nineteenth century as wages started to rise, but large disparities remained and, in some cases, even grew until the start of World War I. The most developed European nations at the time adopted alternate social democratic courses, to the benefit of their citizens, whereas Russia, the most backward nation, did experience a communist revolution.

Marx's analysis failed to consider the possibility of long-term technological advancement and consistently rising productivity—factors that could, in part, offset the accumulation and concentration of private capital. Due to a lack of complete statistical data and maybe because of his preconceived conclusions from 1848, Marx's extreme political views occasionally caused him to make rash claims that were difficult to back down from. Therefore, in order for economic theory to be strong, it needs to be based on thorough historical sources—a field in which Marx may not have made the best use of his resources.

Notwithstanding these drawbacks, Marx's critique is nevertheless relevant on a number of levels. With the resources at his disposal, he endeavored to solve a key question about the unparalleled concentration of wealth during the Industrial Revolution, setting an example for modern economists to follow. Furthermore, Marx's theory of infinite accumulation provides an important perspective that applies to the complexity of the twenty-first century as well as the nineteenth. In a time when productivity and population growth rates are low, money accumulation becomes very important, especially if it reaches excessive levels that could cause social instability. Essentially, the equilibrium that results from low growth might not be as disastrous as Marx predicted, but it still raises important questions, especially in light of the substantial private wealth that rich European countries and Japan have accumulated since the late twentieth century, which is consistent with Marx's reasoning.

2.4.4. From Marx to Kuznets

Making the shift from the nineteenth-century economic analyses of Ricardo and Marx to the twentieth-century perspectives of Simon Kuznets, one can see that economists' attraction toward dire predictions gave way to a more positive outlook marked by stories that resembled fairy tales or, at the very least, had happy endings.

According to Kuznets' hypothesis, income inequality would gradually decrease over the later phases of capitalism growth and eventually stabilize at a level that is acceptable, regardless of particular policy interventions or national differences. This idea, which dates back to 1955, captured the postwar prosperity that French people sometimes refer to as the "Trente Glorieuses," or the thirty blissful years that spanned from 1945 to 1975.[5] Kuznets believed that all societal sectors would eventually profit from steady economic expansion, hence patience was essential. One saying that captured this idea was "Growth is a rising tide that lifts all boats."

Robert Solow's 1956 analysis, which outlined the conditions for attaining a "balanced growth path," was similarly optimistic. According to this path, all economic variables—output, incomes, profits, wages, capital, asset prices, etc.—would increase consistently and ensure equitable benefits for all social strata with minimal deviations from the norm.[6]

Kuznets's viewpoint contrasted sharply with the apocalyptic predictions of the nineteenth century and the ideas of an ever-expanding inequality gap held by Marxists and Ricardians. Notably, Kuznets's theory was significantly different from previous economic assessments in that it was supported by a strong statistical foundation. With his groundbreaking 1953 publication, "Shares of Upper Income Groups in Income and Savings," Kuznets led the creation of historical income distribution statistics in the middle of the 20th century. Kuznets's seminal study, despite its narrow emphasis on the United States over a 35-year period (1913–1948), made use of two important data sources: US federal income tax returns and his own estimates of the country's GDP. This ground-breaking work laid the groundwork for further studies in the field by being the first attempt to quantify social inequity on such a large scale.[7]

It is crucial to realize that quantifying income inequality and following its evolution over time would be an impossible task without the convergence of two crucial datasets. Although there were early attempts in Britain and France in the late seventeenth and early

[5] Simon Kuznets, "Economic Growth and Income Inequality," American Economic Review 45, no. 1 (1955): 1– 28.
[6] Robert Solow, "A Contribution to the Theory of Economic Growth," Quarterly Journal of Economics 70, no. 1 (February 1956): 65– 94.
[7] Simon Kuznets, Shares of Upper Income Groups in Income and Savings (Cambridge, MA: National Bureau of Economic Research, 1953). Born in 1901 in Ukraine, Kuznets immigrated to the United States in 1922 and attended Columbia University before joining Harvard as a professor of economics. In 1985, he passed away. He was the first to publish historical data on inequality and the first to examine the US national accounts.

eighteenth centuries to estimate national income, the development of yearly series of national income data was not pioneered until the twentieth century, especially between the World Wars, by economists such as Kuznets, John W. Kendrick, Arthur Bowley, Colin Clark, and L. Dugé de Bernonville. These datasets shed light on a nation's overall income, while income statements—which were made possible by the progressive income taxes that many countries implemented during World War I—became essential for figuring out how much of the nation's income was made up of high earners.[8]

Furthermore, a variety of data about the current tax bases were available even in the absence of income taxes. But these datasets didn't give information on incomes, and until it became legally mandatory to report income to the government, people frequently didn't know how much they actually made. In addition to providing funding for public projects and distributing the tax burden fairly, taxes also make classification easier, advance democratic transparency, and foster knowledge.

Thanks to his innovative approaches to gathering data, Kuznets was able to examine how the distribution of income in American society changed over time for different social groups. According to his research, there was a notable decline in income inequality between 1913 and 1948. In particular, by the late 1940s, the top decile of earners' share of the national income had dropped from 45–50 percent to about 30–35 percent. This significant decrease, which is equal to half the income of the 50% of Americans who are poorest, demonstrated an unquestionable and evident decline in income inequality.

This information was quite important, and it caused a great deal of discussion in postwar economic circles among scholars and international organizations. In contrast to the absence of empirical foundation of previous discussions on inequality by authors such as Malthus, Ricardo, and Marx, Kuznets's work presented objective facts for the first time. Though not without flaws, the thoroughly detailed compilation efforts presented in Kuznets's 1953 volume allowed for replication of estimates by offering transparency into his sources and techniques. Furthermore, Kuznets's results revealed good news: inequality is decreasing, which provided a glimmer of hope amidst the talk of economics.

[8] To assess overall income, we also need national accounts, since it is frequently the case that only a fraction of the population is obligated to file income taxes.

2.4.5. The Kuznets Curve in the Cold War Context

Even Kuznets admitted that the fall in high incomes in the US between 1913 and 1948 was mostly accidental, caused more by the shocks of World War II and the Great Depression than by any innate or natural mechanism. He warned against jumping to conclusions in his thorough 1953 analysis. Still, Kuznets offered a noticeably more optimistic reading of his results than in his earlier work when presiding over the American Economic Association convention in Detroit in December 1954. His next talk, "Economic Growth and Income Inequality," was published in 1955 and presented the idea of the "Kuznets curve."

This hypothesis states that during the process of industrialization and economic development, inequality exhibits a bell-shaped pattern. Early industrialization is a time when inequality first increases because only a small portion of the population gains unexpected wealth. However, as a greater proportion of the population participates in economic growth, inequality declines in more developed stages of development.

Kuznets's seminal work from 1955 is informative in that it emphasizes the need for rigorous data interpretation and recognizes the contribution of outside shocks to the reduction of inequality. Nevertheless, he made the argument that, independent of governmental actions or outside happenings, the internal dynamics of economic development might also eventually lead to a decline in inequality.[9]

The "Kuznets curve" became popular, explaining the observed decline in inequality in the US between 1913 and 1948 as representative of a global phenomenon that affected all countries, including those facing postcolonial poverty. During the Cold War, Kuznets's optimistic theory—which he first expressed in a presidential address to the American Economic Association—ran strongly with those seeking to maintain developing countries inside the framework of the free world.

[9] Kuznets, Shares of Upper Income Groups, 12– 18. The term "the inverted-U curve" is occasionally used to describe the Kuznets curve. In particular, Kuznets contends that an increasing proportion of laborers are shifting from the impoverished agricultural sector to the wealthy industrial sector. Since only a small portion of the population initially gains from the industrial sector's prosperity, inequality rises. But in the end, everyone wins, and inequality goes down. The generalizability of this highly stylized method should be apparent. Labor can be moved, for instance, between economic sectors or between occupations with varying degrees of pay.

The data Kuznets had provided in his 1953 book all of a sudden turned into a potent political tool[10]. He knew fully that his theory was wildly speculative[11]. However, he also knew he would have a significant impact because he presented such a positive theory in the framework of a "presidential address" to the major professional association of US economists, an audience that was likely to accept and spread the good news from their distinguished leader: thus, the "Kuznets curve" was created. He was careful to remind his audience that the goal of his hopeful predictions was to keep the developing nations "within the orbit of the free world,"[12] just to make sure they all understood what was at stake.

The importance of Kuznets's work in creating the first US national accounts data and historical metrics of inequality cannot be overstated. Nevertheless, the Kuznets curve theory's empirical base was not as stable due to the reliability of data and other external factors. According to Piketty (2014), the dramatic decline in income inequality that occurred in the majority of wealthy nations between 1914 and 1945 was caused more by the economic and political turmoil that followed the two wars than by the peaceful process of intersectoral mobility that Kuznets had proposed.

2.4.6. Revisiting the Distributional Question Amidst Global Turmoil

Today, the world is going through a period similar to the great economic transformations of the early nineteenth century when our ancestors observed rapid global economic instabilities which had many potential consequences of wealth distribution both at domestic and international markets. Just as the 19th century economists who meticulously analyzed long-term patterns and highlighted the importance of looking into the distribution problem in economic analysis, we are forced to look at these fundamental questions, especially now, when the consequences of one crisis after another unfold before us.

The impact of these crises cannot be disregarded, we must consider the lessons learned and ensure that redistributive measures are implemented promptly.

---

[10] Interestingly, Kuznets did not have any statistics to support his claim that inequality increased during the nineteenth century, despite the fact that most observers agreed that this was the case.
[11] "This is perhaps 5 percent empirical information and 95 percent speculation, some of it possibly tainted by wishful thinking," as Kuznets himself put it. See Kuznets, Shares of Upper Income Groups, 24– 26.
[12] “The future prospect of underdeveloped countries within the orbit of the free world” (28).

The recent crises in the 21st century symbolize how susceptible to disruptions global economic systems are. Whether it is the financial turmoil of 2008 or the unprecedented challenges brought about by the COVID-19 pandemic, each crisis has a unique imprint on the income distribution, thereby leaving behind lasting marks like changing the landscapes of the society and exacerbating inequalities Through assessment of the implicit attributes and consequences of these crises, we set up an outline of analysis of the income inequality determinants.

2.5. Income Inequality in the 21st Century Crises

Given the focus of this study on understanding the income inequality determinants during times of crisis, it is important to examine how such crises affect income inequality and the different characteristics of each observed crises in this study. Following will be provided an overview of the observed crises and their effects before delving into the empirical analysis that attempts to identify the most important determinants of income inequality during the crises.

Economic crises affect society profoundly, yet not everyone is equally affected by them. Rather, they frequently worsen already-existing disparities, making life more difficult for those who are already vulnerable. This finding has sparked a great deal of examination on the relationship between income distribution and economic downturns, which has helped to clarify the mechanisms of social exclusion and poverty.

Several empirical studies have examined how economic crises affect income inequality, with varying degrees of success. However, there is evidence to show that income inequality tends to worsen during times of crisis, which is associated with a higher risk of poverty and social exclusion (Melidis and Tzagkarakis 2022; Bodea et al. 2021).

Austerity measures implemented in reaction to economic downturns are a major reason behind this occurrence. These policies, which are intended to lower deficits and stabilize national economies, frequently have negative consequences on the distribution of income. Austerity measures, for example, may result in lower public sector wages, a reduction in social welfare programs, and a rise in unemployment rates, which would disproportionately affect the poor and vulnerable populations (De Beer 2012).

2.5.1. Direct Economic Effects of the Crises

The general consensus is that the poor are disproportionately affected by economic crises (Baldacci, Mello, & Inchauste, 2002), although the actual data on this issue paints a different picture. Researchers have found a number of ways that crises drive income inequality (Bodea, Houle, & Kim, 2021).

Financial crises typically start off by slowing down economic development and raising unemployment rates. It is frequently demonstrated that financial crises cause significant output losses, even though reverse causality presents a barrier for empirical estimation (Baldacci, de Mello, & Inchauste, 2002; Bordo & Meissner, 2015; Reinhart & Rogoff, 2009a,b). Economic growth is significantly hampered by banking crises in particular, as well as overlapping crises affecting debt, currency, and banking (Bordo & Meissner, 2015). Furthermore, it has been shown that rising debt and inflation, particularly at high levels, impede output growth (Easterly & Bruno, 1999; Andres & Hernando, 1997; Barro, 1995; Kumar & Woo, 2010). It has been demonstrated that stock market volatility even inhibits economic growth (Levine & Zervos, 1998).

These crises usually cause recessions that result in job losses, with low-skilled, low-income people suffering the most from unemployment (Hibbs, 1987). Furthermore, structural unemployment is strongly linked to rising income inequality (Mocan, 1999)[13], and long-term unemployed people frequently see diminishing re-employment salaries (Jacobson, LaLonde, & Sullivan, 1993; Ruhm, 1991; Nichols, Mitchell, & Lindner, 2013). As a result, financial crises cause output losses and differences in unemployment between the rich and the poor, which in turn worsen income inequality.

Financial crises may also reduce labor's ability to bargain, which would increase income inequality if employees take lower pay in order to increase company profitability. During times of crisis, capital mobility—which already reduces labor's income share—may increase (Furceri & Loungani, 2015; Maarek & Orgiazzi, 2013).[14] According to Diwan (2001), labor and capital engage in distributional conflicts during crises. Even in cases when labor is organized, it may agree to wage limitations in order to avoid the widespread layoffs that bankruptcies threaten.

On the other hand, during times of crisis, some processes might have a disproportionate impact on the income of the wealthy.[15] For instance, a stock market crash may result in significant wealth loss, especially in corporate and non-corporate shares, which would disproportionately affect the wealthy (Wolff, 2013). According to research by Roine, Vlachos,

[13] A related body of literature examines the prevalence of poverty during financial crises. According to this research, currency crises make poverty worse (Baldaci et al., 2002, Nikoloski, 2011, Rewilak, 2018). The impact of debt and banking crises is less clear.
[14] According to Furceri and Loungani's (2015) research, liberalization of capital accounts leads to a rise in income inequality, particularly when it occurs after financial crises involving debt, banking, and currency.
[15] A more balanced picture of how recessions affect inequality is presented by Jenkins et al. (2013), who contend that the impact varies depending on the type of recession (impact on employment income versus investment income) and the type of policy responses that may counteract losses in earned employment income.

and Waldenström (2009),[16] the wealthiest 1% of people see a decline in income during times of strong economic expansion, whereas the very rich generally profit from them.

This does not mean, however, that middle-class wealth is immune to financial crises, particularly in industrialized countries. Middle-class wealth is susceptible to financial instability due to rising household debt and domestic economies' growing reliance on the financial sector (Chwieroth & Walter, 2019). However, it is still uncertain if income losses from middle-class assets, including leveraged real estate, are caused by wealth loss to the same degree as wealth losses from affluent assets (Kuhn, Schularick, & Steins, 2019).

2.5.2. Effects of Crisis-resolution Policies

In addition to the inherent effects of financial crises, the policies put in place as a result have a substantial impact on how money is distributed. According to Mian et al. (2014), different groups fight for and are granted official support in the wake of the crisis. Notably, big banks who need bailouts frequently have good networks and organization, which makes it easier for them to get government guarantees. On the other hand, mortgage holders, who have also been impacted by the collapse of the property market, frequently lack the structure and power to obtain government assistance.

More broadly, financial crises usually result in a series of austerity measures, including as reductions to spending (Blyth, 2013), government employee layoffs (IMF, 2000; OECD, 2011), and tightening of domestic monetary policy (Langhammer & Souze, 2007). For instance, policymakers usually raise domestic interest rates to combat rising inflation and currency devaluation. But doing so reduces employment, which exacerbates the negative consequences that crises have right away on income equality. Similarly, governments frequently undertake spending cuts, postpone investments, and lay off people in response to debt crises and the subsequent surge in debt that follows financial crises. These actions disproportionately affect the earnings of the disadvantaged who rely significantly on social benefits. Fiscal consolidation directly leads to income inequality, as evidenced by studies by Ball et al. (2013) and Woo et al. (2013). This is especially true given the effects it has on employment and wages.

[16] Their data spans the twentieth century and includes 16 countries.

2.5.3. Characteristics of the 21st Century Crises

Comprehending the unique characteristics of every crisis is crucial for multiple reasons. First of all, it offers important perspectives on how various crises affect inequality and income distribution. Through analyzing the distinctive characteristics of every crisis, scholars can more accurately pinpoint the elements that lead to income inequality amid these times of financial turmoil. Second, understanding the distinctive characteristics of every crises is crucial for policymakers to develop targeted and effective policies. The dynamics and underlying causes of each crisis must be considered when crafting policies aimed at lessening the effects of economic downturns on income disparity. In the absence of a comprehensive comprehension of these attributes, decision-makers run the danger of executing inefficient or detrimental policies. Additionally, efforts to alleviate income inequality need to be adaptable and strong due to the interconnectedness and complexity of the crises of the twenty-first century. Understanding the distinctive characteristics of every crisis helps decision-makers create flexible policies that can successfully address changing economic issues. Therefore, it is crucial to comprehend the distinctive characteristics of each crises in order to conduct research and provide well-informed policy proposals that can advance greater income equality.

The observed period in this study has been defined by the transformative events that have influenced the global environment resulting in comprehensive crises that have deep societal, economic, and governance dimensions. These crises are defined by their inherent complexity, interlinked nature, and transformative effects on societies and nations. Therefore, knowledge of the characteristics of these crises provides a key consideration when developing robust and flexible strategies.

One peculiar characteristic of the 21st-century crisis is the everlasting economic instability that echoed throughout the world. The financial crisis of 2008 and the recessions that followed have shown the interdependency of global markets. Examples of such factors include fast technological changes, trade conflicts and the COVID-19 pandemic among others, which have led to economic uncertainties, thus, undermining models of economic stability. The development of global health crisis, including COVID-19 pandemic, has changed the viewpoint of the world on public health weaknesses. The characteristics of such crises include their sudden and prevalent form, the pressure they put on health systems, and the ability to shed light on and deepen pre-existing social-economic inequalities. Crises such as the above have led people to emphasize the need of both international cooperation and the scientific aspect of crisis management.

The 21st century is also characterized by the intensification of various ecological disasters, geopolitical tensions and cybersecurity wars. The ecological disasters which started in the forefront of the climate change included extreme weather conditions, increased sea-level rise, and loss of biodiversity. These crises highlight the unity of human activities and the environment, which requires urgent and collaborative actions to ensure sustainable growth and climate resilience. The geopolitical tensions in the form of power struggles, territorial disagreements, and ideological conflicts that define intercultural and inter-state relations also marked the start of this century. They included the emergence of nationalism, the reappraisal of internationalism, and the employment of cyber warfare as a strategy for the state. Technological advancements have given birth to novel opportunities, but at the same time they have led to the emergence of the new crisis situations. Features include cybersecurity threats, the effects of technological automation on jobs, and the moral issues that will arise from innovations such as artificial intelligence. These disruptions require agile governance models and global collaboration.

Finally, social and political turmoil has increased significantly especially due to economic disparities, identity politics, and discontent with governing institutions. Mass rallies, the emergence of populist movements, and threats to democracy through the challenge of the hallowed democratic norms were often seen around the world throughout these last two decades. One dominant feature of modern-day crises is the ability of such events to amplify and aggravate the economic and social inequities that already exist. From economic recessions to public health emergencies such as pandemics and epidemics, most of these crises have a tendency of affecting the poor members of the societies more negatively compared to the better-off population. To reduce inequalities, we need relevant policies which focus on causes and push forward with inequality reduction and inclusive development.

This study will have a closer look at three events which created a major shock and left severe consequences on Europe’s economy. Those are the global financial crisis, the Sovereign debt crisis, and the COVID-19 pandemic.

a. The Global Financial Crisis

The Global Financial Crisis (GFC) of 2007-2009 is a defining point, a revealer of the latent vulnerabilities, enclosed within the global financial system. The crisis stems from the boom and bust of the subprime mortgage market in the US that expanded into a worldwide recession. Inequality in income aggravated by the financial crisis emerged as a pressing issue, unveiling a multifaceted nexus of determinants contributing to income inequality in the wake of the crisis.

The global financial crisis determinants of income inequality were complex, from financial market dynamics to housing policies and the dynamics of the labor market. The crisis followed as there was financial stress to such a level of the loss of jobs and decreasing of asset values as a result of financial institutions. The latter recovery did help financial markets but the spoils of this recovery benefit distributions were also shaky. The affluent strata of the society having large assets in financial instruments showed a quicker recovery of their wealth making the gap between the rich and poor wider. The burst of the housing bubble had a disproportionate impact on the population belonging to lower incomes through foreclosures and decreasing property values. The echoes of inequalities in the sphere of housing policies, which included even sub-prime lending, brought to light the connection between economic policies and the income inequality. The middle-class and working middle-class are those that are particularly affected by job losses and wage stagnation since this groups earns the largest proportion of income; the gap continues to widen. The difference between the two groups only widened with the financial sector's recovery accompanied by lavish executive salaries.

The global financial crisis aftermath offered an ideal environment for examining the complex connection between banking crises and wealth inequality, which is the main focus of the research of Maria Shchepeleva et al. (2021). Using data on wealth inequality from the years after the Great Financial Crisis, Shchepeleva et al. (2021) carried out a thorough investigation across a wide range of nations impacted by this economic crisis. Their study aimed to characterize the post-crisis scenario in terms of differences in wealth distribution by incorporating data from Laeven and Valencia (2020) and insights from the Credit Suisse Global Wealth Report for the years 2010-2018. They specifically looked at metrics like output loss and fiscal cost to determine the extent of the financial crisis and how it affected wealth disparity.

The effect of the global financial crisis on the income inequality poses a paradox. One school of thought holds that the crisis may have made income and wealth inequality worse. Compared to the broader population, the wealthiest people may have fared better during the crisis since a smaller percentage of their wealth was invested in real estate. On the other hand, the most vulnerable members of society were disproportionately affected by the global financial crisis, which may have forced them to spend all of their resources in order to maintain their standard of living. Furthermore, it's possible that post-crisis fiscal austerity measures further weakened efforts at redistribution, thereby widening the wealth gap. Nevertheless, other theories suggest that the global financial crisis might have lessened income and wealth disparities. The wealthiest members of society may have been disproportionately affected by the crisis-induced decline in financial asset prices, which was sparked by asset sales by leveraged economic agents. However, the precise distributional impacts of the global financial crisis still need further empirical research.

In addition, the effects of the global financial crisis on income and wealth inequalities may differ in developed, and developing countries due to differences in the degrees of economic and financial growth as well as starting wealth inequality. Developed countries may be affected differently from developing and underdeveloped countries due to their higher level of financial development and lower beginning wealth inequality.

b. The Sovereign Debt Crisis

The Sovereign Debt Crisis, which occurred between 2010 and 2019, after the Global Recession, mainly affected several European countries, revealing fundamental structural issues within the Eurozone. The dynamics of income inequality during this period were facilitated by austerity measures, economic contractions, and social policy adjustments. As a result of rising public debt, several European countries introduced austerity measures such as cuts in social and welfare programs as well as wages in the public sector. These instruments were hitting vulnerable segments of the society, thus amplifying the gaps between the wealthiest and the poorest members of society. Rising levels of unemployment coupled with decreased government spending fostered the challenges that people of low income were facing. The economic recession as a result of the economic downturn illustrated the sensitivity of some sectors of the economy to fiscal crisis.

Most countries across the world made reforms in their social policies which were meant to be an attempt of cutting expenditure on public services but many of them ended up destroying social guarantees. As these adjustments took place, the issue of income inequality came to the fore, with the most marginalized groups feeling the impact of inadequate access to basic services. These reforms frequently unintentionally weakened social safety nets and diminished fundamental social guarantees, depriving underprivileged communities of sufficient access to crucial services. As a result, the topic of income inequality gained prominence in public conversation, with the most disadvantaged populations suffering from a lack of access to crucial services and support networks.

Additionally, low-income workers' and households' difficulties were exacerbated by the economic contractions brought on by the Sovereign Debt Crisis. Many people, especially those who are already living paycheck to paycheck, are experiencing increased financial insecurity as a result of rising unemployment rates, salary stagnation, and decreased job security. Consequently, the gap in socioeconomic status between the wealthy and the underprivileged expanded, thereby sustaining cycles of destitution and unfairness. In addition, the Sovereign Debt Crisis emphasized how critical structural changes are to promoting equitable economic growth and minimizing income inequality. To guarantee that all residents had fair access to opportunities and resources, governments were forced to review their social programs and economic policies. However, political opposition and conflicting policy agendas made the execution of such measures difficult.

c. The COVID-19 Pandemic Crisis

The COVID-19 pandemic, one of the greatest healthcare tragedies that this world ever faced, changed the social, economic, and income structure across the nations. Based on preliminary data, it appears that the COVID-19 pandemic has caused an increase in worldwide income inequality. More importantly, the epidemic probably reduced income inequality between countries to levels seen in the early 2010s. The pandemic sparked a severe worldwide recession, which has an impact on wealth disparity via both health and economic routes.

The combination of shocks brought about by the COVID-19 epidemic was one of the elements that made income inequality worse. Lockdowns and social distance policies disproportionately impacted service sector operations that require face-to-face communication, like tourism. This exacerbated income inequality by having a substantial effect on lower-paid and lower-skilled people employed in these sectors. Large-scale policy support, on the other hand, as demonstrated by government stimulus packages and income support programs, might counteract any increase in income disparity brought on by COVID-19.

Furthermore, in contrast to previous epidemics, the COVID-19 pandemic was tackled by global policymakers with extensive, recurrent, and ongoing lockdowns and social distancing measures. Due to the fact that these policies disproportionately, affected industries that employ informal workers—people who often have lower incomes and fewer resources to cushion losses—income inequality was further exacerbated. On the other hand, high-tech industries prospered during the epidemic, hiring more people with advanced degrees and high salaries.

The COVID-19-driven economic slump has led to massive unemployment and reduced working time. Telecommuting, which was more common in the higher-skilled professions, also worked to worsen inequities in job stability and income sustainability. Industries like information technology and finance showed some degree of resilience in view of the fact that both hospitality and retail had very severe challenges. These industries were also characterized by contrasts in income trajectories as a result of the contrasting fortunes among the workers.

Government responses such as providing stimulus packages and income support plan acted significantly towards reducing incomes inequality. Nevertheless, the efficiency of these interventions differed among countries, thereby providing evidence of policy choices mattering for income distribution during crises.

The comparison of the dynamics of income inequality across these crises shows both similarities and differences in their determinants. The identification of such determinants is critical for structuring focused policy responses to income gaps that address the base of the inequality in their overall structure.

As crises were seen all over the world in the 21st century, the effects were felt by every nation, which proved that the global economy is interconnected. The mentioned crises and events are just an evidence of the extreme importance of dealing with income inequality on the national level and even an international level, because income inequality has such serious consequences on the way people live and even the world as a whole. Seeing income inequality through a global perspective, we gain knowledge about its consequences, which surpass the state borders and contribute to the economic development, social stability, and fighting the poverty in the world. Hence, by diving into the national and international repercussions of income inequality we reach the in-depth knowledge about its widespread consequences and discover the collaborative approaches to diminish its significance for all the countries involved.

2.6. Global Concerns and Diverse Consequences of Income Inequality

Income inequality is a global issue with far-reaching implications, affecting countries at various stages of development. Developed nations often grapple with increasing disparities between the wealthy elite and the rest of the population, while developing countries may face challenges stemming from historical injustices, inadequate access to education and healthcare, and limited economic opportunities. Income inequality can impede economic development, exacerbate social tensions, and hinder poverty reduction efforts, creating a cycle of disadvantage that is challenging to break.

The issue of income inequality is not limited to any one nation or historical period. It is a persistent, worldwide problem that has lasted for centuries. Income inequality has existed for as long as there have been civilizations, even in the remote and globally connected modern world. As a worldwide issue, income inequality shows up in many forms in different nations, impacting political environments, social cohesiveness, and economic stability. The consequences of unequal wealth distribution are complex and manifest in a number of ways, including economic growth and productivity, social cohesion and stability, health and education disparities, political landscape, interconnected global challenges, and globalization's impact. All of these consequences of income inequality are categorized in four major groups: economic, social, political, and global.

1. ***Economic consequences*** spread from diminished economic growth, reduced social mobility, to strain on public finances. Income inequality can hinder economic growth by limiting access to resources and opportunities for a significant portion of the population. This can lead to lower levels of education and competence in the workforce, affecting productivity and innovation. Additionally, income inequality can reduce social mobility, causing difficulties in accessing high-quality healthcare, education, and work opportunities, which can perpetuate poverty cycles. Furthermore, income inequality can strain public finances, as the need for social safety nets and welfare programs increases, leading to increased public spending and potential financial difficulties that may necessitate tax law changes (Dabla-Norris, et al., 2015).

2. ***Social consequences*** include health disparities, education inequalities, as well as, increased crime rates. Health inequalities are often exacerbated by lower incomes, leading to chronic illnesses and shorter life expectancy. Education inequities are often

a result of income inequality, with low-income children having less access to quality education, resulting in lower educational attainment and less opportunities for upward mobility. A cycle of poverty may be perpetuated by people with lower earnings finding it difficult to access opportunities for decent healthcare and education. Long-term possibilities for sustainable growth in a nation might be hampered by limited access to healthcare and education, which can lower human capital development. Additionally, higher crime rates are linked to economic inequality, fueling social unrest and increasing the likelihood of violence, theft, and other criminal activities (Dabla-Norris, et al., 2015). When a large section of the populace believes that the economic system is unfair or favors a small number of people, social cohesion is jeopardized.

3. ***Political consequences*** are most seen through erosion of trust in the institutions, political polarization, and threats to democracy. Wealth inequality poses significant threats to political and social institutions, potentially leading to the erosion of trust in institutions and political polarization. This can result in disillusionment and a loss of trust in government efficiency and justice. Economic disparities can fuel ideological divisions and hostility among different socioeconomic groups, obstructing productive policy discourse and compromise. Furthermore, extreme income inequality can threaten democracy, as a small, rich elite may have disproportionate power and shape policy decisions that serve their interests, potentially compromising the democratic values of equal representation and accountability (Dabla-Norris, et al., 2015). In this situation, political dynamics will be influenced by income inequality, which may result in decisions about policy that give preference to the wealthy over the underprivileged.

4. ***Global consequences*** from income inequality result in economic inequalities between nations, migration pressures, and global security risks. Income inequality is a global phenomenon that hinders sustainable growth in less wealthy regions and contributes to global economic imbalances. This leads to migration pressures, as people from low-income areas may migrate to affluent countries for better opportunities, creating demographic and socioeconomic issues for both countries. Extreme income inequality can also contribute to global security issues, as it can lead to social unrest, wars, refugee crises, and other geopolitical issues with far-reaching effects (Dabla-Norris,

et al., 2015). Moreover, interconnected global challenges like pandemics, and climate change are all made worse by income inequality. These difficulties may disproportionately affect vulnerable communities with few resources, deepening the divide between the privileged and the downtrodden. Although it has promoted economic integration, the process of globalization has also led to income inequality. There have been winners and losers as a result of global economic integration, with certain societal groups gaining far more than others.

Comprehending the global impact and diverse consequences of income inequality and its historical progression is imperative in order to devise effective policies that advance fair development and cultivate a future that is both inclusive and sustainable. This dissertation will go deeper into the determinants of income inequality and examine how it manifests itself in developed and developing countries in the following chapters.

3. THEORETICAL FOUNDATIONS AND EMPIRICAL LITERATURE REVIEW OF INCOME INEQUALITY DETERMINANTS

This chapter offers an in-depth analysis of well-known theories that shed light on the determinants of income inequality. Although there are several other important theories, this study will concentrate mainly on the theory formulated by Simon Kuznets, since his theory continues to be among the most widely known and influential theories in this field. The chapter is also considering works of scholars like Piketty and Milanovic. Finally, it focuses on how valid all these theories are to the current European context, especially in comparison of income inequalities between the developed and developing European countries. The second half of this chapter focuses on conducting a comprehensive literature review on the income inequality determinants. It classifies these determinants into several categories, economic development, demographic, political, cultural and environment, and macroeconomic determinants to generate detailed categories for empirical analysis. The chapter builds from the integration of insights from previous studies to provide a theoretical basis and a frame of reference for the multifaceted and complex nature of income inequality and its root causes.

3.1. Theoretical Review

The formal investigation of phenomena of income inequality started with the prominent work of Simon Kuznets in 1955. Kuznets introduced the inverted U theory that developed an inverse u-shape correlation between GDP and income inequality. In his theory, he states that as a country becomes more developed economically, inequality increases initially but eventually decreases as the country advances a much higher level of economic development. What is undeniable is that Kuznets' theory had a huge contribution towards the subject of study and it's still bears as a way of studying income inequity.

Despite the usefulness of Kuznets' theory in addressing this relationship, other important theories have also been developed to analyze the problems of income inequality and its determinants. One of the theories that explain the role of technological progress in the development of income disparities is the Skill-Biased Technological Change (SBTC) theory. Next is the Dual Labor Market theory, which revolves around diversity in labor markets and their potential effects on income inequality. The Institutional theory aims to provide a description of institutions and roles in the course of income inequality. The Globalization theory speaks to the effects of globalization, achieving the same goal, while the rationale behind the Human Capital theory is that the income inequality depends upon the level of education and skills. All these theories can be considered as relatively recent compared to the Kuznets theory. Although they are vital for determining current trends, the choice to focus on Kuznets' theory is based on its historical importance and long-lasting power in shaping the discourse on income inequality.

While this study is on Kuznets, it is also significant to mention other remarkable scholastic contributions to this area in the form of emergent economists' works, such as Piketty and Milanovic to the study of income inequality. Piketty studies the accumulation of wealth and its role in inequalities between individuals and income, while Milanovic emphasizes on the many aspects of global income disparities and the uneven dynamics beneath it. Although the importance of their achievements should be noted, this study will only devote a brief section to their work because our main focus is to elaborate on the Kuznets theory as the background for their framework development builds on his groundbreaking ideas.

Such a strategic focus on the Kuznets' theory allows one to uncover the historical context and long-term outcomes of the analysis regarding income inequality. The long-term impact of Kuznets' contribution to income inequality research is evaluated through the understanding of the underpinning theory, empirical validation, and subsequent broader impacts using an example of Kuznets' contribution in the analysis of inequality from income inequality.

In doing so, the study hopes to make valuable contributions to the larger discussion by contributing meaningful information about the factors that shape income distribution and the pursuit of an equitable society.

3.1.1. The Kuznets' Theory

Kuznets inverted U curve is the one major theory, put forward by Simon Kuznets nearly 70 years ago, that explains why countries' income distributions differ from one another. This crucial theoretical strategy for balancing the causes of inequality was further explored by Robinson (1976), and it has since been essential to comprehending variations in inequality among nations.

According to Simon Kuznets' hypothesis, which is supported by the inverted U-shape of the Kuznets curve, as an economy grows, market forces first drive up and subsequently drive down societal and economic inequality (Moffatt, 2019). Since almost everyone lives at or below the subsistence level, the theory implies that income inequality must be low at very low-income levels. Increased inequality is impossible, given the tiny size of the overall output, which would result in many more individuals living below the subsistence level (Milanovic, 2000).

However, Kuznets hypothesized that differences or gaps in workers' wages in different sectors of the economy would start to emerge, leading to increases in inequality as a nation's economy develops over time and industrialization takes hold (Stuart, 2012).

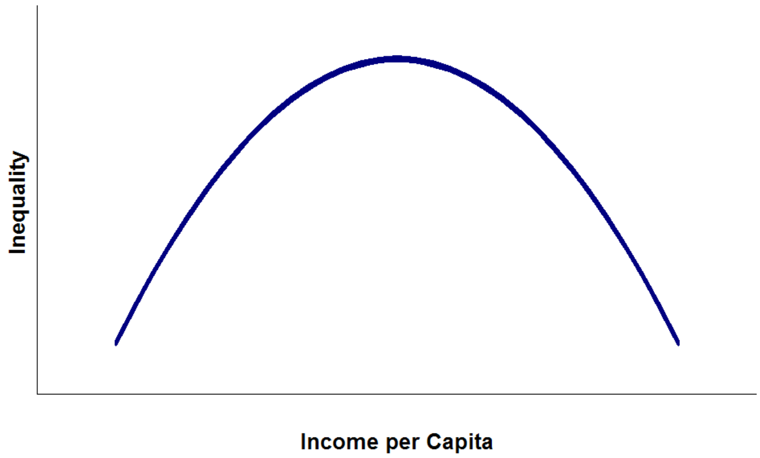
Throughout the initial stages of the development of an economy, there are more prospects for new investments for individuals who already have the money to invest. Because of these new investment opportunities, those currently wealthy have the chance to become even wealthier. On the other hand, the flow of cheap rural labor into the city keeps working-class wages low, resulting in a widening income gap and rising economic inequality. The Kuznets curve predicts that as a nation industrializes, rural employees, like farmers, start to relocate to urban regions in search of better-paying jobs. However, as a result of this migration, there is a significant income gap between rural and urban areas, and urban population growth causes a decline in rural areas. However, following Kuznets' hypothesis, this same income inequality is anticipated to decline after a particular average income level is reached and the processes connected to industrialization, such as democracy and the creation of a welfare state, take hold. Society is intended to gain from the trickle-down effect and an increase in per capita income at this stage of economic development, which will effectively reduce economic inequality (Moffatt, 2019).

Thus, the famous inverted U-shaped curve theory of Kuznets was formed. Over the three decades that followed, the majority of empirical research in the field concentrated on establishing or refuting the relationship between economic growth and inequality (Stuart, 2012).

a. The inverted U-shaped curve

With income per capita plotted on the horizontal x-axis and economic inequality plotted on the vertical y-axis, the Kuznets curve's inverted U-shape shows the key concepts of Kuznets' hypothesis (Figure 3). According to the figure, as per-capita income rises over the course of economic development, income inequality follows the curve, initially increasing before declining after reaching a peak.

Figure 3. Kuznets' curve



The Kuznets inverted "U" hypothesis states that an indicator of income inequality, such as the Gini coefficient, should initially be positively connected with per capita income growth or economic development. Nevertheless, in a later period, once the economy has reached the curve's peak, an inverse relationship between the two variables should be seen (Nesta & Metu, 2021). Although Kuznets initially solely connected economic growth as a macroeconomic factor to inequality, the idea has lately been modified to include additional macroeconomic factors like pollution, poverty, and technology (Cassette, Fleury & Petit, 2012; Gruber & Kosack, 2014).

Both the original version and the modified version have generated a lot of debate.

3.1.1.1. Kuznets Followers

When Kuznets published his article in 1955, he added the following to the conclusion: "This work is perhaps based on 5% empirical information and 95% speculation" (Kuznets, 1955, p. 26). Through this statement, he extended an invitation to future generations of economists to carry on the study he had begun in his paper for the American Economic Review. The investigations conducted by Fields (1989), Deininger and Squire (1996, 1998), Higgins and Williamson (1999), Barro (2008), Prados de la Escosura (2008), Rattan (2012) are only a few of the studies that have presented evidence regarding the Kuznets hypothesis, either, supporting it or showing that there is no significant proof of this theory.

We can start by discussing the findings that back up the Kuznets theory by demonstrating that the countries under investigation form an inverted U-shaped curve. In this context, Barro (2008) incorporated the impact of "openness to trade" on economic inequality and found that the Kuznets curve held for a sample of diverse nations from 1960 to 2000. According to the study, increased trade would lead to greater economic inequality for a given income level, even though the relationship was not statistically significant. Barro (2008) claims that the increase in trade could raise per capita income, so even if it increased inequality, it would also have the compensating effect of lowering poverty.

The Kuznets curve was also demonstrated by Higgins and Williamson (1999) for a variety of nations between 1969 and 1990. Their study was distinctive in that it was divided into different age groups and openness to trade. In this instance, they discovered that while the cohorts of young individuals displayed more overall inequality, the cohorts of adults exhibited less economic inequality. They noticed that industrialized countries had lower levels of inequality than developing countries and had higher numbers of older people due to their longer life expectancies. Higgins and Williamson (1999) discovered that globalization does not affect inequality, similar to the findings of Barro (2008) (Martínez-Navarro, Amate-Fortes, Guarnido-Rueda, 2020).

Another author who supported Kuznets' inverted U theory was Paukert (1973). He studied income distribution and GDP per capita in 56 countries, 40 of which were developing nations. The findings of his research have demonstrated a relationship between inequality levels and per capita GDP. The author noted that the highest level of inequality within a country results from moving from the lowest income level (GDP per capita less than $100) to the second lowest income level (GDP per capita between $100 and $200). The author also noted that inequality increases until GDP per capita reaches approximately $2000 and begins to decline (Matins-Bekat & Kulkarni, 2009). Numerous other studies, such as Cline (1975), Chenery and Syrquin (1975), and Papanek and Kyn (1987), that used cross-sectional data came to the same conclusions.

In terms of intra-country inequality, Summers, Kravis, and Heston (1984) also found a similar tendency. They looked at inter-country income inequality and found that between 1950 and 1980, inequality significantly decreased across industrialized nations, moderately decreased for middle-income nations, and marginally increased for low-income nations. Kuznets is also supported by Greenwood and Jovanovic (1990), as well as numerous other, even more recent papers (Partridge, 1997; Li and Zou, 1998; Helpman, 1998; Forbes, 2000; Azzoni, 2001; Bourguignon and Spadaro, 2006; Nahum, 2005; Iradian, 2005; Lin, Huang & Weng, 2006; Beckfield, 2009; Bandelj and Mahutga, 2010).

Other theoretical studies that have supported Kuznet's inverse U-shaped curve include those by Aghion and Bolton (1997), Aghion, Caroli, and Garcia-Penalosa (1999), Caselli and Ventura (2000), and many more.

3.1.1.2. Kuznets Critics

Kuznets' curve would not have endured without its fair share of opponents. In fact, Kuznets himself underlined the "fragility of [his] data" among other concerns in his study, as was already mentioned.

Extensive research has been done on Kuznets' empirical relationship's inter-temporal and cross-country critics. It is still a controversial topic. The debate has centered on three main points: (1) the relationship's very existence (it was argued that the Latin American countries, which are in an intermediate stage of development and exhibit high inequality for peculiar reasons), (2) its applicability to various nations and regions, and (3) its applicability to various periods (Milanovic, 2000).

The main defense made by opponents of Kuznets' hypothesis and the associated graphical representation is based on the countries included in Kuznets' dataset. According to his critics, the Kuznets curve merely depicts historical disparities in economic development and inequality among the dataset's participating countries rather than an average progression of economic development for any one country. Kuznets predominantly used Latin American nations, which have a history of having significant levels of income inequality compared to other such nations with similar level of economic growth. Therefore, the middle-income countries employed in the data set are used to prove this argument. According to critics, the Kuznets curve's inverted U-shape starts to lessen when this variable is controlled. Over time, additional objections have surfaced as more economists have created hypotheses with more dimensions and as more nations experienced rapidly increasing economic growth that did not always match Kuznets' theory (Moffatt, 2019).

Despite the data and methodological flaws, Kuznets's concept has been tested numerous times with varying degrees of success. While some studies have supported it, most find no proof of such a deterministic relationship. Disaggregated data on employment in the three economic sectors and the shares of each sector in total output are necessary to test the Kuznets hypothesis. However, these data are frequently unavailable or of questionable quality in many countries (Nikoloski, 2009).

Although many economists take Kuznet's claim as a stylized fact, Adelman and Robinson (1989), Anand and Kanbur (1993), and many others, have provided significant evidence suggesting that there is little or even complete absence of conclusive empirical support for the Kuznet's curve (Vanhoudt, 2000).

Other opponents typically tend to either provide only a weak case against the inverted-U curve or find no meaningful link at all (Deininger & Squire, 1998; Lee & Roemer, 1998; Fields and Ok, 1999; Li, Squire, & Zou, 1998; Castelló and Domenech, 2002; Panizza, 2002; Lopez, 2004; Lopez et al., 2013).

In 1996, Deininger and Squire (1996, 1998) created a database that examined the nations for which they had data on income inequality and global inequality. The Kuznets theory appeared to be supported when they examined these nations and discovered that Latin America, the Caribbean, and sub-Saharan Africa had the highest levels of inequality, with Gini indices of about 50%. In contrast, wealthy countries had low Gini indices. When evaluating the changes in inequality experienced in their sample countries during a decade that demonstrated economic expansion, Deininger and Squire (1996) did not discover any systematic relationship between the aggregated income increase and changes in the Gini coefficient. According to their findings, inequality increased for half of the studied time while it dropped for the other half. They contend that these slight variations in the Gini coefficients cannot be explained by changes in income and solely have the intended impact of reducing poverty during periods of economic expansion.

Additionally, Deininger and Squire (1998), who validated their theory two years later, showed that just two of the sample nations' income coefficients in relation to reduced inequality were positive for low-income countries. The effect was eliminated by including a fictitious variable for the nations that made up Latin America in the study, leaving the coefficient negative. These findings demonstrate that there is little empirical support for any Kuznets curve and that cross-sectional research can be deceptive. This is because, as a whole, Latin American countries have moderate income levels and typically have inequality levels typical of high-income countries (Martínez-Navarro, Amate-Fortes, Guarnido-Rueda, 2020).

The insufficient data that was used to develop the inverted U theory is the principal point of criticism leveled at Kuznets' hypothesis. Fields (1989) noted that the average length of the data utilized in Kuznets' study was ten years, which may not be sufficient to make forecasts for several generations.

Fields (1989) presented evidence demonstrating that the Kuznets curve was not always satisfied by focusing on economic growth rather than development. This study found that inequality grew just as frequently in low-income countries as in high-income countries when economic growth was present. Therefore, the only evidence for changes in inequality brought about by economic growth was the reduction of poverty due to increased national income. In addition, Fields (1989) also investigated the differences in inequality between Asia and Latin America. He concluded that statistically speaking, the results did not differ significantly from each other. However, there were higher rates of rising inequality in Latin America than in Asia. Fields (1989) further emphasized that the standard of living and income from the informal sector, which is generally much larger in developing countries, are not considered by the Gini coefficient. Based on Fields's (1989) research, there is no relationship between changes in inequality and the rate of economic growth, nor between changes in inequality and the level of national income. This shows that the main determinant of whether inequality is rising or falling is not economic growth but rather the type of growth. The results of the study also suggest that equal income distribution is necessary for countries to grow rapidly. The findings of Deininger and Squire (1996, 1998), as well as Fields (1989), served as the foundation for Rattan's (2012) concept of "The Latin American Effect," which refers to the distortion brought about by Latin American nations with middle-income levels and high inequality (Martínez-Navarro, Amate-Fortes, Guarnido-Rueda, 2020).

The in-depth investigation by Prados de la Escosura (2008) into the unique case of Spain from 1850 to 2000 is an intriguing case that rejects Rattan's (2012) assertion of the "Latin American Effect." Prados de la Escosura noted that inequality increased during times of political unrest while it decreased during times of economic expansion; as a result, the study concluded that the Kuznets hypothesis was true with regard to inequality. The study is pertinent because Spain followed the same pattern as Latin America from colonial times until 1950. Due to the economic expansion Spain experienced in the 1950s, the pattern was broken when it started to converge with the most developed nations, particularly those in Europe (decreasing its Gini index). This has led to the interpretation that Latin America, like Spain at the time, has yet to reach its turning point on the Kuznets curve, making it too early to determine whether the hypothesis is true or false for this economic bloc. This study shows that Latin America, like Spain before the 1950s, is still in the ascendant part of the Kuznets curve; the Kuznets hypothesis is therefore not yet accepted when studying this group of nations (Martínez-Navarro, Amate-Fortes, Guarnido-Rueda, 2020).

On a theoretical level, there are studies like Bourguignon (1990), Anand and Kanbur (1993), Vicente and Borge (2000), Alderson and Nielsen (2002), Moller et al. (2003), Korzeniewicz and Moran (2005) which have produced arguments that challenge Kuznets' hypothesis (Dafermos & Papatheodorou, 2013). Other such studies challenging the Kuznets curve on a theoretical level are:

Anand and Kanbur (1986) used cross-sectional data and discovered that a U-shaped curve, not an inverted U, provided the best match for a relationship between economic growth and income inequality (Fields, 1989.)

Alves, Coelho and Roxo (2022) discovered a U-shaped relationship in which a higher GDP per capita resulted in greater inequality.

Yang (2017) supported the S-shaped curve hypothesis by suggesting that economic growth could be caused by an increase in income inequality, and that the implementation of fiscal redistributive measures has a negative impact on GDP per capita in some countries.

According to Bahmani-Oskooee & Gelan (2008), economic growth and income inequality are positively correlated during the development stage (short-run), but the relationship is inverse during the industrialized stage of the economy (long-run).

Gelan and Price (2003) examined the causal relationship between economic growth and income inequality in Sub-Saharan Africa using the Kuznets hypothesis. Their empirical results contradicted Kuznets's theory by demonstrating that the connection is positive in the long term in Sub-Saharan African nations.

Jianu et al. (2021), in their article from the 2010–2018 period, observed the relationship between income inequality and economic growth from the standpoint of each country's level of development inside the European Union. The countries were divided into two clusters of 14 each using the median GDP per capita stated in the purchasing power standard. The analysis was carried out using the cross-section weights option and the Estimated Generalized Least Squares method with fixed effects. Their findings demonstrated that while income inequality is detrimental to growth for developing EU countries, it is positively correlated with it for the developed EU Member States.

Sayed and Ping (2020), in their more recent research, which supported an "N" shape in the long-term relationship between income inequality and economic growth, also disproved Kuznets' theory.

Even the theory's entire formulation is called into question by Piketty (2014) because it was developed using data from 1913 to 1948, a period during which changes in inequality were likely caused by the effects of the two world wars and the economic and political shocks they brought (particularly for the wealthy), rather than the intersectoral mobility the theory predicted. According to him, the actual evidence used to support this curve theory was extremely fragile. However, what Piketty (2014) demonstrates is a broad hypothesis that outlines a positive correlation between economic growth and inequality. According to Piketty (2014), inequality will increase when economic growth is less than the rate of return on investment.

There are also studies that question the suitability of the Kuznets data sets.

Gobbin and Rayp (2004) worked with data on income inequality in growth empirics, ranging from cross-sections to time series. According to them, researchers looking into income inequality must look for pertinent data. Even though the majority of studies simply use pre-existing datasets, locating trustworthy data is not only challenging but also not always easy. Their findings draw attention to a few mistakes that might be made while using inequality statistics.

Wan et al. (2006) discussed the relationship between inequality and growth in the short and long term using empirical evidence from China. They argue that the conventional approach of data averaging makes it challenging to look into the relationship between inequality and growth. He instead employs the polynomial inverse lag framework to assess the impact of inequality on investment, education, and eventually growth with precisely defined temporal lags.

Despite significant efforts to draw a conclusion on the connection between economic growth and income inequality, the economic literature devoted to this issue lacks conclusive evidence about how economic growth affects income inequality. The majority of research findings in the literature review, however, corroborate the assertion that the relationship between the examined indicators depends on the degree of income inequality or the level of the country's development.

Finding common trends in growth and inequality development across all nations and addressing them with a single theory is generally exceedingly challenging. Significant historical, developmental, social, political, and economic disparities, among other things, contribute to the issues. However, if we had to make a forecast for our study area—the European countries—the Kuznets theory would lead us to believe that there is a negative correlation between growth and inequality in developed countries and a positive correlation between growth and developing countries.

3.1.1.3. After Kuznets

However, as the Kuznets hypothesis controversy raged on in the late 1980s and early 1990s, a new wave of research emerged that sought to expand on the hypothesis by taking a more comprehensive multidimensional approach to the study of income inequality (e.g., Atkinson et al. 1995; Gottaschalk & Smeeding, 1997; Gustafsson & Johansson, 1999). This more recent or revised approach focuses on understanding the composition of income inequality by looking at a variety of potential factors, including demographic, social, institutional, and cultural variables in addition to economic ones, that may affect patterns of income inequality. Most multidimensional studies of inequality have, until now, concentrated on OECD nations because of the greater accessibility and availability of data there (see, for instance, Gustafsson and Johansson, 1999; Acemoglu, 2003; Atkinson, 2008).

To be sure, research on the creation and use of such a multidimensional approach has pioneered new territory in terms of locating the crucial factors that are believed to support the observed patterns of inequality in these developed nations. However, there are still a number of significant gaps in the literature regarding more generalized international patterns of income inequality (Stuart, 2012). To the author's knowledge, no significant international study has yet used the most recent data from the last decade. As a result, we have yet to learn much about global inequality trends from 2000 to 2020. We can overcome these constraints and deepen our understanding of global patterns of inequality thanks to the large-scale accessibility of new data resources. We must first shed light on the factors influencing these patterns if policies are to be developed to address the imbalances in income inequality that exist worldwide.

As evidenced by the numerous articles published about income inequality each year, the Kuznets-curve hypothesis is still a contentious topic. It is possible to find contributions that either support it, like those by Zhang (2014), Utari and Cristina (2015), Jauch and Watzka (2016), Nielsen (2017), VanHeuvelen (2018), and Comin (2019), or that contradict it, like those by Yusuf et al. (2014), Kiatrungwilaikun and Suriya (2015), Meneejuk and Yamada (2016), Kanbur (2017), Costantini and Paradiso (2018), and Baymul and Sen (2019). There are also those who use the Kuznets theory in other contexts, such as Sulkowski and White (2016), who proposed the Kuznets curve of happiness or, more recently, Auci and Trovato (2018) who successfully used the Kuznets hypothesis to understand how inequality affects the environment by replacing inequality levels with CO2 emissions (Martínez-Navarro, Amate-Fortes, Guarnido-Rueda, 2020).

In conclusion, research on the Kuznets curve has yielded mixed results. Even so, it is still possible to draw conclusions that seem justified. On the one hand, all studies indicate a connection between economic growth and economic inequality. Authors like Fields (1989) noted that, despite this connection, the Kuznets hypothesis was based on a subset of nations, including those in Latin America, which produced false results. However, based on the evidence presented, it also appears to be accepted that inequality has a negative impact on economic development, which encourages and justifies the use of redistributive policies to enhance economic growth and development (Martínez-Navarro, Amate-Fortes, Guarnido-Rueda, 2020).

3.1.2. Piketty and Milanovic

The work of Kuznets (1955) was expanded upon more recently by Thomas Piketty in 2013, with the following differences:

1. Economic inequality was determined using taxpayer-declared income.
2. GDP growth rate was used in place of GDP per capita (a measure of economic development).
3. Piketty used more countries and time periods than Kuznets.

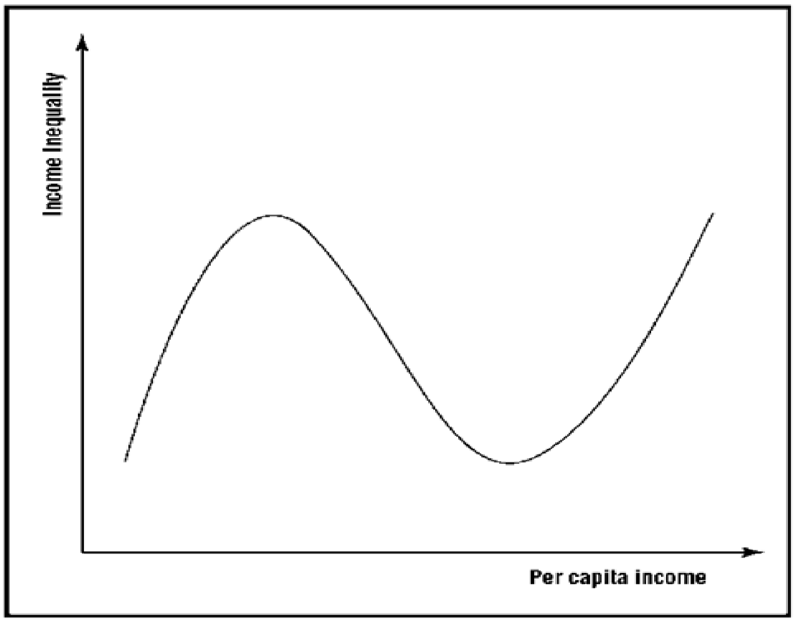
Piketty examined income inequality patterns in Great Britain, France, Sweden, Germany, the United States, and Japan. Since the 1950s, there has been a general trend toward rising economic inequality in developed countries, which he attributes to income concentration—understanding income as the right of property over capital, land, stocks, bonds, and other assets. Kuznets' prediction that nations with high GDP per capita levels are those with the least economic inequality—would not be realized if we assumed that increases in GDP cause increases in GDP per capita, given that developed nations have low birth rates. According to Piketty's (2013) theory, the primary cause of economic inequality is represented by the formula: $r>g$, where r is the average capital return rate (i.e., interests, benefits, income, dividends), and g is the GDP growth rate, also representing population growth. Highlighting the fact that Kuznets' observation of a decline in inequality in the USA during the first half of the 20th century was not just the result of natural market forces (i.e., the country's economic growth) but also of a decrease in the capital return rate and an increase in the economic growth rate at the same time. Finally, Piketty concludes that a capital tax must be implemented in order to decrease income accumulation among the richest part of the population and to transfer this income to the working class in order to decrease inequality, contain the force that generates this divergence, and fulfill Kuznets's prediction of a future with less economic inequality. The Piketty book has sparked debate as well. In response to his suggestion that taxes be used to redistribute wealth, proponents of capitalism and free markets have attempted to refute his claim. Because of this, scholars who have carefully examined the Piketty database, including Magness and Murphy (2015), McCloskey (2014), and Henderson (2014), have questioned the overall validity of Piketty's thesis and asserted that Piketty manipulated the data to support his hypothesis. Additionally, Piketty's model is open to criticism, with Acemoglu and Robinson's 2012 research study, which they co-authored, being the most notable example. They pointed out that for Piketty's model to work, capital owners would have to set aside 100% of their earnings. Consuming nothing and saving 100% of the earnings is an impossible assumption given that they must first allocate some of their income to consumption and will almost certainly invest due to pressure from rival firms (Martínez-Navarro, Amate-Fortes, Guarnido-Rueda, 2020).

Lemieux (2016), another expert on inequality, criticized Piketty's research (2013) for concentrating on the wealthiest 1% of the population and ignoring the remaining 99%, who can behave differently. This limitation of Piketty's research to the wealthiest population cohort prevented Lemieux from elucidating the causes of the real inequality that affects the remaining 99% of the population. Lemieux (2016) criticizes Piketty's study (2013) for being narrowly focused on a particular population group rather than being comprehensive as Piketty attempts to portray. The main difference between Kuznets' (1955) theory and the conclusions reached by Piketty (2014) is that Kuznets predicts that economic inequality will tend to decrease, as has previously been observed. In contrast, Piketty suggests that if capital gains taxes are not levied in the future, they will (Martínez-Navarro, Amate-Fortes, Guarnido-Rueda, 2020).

When the Kuznets curve is examined using the Gini variable for the entire sample, one notices a concave curve, just as Kuznets had predicted. However, if we distinguish between developing and developed nations, we can see that, as Piketty predicted, the graph eventually takes the shape of a sinusoid with an upward trend. He asserted in his book that income inequality would increase if capital gains tax is not implemented to transfer income from those who earn more to those who earn less.

This theory is supported by Milanovic (2016), who also discusses inequality and economic development in terms of a sinusoidal form (Figure 4). However, unlike Piketty, Milanovic contends that the disappearance of the middle class in the West and the simultaneous action of technological advancement and globalization are the causes of the "second Kuznets curve," which Milanovic refers to as the resurgent inequality (Martínez-Navarro, Amate-Fortes, Guarnido-Rueda, 2020).

Figure 4. The S-shaped Curve



Milanovic also provides additional justifications for the rise in inequality. These include homogamy (people with high purchasing power marrying highly educated people) and the expanding role of money in politics, which allows the wealthy classes to impose rules that are advantageous to them by funding political campaigns, strengthening the dynamics of inequality. In light of this, we are unable to disapprove of Kuznets's or Piketty's ideas (Martínez-Navarro, Amate-Fortes, Guarnido-Rueda, 2020).

3.1.3. The Kuznets curve in modern Europe

Castells-Quintana, D., Ramos, R. & Royuela, V. (2015) in their study note that the relationship between inequality and development does not follow an inverted-U pattern. They claim that since European countries are already developed, we would only observe the Kuznets curve's negative slope. However, some of the European countries with the highest GDPs per capita also exhibit high levels of inequality. If we examine how inequality has changed over time, we can see that most European countries have recently experienced rising inequality trends. In fact, some of the most developed and GDP per capita growing countries in Europe are also some of the countries with the highest levels of inequality. Previous studies, such as Davis (1992) and Freeman and Katz (1994) have already made the case that current economic growth patterns, particularly in already industrialized nations, may be linked to rising inequalities. As a result, the previously inverted-U relationship between economic growth and inequality may now take the form of an N shape, with inequality first rising, then falling, and then finally rising again (Conceiçao and Galbraith 2001; Guilera, 2010; Alderson & Doran, 2013). Thus, for European countries in recent years, we would only be able to appreciate the U-shaped portion of the N-shape. In poorer European countries (i.e., countries with low GDP per capita), an increase in GDP per capita is associated with a decrease in inequality. In contrast, an increase in GDP per capita is associated with an increase in inequality in wealthier countries (i.e., countries with high GDP per capita).

Growing inequality in relatively industrialized economies can be explained by various factors. The "original" explanation for the inverted-U curve between development and inequality is that transitions from agriculture to industry represent changes in developing countries. However, similar changes can also be seen beyond the initial transition from rural to urban areas in other sectors. In their analysis of how income composition has changed over time, Greenwood and Jovanovic (1990) consider the transition from less complex to more complex sectors. One can imagine, for example, transitions from low to high-value-added services, such as tourism to financial services, at later stages of development. As a result, we can anticipate that a rise in income inequality will also accompany changes brought on by increased productivity: the introduction of technological innovations may be accompanied by high incomes owned by a few people who benefit more than others from the new technology. In fact, according to Conceiçao and Galbraith (2001), what fuels inequality in post-industrial economies is the monopolistic nature of goods and services that require a high level of knowledge. However, we can anticipate that the new technology will eventually gain acceptance and become more affordable. As a result, technological advancements will benefit more skilled workers, the average income will rise, and the extra profits from the original monopoly will disappear. Accordingly, inequality will tend to decrease after an initial increasing phase, resulting in a "new" inverted-U curve.

Skill-biased technological advancement is another element that could contribute to increases in inequality (Alderson et al. 2005). The introduction of computerization is linked to decreased labor input for routine tasks and increased labor input for non-routine components (Autor et al., 2003). Workers with high skill levels have an advantage when performing unconventional tasks (problem-solving and creative jobs). Low-skilled workers have an advantage when performing manual labor that is not routine and calls for flexibility and interpersonal interactions, like providing personal health services. Workers with medium skill levels can be found in the middle of the distribution, carrying out routine tasks in accordance with established protocols. Computerization replaces routine tasks, which are carried out by middle-wage workers, and complements skilled tasks. It does not affect low-skill tasks. As this technology gets more affordable, middle-class workers' salaries decline, increasing inequality.

The income distribution will typically be impacted by additional factors that impact the skill composition of labor force demand. One of these elements is growing global economic integration, or globalization, which has been linked to the possibility of increased inequality in developed nations. The Heckscher-Ohlin and Stolper-Samuelson theorems indicate that increased openness strengthens developed regions' comparative advantage in sectors with skill-intensive products. As a result, greater inequality may develop since increased trade is linked to higher returns for skilled workers. Inequality and trade liberalization would be mutually exclusive (Kremer & Maskin, 2003). Increased openness causes labor in developed economies to move steadily from low-skilled to skilled sectors as they specialize in creating products requiring a high skill level. This result is even more accentuated by technological change. According to Jaumotte et al. (2008), technological advancement and globalization tend to raise the returns to skills, which in turn increases inequality (with technology's contribution being much more significant than openness, especially in developed countries).

Finally, it has been suggested that institutional factors, such as socio-demographic factors and labor market institutional characteristics, are essential (Castells-Quintana & Royuela, 2012).

The most common empirical method for analyzing inequality involves regressing a measure of inequality against the indicators of the factors derived from theoretical frameworks. For instance, the Kuznets curve is examined using both the linear and quadratic forms of the log of GDP per capita along with a set of control variables. Barro (2000) uses continental dummies and several institutional variables, including ethnicity, language, religion, democracy, a measure of trade openness that can be connected to globalization, and the population's educational attainment. This variable can be connected to the concept of technological change.

Most studies looking at the causes of inequality have used data at the national level. The use of regional data can also have significant benefits of its own. Individuals may not only be more impacted by local than global issues, but the regional dimension also considers a high degree of labor mobility among the production factors. It is predicted that low levels of mobility will lead to significant spatial inequalities in terms of affluence, poverty, and stagnation. With the aid of regional data, inequality can be made more noticeable when there are slight differences in the starting circumstances. The omitted variable bias that can appear in more aggregated exploration is also reduced in this line by using regional data.

By examining regional data, researchers can find subtleties that would be missed at the national level, considering things like labor mobility and local problems among production components. This method lessens the potential for bias resulting from more aggregated studies and helps to draw attention to spatial inequities (Lagerlöf, 2021).

Consistent with this regional outlook, research conducted in the European Union frequently examines income inequality from both national and international perspectives. Filauro (2018) explores the distinctive characteristics of net income inequality in the EU28, making a distinction between intra- and inter-country inequality. The results show that differences inside individual member states, rather than between them, account for a large amount of the economic inequality in the EU. This viewpoint emphasizes how the different levels of inequality in each member state within the EU affect the overall levels of income inequality in the EU. Moreover, Filauro contends that although the overall trend of inequality—as indicated by the Gini index—had a decline between 2006 and 2009, the coefficient had stayed comparatively steady thereafter, circling around 0.35.

Adding to this, Bonesmo Fredriksen (2012) supports the idea that the main factor influencing the overall levels of inequality in the EU is intra-country inequality. The author also points out a particular pattern in the income distribution, pointing out that between 1980 and 2008, the difference between the top and lowest portions of the income distribution grew. In particular, Bonesmo Fredriksen notes that during the same time period, the share of earners in the bottom percentile has decreased, whilst the money acquired by those in the top percentile has increased.

These results also support the arguments made by Fischer and Strauss (2021), who argue that the decline in income of the lowest earners is not the only reason for the increase in income inequality in the European Union. Rather, they contend that the rising percentage of income going to individuals who already have the highest income levels is what is driving the rise in income inequality.

When considered collectively, these viewpoints highlight how complicated income inequality is inside the European countries and imply that it cannot be reduced to a single point of view. Instead, differences in income distribution within the European countries depend on a number of variables, including time, place, and the particular income distribution under study. Developing comprehensive initiatives to address and alleviate income inequality within the European countries requires a detailed understanding of this issue.

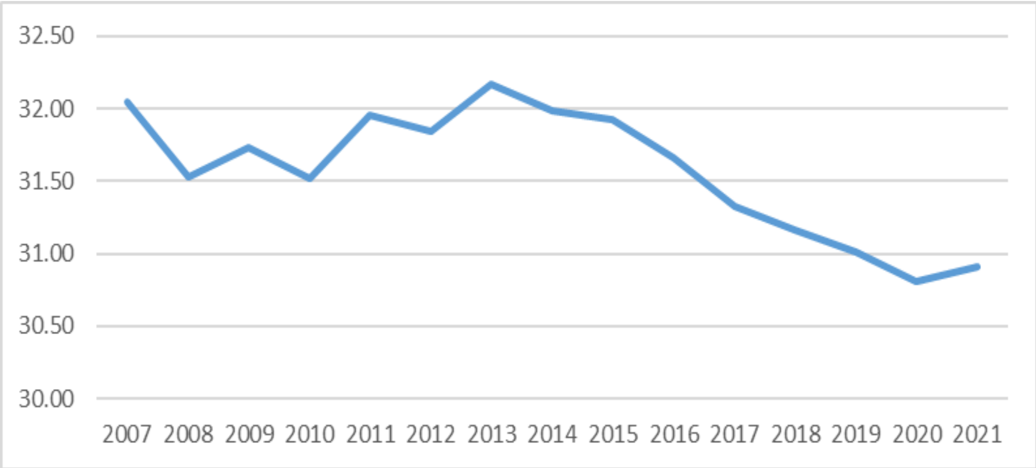
3.1.4. Income Inequality in Modern Europe

The topic of income inequality in Europe often leads to the voicing of various opinions and analysis, as the distribution of wealth across the continent shows huge divergencies. Reduction of income gap varies from the developed Western European urban areas to the rising economies of the East. This, in turn, shapes the social welfare, economic stability, and political landscapes. Comprehending the causes behind these inequalities, which are deep-rooted in history and/or structural nature, or linked to particular governmental policies, is pivotal for policymakers, economists, and social scientists as well. The picture depicting globalization, digitalization, and dynamic labor market acts only as the canvas to show the intricacy of income discrepancy in Europe and emphasizes the need for implementation of fairness and equal opportunities.

The period of 2007-2021 was an even more turbulent time for Europe which can be described as a cluster of economic crises that negatively affected income inequality of the continent in general. The global financial crisis of 2007-2008, followed by the European sovereign debt crisis and consequent austerity programmes in a number of countries led to major redistribution of resources and significant shifts in social dynamics. This was then compounded by the high unemployment rates, high inflation, and general economic slump in many countries which occurred due to the pandemic crisis. Those times not only highlighted and aggravated the pre-existing inequalities, but also made the difference between the rich and poor much more evident. When economies were fighting against recession, unemployment, and austerity measures, the consequences of income inequality became more evident, impacting both the economic policies and the social viewpoints and political discussions. In this context, assessing income inequality in Europe during this time helps to reveal the complex and far-reaching impacts of economic crises, painting a picture of both the challenges and the opportunities for establishing a more just and strong society.

To show the development of income inequality levels through these crises' years, the author calculates the average Gini Coefficient of Europe from 2007 to 2021 (Figure 5). During the whole period from 2007, the average Gini Coefficient in Europe is a stable line with slight oscillations, reaching its peak in the year 2013, hinting at a short-term rise of income inequality. It is possible that this might be because of lingering effects of the global economic crisis, and the ongoing effects of the sovereign debt crisis, which had different impacts on the European sovereign states. The subsequent years show a declining trend, which points to a gradual reduction of income inequality across the continent.

Figure 5. Average Gini Coefficient in Europe (2007-2021)



Source: World Bank database, author's calculations

From 2017, the Gini Coefficient slope becomes more prominent and reaches its minimum in 2020. This could be a sign of the economic implications of the policies that were implemented across Europe, seeking to ensure the wealth redistribution and social welfare. Nevertheless, one must understand that this is a broad measure and it does not account for regional disparities, demographic changes, and shifts in public policies that might essentially tackle the income distribution within a particular country. Moreover, it is worth bearing in mind that data collection methods may show significant discrepancies among countries, possibly leading to problems in the reliability and interpretation of the Gini coefficient. It is of the essence to place the discussion on inequality under the social and economic environment that use the factors such as labor market conditions, tax policy and social security systems in Europe.

In this period, the trends in the Gini Coefficient lead us to other questions, namely, what policies or shifts in the economy were responsible for these changes. Therefore, it is advisable to further explore. Through investigation of the interconnectedness of policy decisions and inequality factors, we can develop a deeper knowledge of Europe's progress in dealing with the income gap issues, which are still to be resolved.

3.1.5. Income Inequality in Developed vs. Developing European Countries

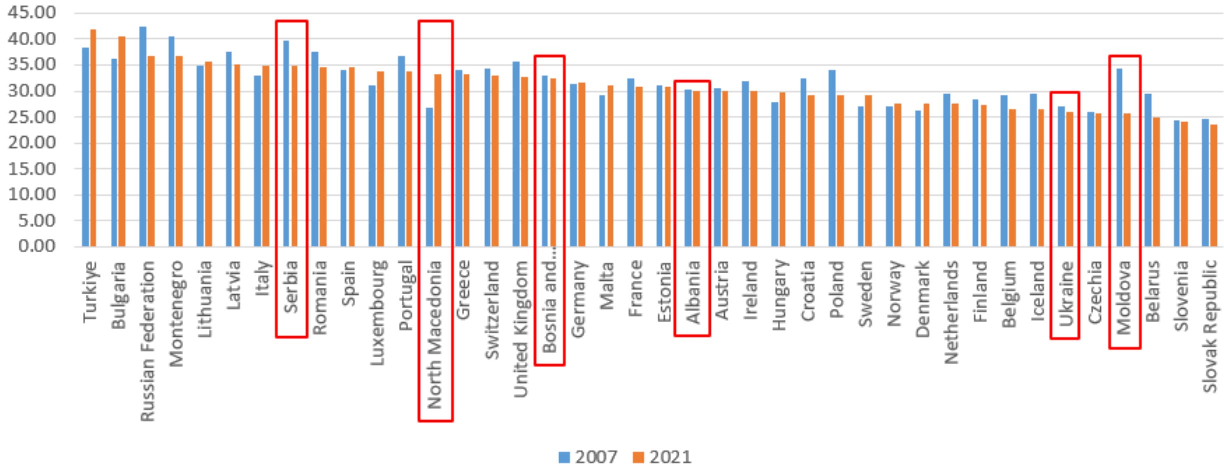
Income inequality, as a complex issue, differs between the European developed and developing countries. Thus, a detailed analysis of income inequality and its determinants in the context of Europe is necessary to comprehend the two sets of the countries' differences in experiences.

On the one hand, developed countries in Europe are influenced by various factors, among which most notable are the progressive taxation systems, social safety nets, and robust educational opportunities. The stability of income structures is further supported by a history of socioeconomic policies and strong institutions. Still complications are there due to globalization and technological advancement which might aggravate income inequalities hence making a demand for responsive policy frameworks. Countries like Germany and Norway have relatively low-income inequality, while the UK and Spain have higher levels. In most developed European nations, levels of income inequality are lower than the world average. All these add to creating a more egalitarian allocation of resources. Meanwhile, in these countries' differences continue to prevail most notably revealed in urban-rural gaps and cultural divides. Addressing these intranational discrepancies remains critical for sustaining equitable income distribution.

Developing European nations, on the other hand, struggle with their own unique factors that contribute to income inequality. Inequality tends to be worse in Eastern Europe, Balkans, and Caucasus due to weak institutions, uneven development, and intergenerational poverty transmission. Historical influences have endured, especially the shifts from centrally planned to market-oriented economies. High inequality perpetuates intergenerational poverty transmission. Targeted interventions are necessary to navigate the difficulties of emergent economic institutions due to the legacies of historical injustices. International organizations provide financing for infrastructure, healthcare, education, and agricultural development, while aid programs show mixed results and political instability hamper long-term sustainability. Urban-rural differences are still present because of past disparities. To make sure that everyone benefits from prosperity, it is important to strike a balance between social inclusion and economic development.

Intricate patterns can be seen when comparing income inequality between developed and developing European countries (Figure 6). Developed countries have more equal income distribution because of inclusive economic systems and well-established social policies. Due to historical legacies, developing nations must combine social inclusion and economic progress with careful interventions. The intricate web of income inequality throughout Europe is woven by the interactions of these variables. These differences of the income inequality levels of the European developed and developing countries are represented in the graph below.

Figure 6. National income inequalities in Europe (Gini, 2007 and 2021)



Source: World Bank database, author's calculations

The graph represents a comparison of income inequalities within all European countries observed in this study, for the years 2007 and 2021. The income inequalities are represented by the Gini coefficient which is an indicator of income inequality, with 0% for perfect equality and 100% for perfect inequality. On the x-axis are the countries ranking from highest income inequality in 2021 to lowest income inequality in 2021, while on the y-axis are the Gini coefficients in percentage levels. There are two bars for each country, light blue representing data from 2007, and orange bar representing data from 2021. These two years are chosen as comparison as they are the first and the last year of the observed period in this study.

The graph allows visual comparison between the two years for each country, but also the comparison between countries. A country with higher bars represents a country with higher income inequality. By observing the heights of the paired bars, it can be determined if income inequality in that country has increased, decreased, or remained relatively stable between 2007 and 2021.

As an example, countries like Bulgaria, Italy and Luxembourg show an upward trend in the Gini coefficient, which indicates higher income inequality. On the contrary, countries like Belarus, Moldova, and the Russian Federation show a decline, which means a fall in their income inequality levels. Some countries such as Belgium and Czechia show minimal change, which may suggest that the income distribution has not change significantly in this fifteen-year period of observation.

The graph also makes a distinction between the developed and developing countries, by highlighting with red rectangular lines the developing countries, which are characterized by emerging economies and are in the process of industrialization. These developing countries are usually characterized by higher Gini coefficients compared to the developed countries, showing that the rich-poor gap is bigger within these countries. The levels of the inequality coefficients of these developing countries moved differently, some were increasing from 2007 to 2021 (North Macedonia), some decreasing (Serbia, Moldova), while others remained almost the same (Bosnia and Herzegovina, Albania, Ukraine).

Developed countries, on the other hand, typically tend to be those with a more advanced post-industrial economy, complex technological infrastructure, and generally, the most elevated levels of living standards, thus expected to show lower levels of income inequality. According to the observed data in the graph, the developed countries show a trend that is towards a decreasing inequality or no difference (minimal change) from 2007 to 2021, comparing to the developing ones which exhibit more unpredictable trends with some showing considerable changes in either direction. These lower coefficients mean that incomes in the developed countries are more equal and that they have stronger social safety nets and more effective welfare programs.

It would be wise to consider additional information when interpreting the Gini coefficient, for it is essential to look at economic policies, social welfare programs, and social events which may affect these variations over time. The study of Gini coefficient can reveal facts about the economic situation and to what extent the government policies regarding income distribution are effective. Moreover, the impact of these government policies can be seen through the graph by observing if there is a change in the level of the income inequality. It further acts as an instrument to compare the trends of income inequality among the European countries.

With respect to this, it would be appropriate to conclude that how income inequality will develop in Europe in the future will depend on how well developing and developed countries follow their respective policies. Against this backdrop, it becomes important to shape a more equitable future throughout the European landscape by addressing the social gaps, leverage technological breakthroughs for inclusive growth, adjust to changing global economic patterns. For these reasons, successful navigation through the many challenges of a fast-evolving socio-economic world demands that the measures be proactive and context-specific. While issues such as enhancing progressive taxation, strengthening social safety nets, and promotion of inclusive education are more sensible for many developed European countries faced with the challenge posed by technological advancements and globalization, developing European countries need comprehensive policy frameworks to address historical disparities, targeting interventions in education and healthcare, bridging urban-rural gaps, and ensuring inclusive economic growth. The overall comprehensive policy frameworks help to address historical disparities, target the interventions of education and health care, bridge the urban-rural gaps, and inclusive economic growth by the developing European countries. To reduce income inequality, balancing the economic liberalization with robust social welfare policies is a prudent approach. Education is needed but not enough on its own, comprehensive tax benefit wage policies and investment by the people are also needed. Finally, reducing inequality requires sustained efforts that combine equitable economic growth with income redistribution. With political will and international cooperation, low inequality outcomes can be within reach for both developed and developing countries.

Although no particular theory provides a complete explanation for income inequality, the theoretical landscape still offers great insights into the fact that income inequality is such a complex phenomenon. Moving forward, income inequality must be considered holistically as it implicates many variables some of which are interdependent.

After the review of the theoretical foundations which is articulated further, the literature review dives into the empirical studies that are concerned with the variety of determinants of income inequality. Recognizing the limits of the existing theories, this literature review seeks to comprehensively examine the complex array of variables that support the changing pattern of income inequality. By synthesizing findings from a range of studies, this review seeks to shed light on the complex interplay between various socio-economic factors and income inequality outcomes.

3.2. Literature Review

Despite the abundance of literature on the determinants of income inequality, no comprehensive theory encompassing all the potential determinants of income inequality has ever been discovered. Most publications in this field focus on just one or a small number of different aspects, covering only one of several determinants. Studies are looking at a larger number of determinants (e.g., Nielsen, 1994; Gustafsson and Johansson, 1999; Nielsen and Alderson, 1997; Xu and Zou, 2000; Clarke, Xu, and Zou, 2003), still, they do not aim to address all the possible determinants of income inequality discussed in the relevant literature. Even though such an approach offers a more insightful assessment of the potential mechanisms of impact, it is debatable whether the outcomes of such empirical research reflect reality. Parker (1999) expresses the same uncertainty. In addition to a causal relationship, there is always a non-causal relationship created when, for instance, a third variable influences both variables under consideration. The results of the empirical research that solely considers these two variables may be deceptive regarding the causal relationship. As a result, it would be important to incorporate as many variables into the study as the available data would permit.

Furthermore, it is logical to anticipate that the variables will have causal links among themselves if the study considers as many causes of income inequality as possible. As a result, many of the factors also have an indirect effect on income inequality through other factors in addition to their direct effect. As a result, each specific factor's overall impact on income inequality consists of both a direct and an indirect effect. The indirect effect might differ significantly from the direct effect and occasionally even have the opposite sign. Therefore, if the interrelationships between the elements are not taken into account, the overall effect can also differ significantly from the direct effect, yet only the direct effect is calculated. Typically, in economics, we are interested in how one variable affects another, ceteris paribus. The entire impact of a specific determinant on income inequality, which includes both the direct and indirect effects, serves as the best indicator of how the level of income inequality has changed as a result of that determinant's change. Therefore, all possible interactions between these determinants must be considered when analyzing the causes of income inequality.

Although this study follows the ceteris paribus traditional approach by analyzing the effects of determinants on income inequality, one-by-one, the merit of this study is the width of factors used. More importantly, by borrowing from four different categories—economic development, macroeconomic factors, demographic factors, and political factors—the study has retained a comprehensive character. Instead of considering the impact of direct effects alone, this approach considers the wide range of determinants that cumulatively influence income inequality. This systemic analysis of factors from different categories is based on the premise that becoming fully aware of the multidimensional dynamics involved in the issue at hand may shed a subtler light on it. Therefore, the study contributes to the literature by providing wider investigation, involving various determinants in order to understand the various intricacies that influence income inequality. As this analysis moves towards the description of categorized determinants such as economic development, demographic factors, political factors, cultural and environmental factors, as well as macroeconomic factors, it prepares the ground for an in-depth analysis of each factor's unique influence on the pattern of income dispersion.

3.2.1. Determinants of Income Inequality

After categorizing the determinants of income inequality that have been addressed in the literature, this study goes on to examine each of these aspects. The study draws on the classification of the twenty-four factors of income inequality suggested by Kaasa (2005) divided into five categories: economic development (country's wealth, development of economic structure, economic growth, and technological development), demographic factors (urbanization, the share of children in population, composition of households, educational level, education inequality, education expenditure), political factors (the share of the government sector, democratization), cultural and environmental factors (land concentration, cultural variation, shadow economy, corruption, abundance of natural resources), and macroeconomic factors (inflation, unemployment, financial development, export, import, foreign investments).

In addition, the literature review augments this structure by providing additional factors of income inequality taken from other studies. These supplementary factors are explained in the section "other" under each category. For the category "economic development" there are no additional factors added. For the category "demographic factors" several additional factors of income inequality are added for observation, i.e., immigration, knowledge, child mortality and fertility, population growth, and family size. Under the "political factors" category is added policy liberalization, as well as the six World Bank governance indicators: political stability and absence of violence/terrorism, the rule of law, voice and accountability, regulatory quality, government effectiveness, and control of corruption. The "cultural and environmental factors" is enriched by the one additionally observed factor "gender discrimination at work". Finally, most additional factors added were under the category of "macroeconomic factors". The factors that were added are: gross fixed capital formation, minimum wage, tax and transfer systems, value-added tax, remittances, domestic savings and domestic consumption, government expenditure, social expenditures, and globalization.

Table 2. The five categories of the factors of income inequality

Group	**Factors proposed by Kaasa (2005)**	**Factors from other studies**
Economic development	– Country's wealth – Development of economic structure – Economic growth – Technological development	
Demographic factors	– Urbanization – The share of children in population – The share of elderly people in population – Composition of households – Educational level – Education inequality – Education expenditure	– Immigration – Knowledge – Child mortality and fertility – Population growth – Family size
Political factors	– The share of the government sector – Democratization	– Policy liberalization – Political stability and absence of violence/terrorism – Rule of law – Voice and accountability – Regulatory quality – Control of corruption – Government effectiveness
Cultural and environmental factors	– Land concentration – Cultural variation – Shadow economy – Corruption – Abundance of natural resources	– Gender discrimination at work
Macroeconomic factors	– Inflation – Unemployment – Financial development – Export – Import – Foreign investments	– Gross fixed capital formation – Minimum wage – Tax and transfer systems – Value-added tax – Remittances – Domestic savings and domestic consumption – Government expenditures – Social expenditures – Globalization

Source: Author's own work based on data from Kaasa (2005) and other studies from the literature review

All these factors, the twenty-four factors from Kassa (2005) and the twenty-two additional factors from other studies will be closely observed in the following part, category by category. At the end of the literature review, the study will underline which of all those factors will be included in the empirical analysis of this study.

3.2.1.1.Economic development determinants

Economic development-related factors have definitely received the most attention in prior research on the factors of income inequality. The variables under this category include the country's wealth (often expressed as GDP per capita), economic growth, technological development, and changes in the economic structure.

Kuznets (1955) was the first to put forth the widely accepted theory known as the "inverted-U hypothesis," income inequality tends to rise in the early stages of economic development but fall in the later ones. By establishing the theory of the inverted U-curve, Kuznets was one of the first scientists to elaborate on the relationship between economic growth and inequality. He contends that because of urbanization and industrialization, income inequality should rise in the early phases of development and fall subsequently (as a large fraction of the rural labor force would be already attracted by industries). Following this model, income inequality will increase as the processes of industrialization and urbanization take hold and the transition from the agricultural to the industrial sector starts, mostly because a larger proportion of the urban population now earns more from the industrial sector. However, patterns of inequality will shift as more individuals enter this sector to benefit from higher earnings and possibilities. Those who remain in agriculture will then see an increase in wages (due to a shortage of workers in this area), reducing overall inequality.

Robinson (1976) and numerous other scholars later developed further Kuznets' theory, which claims that economic growth has a positive effect on income inequality in low-income per capita states and a negative one in later stages of development. Robinson (1976) showed that when the fraction of the urban population rises, overall inequality will first grow and then subsequently decline.

Although it has changed throughout time, Kuznets theory is still the cornerstone of research on income inequality. Recent studies have looked beyond changes in agriculture and industry, instead focusing on inverted-U curves of financial development, advancements in technology, the accumulation of human capital, and other aspects (most of which will also be discussed further in the paper).

A. Country's wealth

The majority of research on the relationship between a country's wealth and income inequality is based on Kuznets' (1955) theory. Having in mind that numerous studies try to validate or challenge Kuznets' hypothesis, GDP per capita is often used in the majority of research that examine various aspects of income inequality as a reference to this theory. The results from these studies prove the complicated relationship between GDP per capita and income inequality. Following are only some of them:

Ivaschenko (2002) discovered that in the transitional economies of Eastern Europe, there was a positive correlation between per capita GDP and income inequality.

Choi (2006) indicate that while higher GDP per capita may contribute to greater income inequality, the relationship between the two is dependent on a number of variables, including FDI and the degree of economic growth. This was shown through the findings which discovered that FDI raises income inequality and has an effect on GDP per capita.

According to Barro (2008), there is an inverse-U-shaped link between per capita GDP and income inequality, with the negative impact of income inequality on economic growth decreasing as per capita GDP increases.

Mekenbayeva and Karakuş (2011) looked at the connection between GDP per capita and income inequality in developed and developing countries from 1980 to 2009. A negative relationship between the two variables can occur in developing countries due to a negative opportunity-creation effect that works through the restrictions on human capital investment that it places on the poor. It can also result from imperfect capital markets, unsuitable and risky conditions for investors, and unstable political environments. While the situation is different in developed countries because of their higher marginal capital productivity, marginal propensity to save overall, and weaker inclination for leisure.

Malul (2012) found that at a more advanced stage of the development process, the per capita income-inequality relationship turns from positive to negative, supporting Kuznets hypothesis.

According to Rubin and Segal (2015), income inequality in the United States of America during the post-war years (1953–2008) is found to be positively connected with economic growth, represented by GDP per capita.

According to research by Markus Brueckner (2015), rising national income significantly moderates income inequality. For example, a one percent increase in real GDP per capita typically results in a 0.08 percentage point reduction in the Gini coefficient; this finding holds true for all income levels, time periods, and estimation methods. Both Brueckner (2015) and Brueckner and Lederman (2018) discovered that, depending on the degree of economic development, income inequality has a negative effect on GDP per capita growth.

In their study, Brueckner & Lederman (2015) show that income inequality tends to have a significant negative effect on transitional gross domestic product per capita growth and the long-run level of gross domestic product per capita on average. Nevertheless, the impact differs in relation to the level of economic development as the relationship is positive between income inequality and gross domestic product per capita in the poorest countries. While at an earlier stage of the growth process, Kuznets hypothesis seems to get support, at a later stage of the development stage the hypothesis was disproved.

In their following study, Brueckner and Lederman (2018) by using instrumental variables regressions demonstrate that in low-income countries transition to higher income level is positively associated with income inequality, while in high-income countries inequality has significant negative effect on transition to higher income level.

Bayarjargal (2017) based on the system-GMM estimation method, substantially supports the hypothesis of inverse U-curve relationship between GDP per capita and income inequality.

Shahbaz (2010) used time-series data for Pakistan from 1971 to 2005 and the ARDL bound test to identify the relationship between economic growth (GDP per capita) and income distribution. The results demonstrate a significant and positive relationship between income inequality and economic growth in Pakistan. The findings support the existence of Kuznets inverted-U, as well as inverted S-shaped curve in Pakistan.

Ganaie (2018) investigates incomes inequality and its main drivers from 1963 to 2007 using ARDK cointegration approach. The findings show that, although real GDP per capita has a negative relation with overall inequality, its effect on the share of income of the top 1% is positive.

Lee and Lee (2018) shows that income inequality is strongly influenced by the country's wealth, and higher economic and political risks are typically associated with higher inequality. Seemingly, low-income countries have higher income inequality. Moreover, the increase in income distribution is only dynamically sustained after a specific threshold level of nation risk has been reduced, considering the non-monotonic effect of country risk. To promote income distribution, policymakers must examine the advantages of reducing national risk in order to raise the degree of stability in the nation (Lee and Lee, 2018).

According to Altunbaş and Thornton (2019), the impact of financial development on income inequality differs depending on the economic level of a nation, encouraging inequality in low- and high-income nations and equality in upper-middle-income ones. The effect of financial development on income inequality appears to vary with a country's income level across a panel of 121 nations. In upper-middle income nations, it encourages equality across inequality quantiles; in low- and high-income countries, it encourages inequality across inequality quantiles.

In other studies, as a measure of a nation's wealth is used the energy consumption per capita. Examples can be seen in Muller (1988), who using a cross-section of the years 1965–1975, discovered an inverse U connection between energy usage and income inequality. When Nielsen and Alderson (1995) analyzed panel data for the years 1952–1988, they came to the same conclusion. Nevertheless, Nielsen (1994) employed GDP per capita and energy consumption separately, and in a cross-section of 1970, these variables didn't seem to have much of an impact on income inequality.

In the majority of the time however, the GDP per capita serves as a measure of a country's wealth.

b. Economic growth

Another frequently used determinant of income inequality from the category of "economic development determinants", is the GDP growth. Despite the GDP per capita being preferred in studying the relationship between economic development and income inequality since it reflects the average income of individuals, and provides a longer-term perspective on economic development, GDP growth can be occasionally seen as a representative for economic development in studies observing income inequality. One such study is Ravallion & Chen (1997) who discovered a negative correlation between economic growth and income inequality. They claimed that in developing countries, distribution frequently fared better than it worsened in developed countries and that negative growth frequently hurt distribution more than positive growth. Another such study is Odedokun and Round (2001) who using the OLS model investigated the relationship between income inequality and economic growth in 35 African nations between 1960 and 2009. The findings indicated that in addition to the level of economic development, income distribution is influenced by the size of the government budget, the amount allocated to subsidies and transfers, the stage of the economic cycle, the proportion of the labor force employed in agriculture, and the endowment of human and natural resources. Additionally, they discovered a negative correlation between inequality and growth.

c. Technological development

Technological development is often separately analyzed as a determinant of income inequality. For instance, Cornia and Kiiski (2001) discovered that while technological development has a lesser effect in less developed countries, it is one of the most significant variables influencing income inequality in developed countries. According to Snower (1999), there can be different influencing mechanisms. When technology undergoes significant development, skilled workers' salaries rise while those of unskilled workers remain the same. If there are significant changes, skilled workers will replace unskilled workers in the workforce; as a result, salaries for skilled workers would rise while demand for unskilled workers will fall, as will their pay. Bresnahan (1997), who examined the effect of computerization on income inequality, concluded that computerization also makes income inequality worse. So, it makes sense that technological advancement will widen the gap between the rich and the poor. However, it must be acknowledged that this influence has been analyzed primarily in fairly theoretical studies due to the lack of widely accepted markers for technological growth. Kharlamova, Stavytskyy, and Zarotiadis (2018) examined how technological developments impact income inequality in European nations. The outcome demonstrated that there are two possible effects of technology on inequality: positive and negative. It was discovered, in particular, that the UK and Central European nations have advanced to a point where economic development and redistribution are so advanced that changes in labor productivity are not significantly linked to an increase in income inequality. The results also show that the impact of inequality being triggered by technological development is reduced the more economically developed a nation is.

d. Development of the economic structure

The level of development of the economic structure is another indicator which some studies use to examine the relationship between income inequality and economic development. For instance, such study was Abdel-Ghany (1996) where one of the factors used to measure income inequality was the ratio of manufacturing to service workers. Others were the studies by Nielsen (1994) and Nielsen and Alderson (1995, 1997) where they used sectoral dualism indicator to show the income inequality between the sectors. The comparison of two sectors is done by subtracting, for instance, the agriculture' share of the GDP from the labour force share employed in agriculture (Nielsen and Alderson, 1995). is also nonlinear. Today, however, more complex indicators are necessary, as three sectors must now be considered.

Since the methods used in different studies are different, no general assumption can be made about the effect of economic structure development on income inequality. It can be presumed, therefore, that the development of an economy's structure has a nonlinear impact, much like the country's wealth.

3.2.1.2. Demographic determinants

The next set of determinants of income inequality includes demographic factors, such as urbanization, population age structure, household composition, immigration, educational level, educational inequality, and education spending. In earlier literature, these factors have also been thoroughly researched.

a. Urbanization

Regarding how urbanization affects income inequality, conflicting theories exist. Crenshaw (1993) demonstrated that reduced inequality is associated with higher population densities, explaining this by pointing to the likelihood of more sophisticated social organization in the presence of higher densities. Conversely, Nielsen and Alderson (1997) and Litwin (1998) discovered that increased urbanization and population density increase inequality, with income inequality, often being larger in urban rather than rural settings. The impact of urbanization on income inequality was shown to be negligible in Li, Squire, and Zou's (1998) study, which used panel data for the years 1947 through 1994, as well as in Xu and Zou's (2000) work, which used data from China.

b. Population age structure

There is also some uncertainty over how the population age structure affects income inequality. Deaton and Paxson (1997) assert that as older individuals have a wider range of incomes, having more of them in the population increases income inequality. On the other hand, Higgins and Williamson (1999) discovered that inequality reduces as a bigger proportion of the population between the ages of 40 and 59 is present in the population. It is conceivable that a higher proportion of older and more experienced individuals lowers the demand for them and the salary premium for experience, resulting in decreased overall inequality. According to Nielsen and Alderson (1997), the percentage of elderly individuals (65 and older) in U.S. counties had a varying effect on income inequality in different decades. Both studies by Gustafsson and Johansson (1999) on OECD nations from 1966 to 1994 and by Muller (1988) using a cross-section from 1965 to 1975 both demonstrated that having more children (aged 0–14) increases income inequality. This can be explained by the supposition that the birth rate is higher in families with lower incomes, which causes the earnings per family member to decrease even further in this group of people and, as a result, raises total inequality.

c. Household composition

Household composition has a significant impact on the formation of income inequality because it is typically determined by the average income of the family members. Because homes of different types have varied earnings per household member, it has been assumed that the more distinct the types of households, the greater the income inequality (Wilkie, 1996). As the average number of household members falls (children leaving their parents younger, fewer marriages, and more single people), the overall inequality rises since larger households are better equipped to equalize the income per household member (Blank and Card, 1993). The majority of studies have concentrated on the effect of the percentage of households with a single female head. It is expected that single-female-headed households have a lower income per household member since they typically have one employed person instead of two as in the traditional family type. As a result, the total inequality is larger when there are more single-female-headed households (Partridge, Partridge, and Rickman, 1998). Numerous studies employing data from the United States, including those by Maxwell (1990), Nielsen and Alderson (1997), Bishop, Formby, and Smith (1997), and Chevan and Stokes (2000), provide evidence in favor of this premise.

d. Educational level

One of the key elements in eliminating income inequality is education. It's a widely held assumption that expanding educational possibilities will raise the poor's chances of finding work and reduce inequality. However, there isn't a clear-cut solution provided by the studies on this subject. The study, therefore, takes a closer look at this determinant.

The idea that education plays a role in explaining income disparities also has a long history, going all the way back to Adam Smith. According to Mincer (1958), Schultz (1961), and Becker (1962), educational attainment is usually seen to have an impact on income inequality, a phenomenon commonly referred to as "skills deepening" (Williamson, 1991). Nevertheless, Sianesi & Van Reenen (2003) found that the effect of endowments at various educational levels (i.e., primary, secondary, and tertiary) tends to depend on a country's development level, with tertiary education being the most significant for income variations (Berry and Glaeser, 2005; Shapiro, 2006). A higher level of educational attainment can be attained by increasing educational quality, increasing access to education, and increasing financial investment in educational infrastructure. For instance, increased tertiary education access is anticipated to boost the earning potential of the lowest strata, resulting in a decrease in income inequality (Checchi, 2000). More access to education also makes it possible for people to participate in the market economy with greater knowledge, which reduces the influence of the wealthy on public policy. It also increases social and job opportunities for the poor, which also results in a decrease in inequality. Because of this, education is thought to be one of the best strategies for lowering income inequality (World Bank, 2002).

The literature provides a number of empirical analyses on how education and inequality are related, using a number of indicators to suggest the skill endowment that results from education (educational attainment, adult literacy test results, secondary or tertiary attainment level), or education inequalities and their impact on income inequalities. The economic literature generally agrees with the claim that a higher level of education encourages social equality.

For instance, Breen and Garcia-Penalosa (1999) demonstrated that income inequality is greatly reduced in both developed and developing countries by increasing educational attainment. Empirical evidence is also found by Li et al. (1998), Barro (2000), Checchi (2000), De Gregorio and Lee ((2002), and Gunatilaka and Chotikapanich (2006) to support the claim that increasing educational attainment results in more evenly distributed income. Celikay and Sengur (2016) investigated the effects of educational levels in 31 European countries between 2004 and 2011. Their findings showed that a 1% increase in education level lowers the level of income inequality among the nation's citizens. Therefore, having a high degree of education has a negative impact on income inequality. In their study, Palaz et al. (2013) further supported the idea that education reduces income inequality in society.

In addition, several scholars use variations in educational attainment to analyze the effects of education on income inequality. In this regard, Cornia (2015) claims that the rise in secondary and tertiary completion rates during the 1990s and 2000s, particularly among the impoverished population, caused, among other things, a decline in inequality in Latin America due to a more skilled labor force and due to a more equitable distribution of human capital. On the other hand, Matos (2019) discovers that households with higher incomes and higher levels of education are more likely to be in debt, demonstrating how tertiary education may worsen inequality via the debt channel. In contrast to Li et al. (1998), who argue that completion of secondary school is a significant predictor of inequality, Barro (2000) finds that all three levels of educational attainment have a large and robust influence on how income is distributed.

According to Knight and Sabot (1983), the balance between the "composition" and the "wage compression" effects determines how differing levels of educational attainment affect income disparities. With regard to the "composition" impact, more tertiary education tends to widen the income gap, at least at first. In terms of the "wage compression" impact, education eventually results in reduced income inequality. The supply of highly educated workers rises as tertiary education rises, which lowers their earnings; conversely, the supply of less educated people declines, which increases wages for such workers. As a result, an increase in the workforce's education level is anticipated to boost competition for jobs requiring advanced degrees, which should help to narrow the wage gap between those with more education and those with less (Tinbergen, 1975). In addition, a bigger percentage of the population with higher levels of education causes the value of degrees to rise and, over time, lowers earnings for highly educated workers. As a result, the relationship between education and income inequality is predicated on a balance between supply and demand.

Although it is frequently asserted that increased educational attainment lowers income inequality (Nielsen and Alderson, 1995; Chu, 2000; Sylvester, 2002), it is important to distinguish between the average level of education and educational variations. The average number of years spent in school is frequently employed as a measure of the population's educational attainment. However, the results are once again inconclusive. For instance, income inequality was discovered to be lower in American counties with higher average years of schooling, according to Partridge, Partridge, and Rickman (1998). On the other hand, Sylvester's (2002) study, which included a cross-section of 50 countries, revealed that nations with a greater average number of education years were less likely to experience poverty. According to Shavit (1994) and De Gregorio and Lee (2002), higher educational attainment and a more equal distribution of education can result in a more equal income distribution. Indeed, Duncan (1998) notes the fact that childhood poverty, which can restrict access to education, has a negative influence on finished schooling. Filmer and Pritchett (1999) brings forth the role of household wealth in the educational attainment that could affect income inequality. These studies collectively suggest that increasing mean years of schooling can help reduce income inequality.

e. Educational inequality

Education is regarded as a factor in the salary inequality (Aiyar and Ebeke, 2019). As a result, having access to high-quality education is seen as "a powerful engine" for advancing equality (Walker et al., 2019). Given its significance in facilitating access to economic and social possibilities, formal education is regarded in this context as one of the major variables that impact inequality (Cruces et al., 2012). According to the theory, a nation's income distribution is more uneven, and the more unequal the access and the education opportunities. There are areas, particularly in the EU's developing nations, where access to education is restricted by social and economic issues. At the same time, a labor shortage that lacks educated and competent workers are further impeding social and economic progress. It may be true for developed economies that wealth inequality—and particularly poverty—has a greater effect on educational disparities than does the other way around.

Hendel, Shapiro, and Willen (2005) demonstrate that more affordable education (for instance, as a result of financial growth) might actually worsen income distribution because when high-ability persons, previously disadvantaged, are now given the opportunity to attend more affordable educational institutions, they will leave the uneducated pool, pushing down the wage for unskilled workers and raising the skill premium. This claim is also supported by empirical data. When Mughal and Diawara (2011) looked into the connection between human capital and economic inequality in emerging countries, they discovered that there was a negative relationship between income inequality and education at all levels. Increases in educational disparities, according to Gosling, Machin, and Meghir (2000), who examined data from the U.K. from the late 1970s to the mid-1990s, accounted for nearly a third of the increase in pay dispersion.

Recent research indicates that the primary mediator of the relationship between income inequality and economic growth is inequality of opportunity, which is related to intergenerational inequality (Aiyar and Ebeke, 2019). The possibility of children from a specific socioeconomic class becoming wealthier than their parents is known as intergenerational or social mobility, and it is closely related to the accessibility of education (Walker et al., 2019).

Higher-income inequality should theoretically go hand in hand with higher educational inequality since a higher education level should logically guarantee a higher income. Studies by Chiswick (1971) and Cornia and Kiiski (2001), which used global cross-section data, provide evidence in favor of this hypothesis. According to Nielsen and Alderson (1997), who used the indicator of educational heterogeneity, the influence of higher educational heterogeneity on increasing inequality had grown stronger over time in U.S. counties between 1970 and 1990, i.e., the effect of educational expansion on inequality turned out to be positive. The shares of the population with various educational levels are employed in some studies. The findings of Chevan and Stokes (2000), which are partially corroborated by their examination of data from the United States, suggest that higher shares of the population with both low and high educational levels are typically related to increased income inequality. So, it seems reasonable that educational inequality would lead to greater income inequality. The indicators of student enrollment are also frequently employed, but as their purpose is to enable future educational level prediction rather than present educational level prediction, it would be premature to presume their impact on the current income inequality. Therefore, it is preferable to use the indicators of educational inequality.

f. Educational spending

Education spending is frequently examined as a determinant of income inequality. If impoverished individuals have access to public education, government spending on education can lessen income inequality. They cannot benefit from public schooling if their income is too low, which furthers income inequality (Sylvester, 2002). According to Sylvester's empirical study from 2002, which examined 50 countries, income inequality is lower in nations where the government spends more on education. It is possible, though, that nations with more public spending on education may also have higher public spending overall and higher spending on redistributive transfers. Therefore, the association between education spending and income inequality may not be causative but rather result from shared causes. For instance, Doessel and Valadkhani (1998) investigated Iran from 1967 to 1993. They included both total government spending and education spending in their analysis, and it turned out that overall government spending reduced income inequality but education spending had little to no impact on it. However, Glomm and Ravikumar (2002) demonstrated in their research that income inequality can still rise even when all groups receive public education of the same quality. Therefore, the impact of education spending on income inequality is debatable and calls for additional research.

Additionally, government spending on public and private education is also crucial. Public education spending lowers income inequality, whereas private education spending has the exact opposite impact (Huber, Gunderson, and Stephens, 2002). Additionally, Huber, Gunderson, and Stephens (2002) and Busemeyer (2015) also carried out studies that demonstrated the significance of sources of education funding in determining how income is distributed. Inequalities were eliminated as a result of public spending on these initiatives, whereas they were widened by private subsidies. The reason for all of the aforementioned is that educational institutions are more selective and discriminate against the poorer students as a result of their increased reliance on private funding, which ultimately deprives them of future opportunities for personal growth, social mobility, and professional prospects. People who are born into low-income socioeconomic groups struggle to realize their full potential and are unable to find suitable employment or education, which later in life has a negative impact on their income and the degree of social stratification based on income (Stiglitz, 2012). For those who attend privately sponsored colleges prior to beginning their employment, the situation is the exact opposite. In turn, higher public spending on education boosts knowledge and aids in obtaining better education for each segment of the social structure, thus reducing income inequality in society.

g. Other demographic determinants

There are also other less researched demographic determinants that are found to have an impact on income inequality.

- **Immigration.** Moore and Pacey (2003) concentrate on the effects of immigration on income inequality in Canada between 1980 and 1995. They conclude that immigrants play a significant part in the inequality story, which may be justified by a straightforward explanation. "Those who have just immigrated have always held lower-paying occupations as they attempt to acclimate to a new society." However, given that it takes some time for new immigrants to acclimate to the labor market, their research implies that the overall impact of immigration is a somewhat short-run event. When recent immigrants are taken out of the sample, inequality still rises, but at a slower rate.

- **Knowledge.** The research of Shahabadi et al. (2017) also shows that knowledge has a significant impact on income distribution in small open economies.

- **Child mortality and fertility.** Sarkar's (2008) research focused on persistent income inequality among various income groups. In an overlapping generation model, he used fertility and child mortality. A trap of income inequality that discourages the poor from investing in their children's education was shown to be created in low-income nations as a result of the interaction of differential child mortality and child fertility. Additionally, he concluded that disparate child mortality is a crucial component in the transmission of income inequality.

- **Population growth.** According to Alderson and Nielsen (1995), very rapid population expansion might worsen income inequality. The population is redistributed toward older, more unequal cohorts when the population growth rate declines, and this might result in national inequality, claim Deaton and Paxson (1997).

- **Family size.** In their work, Baiocchi and Distaso (2004) point out that family size has a significant impact on inequality, both statistically and quantitatively, and that this impact helps to explain the UK's recent, exceptional rise in inequality.

3.2.1.3.Political determinants

The political determinants that are expected to affect income inequality are shares of the government and the private sector, democratization, liberalization, etc.

a. Share of the government sector

The proportion of government spending in the GDP is typically used to calculate the share of the government sector in the economy. Transfers, such as pensions, subsidies, and grants, make up a sizable amount of government spending and serve to redistribute and equalize wealth in society. Therefore, a larger share of the government sector should result in a lessening of income inequality. The second potential mechanism of the government sector's influence on inequality reduction is the fact that earnings inequality in the public sector is typically lower than in the private sector (Gustafsson and Johansson, 1999).

Numerous panel data analyses have shown that the share of the government sector reduces inequality: Durham (1999) examined the period from 1960 to 1992, Gustafsson and Johansson (1999) the period from 1966 to 1994, Clarke, Xu, and Zou (2003) the period of 1960 to 1995. The same findings were obtained by Stack (1978) using a cross-section from the 1960s. However, the amount of transfers in overall spending determines how much of an impact government spending has on reducing inequality. Income inequality may actually rise as a result of government spending if the majority of it is directed toward more wealthy individuals (Xu and Zou, 2000; Clarke, Xu and Zou, 2003). Blejer and Guerrero (1990) demonstrated a correlation between increasing income inequality and higher government spending that was allocated to industrial projects that benefited wealthy people rather than social insurance. As a result, it is unclear what impact the share of the government sector may have on income inequality.

There is no need to add the share of the private sector in the analysis since it is already taking into account the government sector, and the shares of the two sectors are linked (if one increases, the other falls). When analyzing transition countries, the contribution of the private sector to the economy has been a major consideration. For instance, Ferreira (1999a) notes that privatization worsens income inequality since the previously disadvantaged people have fewer opportunities to profit from privatized assets. Higher earnings inequality in the private sector is the other factor (Ferreira, 1999a). These results support the hypothesis regarding the influence of the government sector's share on reducing inequality.

b. Democratization

There isn't a single, commonly accepted indicator of democratization. The chances for more redistribution and a more equitable allocation of income are greater for impoverished people in more democratic societies, which also gives them more political rights (Sirowy and Inkeles, 1990; Gradstein and Milanovic, 2002). According to Gradstein and Milanovic (2002), the growth of the franchise industry has lowered income inequality. Li, Squire, and Zou (1998) examined panel data from 49 nations for the years 1947–1994 and discovered that a rise in civil liberties lowers income inequality. Similar outcomes were achieved by Lundberg and Squire (2003) using similar data. On the other hand, it is asserted that authoritarian countries make it easier to implement redistribution (Sirowy and Inkeles, 1990). Additionally, there are greater opportunities to reduce the disparities in regional incomes as a result of an authoritarian regime's increased centralization (Durham, 1999). For instance, Crenshaw (1993) concluded that democracy had an increasing impact on inequality using a cross-section of the year 1970. According to Nielsen and Alderson (1995), income inequality used to be much lower in communist nations. However, the index of political democracy in Nielsen's (1994) and Nielsen and Alderson's (1995) studies, the index of civil liberties and political rights in Higgins and Williamson's (1999) work, and the index of democracy in Durham's (1999) study all seem to not affect the level of income inequality. According to some scholars, the duration of democratic experience, not the quality of democracy today, is what matters (Nielsen and Alderson, 1995; Gradstein and Milanovic, 2002). For instance, Muller (1988) observed that the level of income inequality varied with the age of democracy using a cross-section of the years 1965 to 1975. It is yet unclear how democratization has affected income inequality. Durham (1999), for instance, offers a more thorough list of pertinent articles.

c. Other political determinants

The literature shows that apart for the abovementioned, there are also other political determinants that are found to have an impact on income inequality. One of those is policy liberalization.

- **Policy liberalization.** Income inequality has also been linked to policy liberalization. For instance, Stewart and Berry (2000) concluded that liberalization as a whole worsens income inequality. According to the empirical study of Cornia and Kiiski (2001), the changes had an overall negative impact on inequality in 32 nations between the years 1985 and 1990. The absence of suitable liberalization indicators, however, limits the empirical investigation of the effect of liberalization on income inequality. There aren't always liberalization indices accessible for all nations or all periods of interest. It makes sense to examine the impact of the various facets of liberalization separately because reforms in various fields may affect income inequality in varied ways. Smaller redistribution and privatization have already been studied along with the share of the government sector, however, the liberalization of foreign trade can be analyzed as a macroeconomic determinant.

Often as political determinants are taken the worldwide governance indicators (WGI) developed by the World Bank to help assess the perceptions of governance across countries:

- **Political stability and absence of violence/terrorism.** Studies have revealed that political stability has a strong influence on income inequality. Alesina (1994) found that inequality of income can lead to social unrest which further causes disinvestment and low economic growth. Perotti (1993) also highlighted how the political equilibrium impacts the relationship between income distribution and growth. Contrary to this, Bollen and Jackman (1985) did not find direct effects of political democracy on income inequality, implying that the relationship is not straightforward. The role of the distribution of political power and relative distribution of earnings on growth is stressed by Bénabou (1996), who also notes that political stability can play an indispensable role in setting the extent of inequality.

- **Rule of Law.** The Rule of Law has an effect on income inequality, a strong rule of law being linked to lower inequality (Bennett, 2016; Bhagat, 2020; Tomita, 2022). This situation is more obvious in countries with an English legal background (Tomita, 2022). Nevertheless, the effect of the rule of law on inequality differs by region, as better legal systems in Latin America decrease inequality, whereas in other parts of the world they may raise it (Sonora, 2019).

- **Voice and Accountability.** Research has shown that "voice" and accountability can have a significant impact on income inequality. Folger et al. (1979) found that when individuals have the opportunity to express their opinions and participate in decision-making processes, they are more satisfied with the outcomes, which can potentially lead to more equitable distributions of resources. This is particularly important in the context of income inequality, as it can help ensure that the preferences of all income groups are taken into account in policy decisions (Gilens, 2005). However, Klugman et al. (2014) highlights the role of social norms and biases in limiting the voice and agency of certain groups, particularly women, which can perpetuate income inequality. Williams (1998) further argues that fair representation in decision-making bodies is crucial for addressing the needs of historically marginalized groups, including in the context of income inequality.

- **Regulatory Quality**. Research suggests that regulatory quality can have a significant impact on income inequality. Kahneman (1986) highlights the role of fairness in market behavior, indicating that exploitative practices can exacerbate inequality. This is supported by Chambers (2021), who argues that regulation often benefits incumbents and limits competition, leading to higher income inequality. Delis et al. (2012) further explores the link between bank regulations and income distribution, finding that liberalization can decrease inequality, but the effects vary based on economic and institutional development.

- **Government Effectiveness**. The impact of Government Effectiveness on income inequality is a complex issue with various factors at play. Korpi and Palme (1998) highlights the paradox of redistribution, suggesting that the structure of welfare state institutions can influence poverty and inequality. Stack (1978) adds to this by discussing the effect of direct government involvement in the economy on income inequality, while Tanninen (1999) suggests a non-linear relationship between government expenditure and growth, which can indirectly affect income inequality.

These studies collectively underscore the need for effective government policies and institutions to address income inequality.

- **Control of corruption.** Despite being one of the six governance indicators, corruption is considered as a cultural determinant in Kaasa (2005) study. Therefore, it will be more closely observed in that section in this literature review. In the empirical analysis of this study though, control of corruption will be taken as it is, a governance indicator under the section of political determinants of income inequality.

3.2.1.4.Cultural and environmental determinants

Income inequality is also significantly influenced by cultural and environmental factors. Some of them are land concentration, cultural diversity, the shadow economy, corruption, and an abundance of natural resources.

a. Land concentration

In countries with historically higher land concentration, there is a positive correlation between higher land rent inequality and higher overall income inequality. For example, Lundberg and Squire (2003) found that increased land concentration contributes to income disparity based on panel data from 38 nations. Similar outcomes were obtained in Crenshaw (1993). However, Cornia and Kiiski (2001), who analyzed the periods of 1970–1974 and 1990–1999, reveal that the impact of land concentration on rising income inequality has decreased with time. Land concentration was found to be insignificant in predicting income inequality for the years 1980–1997 in the study of Gupta, Davoodi, and Alonso-Terme (2002). The assumption is that greater land concentration leads to greater income inequality, but the impact eventually fades.

b. Cultural traditions

Studies on the impact of cultural traditions on income inequality are quite rare. Furthermore, cultural traditions and their variances lack a unified indicator. It is believed that individuals are less interested in redistribution when there is greater ethnic diversity, which leads to greater income inequality (Clarke, Xu, and Zou, 2003). The panel data of 91 nations from 1960 to 1995 was used by Clarke, Xu, and Zou (2003) to find evidence in favor of this hypothesis. After analyzing panel data from 126 nations for the years 1960–1998, Gradstein, Milanovic, and Ying (2001) found that income inequality is influenced by the religious traditions of a given nation. Partridge, Partridge, and Rickman's (1998) investigation of American counties revealed a similar connection. In 2000, Muschinski and Pickering analyzed the impact of tribal cultural traits on income inequality in North America. Unfortunately, it is challenging to compare the findings of this study with those of other studies due to its unique nature. Therefore, it may be concluded that while cultural variation is likely to worsen income inequality, greater research is needed to fully understand its influence (Muschinski and Pickering, 2000). This is partly because most studies have omitted these determinants, usually as a result of a lack of data availability.

c. Shadow economy

Corruption and the shadow economy are two phenomena with strong ties to cultural norms. Mixed findings arise from studies on how the shadow economy affects income inequality. Both Magessi and Antunes (2015) and Huynh and Nguyen (2020) make the case that the shadow economy can lessen income inequality; the latter highlights the benefits it offers to the lowest quintile of income earners. On the other hand, Berdiev and Saunoris (2019) and Przychodzen and Przychodzen (2009) offer opposing perspectives; the former finds a bidirectional positive association between the two, while the latter finds a positive correlation between the shadow economy and income inequality in post-socialist states. These results demonstrate how intricate the connection between income inequality and the shadow economy is, and how more study is necessary to completely comprehend their dynamics. Rosser and Rosser (2001) provide a theoretical analysis of the relationship between the shadow economy and income inequality indicating that if the share of the shadow economy increases, the inflow of taxes and opportunities for redistribution will decrease, and as a result, income inequality may increase. Because it is difficult to measure the shadow economy, it appears that the impact of this segment on income inequality has not been scientifically investigated.

d. Corruption

Studies time and time again have revealed that corruption has a large impact on income inequality. Countries with higher levels of corruption are often characterized by more income inequality (Gupta, Davoodi, and Alonso-Terme, 2002). This is due to a range of factors such as lower economic growth, less progressive tax system, limited social spending, and inequality in education and asset ownership. Treisman (2000) showed that the causes of corruption are complex, involving a combination of historical, cultural, and economic factors. Though the problem is challenging, it is extremely important to fight this battle in order to narrow income inequalities and eradicate poverty. Gupta, Davoodi, and Alonso-Terme (2002) examined the impact of corruption on income inequality using data from a cross-section of the years 1980–1997. They discovered that more corrupt countries have more opportunities for wealthy individuals to take advantage of redistribution and use it to their own advantage, which results in larger income inequality. Samanchuk (2016) further looked into how corruption affected income inequality in 11 post-communist Central and Eastern European nations as well as 17 additional European Union nations using the panel Vector Autoregressive model. The study discovered that corruption and income inequality have a positive relationship.

e. Natural resources

Natural resource wealth is typically viewed as contributing to growing inequality. If natural resources are abundant, such as minerals and metals, then production is capital-intensive rather than labor-intensive and requires more skilled workers than unskilled ones. The salaries of skilled workers are higher and the wages of unskilled workers are lower depending on the demand for labor (Cornia and Kiiski, 2001). Furthermore, the concentration of ownership and rent is frequently linked to the abundance of natural resources, which in turn raises overall income inequality (Gupta, Davoodi, and Alonso-Terme, 2002). In their study of a cross-section for the time period 1980–1997, Gupta, Davoodi, and Alonso-Terme (2002) included the proportion of natural resources in exports, and they found that it appeared to be a factor that was boosting inequality. Williamson (1997), on the other hand, used data from 1965 to 1990 and found that, in his study, the abundance of natural resources had little impact on income inequality. Cornia and Kiiski (2001) found that the influence of natural resource availability on rising inequality had decreased over time when they compared 1970–1974 to 1990–1999. Therefore, it may be argued that the abundance of natural resources does enhance income inequality, similar to how land concentration does, although the effect weakens over time.

f. Other cultural determinants

There are few other factors which are less often taken as cultural determinants of income inequality.

- **Gender discrimination at work.** The issue of gender discrimination at work is another determinant related to income inequality. Statistics show that women are less likely to hold managerial positions and that they usually make less money doing the same work as men. Moreover, the OECD claims that non-standard work, such as temporary, part-time, and self-employment, has supplanted traditional, permanent, full-time employment. Statistics show that women typically pick non-standard labor, which results in fewer hours worked than those of males. Having children, housekeeping, or preconceptions are common causes of this.

3.2.1.5.Macroeconomic determinants

In the past twenty years, macroeconomic determinants have also been regarded as contributors to income inequality. Although economic development can be categorized as a macroeconomic variable, it seemed reasonable to analyze the factors associated with economic development in a standalone section given the significantly higher attention they have received in the relevant literature. Macroeconomic factors include determinants like inflation, unemployment, financial development, export, import, and foreign investments.

Only a few studies have examined the connection between macroeconomic variables and income inequality from different angles. Mocan (1999) and Blejer and Guererro (1990) are both time-series studies that are preoccupied with determining the effects of certain macroeconomic variables (such as inflation and unemployment level) on income distribution. Other time-series studies, for instance, Auten and Carroll (1999) and Feenberg and Poterba (1993), focus on the effects of fiscal policy, particularly tax rate, on inequality.

Galor and Zeira (1993) investigate the theoretical connection between income distribution and investments in human capital. They investigate the connections between long-term macroeconomic difficulties, economic growth, and sectoral adjustment, and how income and wealth distribution are related to these. Their findings demonstrate how the wealth gap can have a major long- and short-term impact on overall economic activity.

Dafermos and Papatheodorou (2013) analyze the causes of inequality and poverty in the EU by examining the effects of institutional and macroeconomic factors between 1994 and 2008. According to the study, social transfers in cash, especially those that do not include pensions, have a significant negative influence on inequality and poverty. There is no solid empirical evidence supporting the effect of employment on inequality and poverty.

Ersoy and Baykal (2016) looked into the factors that contributed to income inequality in the EU-27 between 2004 and 2014, including GDP growth, private sector debt, social benefits, unemployment, and tax from low salaries. According to the analysis, income inequality rises along with unemployment and falls along with social benefits. Income inequality in the EU member states, however, is unaffected by GDP growth, private sector debt, and taxation from low wages.

Munir and Sultan (2017) used panel data from 1993 to 2015 to investigate the macroeconomic determinants of income inequality in Pakistan and India. According to the study, factors influencing income inequality in the two countries include per capita GDP, government consumer spending, fertility rate, value addition in the agriculture sector per capita arable land, urban population, and globalization.

Oczki, Muszyska, and Nicolaus (2017) investigated the correlation between income inequality and the GDP per capita measure of economic progress in EU member states from 2004 to 2013. The study also found a statistically significant and positive relationship between income inequality and the rate of unemployment and tertiary education attainment. Additionally, the share of the self-employed is significant among the new member states compared to the EU15 countries' old-age dependency ratio. The data, however, support a U-shaped rather than the inverted U-shaped relationship suggested by the Kuznets theory.

a. Inflation

The question of whether inflation promotes or lowers income inequality is not clearly answered by theory or empirical research. According to some, inflation worsens income inequality by devaluing fixed nominal earnings such as pensions and subsidies, which are experienced by the poorest individuals (Gustafsson and Johansson, 1999; Parker, 1999; Xu and Zou, 2000; Cornia and Kiiski, 2001). Blejer and Guerrero's (1990) analysis of the Philippines and Xu and Zou's (2000) investigation, which employed Chinese data, both revealed inflation's tendency to increase inequality. Beetsma and Van Der Ploeg (1996), Edwards (1997), Al-Mahrubi (1997), Amornthum (2004), Bouvet (2010), and Albanesi (2007) all support the same point of view. Contrarily, some studies have found that inflation lowers income inequality, including those by Gustafsson and Johansson (1999), Jäntti (1994), Johnson and Shipp (1999), Coibion et al., and Maestri and Roventini (2012). Last but not least, after studying Australian data, Creedy and van de Ven (1997) concluded that inflation had absolutely no impact on income inequality. Furthermore, Dimelis and Livada (1999) note that the influence may vary depending on the nation under study. As a result, it is impossible to draw any definite conclusions about how inflation affects income inequality.

However, a strong positive correlation between inflation and income inequality is seen in the majority of research publications examining the factors influencing income distribution. Inflation affects inequality by lowering disposable income (Cardoso, et al., 1995). According to him, even while it does not disproportionately harm the poorest individuals because of their small cash holdings, it might drastically reduce middle-class income. On the other hand, Cornia (2004) discovers that the impact is greater for the poorest people since they are the least able to index their wages and maintain the true value of their assets.

Similar reasoning is used by Bulir (2001), who divides workers into wealthier "insiders" and poorer "outsiders" with varying sensitivity to inflation. The author assumes that the first group "has assets other than currency and is employed under a different wage regime than the outsider," making them relatively safe from the risks of inflation. "The insider may earn the majority of his remuneration in the form of stock options or inflation-adjusted nonwage perks, the market value of which is uncorrelated with inflation," according to the compensation policy. If he worked in a unionized industry, he might also have received an indexed salary. On the other hand, the outsiders, who primarily have nominal contracts, are far less shielded from changes in actual wages.

Easterly and Fisher (2001) also hold the same opinion that the rich are better protected because they have higher levels of education and a better understanding of inflation. They also have better access to financial instruments that can be used as a hedge against inflation, whereas the poor have a higher proportion of cash and are therefore more vulnerable to the effects of inflation. Additionally, they might be more reliant on government-provided income (pension, subsidies, or direct transfers), which might not be completely adjusted to inflation and cause real earnings to decline as a result of inflation.

Li and Zou (2002) looked at the connections between income inequality, inflation, and economic growth. A panel data study was carried out for 46 nations, spanning the years 1952 to 1992. Increased income inequality is a result of inflation, which also encourages the concentration of wealth in the hands of the wealthy. The study also discovered a conflict between inflation and economic growth.

Bulir (2008) utilized a fully modified OLS (FMOLS) model under the Kuznets hypothesis to examine the relationship between inequality and inflation in India from 1971 to 2006. The effect of price stability on the distribution of income, according to Bulir, was not linear. The study found that when inflation falls from hyperinflationary levels, income inequality is dramatically reduced. Additionally, it appears that the Gini coefficient and income distribution only slightly improve with each step down toward an extremely low level of inflation. This result supports the economic theory's prediction that inflation has a negative impact on savers and employees with fixed incomes. Thus, it is anticipated that during an inflationary period, salaried employees, lenders, and net savers would all suffer.

According to Rossana and Hoeven (2011), the relationship between inequality and inflation depends on the country's monetary policies. The study demonstrates that in high inflation countries, restrictive monetary policy is frequently advantageous for income inequality. It does this by using the OLS approach using time-series data for the United States of America and 15 OECD countries. In other words, Rossana and Hoeven believe that rather than the inflationary pattern itself, it is the monetary policy that determines the inflationary pattern that correlates with income inequality.

Yue (2011) examined the connection between inflation, economic growth, and income inequality. He carried out the analysis of Korea from 1980 to 2002. According to the study's error-correction model, economic growth and income inequality have a long-term relationship. Additionally, he discovered that over the long term, inequality and inflation have no relationship.

Thalassinos, Ugurlu, and Muratoglu (2012) studied the paradox of inflation and its relationship with income inequality. They did the analysis for 13 European nations for the years 2000 to 2009. They demonstrated a positive and large influence of inflation on income inequality by using panel data techniques.

b. Unemployment

Another factor that affects inequality is the rate of unemployment, which is frequently cited as the main cause of income inequality in a nation. Theoretically, a higher unemployment rate would result in a reduced population income, which would change the way income is distributed, disproportionately affecting the poor. According to Mocan (1999), because low skilled workers are more vulnerable during economic downturns, unemployment worsens the relative status of the poor. Mehic (2018), on the other hand, looks at the relationship between industrial employment and income inequality in 27 high- and middle-income nations from 1991 to 2014 and finds that there is a negative correlation between the two.

Despite the conflicting effects of unemployment on income inequality, empirical studies that demonstrate an increase in inequality are more common than those that show a decrease (Gustafsson and Johansson, 1999, and Parker, 1999). This is explained by the idea that unemployment predominantly harms those with lower incomes (Gustafsson and Johansson, 1999; Dimelis and Livada, 1999); there is unemployment inequality, and poorer people lose their jobs more frequently, which causes their earnings to become even lower (Blank and Card, 1993; Johnson and Shipp, 1999; Parker, 1999). Numerous scholars concur that low-paid, unskilled people are more negatively impacted by unemployment, particularly during economic downturns when they are the first to be let go as employers hold onto more qualified personnel (Levernier, et al., 1995; Cardoso, Paes de Barros, & Urani, 1995; Cornia, 2004; Martinez, Ayala, & Ruiz-Huerta, 2001). For post-socialist nations, Bandelj and Mahutga (2010) discovered a negative correlation between unemployment and GDP in logarithmic terms as a coefficient against inequality.

However, viewpoints may differ when it comes to the resulting changes in income inequality, similar to how they did with some prior determinants. Numerous empirical studies have demonstrated the link between rising unemployment and rising income inequality. Jäntti (1994) and Abdel-Ghany (1996) examined data from the United States, Sharpe and Zyblock (1997) examined data from Canada, and Blejer and Guerrero (1990) examined the situation in the Philippines. Increased inequality in OECD nations is documented by Checchi and Garcia-Penalosa (2008) and Maestri and Roventini (2012). Conversely, Nielsen and Alderson (1997) discovered that in the United States in 1980, higher unemployment was linked to lower income inequality. This impact was negligible between 1970 and 1990.

While studies like Cardoso, Paes de Barros, & Urani (1995) and Jäntti (1994) find a positive association between rising unemployment and inequality, Martinez et al. (2001) claim the impacts depend on how unemployment affects different members of the households, whereas it focuses on spouses and young or on the heads of the households. According to Naci Mocan (1999) and Bjorklund (1991), intra-family changes in the labor supply and benefits like unemployment insurance and welfare can make the impacts of inequality less noticeable at times.

Studies that demonstrate no influence at all include those by Blank and Card (1993), Johnsson and Shipp (1999), who examined data from the United States, and Gustafsson and Johansson (1999), who examined panel data from several nations. Ekill (2011) and Castaneda, Diaz Gimenez, and Rios-Rull (1998) also found no evidence of a connection between unemployment and Gini coefficients.

Due to the fact that the majority of studies on this topic have only examined data from one country at a time, additional research into how unemployment affects income inequality using worldwide panel data is required. Therefore, while examining the relationship between unemployment and inequality in Europe, Galbraith et al. (2000) discovered a positive relationship both within and across nations, as well as over time. This finding refutes the notion that state interventionism-related rigidities are to blame for unemployment in Europe (like rigid wage structures, high minimum wages, or high social welfare). Although there is evidence that disparities have always been higher where unemployment rates were higher, the authors claim that there was a false conventional view that argued for a negative link between unemployment and inequality. In addition, more equal, wealthy European nations have lower unemployment rates than poorer nations, which are characterized by greater inequities, weaker social protection programs, and more unemployment.

In addition to reducing income, unemployment has numerous other detrimental effects that are likely to worsen inequality, including loss of freedom and social exclusion, skill and motivational loss, psychological harm, gender and racial disparities, health issues, decreased output, rising fiscal burdens, and others (Sen, 1997).

Furthermore, Stiglitz (2012) believes that the 2008 financial and economic crisis, which saw a steady increase in unemployment, was a major contributor to inequality because it disproportionately impacted socioeconomic classes with lower incomes. The stock market recovered considerably more quickly than the labor market, despite the fact that during the crisis the financial shock was far stronger than the shock in the labor market, which also affected the top deciles of the income distribution. This was brought on by the labor market's structural issues, such as the incompatibilities between supply and demand. Overall, the increase in inequality was caused by the top deciles' revenues recovering far more swiftly than the bottom deciles.

f. Financial development

Studies have shown that the growth of the financial sector spurs economic expansion (Levine, 1997, 2005), but there is less agreement regarding the impact of inequality. According to some authors, financial development is in favor of the wealthy, increasing the income share of the top percentile (Rajan & Zingales, 2003; Roine, Vlachos, & Waldenström, 2009); or increasing the wage gap between skilled and unskilled workers if it makes education more accessible (Hendel, Shapiro, & Willen, 2005).

However, the majority of the authors concur that financial development disproportionately benefits the poor (Beck, Demirgüç-Kunt, & Levine, 2007; Clarke, Lixin Colin Xu, & Heng-fu ZouJ, 2006; Demirgüç-Kunt & Levine, 2008), particularly through increased individual economic opportunity and better access to capital for those who previously did not meet the requirements, as well as accelerated aggregate growth brought on by improved capital allocation efficiency, which was previously restricted by credit constraints and market imperfections (Banerjee & Newman 1993; Galor & Zeira 1993).

According to a third perspective (Greenwood & Jovanovic, 1990), there is an inverse U-shaped relationship between the growth of the financial industry and income inequality. This indicates that inequality rises during the early phases of growth when only the wealthy have access to capital due to high fixed costs, but falls during the later stages when the position for the poor improves due to increased access to finance.

Therefore, although still unclear, it appears that the development of the financial system may assist the poor more than the rich, particularly in Europe, where there is already a developed financial system. As a result, the first section of the inverted-U curve should not apply in this situation.

This is demonstrated by Gimet and Lagoarde-Segot (2011) in their research on the importance of financial development in the European Union from 1995 to 2000, as well as in a separate study in 49 European countries from 1994 to 2002. Their findings demonstrated that financial development had a favorable impact on lowering income inequality in European countries and also enhanced growth and development.

The majority of the other publications similarly demonstrated how a country's inequality gap is decreased by financial deepening. Kim and Lin (2011), Gimet and Lagoarde-

Segot (2011), Baligh and Piraee (2013), and others have discovered links between financial development and income inequality. For instance, Ang (2010) investigated India's enormous financial growth between 1951 and 2004 in order to reduce inequality. The results demonstrate that because of the significant economic growth, financial advancement had a favorable effect on income inequality. Kim and Lin (2011) found in their study that financial development raises a nation's level of trade openness, growth, and development, and reduces inequality over time. Khan et al. (2018) demonstrated that a country's wealth discrepancy is reducing as financial expansion deepens.

d. Trade (exports and imports)

The neoclassical Heckscher-Ohlin theory of international trade states that nations will specialise in the sector in which they have a competitive advantage by exporting items that utilise those factors of production and importing those that do not. Stolper and Samuelson (1941) using the Heckscher-Ohlin theory, projected that trade would result in lower earnings for those who owned scarce factors and higher incomes for those who owned abundant ones. Due to higher returns to capital owners (the abundant factors of the economy) and higher demand and compensation for skilled labour, developed countries will experience an increase in inequality. Because their unskilled workers will benefit more than their skilled labour or capital owners, the less developed countries will have less income inequality (Reuveny & Li, 2003).

Similar to Kuznets' theory, this one has gained both proponents and opponents over time. Sachs, Shatz, Deardorff, and Hall (1994) concluded that U.S. trade has expanded employment in high-skill sectors of the economy while decreasing employment in low-skill sectors. They also noted that prices of less skill-intensive commodities have decreased, and there is a growing wage gap between low- and high-skilled employees. Wood (1995, 1998) also discovered proof in favour of the Stolper-Samuelson model for developed countries. The demand for skilled labour and income inequality, in contrast to what the model predicts, actually increased over the 1980s and 1990s, according to Robbins (1996). The similar conclusion was reached by Spilimbergo, Londoo, and Székely (1997) regarding less developed nations as well as declining inequality in rich nations, which also defies the model. Barro (2000) has demonstrated that increased trade openness increases inequality in developing nations, but that this link shifts and turns out to be negative beyond a certain point, when the per capita GDP reaches about $13,000. In fact, the majority of actual data from the past two decades typically did not confirm the neoclassical trade theory's expectations (Cornia, 2004).

Other channels by which trade influences income distribution are mentioned by some scholars in addition to the model that was previously covered. For instance, improved price competition could lead to price cuts on essential consumer products, which would help the poor more since they spend a larger proportion of their income on those items. Inequality is reduced as a result of trade liberalization and open markets, which also undermine wealthy monopolies and economic privileges (Birdsall, 1998). Blanchard (2000) claimed that, on the one hand, when trade lowers wages for unskilled workers, it encourages them to pursue education, while on the other hand, companies actually recruit more of those individuals due to lower costs; both these effects diminish inequality (as cited in Reuveny & Li, 2003).

All of the aforementioned topics, however, relate to trade between developed and less developed nations, but reality today reveals that a significant portion of international trade takes place between wealthy nations with comparable factor endowments, particularly in intra-industry trade, which is a two-way exchange of similar goods (Tomat, 2010). According to Krugman (1981), economies of scale and customer needs for variety cause countries to increase this type of trade as they become more similar. He also showed that, in contrast to more conventional trade, such trade has no significant impact on how income is distributed.

So, as we can see, there is uncertainty about how trade openness affects inequality. According to Richardson (1995), a variety of factors affect how import and export activity affects income inequality. They might be influenced by a nation's level of development (although the direction is unclear), its top trading partners, and the nature of the trade it does. Increased imports from developing countries to developed countries may result in lower salaries in the highly competitive production sectors of developed countries, which will worsen inequality in those countries. Nevertheless, the impact can vary in developing countries or in the case of trade between developed countries themselves (Gustafsson and Johansson, 1999). According to Xu and Zou's (2000) research, China's foreign trade expansion from 1985 to 1995 coincided with an increase in income inequality. Through analysis of developing countries, Litwin (1998) achieved the same outcome. The ratio of summarized exports and imports to GDP was employed in both studies as an indicator of international trade. It makes sense to separate import from export in this situation. For instance, Gustafsson and Johansson (1999) included imports from developing countries in their research of OECD countries and found that it was a factor that increased inequality. Export was included in Li, Squire, and Zou's (1998) research of panel data from 49 developed and developing countries, and it seemed to be a factor that decreased inequality. However, further research on the effects of import and export on income inequality is undoubtedly needed.

There are conflicting findings from other studies as well that examine how trade liberalization affects income inequality.

According to Wood (1994), Bourguignon and Morrisson (1990), Reuveny and Li (2003), Calderón and Chong (2001), Dollar and Kraay (2001 and 2002), Harrison (2005), and Ortega and Rodriguez (2006), income inequality declined as a result of trade liberalization. Recent research by Lim and McNelis (2014) shows that between 1992 and 2007, a sample of 42 nations, trade openness increased income inequality. Other researchers (Edward, 1997; Li, Squire and Zou, 1998; Dollar and Kraay, 2002; Vivarelli, 2004) did not find any evidence of a connection between openness and income inequality. Easterly (2005), Lundberg and Squire (2003), Cornia and Kiiski (2001), Barro (2000), and Milanovic and Squire (2005) also could not conclusively demonstrate that trade liberalization and globalization increase income inequality in any way.

e. Foreign direct investment (FDI) and technological transfers

Fortunately, although not without some inconsistencies, the connection between inequality and foreign direct investment is clearer. Researchers who contend that inward FDI worsens inequality typically point out that it concentrates on industries with a disproportionately high level of skill and technological intensity. Even if it generates jobs and raises income, it primarily benefits people with higher levels of education, widening the income gap (Jaumotte, et al., 2008).

FDI-generated externalities and spillovers, imitation, reverse engineering, labor turnover, and spinoffs are further sources of new technology that domestic enterprises might use to their advantage. By implementing new technologies, they both encourage economic growth and raise the demand and wages for competent workers (Borensztein, de Gregorio, & Lee, 1998; de Mello, 1999; Lin, Kim, & Wu, 2013; Saggi, 1999). Additionally, if unskilled labor is replaced by new technology, the capital share and overall income concentration may increase (Cornia, 2004). Although perhaps only temporarily, each of those factors would lead to greater inequality. Inequality should decline in the long term. Based on a model developed by Aghion and Howitt (1998), Herzer and Nunnenkamp (2011) explain that "the skill premium increases as long as learning efforts lead to a strong demand for talents that are in short supply." As a result, pay inequality decreases to the extent that enterprises have successfully made the switch to the new technology paradigm and the availability of necessary skills improves. In conclusion, it appears that FDI tends to increase inequality in the short run by raising the skill premium, but once the supply and demand of skilled workers are equal, income inequality should start declining. This was empirically demonstrated by Herzer and Nunnenkamp (2011) in their investigation of the relationship between FDI and income inequality in ten European countries from 1980 to 2000. The study indicated that, in the short run, FDI directly affects income inequality, whereas in the long run, FDI has a negative association with income inequality. This link was determined using causality and panel cointegration techniques.

Franco and Gerussi (2013) also looked at the impact of trade openness and inward FDI on income inequality. They conducted their analysis based on data from 18 transition economies from 1990 to 2006. They discovered that FDI had a negligible influence on inequality, whereas trade openness had a considerable positive impact on inequality in the short term and a negative impact in the long term.

f. Other macroeconomic determinants

Other less researched macroeconomic factors which might influence income inequality are following:

- **Gross fixed capital formation**. Another macroeconomic determinant that affects income distribution is the investment rate, which is measured by gross fixed capital formation as a share of GDP. When adjusting for other factors, Sarel (1997) discovered that higher investment rates lessen income inequality. In his best-selling book, Piketty (2014) noted that inequality rises when capital investment's proportion of national income rises and wages' part slows overall income growth. Maldonado (2017) discovered that the rate of investment affects income growth on all tiers.

- **Minimum wage**. Blažević (2013) studies the effect of the minimum wage on income distribution. According to Škare and Stjepanović (2013), future research on income distribution and inequality needs to consider the problem of long memory in these dynamics. In addition, Sharma (2013) has pushed the need for further research into the role that society plays in income distribution.

- **Tax and transfer systems**. Income inequality is largely influenced by fiscal policies. Given that it is the primary mechanism for addressing income inequality through redistribution, this seems logical. According to empirical research by Milanovic (2000), redistribution would increase the share of the poor in disposable income as income inequality rose. This implies that countries with rising inequality have previously successfully employed the redistribution mechanism to help the poor. Hodler (2008) examines the impact of income redistribution on inequality in a society where people have varying earning potentials, preferences for consumption, and leisure activities. He contends that if redistribution is relatively limited, generous redistribution tends to reduce inequality in a heterogeneous society. Nevertheless, if redistribution is more extensive, it tends to worsen social inequality since it punishes those who enjoy consumption.

- **Value-added tax**. The findings of the literature concerning the impact of VAT on income inequality are contradictory. Narsis (2011) and Alavuotunki (2019) both discovered that the implementation of VAT resulted in a rise of income inequality, with a greater impact on low-income countries. Stiglitz (2007) also accentuated the regressive nature of VAT, especially in the context of developing countries. Nevertheless, Carroll (2010) proposed that VAT could possibly eliminate the shortcomings of income taxation. Taken together, these studies point to the need for more research and careful deliberation on the possible ramifications of VAT introduction.

- **Remittances**. The study on the effect of remittances on income inequality differs in the findings. Stark et al. (1986) has established that internal migrants' remittances can help reduce income inequality, while those from international migrants can rather intensify income inequality. Acosta et al. (2007) supports this by finding that remittances of Latin American and Caribbean countries have a small, negative impact on income inequality. Nevertheless, Taylor (1999) contended that remittances can relieve production and market restrictions, which might cause inequality to fall. Barham and Boucher (1998) compounded these intricacies by proving that in some cases, migration and remittances increase income inequality. The study outcomes show that remittances influence income inequality differently within different contexts and is dependent upon several factors.

- **Domestic savings and domestic consumption**. Renewed attention to inequality and saving emerged in light of their strong bearing on global imbalances and financial crises. X. Gu et al. (2015) indicate that the negative relationship between saving and inequality vanishes if the savers' funds are used by the spending households for consumption as in the USA, but the positive relationship is retained if the saving is allocated through the financial systems to the production firms as in China. The policy implication is that inequality must be lowered in order to raise saving in the USA and other OECD countries and boost consumption in China and other parts of emerging Asia.

- **Government expenditure**. Calderon and Serven (2004) examined the relationship between government spending and income inequality using the government debt to GDP ratio as a proxy. Utilizing data from a panel of Latin American nations, they discovered that government-financed infrastructure projects create employment and income opportunities, particularly for low-skilled workers, which helps to reduce inequality. Contrary to the findings of Calderon and Serven (2004), who examined the nations with the highest levels of inequality, Chatterjee and Turnovsky (2012) found that government investment causes inequality to rise over time regardless of the funding source. Furthermore, Maestri and Roventini (2012) discovered that the institutions of the investigated nations play a significant role in the correlations between inequality series and government consumption.

- **Social Expenditures**. Studying the link between state social spending and disposable income inequality may initially appear pointless because, in theory, social spending should have a negative effect on inequality. However, Niehues (2010) argues that although social expenditure's first-round impacts frequently have a negative influence on inequality, some of its second-round effects are also thought to have adverse behavioral consequences, which have the opposite effect and increase inequality. Such situations occur as a result of redistributive policies' detrimental effects on labor supply reduction incentives. Given that the labor market is more elastic at low income levels and less elastic at higher income levels (Røed. and Strøm, 2002), this would particularly affect low income groups and cause unemployment to rise at these levels, which would have a negative effect on income inequality. However, the majority of social spending (which includes both social insurance and social assistance benefits) is given to low-income groups, meaning that overall, social spending has a negative influence on income inequality. Niehues (2010) utilizes a panel regression and the System GMM estimator to discover that income inequality decreases as social expenditures increase. Following a structural analysis of social spending, the paper makes the case that pensions and unemployment insurance are what help inequality decline, whereas more targeted benefits, which have a positive impact on pre-government income inequality, may have a weak but positive correlation with inequality. De Gregorio and Lee (2002) investigate whether government social spending has any impact on income disparities and discover that it helps ensure a more equitable distribution of income. They offer two explanations for this effect: first, they argue that a portion of social spending represents transfers to the poorer quintiles, increasing their income as a result (distributional effect); and second, they contend that social spending improves the poor's access to healthcare and education, which will ultimately promote future income equality.

- **Globalization**. Globalization is one of the first factors that frequently appear in literature and has an established impact on inequality. O'Rourke (2001) states that "globalization encompasses declining barriers to trade, migration, capital flows, foreign direct investment (FDI), and technological transfers". The degree of international trade in economies is a process that is a result of globalization. Poorer nations frequently lack possibilities to expand their economies more broadly and engage in international trade because of their poor domestic conditions, such as lack of land and resources for development, low level of education, inadequate infrastructure, and unsuitable economic policies. As a result, worldwide inequality is rising, which is consistent with the policy of impoverishing the neighbor. A number of academics, such as Korzeniewicz and Moran (2007), make the case that globalization has a negative impact on inequality, but Firebaugh and Goesling (2007) go more in the direction of the opposing view. Blackman (2007) is one of the authors who evaluate how globalization affects income inequality without taking a side in the debate. The same findings were reached by Dorn, Fuest, and Potrafke (2022), who conducted a study on globalization in Europe and concluded that, in general, inequality is unaffected by globalization. The study's proxy for globalization was the export trade index. The relationship could also be very different depending on which aspect of globalisation is examined.

3.2.2. Literature Review Conclusion

After this literature review on the income inequality determinants, it is safe to say that nothing is set in stone. Even though it is possible to predict some relationships, such as a positive link between inequality and unemployment, or negative link between income inequality and economic development, all of them could very well turn out to be the opposite of what is expected, as the findings of the observed studies have shown. It will be even more unpredictable and challenging for the other less researched determinants such as remittances, domestic consumption spending or savings, gross fixed capital formation, or population growth to determine their impact on income inequality.

As it was seen from the broad literature review, there is a significant amount of literature about the income inequality determinants. Hundreds, even thousands of studies are trying to contribute to the literature for determining the factors that impact income inequality. Most of these articles are however focusing on either a single factor or a few of them, while a much smaller number of studies are observing more determinants of income inequality at once. Nonetheless, they are still not covering all the income inequality determinants discussed in the pertinent literature. The reason why most studies are focusing only on one or a few income inequality determinants is usually because this approach offers a more insightful assessment of the potential mechanisms of impact. However, it is debatable whether the outcomes of such empirical research reflect reality. For this reason, this study will try to incorporate a number of determinants that will paint a more insightful picture of their combined influence.

The inspiration for incorporating more determinants in one study is of course taken from several existing studies which are already looking at more than few factors of income inequality at the same time.

Following is a table with some of those studies that have delved into the complex web of multiple determinants influencing income inequality, employing a comprehensive approach that considers these factors simultaneously.

Table 3. Studies which incorporate several income inequality determinants in their analysis

Tanzi (1998)	market forces, social norms, ownership of real and human capital, the role of the government
Škare and Stjepanović (2014)	import, export, GDP, investment spending, government spending, inflation, unemployment, labor force, population
Mirguseinova (2015)	Economic growth, globalization, financial development, inflation, unemployment, education
Castells-Quintana et al. (2015)	Economic growth, tertiary specialization, openness, and technological change, sectoral composition of the economy, the level of population density, unemployment, and institutional factors.
De Jong (2016)	Education, public investment, corruption, R&D expenditures, economic growth, immigration, tax and transfer systems, trade openness, unemployment
Ersoy and Baykal (2016)	GDP growth, private sector debt, social benefits, unemployment, tax from low wages.
Zulkarnaen (2017)	Democracy, education, GDP per capita, government spending, FDI
Munir and Sultan (2017)	per capita GDP, government consumption expenditure, fertility rate, value addition by agricultural sector, per capita arable land, urban population, and globalization.
Hovhannisyan, et al. (2019)	trade openness, unemployment, FDI, and the share of the elderly population.
Buba, et al. (2019)	quality of the rule of law, trade liberalization, level of financial development, education level.
Bucevska (2019)	GDP, growth rate of government debt, growth rate of fixed capital formation, inflation, unemployment, growth rate in terms of trade, education, and growth rate of population.
Tsaurai (2020)	economic growth, ICT, financial development, FDI, infrastructural development, and trade openness
Shao (2021)	GDP, capital stock, investment, population size, employment rate, import and export, average working hours, labor share, educational attainment, inflation, and civil liberty
Mdingi and Ho (2021)	Economic development, technological development, social-political unrest, the savings rate, the imperfection of credit markets, the political economy, and the fertility rate
Laskowska (2021)	globalization, access to education, the structure of the household, the form of employment, demographic factors, the rent-seeking problem.
Jianu et al (2021)	GDP, the harmonized index of consumer prices (HICP), gross capital formation, high-tech exports, and the employment rate of people graduating from tertiary studies in the last few years

Source: Author's own work based on the literature review

Nonetheless, there is still no complex theory comprising all the hypothetical income inequality determinants that can be found. This study will not try to include all the known determinants, but will sure try to include a larger number of them compared to the other studies. For the sake of depth and focus, the study will limit its analysis to a subset of the factors from each of the categories of determinants represented in this literature review (with the exception of the cultural determinants category since there were no consistent data were collected for those factors). The analysis gives preference to more of the macroeconomic factors in view of intense influence they have on income distribution dynamics. The chosen factors are identified as most significant potential contributors to income inequality among European countries during the 21st century.

GDP per capita is chosen as a marker of economic development over GDP growth not only because it aligns with Kuznets' theory but also because directly reflects the average income of individuals within a country, providing insights into the well-being and living standards of the population.

The reason globalization was chosen is that it has a big impact on trade and economic integration, which can change the dynamics of employment and market systems inside nations and impact patterns of income distribution. In the 21st century, this factor is especially significant since rising globalization has affected domestic sectors, labor markets, and income distribution by increasing interconnection and rivalry in the global economy.

Remittances are also included as they serve as a substantial source of income for many households in European countries, especially those with considerable migrant populations. The impact of remittances on income inequality is worthy of attention as they may either increase or decrease inequalities in income distribution, which is particularly relevant for the European continent experiencing migration waves for last several years.

The unemployment rate is chosen as it has a direct correlation with income inequality as high unemployment often leads to income losses and income disparities within a country. As a result of the several severe crises in the last decades, as well as the technological advancements, European countries, just like the rest of the world, have struggled with unemployment challenges, which just highlights the importance of understanding the impact of unemployment on income distribution.

Domestic consumption expenditure is selected since it indicates the level of consumption within a country, which is one of the factors that affect income distribution through its impact on aggregate demand, employment and wages. As a result of globalization and immigration, the European countries have witnessed evolving consumption patterns due to the changes in the demographics, lifestyles, and consumer preferences, affecting income distribution dynamics.

Gross domestic savings which show the share of income that households save and not consume also is included because this can affect investment levels and capital accumulation, thus resulting in income distribution. Amid changing economic conditions and economic downturns, countries around the world have also faced challenges related to saving and investment, which might correlate to the increase in income inequality in some of the European countries.

Value-added tax (VAT) is the one chosen since it is a major source of government revenue and through its effects on consumption patterns as well as the distributional incidence of taxation, can influence income distribution. In the context of European countries, VAT policies and tax reforms have been key areas of debate and reform, underscoring the relevance of understanding their impact on income inequality.

Gross fixed capital formation is represented because it refers to investment in physical assets like infrastructure and machinery which influences the productivity levels, employment opportunities, and ultimately income distribution. The 21st century is a period of vast investment in infrastructure and technology trying to increase economic growth and competitiveness, thus confirming the importance of understanding this factor's impact on income inequality.

Inflation is chosen, because it can influence income distribution through decreasing the purchasing power of wages and savings, especially for lower-income households, who could be less capable of protecting themselves against increasing prices. Inflation has been a major issue as a result of the recessions happening after the last crises which had an effect on the whole world.

Trade is included because of its ability to alter income distribution via its influence on employment patterns, wage levels, and the competitiveness of the industries in the domestic market in the international market. Trade is a significant contributor to the European economies, thus any changes in trade might show significant impact on the income distribution in these countries too.

Furthermore, the governance indicators are chosen as political factors as suggested by the World Bank. These indicators, such as political stability and absence of violence/terrorism, control of corruption, rule of law, voice and accountability, regulatory control, and government effectiveness, are selected because they reflect the institutional framework within which economic activities take place, and thus have significant implications for income distribution dynamics. Moreover, they have been in the center of discussions when it comes to economic development, social cohesion, and income inequality, making it crucial to examine their impact on income inequality.

For demographic factors are chosen educational level and population growth. These factors are considered important as they reflect the human capital and labor force dynamics within European countries, which play a fundamental role in shaping income distribution patterns. The European countries have invested a lot in education and skills development lately trying to increase their competitiveness and adapt to the changing labor market demands. Population growth on the other side, should certainly be considered when Europe is observer due to the continent's aging populations and migration which have shaped the labor market dynamics and income distribution outcomes.

This selection is motivated by the objective of achieving a comprehensive yet concise analysis that throws light on the key determinants on income inequality in the European countries to over the 21st century. Furthermore, the larger set of macroeconomic variables compared to the other categories of variables corresponds to the broad thesis framework which aims at a causal contribution into income distribution dynamics through an economic research approach.

4. DATA ANALYSIS AND RESEARCH METHODOLOGY ON INCOME INEQUALITY DETERMINANTS

This chapter outlines the research design employed in this study. It elucidates the overall approach and framework adopted to investigate the determinants of income inequality in European countries during the 21st century's economic crises. The choice of research design is justified in the context of the research questions and objectives.

4.1. Research Design

The research approach selected for this study is quantitative. This approach aligns with the need to systematically analyze extensive datasets, quantify relationships among variables, and discern patterns that may not be readily apparent through qualitative means.

The selection of a quantitative approach is underpinned by several justifications. Firstly, it enables the analysis of a large sample of European countries, providing a comprehensive view of the dynamics of income inequality. Secondly, quantitative methods allow for the testing of specific hypotheses derived from the existing literature on income inequality determinants. Thirdly, the approach facilitates statistical inference, enabling the generalization of findings to broader populations and contexts.

The research questions posed in this study necessitate a quantitative approach. These questions seek to explore the relationships between income inequality and a range of economic, demographic, and political variables, as well as to assess variations in these relationships during periods of economic crises. A quantitative approach allows for the systematic examination of these relationships and the generation of empirical evidence to address the research questions effectively.

4.2. Research Questions and Hypotheses

This study aims to address these knowledge gaps and contribute to the understanding of income inequality in Europe. Specifically, the research objectives are as follows:

1. To identify the primary determinants of income inequality in Europe during crisis periods in the 21st century, including the global financial crisis and the sovereign debt crisis.
2. To explore how income inequality and its determinants vary across developed and developing European countries, considering factors such as economic development, governance structures, and social policies.
3. To examine the differential impact of crisis periods on income inequality dynamics in Europe and assess the effectiveness of policy responses in mitigating inequality.

By achieving these objectives, this study seeks to provide valuable insights for policymakers, researchers, and stakeholders striving to address income inequality and promote inclusive growth in Europe.

The research questions that this study will try to answer are the following:

1. Which are the most significant determinants of income inequality in Europe in the period of crisis in the 21st century?
2. Is there a difference in the relationship patterns of the income inequality and its determinants in European countries based on their development level?
3. Is there a difference in the relationship between income inequality and its determinants in the period of global financial crisis vs the period of the sovereign debt crisis?

From these research questions appropriately, the research hypotheses are set.

For the first research question:

H1: Economic development has no significant impact on income inequality.

H2: Economic globalization has no significant impact on income inequality.

H3: Remittances have no significant impact on income inequality.

H4: Unemployment has no significant impact on income inequality.

H5: Value-added taxes have no significant impact on income inequality.

H6: Domestic savings have no significant impact on income inequality.

H7: Domestic consumption has no significant impact on income inequality.

H8: Inflation has no significant impact on income inequality.

H9: Trade has no significant impact on income inequality.

H10: Investments have no significant impact on income inequality.

H11: Population growth has no significant impact on income inequality.

H12: Education has no significant impact on income inequality.

H13: Political stability has no significant impact on income inequality.

H14: Control of corruption has no significant impact on income inequality.

H15: Rule of law has no significant impact on income inequality.

H16: Government effectiveness has no significant impact on income inequality.

H17: Regulatory control has no significant impact on income inequality.

H18: Voice and accountability has no significant impact on income inequality.

For the second research question:

H19: There is no difference between the European developed and the developing countries in the relationship patterns between income inequality and its determinants.

For the third research question:

H20: There is no difference between the period of global financial crisis vs the period of the sovereign debt crisis in the relationship between income inequality and its determinants.

4.3. Data and Data Analysis

The dataset covers an unbalanced panel of 40 European countries for the period of 15 years (2007-2021). All countries located in Europe are covered in the analysis, with the exception of Andorra, Kosovo, Lichtenstein, Cyprus, and the microstates like San Marino, Vatican City, etc. due to lack of data and insignificant impact as a result of small size. The data sources used in the study are from the World Bank's World Development Indicators. The lack of data for 2021 was missing for some of the variables. To prevent the loss of degrees of freedom because of those missing data, the moving average method was used to supplement some of those missing observations. Among the various statistical techniques available to address missing data, this approach stands out as a straightforward and well-suited method for the present case.

The European countries are broadly comparable and provide some sense of homogeneity. The descriptive analysis will help make a distinction between these countries based on their development level. These countries are mostly high or middle-income countries, which are economically developed or developing, where we can be confident of good recording practices.

The selection of the potential determinants is done by contemplating the most important macroeconomic, demographic and political indicators, and partially considering the empirical literature in the area. In its early phase, the analysis covered more than 46 control variables that potentially affect the income inequality, however, due to various reasons (missing data, or statistical insignificance), they were narrowed down to the following 18, presented in Table 4.

The dependent variable in the model is Gini coefficient, which measures the degree of income inequality. The independent variables are categorized into the following categories: economic development, macroeconomic factors, political factors and demographic factors.

Table 4. Variables used in the regression analysis

Variables	**Indicator**	**Proxy indicator**
Gini	Gini Index	Income Inequality
gdppc	GDP per capita	Economic Development
eglo	Economic globalization index	Macroeconomic Factors
rem	Remittances (% of GDP)	
unempl	Unemployment rate	
cons	Domestic consumption expenditure (as % of GDP)	
sav	Gross domestic savings (as % of GDP)	
vat	Value-added tax	
gfcf	Gross fixed capital formation (as % of GDP)	
infl	Inflation, consumer prices (annual %)	
trd	Trade (% of GDP)	
pols	Political Stability and Absence of Violence/Terrorism	Political Factors (Governance Indicators)
cor	Control of Corruption	
rol	Rule of Law	
voa	Voice and Accountability	
regq	Regulatory Quality	
gove	Government Effectiveness	
myos	Mean years of schooling	Demographic Factors
popg	Population growth (annual %)	

Source: Author's own work based on the literature review

Note: This table provides a summary of the variables used in the regression analysis. Each variable represents a specific aspect of income inequality and its determinants. The abbreviations are used throughout the study for clarity and brevity. The data for these variables is obtained from the World Bank and will be analyzed to examine their relationship with income inequality in Europe during crisis periods.

Following is a description of the variables used in the regression analysis.

Table 5: Description of Variables Used in the Regression Analysis

Variable	Description
Gini coefficient	The Gini coefficient is a widely used measure of income inequality.
GDP per capita	GDP per capita represents the total economic output per person in a country.
Economic globalization	Economic globalization measures the extent of a country's integration with the global economy.
Remittances	Remittances refer to the money sent by individuals working abroad to their home countries.
Unemployment rate	The unemployment rate represents the percentage of the labor force that is unemployed.
Consumption	Consumption refers to the total expenditure on goods and services by households and government.
Savings	Savings represent the portion of disposable income that is not spent on consumption.
Value-added tax	Value-added tax is a consumption tax levied on the value added to a product at each stage of production.
Gross fixed capital formation	Gross fixed capital formation measures the investment in fixed assets such as machinery and equipment.
Population growth	Population growth represents the rate of increase in the population over a specific period.
Inflation rate	The inflation rate measures the percentage change in the average price level of goods and services.
Consumer Price Index	The Consumer Price Index is a measure of the average change in prices paid by consumers for a basket of goods and services.
Trade (% of GDP)	Trade as a percentage of GDP measures the openness of a country's trade activities relative to its GDP.
Mean years of schooling	Mean years of schooling represents the average number of years of education received by the population.
Political stability	Political stability measures the likelihood of political unrest or instability in a country.
Corruption index	The corruption index assesses the level of corruption in a country's public sector.
Rule of law index	The rule of law index measures the extent to which a country adheres to the rule of law.
Government effectiveness index	The government effectiveness index assesses the quality of public services and policy implementation.
Gini coefficient	The Gini coefficient is a widely used measure of income inequality.

Source: Author's own work based on the literature review

Additionally, the study includes interaction terms between the independent variables and the dummy variables to capture the effects of the different crises' periods. The dummy variables are:

- Development country level dummy (dev)
- Covid19 crisis period dummy (cov19)
- Global financial crisis period dummy (gfc)
- Sovereign debt crisis period dummy (eusdc)

4.3.1. Data Collection

The data used in this study is sourced from the World Bank, which provides a comprehensive and reliable dataset covering a range of macroeconomic, demographic and political indicators for European countries. The dataset spans from 2007 to 2021, encompassing a significant period that includes multiple crisis episodes in the 21st century. By utilizing secondary data, the study ensures consistency, comparability, and access to a wide array of variables relevant to the analysis of income inequality in Europe.

The choice to focus on European countries is driven by several considerations. Firstly, European countries represent a diverse set of economies, varying in terms of development level, political systems, and social structures. This diversity offers an opportunity to explore the determinants of income inequality across different contexts and assess the impact of crisis periods on income distribution. Furthermore, European countries generally exhibit good recording practices and reliable data sources, which enhance the quality and accuracy of the analysis.

The data collected from the World Bank covers a range of economic, demographic and political indicators that are relevant to the study's research questions. These indicators capture key determinants of income inequality comprising a comprehensive set of independent variables.

The time period covered by the dataset, from 2007 to 2021, allows for the analysis of income inequality dynamics before, during, and after major crisis periods. It provides an opportunity to assess the differential impacts of various crises, such as the global financial crisis and the sovereign debt crisis, on income inequality in Europe. By incorporating data from crisis periods, the study can explore how income distribution patterns respond to economic shocks and policy measures implemented during these crises.

The use of secondary data has several advantages. Firstly, it saves time and resources by utilizing existing datasets compiled by reputable organizations such as the World Bank, allowing to focus on data analysis and interpretation rather than data collection. Moreover, secondary data sources often provide consistent and standardized data, facilitating cross-country comparisons and ensuring data reliability.

4.3.2. Sampling and Country Classification

In pursuit of addressing the research question regarding differences in the relationship patterns of income inequality and its determinants based on the level of development, a purposive sampling method is employed. This method allows for the deliberate selection of European countries with diverse development statuses.

The classification of countries into developed and developing categories is based on well-established criteria commonly used in the literature, such as Gross Domestic Product (GDP) per capita, Human Development Index (HDI) by UNDP, or income levels (by World Bank, GNI per capita). For this study, the Human Development Index (HDI) classification criterion by the United Nations Development Programme (UNDP) is chosen due to its comprehensive nature and alignment with the study's focus on development-related factors. HDI is a composite index that takes into account factors such as life expectancy, education, and income to assess a country's overall level of development.

The HDI classification criterion is deemed appropriate as it encapsulates multiple dimensions of development, including income, health, and education. The development level takes as a threshold the 75th percentile in the HDI distribution, it means that the country's HDI value is higher than approximately 75% of all the countries included in the HDI calculation. Thus, countries with HDI score of 0.80 or higher are categorized as 'developed', while countries with HDI scores below 0.80 are classified as 'developing’. Under this classification there are 34 developed countries and 6 developing countries in Europe (Albania, Serbia, Bosnia & Herz., Ukraine, North Macedonia and Moldova).

Table 6. List of Developed Countries Used in the Regression Analysis

Developed countries					
Norway	Netherlands	France	Estonia	Portugal	Belarus
Ireland	Denmark	Slovenia	Italy	Slovakia	Turkey
Switzerland	Finland	Luxembourg	Greece	Hungary	Bulgaria
Iceland	UK	Spain	Lithuania	Montenegro	Croatia
Germany	Belgium	Czechia	Poland	Romania	
Sweden	Austria	Malta	Latvia	Russia	

Source: United Nations Department of Economic and Social Affairs (2014)

Table 7. List of Developing Countries Used in the Regression Analysis

Developing countries					
Albania	Serbia	North Macedonia	Bosnia and Herzegovina	Ukraine	Moldova

Source: United Nations Department of Economic and Social Affairs (2014)

This classification approach facilitates a comparative analysis of income inequality determinants between these two distinct groups of countries. It allows for the exploration of potential differences in the impact of economic, demographic, and political factors on income inequality in developed and developing European nations.

By considering the HDI-based development level classification, the study aims to provide valuable insights into variations in income inequality dynamics, thereby addressing one of the central research questions. Additionally, this classification strategy enhances the generalizability of findings to broader contexts while offering nuanced insights into the complex interplay of income inequality determinants.

4.3.3. Data Analysis

In this study, various analytical techniques are employed to explore the relationships between the independent variables and income inequality. These techniques provide a rigorous framework for analyzing the data and estimating the effects of the determinants on income inequality. The selected analytical techniques include fixed effects estimation, random effects estimation, Least Squares Dummy Variable (LSDV) estimation, and system Generalized Method of Moments (GMM) estimation.

Analytical techniques play a crucial role in panel data analysis as they help address key econometric concerns such as endogeneity, unobserved heterogeneity, and serial correlation. By employing these techniques, the study aims to enhance the robustness and validity of the estimated effects and gain deeper insights into the determinants of income inequality in Europe during crisis periods.

Fixed effects estimation is one of the primary analytical techniques used in this study. It involves incorporating fixed effects or country-specific dummy variables in the regression models. By including fixed effects, the analysis can control for unobserved heterogeneity and time-invariant country-specific factors that may influence income inequality. This approach ensures that the estimated effects of the independent variables capture the within-country variations in income inequality and are not confounded by unobservable country-specific characteristics (Greene, 2012).

Random effects estimation is another analytical technique employed in this study. This technique assumes that the unobserved heterogeneity is uncorrelated with the independent variables. Unlike fixed effects estimation, which captures time-invariant country-specific factors, random effects estimation allows for the estimation of the overall relationships between the determinants and income inequality. It provides insights into the average effects of the independent variables on income inequality across countries, accounting for both time-varying and time-invariant factors.

Furthermore, the analysis includes LSDV (Least Squares Dummy Variables) models with time and country dummies. This approach controls for common external shocks and unobserved country-fixed effects, enabling the identification of individual-country specific and time effects. By adding a dummy variable for each country, the models estimate the pure effect of each explanatory variable while accounting for unobserved heterogeneity (Greene 2013).

The inclusion of country dummies in the LSDV models is crucial as it helps identify the individual-country specific and time effects. By differentiating the effects of the independent variables across countries, the LSDV models allow for a more nuanced understanding of the determinants of income inequality within each country. This approach facilitates the identification of country-specific factors that contribute to income inequality dynamics, enhancing the richness and depth of the analysis.

Additionally, system Generalized Method of Moments (GMM) estimation is used to address endogeneity, serial correlation, and heteroscedasticity concerns that may arise in the panel data analysis (Roodman, 2006). System GMM estimation utilizes a larger subset of instruments and is particularly suited for panel data models with a large number of individuals and a small number of time periods, with explanatory variables that are not strictly exogenous (Roodman, 2008). By incorporating lagged values of the variables and utilizing moment conditions, system GMM estimation improves the validity and reliability of the estimated effects. It allows for the identification and correction of potential biases resulting from endogeneity, serial correlation, and heteroscedasticity, enhancing the robustness of the results. The system GMM estimation utilizes a broader subset of instruments and is particularly advantageous for panel data models with variables that are not strictly exogenous.

These analytical techniques are chosen based on their ability to handle the specific econometric challenges present in panel data analysis. By employing fixed effects estimation, random effects estimation, system GMM estimation, and LSDV models, the study ensures a comprehensive examination of the relationships between the determinants and income inequality, controlling for unobserved heterogeneity, endogeneity, and other econometric concerns.

The utilization of multiple analytical techniques also offers the opportunity to compare and contrast the results obtained from each method, providing a more nuanced understanding of the determinants of income inequality in Europe. By considering different estimation approaches, the study can assess the sensitivity of the results to the modeling assumptions and enhance the reliability of the findings.

4.4. Specification of the Economic Model

To examine the determinants of income inequality in Europe during crisis periods, this study employs a comprehensive econometric model that incorporates various independent variables. The model specification is designed to capture the relationships between these variables and income inequality, providing insights into the factors that contribute to income disparities.

The econometric model used in this study is based on the following specification:

$$Gini_{it} = \beta_0 + \beta_1 X_{it} + \beta_2 X \times d_i + d_i + \theta_i + \gamma_t + u_{it} \qquad (3)$$

Where:

- Income Inequality (Gini) represents the dependent variable, which is measured using the Gini coefficient. The Gini coefficient is a widely used measure of income inequality that ranges from 0 to 1, where 0 represents perfect equality and 1 represents maximum inequality. In this equation, 'i' denotes individual countries, and 't' represents time, encompassing the years under examination.
- β_0, β_1, β_2 are the regression coefficients. They signify the relationships between the dependent variable (Income Inequality) and the various independent variables incorporated in our model, specifically X_{it}.
- X_{it} represent essential independent variables. These variables encapsulate critical economic determinants that could influence income inequality trends.
- $X \times d_i$ represents the interaction term between variable X and the dummy variable di. Interaction terms are pivotal in our analysis as they help us understand how specific economic factors may interact with certain conditions or events, as represented by the dummy variable di.
- d_i is a dummy variable, a binary variable taking the value 1 under certain conditions and 0 otherwise. In our context, it helps account for specific events or situations that might have a differential impact on income inequality, denoting the developed/developing countries, financial crisis dummy, Eurozone debt crisis dummy, and covid-19 crisis.
- θ_i accounts for country-specific fixed effects. These effects capture unobservable, time-invariant characteristics unique to each country that might affect income inequality.
- γ_t incorporates time-specific fixed effects. It accounts for overall time trends and

variations in income inequality that are consistent across all countries.

- u_{it} represents the error term, which encapsulates unexplained variance and random shocks in our model.

The estimation equation serves as the foundation for estimating the effects of the independent variables on income inequality using panel data analysis techniques. Through the estimation process, the study aims to obtain reliable estimates of the coefficients (β_1, β_2, β_3, ..., β_k) and assess their statistical significance. These estimates provide insights into the direction and strength of the relationships between the determinants and income inequality.

Expanding the initial equation specification for estimating the impact of the various macroeconomic, demographic and political factors on income inequality in the selected countries is the following:

$$Gini_{it} = \beta_0 + \beta_1 gdppc_{it} + \beta_2 eglo_{it} + \beta_3 rem_{it} + \beta_4 unempl_{it} + \beta_5 cons_{it} + \beta_6 sav_{it} + \beta_7 vat_{it} + \beta_8 gfcf_{it} + \beta_9 infl_{it} + \beta_{10} trd_{it} + \beta_{11} pols_{it} + \beta_{12} cor_{it} + \beta_{13} rol_{it} + \beta_{14} voa_{it} + \beta_{15} regq_{it} + \beta_{16} gove_{it} + \beta_{17} popg_{it} + \beta_{18} myos_{it} + \beta_{19}\, x\, d_1 + \beta_{20}\, x\, d_2 + \beta_{21}\, x\, d_3 + \beta_{22}\, x\, d_4 + \theta_i + \gamma_t + u_{it} \quad (4)$$

Where:

- i = 1, 2, ..., n is the country index, t = 1, 2, ..., t is the time index, denoting the years from 2007 to 2021.
- Gini represents the dependent variable, which is measured using the Gini coefficient, similar to Equation (1).
- β_0, β_1, β_2, β_3, ..., β_{22} are the regression coefficients. They signify the relationships between the dependent variable (Gini) and the various independent variables incorporated in our extended model.
- The independent variables in Equation (2) capture various economic and contextual factors that could influence income inequality, including GDP per capita (gdppc), economic globalization (eglo), remittances (rem), unemployment rate (unempl), domestic consumption expenditure (cons), gross domestic savings (sav), VAT rate (vat), gross fixed capital formation (gfcf), inflation (infl), trade openness (trd), political stability (pols), corruption index (cor), rule of law (rol), voice and accountability (voa), regulatory quality (regq), government effectiveness (gove), population growth (popg), mean years of schooling (myos), and the interaction terms with d_1 for DEV, d_2 for EUSDC, d_3 GFC, and d_4 for COV19.

- θi and γt are the country-specific fixed effects and year-specific fixed effects, respectively, similar to Equation (1).
- uit represents the error term, capturing unexplained variance and random shocks in our extended model.

Moreover, the composite variables are used in order to capture all interaction terms:

- DEV: This composite variable combine interaction terms that capture how the impact of various factors on income inequality differs between developed and developing countries.
- COV19: This composite variable combines all the interaction terms related to the COVID-19 period.
- EUSDC: This composite variable combines all the interaction terms related to the European sovereign debt crisis.
- GFC: This composite variable combines all the interaction terms related to the global financial crisis.

The empirical model assumes that income inequality level of the European countries is a function of the independent, as well as the interaction terms between the independent variables with the dummy variables. Based on the interaction variables, the aim of the study is to differentiate the impact of the independent variables on income inequality across two group of countries, developed and developing countries, and two periods, the crisis period and the non-crisis period. The coefficients of the interaction terms provide insights into the specific effects of these crises' periods on income inequality. By including these terms, the study aims to address the third research question concerning the differential impact of crises on income inequality.

It is worth noting that since all data are in percentages or indices, except for the GDP per capita variable, there is no need for logarithmic transformation. For the GDP per capita there is a logarithmic transformation which is used in all regression models. The model captures the relationships between the variables and income inequality, considering the role of economic, demographic, and crisis-related factors in shaping income distribution patterns across European countries.

4.5. Model Specification Rationale

The specification of the econometric model is guided by the research questions and hypotheses, which aim to identify the dominant determinants of income inequality in Europe during crisis periods. By including a wide range of independent variables, the model allows for a comprehensive analysis of the factors contributing to income disparities.

The choice of specific independent variables in the model is informed by theoretical frameworks and empirical studies that highlight their relevance in explaining income inequality. For example, GDP per capita is often included as a measure of economic development, with higher GDP per capita expected to be associated with lower income inequality. Education levels, measured by variables such as mean years of schooling, can capture the human capital dimension and its impact on income disparities. Unemployment rates reflect labor market conditions and can influence income distribution.

4.6. Estimation Techniques

The estimation of the econometric model involves employing appropriate estimation techniques, such as fixed effects models, system GMM estimation, and LSDV models, as discussed earlier. Each estimation technique has its strengths and addresses specific econometric concerns. By utilizing multiple estimation approaches, the study ensures the robustness and reliability of the results.

The estimation equation forms the basis for analyzing the impacts of various determinants on income inequality in Europe during crisis periods. Through panel data analysis and the application of econometric techniques, the study aims to estimate the effects of the independent variables and assess their statistical significance. The results obtained from this estimation process contribute to a deeper understanding of the determinants of income inequality and provide empirical evidence to guide policy recommendations for promoting more equitable and inclusive societies in Europe.

5. EMPIRICAL RESULTS OF INCOME INEQUALITY DETERMINANTS

In this section, the study presents the results of the panel data analyses. First are presented the descriptive analysis and the correlation matrix. The main part of the empirical analysis is covering the results of the panel data analysis with fixed and random effect for the full sample of European countries, followed by the results of the LSDV model with the interaction terms model, and in the end the GMM regression models interacting with the dummy variables.

5.1. Descriptive Analysis

The results presented in Table 8 compare various economic, demographic, and governance indicators between developed and developing countries. The table shows the means and t-test results of the independent variables and the dependent variable comparing developed and developing countries. The t-test results indicate whether there are statistically significant differences in the mean values of these indicators between the two groups.

The results show that there is no statistically significant difference in income inequality (measured by the Gini coefficient) between developed and developing countries. On the other side, the results indicate that there are significant differences in the means of all the independent variables between developed and developing countries, except for the variable Gross fixed capital formation, which is a proxy for investment. The lack of statistical significance in this case suggests that, based on the sample data and the statistical test conducted (t-test), there is no strong evidence to conclude that there is a meaningful difference in investment levels between developed and developing countries. This means that, on average, both developed and developing countries allocate a similar percentage of their GDP to gross fixed capital formation, indicating that they are making comparable investments to enhance their productive capacity. However, it is essential to note that the absence of statistical significance does not necessarily imply that there are no differences in investment levels between the two groups. The finding simply means that, based on the available data and the specific statistical test used, the observed difference in investment between developped and developing countries is not large enough to be considered statistically significant. To gain a deeper understanding of the investment patterns and differences between developed and developing countries, further investigation and analysis may be needed.

For all other independent variables, there are significant differences in the means between developed and developing countries. Developed countries have higher levels of GDP per capita, which is a proxy for economic development, higher economic globalization index, gross domestic saving (as a % of GDP), trade (as a % of GDP), higher levels of all worldwide governance indicators, higher population growth rate, and higher mean years of schooling compared to developing countries. On the other side, developing countries have higher level of remittances (as a % of GDP), unemployment rate, domestic consumption expenditure (as a % of GDP), higher value-added tax, and higher inflation rate, compared to developed countries.

Table 8: Descriptive Analysis Results for the Developed and Developing Countries

Variable	Developed Countries	Developing Countries	t-test
Gini coefficient	31.71	31.82	0.2244
GDP per capita	10.19	8.41	-21.6762***
Economic globalization	76.78	64.47	-10.2346***
Remittances	1.59	10.57	25.4112***
Unemployment rate	8.03	15.61	12.4550***
Domestic consumption expenditure	74.28	93.78	18.0930***
Gross domestic saving	25.71	6.21	-18.0930***
Value Added Tax	13.48	18.73	12.5492***
Global fixed capital formation	22.28	22.49	0.3997
Inflation rate	2.82	4.89	3.6516***
Trade	117.21	94.44	-3.3728***
Political stability	96.91	36.33	-14.9627***
Control of corruption	75.74	35.14	-18.4498***
Rule of law	78.71	40.72	-17.1877***
Voice and accountability	79.94	51.93	-14.4726***
Regulatory quality	78.36	47.63	-13.1077***
Government effectiveness	78.43	41.06	-18.8964***
Population growth	0.30	-0.50	-8.8552***
Mean years of schooling	11.82	10.31	-9.4152***

*Note: * p<0.05, ** p<0.01, *** p<0.001*

Source: Author's calculation

This statistical analysis is conducted using the t-test, a widely employed method to assess the significance of differences between means. The formula for calculating the t-test is given by:

$$t = \frac{(\text{Mean Developed Countries} - \text{Mean Developing Countries})}{\sqrt{\left(\frac{(\text{Standard Deviation Developed Countries})^2}{\text{Sample Size Developed Countries}}\right) + \left(\frac{(\text{Standard Deviation Developing Countries})^2}{\text{Sample Size Developing Countries}}\right)}}$$

where:

- Mean Developed Countries and Mean Developing Countries are the respective means of the variable for developed and developing countries.
- Standard Deviation Developed Countries and Standard Deviation Developing

Countries are the corresponding standard deviations.

- Sample Size Developed Countries and Sample Size Developing Countries are the sample sizes for developed and developing countries.

The regression coefficients in the t-test serve as indicators of the relative magnitude of various variables between developed and developing countries. A positive t-test coefficient denotes that the variable tends to be higher in developed countries than in their developing counterparts, whereas a negative t-test coefficient suggests a converse trend, indicating a proclivity for higher values in developing countries. The variations in coefficients denote the extent of the disparities between developed and developing countries in each variable. A higher coefficient for a specific variable indicates a more substantial difference in that particular aspect compared to others. To understand the nuances in the observed disparities, several factors may contribute to the variation in t-test coefficients observed between developed and developing countries:

1. **Standard Deviation**: The standard deviation measures the spread of data points around the mean. If the standard deviation is relatively high, it can result in lower t-test values, as the means may be less distinguishable from each other.
2. **Data Variability**: If the data within each group is highly variable, it can result in lower t-test values. Consistency and homogeneity in data points contribute to higher t-test values.
3. **Outliers**: Extreme values (outliers) in the data can influence the t-test. Outliers may disproportionately impact smaller sample sizes, leading to unexpected t-test values.
4. **Nature of the Variable**: Some variables naturally exhibit higher or lower variability. For instance, variables related to economic indicators may have larger differences between developed and developing countries compared to variables related to social or governance indicators.
5. **Policy Differences**: Variation in economic policies, governance, and institutional structures between developed and developing countries can contribute to differences in coefficients.

5.2. Trend Analysis

In addition to the cross-sectional analysis of income inequality between developed and developing countries, it is imperative to explore the temporal dimension of this phenomenon. Examining trends over time allows for a more nuanced understanding of how income inequality has evolved within individual countries. The following graphs present a comprehensive overview of income inequality trends across all developed and developing countries in our study from the year 2007 to 2021. These visualizations offer a dynamic perspective, capturing fluctuations, turning points, and potential patterns that might not be evident in a static analysis.

Before delving into the specific trends, it is crucial to highlight the significance of temporal analyses in comprehending the multifaceted nature of income inequality. Economic, social, and policy changes over time can shape the trajectory of inequality within a country. Moreover, understanding these trends aids in identifying potential drivers and evaluating the efficacy of policy interventions aimed at addressing inequality. The graphs are organized chronologically, allowing for a sequential examination of income inequality across diverse national contexts. Each country's trajectory is depicted individually, providing a detailed view of the changes in income distribution over the studied period. As the study analyzes these visual representations, it is important to consider the broader economic, political, and social contexts that may have influenced the observed trends.

5.2.1. Income Inequality Trends in the Developed Countries

First are represented the developed European countries and their income inequality trends through the observed period (Figure 7). Looking at the developed European countries that are depicted in the graph, we come across a diversity of trends in income inequality from 2007 to 2021. While there are some countries that have rather stable level of inequality, there are those that show more significant shifts. The difference in trends might reflect the distinct economic policies, labor market conditions, and social welfare systems among these countries.

Figure 7. Income inequality trends in European developed countries (2007-2021)

Source: World Bank data, author’s calculations

Increasing trends of income inequality was noticed in several other European countries, such as Turkiye, Bulgaria, Luxemburg, Sweden, Malta and Italy. In Turkiye, rising income inequality was attributed to uneven economic growth, labor market segmentation with a large informal sector, educational disparities, gender inequality, regional disparities, ineffective taxation, and wealth concentration. Bulgaria experienced increasing income inequality due to the transition to a market economy and concentrated economic growth, exacerbating regional disparities. Luxembourg's growing income inequality resulted from housing policies favoring private ownership, limited access to state aid, fiscal benefits for housing investors, inadequate housing aid for the vulnerable, and speculation leaving flats empty. Sweden's widening income gap was linked to economic privatization, the lasting impact of the 1990s economic downturn, gender inequality, and unequal income growth favoring top earners. In Malta, tax reforms, limited effectiveness of social welfare measures, an education gap, household composition disparities, and market earnings and occupational differences contributed to increasing income inequality. Italy faced rising income inequality due to economic recession, labor market changes, skill-biased technological change, declining unionization, education and skills disparities, and significant regional disparities.

On the other side, during the same period of 2007-2021, countries like Moldova, Russia, Poland, Belarus, Montenegro, Croatia, and Portugal witnessed decreasing trends in income inequality. These improvements were attributed to various factors such as the implementation of social protection programs, targeted policies to reduce poverty and inequality, economic growth, increased employment opportunities, expansion of social welfare programs, and government efforts to reduce regional disparities and promote inclusive growth.

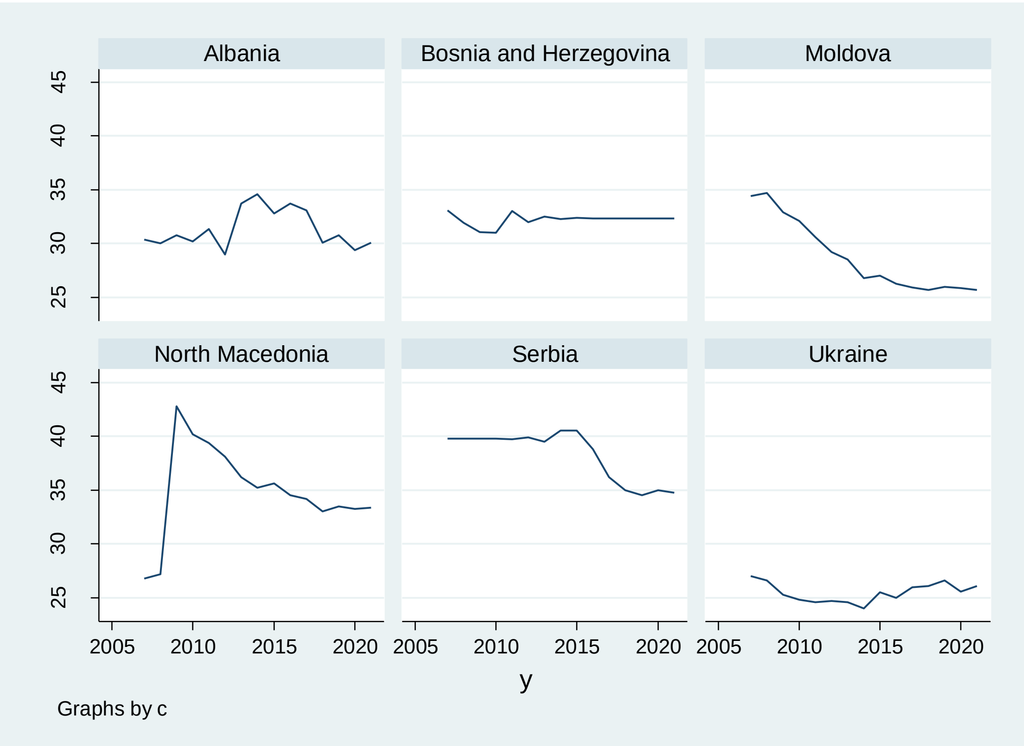
In contrast to the fluctuating trends observed in specific European countries, the rest of the European countries have maintained stability in income inequality over the years. This stability can be attributed to well-established social welfare systems, progressive taxation, robust labor market regulations, a commitment to education and skill development, and a collective emphasis on social cohesion and solidarity, all of which collectively contribute to mitigating the impact of income disparities and fostering a more equitable distribution of resources.

This all brought to the current status of income inequality in Europe (data from 2021 as the latest available data), where countries like Turkiye, Bulgaria, the Russian Federation, Montenegro, Lithuania, Latvia, Italy, Serbia, Romania and Spain are on the top with highest levels of income inequality. In the bottom 10 countries with lowest levels of income inequality in Europe are the Slovak Republic, Slovenia, Belarus, Moldova, Czechia, Ukraine, Iceland, Belgium, Finland and the Netherlands.

5.2.2. Income Inequality Trends in the Developing Countries

Next are represented the developing European countries and their income inequality trends through the observed period (Figure 8). Notably, as the declining trends indicate, the majority of the countries in this graph, similar to the developed ones, are exhibiting a general trend of decreasing income inequality. The different social and economic policies implemented in these countries over the specified time frame may be correlated with these visual trends. Following the trends are observed more closely.

Figure 8. Income inequality trends in European developing countries (2007-2021)



Source: World Bank data, author's calculations

First, looking at the trend line of North Macedonia we can notice that the country witnessed a sharp increase followed by a gradual decrease in the observed period of time. The surge in income inequality in 2009 was driven by the weak social policies, including the absence of a minimum wage policy, a decline in foreign direct investment, decreased credit availability, and a large trade deficit. The implementation of neo-liberal economic policies further eroded legislative protections for workers and maintained low wages, while a political patronage system increased dependence on elites. Fortunately, from 2010 a trend of gradual decrease of income inequality started as a result of the ad-hoc pension increases, increases in social assistance and the introduction and subsequent increases of a minimum wage.

The graph of Serbia follows a slightly, but steadily moving to the downwards direction, indicating a smooth and slow decrease. This implies that there might be ever-recurring policies or budgetary allocations that are a key driver of sustained economic growth across the population as a whole and, as a result, of increasing equal disposable incomes through time.

Moldova also shows a decrease in income inequality over the observed period of time. The downward trend implies that the country has noted considerable progress in cutting income inequalities among its people over the specified period. This might be achieved through successful poverty reduction programs, improvements in wage parity, or distributive fiscal policies designed to boost the economic position of the lower-income group.

Albania is the country with the most fluctuations in income inequality during this period. The graph of Gini coefficient, starting from the year 2007, shows fluctuations around a certain range indicating periodical movements in income rates. Such alterations may denote the influence of the macroeconomic policies, transitions in the labor market, or other social and economic factors. The fluctuation of inequality does not seem to have either an upward trend or a downward trend, meaning it does not point to an economic stability period or a balance among factors that are responsible for inequality increase or decrease in different directions.

The other two developing countries, Bosnia and Herzegovina and Ukraine show steady trends over the years. The trend line of Bosnia and Herzegovina is the one which is virtually straight with only minimal undulations. This type of pattern implies a stage where the level of income inequality has been stable, with only marginal disturbances or even diminutions over time. This may mean that measures to fight equality have not produced significant results, or that the results which came to the surface were offset by countervailing factors. The trend line for Ukraine illustrates the gradual decline of the Gini coefficient with certain fluctuations around the trend going down. This tendency indicates that even during the times of economic crises or periods of instability, there was still the general reduction of income gap. The low inequality might be the result of economic reforms, social assistance programs, and other redistributive policies implemented in the past.

5.2.3. Comparison of the Income Inequality Trends Between the Developed and Developing European Countries

Several significant findings emerge when contrasting the trends in income inequality between developed and developing European countries. First, developing European countries appear to exhibit more noticeable fluctuations, both increases and decreases, which could be attributed to the revolutionary effects of economic reforms, EU accession processes, and the implementation of global aid and development initiatives. On the other hand, more extensive welfare programs are typically seen in developed European nations, which serve as a check on notable rises in income disparity. These systems include of social safety programs, unemployment insurance, and healthcare. Furthermore, economic stability is often higher in industrialized countries, which translates into fewer volatile movements in income inequality. The economic volatility that developing nations may encounter, on the other hand, may cause the Gini coefficient to fluctuate more sharply.

Nations in both groups show a decline in income disparity, possibly as a result of economic expansion. Different underlying causes, though, might be at play. While developing nations might profit from increased investment and industrialization, developed countries are probably better off as a result of higher-value industries and technology improvements.

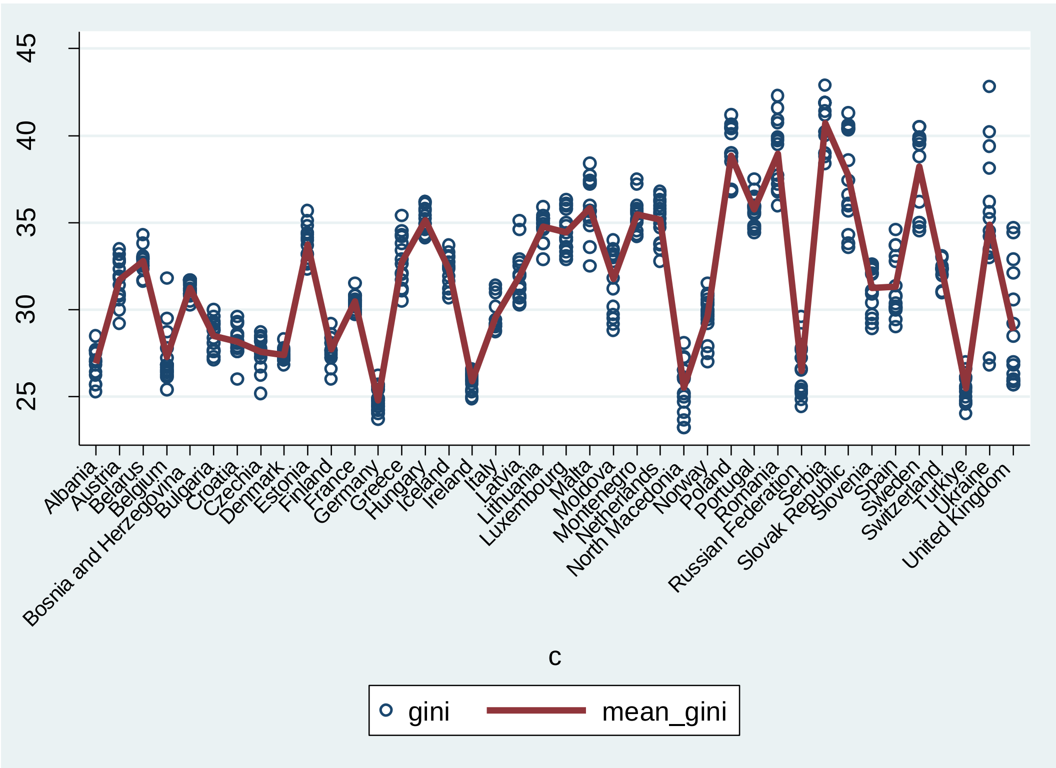
The effects of the global financial crisis and the austerity measures that followed are more pronounced in the patterns of developed countries like Greece and Spain. On the other hand, post-socialist economic reforms and entry into the EU market may have a greater influence on trends in developing nations.

5.2.4. Mean of Gini Index of the European Countries

To complete the income inequality picture and gain a comprehensive view of the collective experience of European countries, the study presents a graph depicting the Mean Gini Index for the entire region. This visual representation serves as a valuable synthesis of the individual country narratives, enabling the study to discern overarching patterns and draw insightful comparisons. The Mean Gini Index graph offers a snapshot of the average income inequality levels and facilitates a comparative analysis of the European countries' performance over the examined period. This visual exploration aims to distill key trends and discern the broader implications for regional economic dynamics and policy effectiveness.

Figure 9 displays the mean of the Gini indices for a set of European countries during the period spanning from 2007 to 2021, while accounting for heterogeneity among the countries. The results obtained from the graph suggest that Slovenia, Czech Republic, Slovak Republic, Belarus, Ukraine, and Norway exhibit relatively lower levels of income inequality among the set of countries examined. Conversely, the Russian Federation, Turkiye, Montenegro, North Macedonia, Serbia, and Bulgaria display higher levels of income inequality. The remaining countries fall within the middle range of the distribution. Notably, the majority of European countries have evidenced a decrease in income inequality, as indicated by the latest available data.

Figure 9. Mean of Gini Index of European countries for the period 2007-2021



Source: Author's calculation

5.3. Correlation Matrix

Before conducting any regression analysis, two correlation matrices were done to explore the relationships among the independent variables. The results from the correlation matrices provided valuable insights into the strength and direction of associations between variables. By examining these interrelationships, a better understanding was gained of the potential connections and dependencies that exist within the dataset.

The first correlation matrix focused only on the governance indicators, while the second correlation matrix explored the associations among macroeconomic and demographic factors.

The correlation results revealed distinct patterns between the two sets of variables.

Specifically, the correlation matrix for the macroeconomic and demographic variables displayed weak to moderate associations. For instance, GDP per capita demonstrated a moderate positive correlation with economic globalization and a weak positive correlation with remittances, while it showed no significant correlation with gross fixed capital formation. Similarly, unemployment rate exhibited only a weak positive correlation with domestic consumption expenditure and gross domestic savings, and no significant correlation with inflation rate.

Table 9. Correlation matrix for macroeconomic and demographic variables

	log_g~pc	eglo	rem	unempl	cons	sav	vat	gfcf	infl	cpi	trd	popg
log_gdppc	1.0000											
eglo	0.6810	1.0000										
rem	-0.6639	-0.3235	1.0000									
unempl	-0.4642	-0.3152	0.2890	1.0000								
cons	-0.6845	-0.4525	0.6709	0.5817	1.0000							
sav	0.6845	0.4525	-0.6709	-0.5817	-1.0000	1.0000						
vat	-0.4805	-0.1382	0.5239	0.3294	0.5028	-0.5028	1.0000					
gfcf	-0.1346	-0.1180	0.1156	-0.1624	-0.1357	0.1357	-0.0639	1.0000				
infl	-0.3485	-0.4465	0.1173	-0.0760	0.0338	-0.0338	0.0048	0.2784	1.0000			
cpi	-0.2397	-0.2970	0.0494	-0.0945	-0.0569	0.0569	-0.0580	0.0552	0.2983	1.0000		
trd	0.2285	0.5393	-0.0175	-0.2277	-0.4806	0.4806	-0.0107	0.0075	-0.0718	-0.0143	1.0000	
popg	0.6104	0.3283	-0.3921	-0.3495	-0.5368	0.5368	-0.3932	0.0501	-0.0799	-0.0730	0.3273	1.0000
myos	0.4239	0.4356	-0.1873	-0.5484	-0.4097	0.4097	-0.2477	-0.0566	-0.1274	0.0196	0.1754	0.0559

Source: Author's calculations

On the other hand, the correlation matrix for the governance indicators demonstrated strong associations (0.75-0.95) among the governance-related factors. Variables such as political stability, control of corruption, rule of law, voice and accountability, regulatory quality, and government effectiveness exhibited substantial positive correlations, indicating a robust interrelationship between these governance dimensions. These findings suggest that improvements or deteriorations in one governance indicator tend to be accompanied by similar changes in others, implying a cohesive governance structure.

Table 10. Correlation matrix for political variables

	pols	cor	rol	voa	regq	gove
pols	1.0000					
cor	0.7773	1.0000				
rol	0.7915	0.9214	1.0000			
voa	0.7421	0.8845	0.9427	1.0000		
regq	0.7936	0.9009	0.9371	0.9392	1.0000	
gove	0.7770	0.9353	0.9198	0.9240	0.9166	1.0000

Source: Author's calculations

These results may indicate that governance indicators are strongly interlinked and tend to evolve collectively within the European countries under study. This could suggest a cohesive governance framework that influences multiple aspects of political performance. On the other hand, the weaker and moderate correlations among macroeconomic and demographic variables may signify a more complex and diverse economic landscape within these countries.

As a result, the study included interactions between these strongly interlinked governance variables and the dummy variables which can help capture and disentangle their joint effects on income inequality more effectively. When variables are highly correlated or interlinked, their individual effects may be challenging to isolate, leading to potential multicollinearity issues in the regression analysis.

By creating interactions between the governance variables and dummy variables, the study introduced additional terms in the model that allowed to assess how the relationship between the governance variables and income inequality changes based on different country groups or time periods. This approach aimed to mitigate the multicollinearity problem that the correlation results initially suggested might be present.

These interactions offer several advantages in this context:

1. Separation of Effects: By introducing interactions, the study allows for differential effects of governance variables on income inequality based on specific country characteristics or crisis periods. This separation helps to identify the unique contributions of each variable to income inequality.

2. Disentangling Relationships: With interactions, the study explores whether the strength or direction of the relationship between governance variables and income inequality varies across different contexts, which can help disentangle their joint effects.

3. Contextual Insights: Interactions provide context-specific insights into the dynamics of income inequality. For example, they can reveal whether political stability has a different impact on income inequality during times of economic crisis or in developed versus developing countries.

5.4. Baseline Regression Analysis - Fixed and Random Effects

The study employs a series of statistical models, each with its strengths and specifications, to decipher the intricate web of factors impacting income inequality. For the baseline regression analysis are done the fixed and random effects models, followed with the Hausman test.

The utilization of fixed and random effects models in this study serves a purpose in examining the determinants of income inequality in European countries while addressing potential sources of bias and unobserved heterogeneity. The decision to employ both fixed and random effects models was guided by the Hausman test, which aids in selecting the appropriate model. By incorporating these models, the study is able to capture both time-invariant country-specific effects (fixed effects) and time-varying unobserved heterogeneity (random effects) that may impact income inequality dynamics. The fixed effects model controls for country-specific factors that remain constant over time, effectively isolating the within-country variations in the explanatory variables and income inequality.

Complementing the fixed effects, the Random Effects Model takes a broader stroke, estimating the average relationships across the board. This model shines when the study's emphasis is on variations between countries rather than within them. It assumes that the individual effects are not correlated with the independent variables, providing a general overview of the relationships at play. The application of these models ensures a robust and comprehensive investigation of income inequality trends, contributing to a nuanced understanding of its underlying determinants.

The Hausman Test then serves as a critical arbiter, guiding the selection between the fixed and random effects models. By comparing the consistency and efficiency of the estimators, the Hausman Test identifies the most suitable model to represent the complexity of income inequality dynamics in Europe during the crisis period.

In addition, the study incorporated four dummy variables representing specific time periods, namely the global financial crisis dummy (GFC), the European Sovereign Debt crisis dummy (EUSDC), the Covid-19 crisis dummy (COV19) and the development level dummy (DEV). The statistically significant coefficients of these dummy variables provided valuable insights into the impact of global financial crises, European sovereign debt crises, the development status of countries, and the COVID-19 pandemic on income inequality in European nations.

In assessing the determinants of income inequality during crisis periods in Europe, four distinct models are employed.

Model 1 introduces a development level dummy to discern variations in the factors influencing income inequality between developed and developing countries. In this model the composite variable d1 combines interaction terms that capture how the impact of various factors on income inequality differs between developed and developing countries.

$$Gini_{it} = \beta_0 + \beta_1 gdppc_{it} + \beta_2 eglo_{it} + \beta_3 rem_{it} + \beta_4 unempl_{it} + \beta_5 cons_{it} + \beta_6 sav_{it} + \beta_7 vat_{it} + \beta_8 gfcf_{it} + \beta_9 infl_{it} + \beta_{10} trd_{it} + \beta_{11} pols_{it} + \beta_{12} cor_{it} + \beta_{13} rol_{it} + \beta_{14} voa_{it} + \beta_{15} regq_{it} + \beta_{16} gove_{it} + \beta_{17} popg_{it} + \beta_{18} myos_{it} + \beta_{19}\, x\, d_1 + \theta_i + \gamma_t + u_{it} \quad (5)$$

Model 2 incorporates a COVID-19 dummy, aiming to identify disparities in these factors between the pandemic and non-pandemic years. In this model the composite variable *d2* combines all the interaction terms related to the COVID-19 period.

$$Gini_{it} = \beta_0 + \beta_1 gdppc_{it} + \beta_2 eglo_{it} + \beta_3 rem_{it} + \beta_4 unempl_{it} + \beta_5 cons_{it} + \beta_6 sav_{it} + \beta_7 vat_{it} + \beta_8 gfcf_{it} + \beta_9 infl_{it} + \beta_{10} trd_{it} + \beta_{11} pols_{it} + \beta_{12} cor_{it} + \beta_{13} rol_{it} + \beta_{14} voa_{it} + \beta_{15} regq_{it} + \beta_{16} gove_{it} + \beta_{17} popg_{it} + \beta_{18} myos_{it} + \beta_{19}\, x\, d_2 + \theta_i + \gamma_t + u_{it} \quad (6)$$

Model 3 integrates a European sovereign debt crisis (EUSDC) dummy, examining differences in determinants during EUSDC and non-EUSDC years. In this model the composite variable d3 combines all the interaction terms related to the European sovereign debt crisis.

$$Gini_{it} = \beta_0 + \beta_1 gdppc_{it} + \beta_2 eglo_{it} + \beta_3 rem_{it} + \beta_4 unempl_{it} + \beta_5 cons_{it} + \beta_6 sav_{it} + \beta_7 vat_{it} + \beta_8 gfcf_{it} + \beta_9 infl_{it} + \beta_{10} trd_{it} + \beta_{11} pols_{it} + \beta_{12} cor_{it} + \beta_{13} rol_{it} + \beta_{14} voa_{it} + \beta_{15} regq_{it} + \beta_{16} gove_{it} + \beta_{17} popg_{it} + \beta_{18} myos_{it} + \beta_{19}\, x\, d_3 + \theta_i + \gamma_t + u_{it} \quad (7)$$

Model 4 introduces a global financial crisis (GFC) dummy, exploring variations in the determinants between the global financial crisis and non-global financial crisis years. Here the composite variable *d4* combines all the interaction terms related to the global financial crisis.

$$Gini_{it} = \beta_0 + \beta_1 gdppc_{it} + \beta_2 eglo_{it} + \beta_3 rem_{it} + \beta_4 unempl_{it} + \beta_5 cons_{it} + \beta_6 sav_{it} + \beta_7 vat_{it} + \beta_8 gfcf_{it} + \beta_9 infl_{it} + \beta_{10} trd_{it} + \beta_{11} pols_{it} + \beta_{12} cor_{it} + \beta_{13} rol_{it} + \beta_{14} voa_{it} + \beta_{15} regq_{it} + \beta_{16} gove_{it} + \beta_{17} popg_{it} + \beta_{18} myos_{it} + \beta_{19}\, x\, d_4 + \theta_i + \gamma_t + u_{it} \quad (8)$$

The subsequent analysis delves into the results derived from these models, shedding light on the nuanced dynamics of income inequality across distinct crisis contexts.

5.4.1. Fixed Effects Model

First are estimated the fixed effects models to control for country-fixed effects. There are four models which differ among themselves only by the dummy variable used (Table 10).

Table 11: Fixed Effects Model Results

VARIABLES	(1) FE with dev	(2) FE with cov19	(3) FE with eusdc	(4) FE with gfc
log_gdppc	-1.049*	-0.871	-0.911	-1.038*
	(0.564)	(0.592)	(0.570)	(0.565)
eglo	-0.137***	-0.133***	-0.156***	-0.137***
	(0.0329)	(0.0331)	(0.0350)	(0.0329)
rem	0.142**	0.148***	0.144***	0.142**
	(0.0553)	(0.0556)	(0.0552)	(0.0553)
unempl	0.0854***	0.0830***	0.102***	0.0881***
	(0.0274)	(0.0275)	(0.0293)	(0.0284)
cons	0.0450**	0.0465**	0.0536**	0.0454**
	(0.0219)	(0.0219)	(0.0225)	(0.0219)
vat	-0.0262	-0.0269	-0.0353	-0.0284
	(0.0433)	(0.0433)	(0.0436)	(0.0437)
gfcf	0.000846	0.00163	-0.00813	-0.00172
	(0.0213)	(0.0214)	(0.0220)	(0.0225)
infl	0.0107	0.0104	0.0114	0.01000
	(0.0164)	(0.0164)	(0.0164)	(0.0165)
trd	0.00780	0.00751	0.00792	0.00801
	(0.00560)	(0.00561)	(0.00559)	(0.00564)
pols	0.0208**	0.0199**	0.0229**	0.0201**
	(0.00892)	(0.00896)	(0.00899)	(0.00910)
cor	0.0394**	0.0409**	0.0363*	0.0394**
	(0.0200)	(0.0200)	(0.0200)	(0.0200)
rol	0.0145	0.0124	0.0236	0.0155
	(0.0238)	(0.0239)	(0.0244)	(0.0240)
voa	-0.00806	-0.0107	-0.00511	-0.00833
	(0.0198)	(0.0200)	(0.0198)	(0.0198)
regq	-0.0780***	-0.0756***	-0.0842***	-0.0789***
	(0.0220)	(0.0222)	(0.0223)	(0.0222)
gove	-0.0333**	-0.0354**	-0.0345**	-0.0329*
	(0.0169)	(0.0170)	(0.0169)	(0.0169)
popg	0.610***	0.573***	0.624***	0.613***
	(0.146)	(0.151)	(0.146)	(0.146)
myos	-0.0490	0.00288	-0.103	-0.0222
	(0.157)	(0.165)	(0.160)	(0.173)
D	-	-0.201	-0.265	0.0856
		(0.204)	(0.164)	(0.233)
Constant	51.23***	48.82***	51.28***	50.87***
	(7.030)	(7.443)	(7.020)	(7.104)
Observations	600	600	600	600
R-squared	0.201	0.202	0.205	0.201
Number of c	40	40	40	40

*Notes: Dependent variable is income inequality. *** p<0.01, ** p<0.05, * p<0.1 indicate significance level at 1, 5 and 10 percent level of significance. D stands for dummy variables, column 1 developed/developing countries dummy, column 2 covid-19 dummy, column 3 is the European sovereign debt crisis dummy, column 4 is the global financial crisis dummy. Independent variable Gross domestic savings (as % of GDP) (sav) is omitted by the model. Developed/developing country dummy is also omitted by the model.*

Source: Author's calculation

In the four fixed effects models analyzed, the R-squared (within) values indicate that approximately 20.1% to 20.5% of the variation in the Gini index can be explained by the included independent variables.

Certain variables consistently show statistical significance in explaining income inequality across all models (p-values < 0.05). These variables are related to economic globalization, remittances, unemployment rate, domestic consumption, political stability, regulatory quality, government effectiveness, control of corruption, and population growth rate. They have a meaningful impact on the Gini index within the specific contexts represented by the dummy variables. Additionally, the GDP per capita variable is also statistically significant at 10% level in two of the models, Model 1 and Model 4.

The dummy variables do not appear to have a statistically significant effect on income inequality in the given models (in Model 1 the "dev" dummy variable is even omitted due to collinearity). The gross domestic saving variable is also omitted due to collinearity in all models.

It is important to note that these results may be context-specific, and further research and analysis are needed to understand the complex dynamics of income inequality in each situation represented by the dummy variables.

5.4.2. Random Effects Model

Next are estimated the random effects models. There are again four models which differ among themselves only by the dummy variable used. The results are presented in Table 12.

Table 12: Random Effects Model Results

VARIABLES	(1) RE with dev	(2) RE with cov19	(3) RE with eusdc	(4) RE with gfc
log_gdppc	-0.698	-0.352	-0.370	-0.504
	(0.524)	(0.546)	(0.530)	(0.526)
eglo	-0.118***	-0.112***	-0.136***	-0.116***
	(0.0320)	(0.0324)	(0.0342)	(0.0323)
rem	0.142***	0.124**	0.121**	0.118**
	(0.0539)	(0.0540)	(0.0537)	(0.0538)
unempl	0.107***	0.108***	0.130***	0.115***
	(0.0266)	(0.0270)	(0.0286)	(0.0277)
cons	0.0441**	0.0417*	0.0494**	0.0408*
	(0.0217)	(0.0218)	(0.0223)	(0.0218)
vat	-0.0309	-0.0338	-0.0436	-0.0368
	(0.0426)	(0.0428)	(0.0432)	(0.0433)
gfcf	0.00395	0.00535	-0.00485	0.000348
	(0.0212)	(0.0214)	(0.0220)	(0.0226)
infl	0.00971	0.0122	0.0138	0.0115
	(0.0164)	(0.0165)	(0.0165)	(0.0167)
trd	0.00527	0.00532	0.00596	0.00588
	(0.00510)	(0.00515)	(0.00514)	(0.00518)
pols	0.0159*	0.0158*	0.0195**	0.0158*
	(0.00884)	(0.00895)	(0.00899)	(0.00909)
cor	0.0251	0.0338*	0.0296	0.0325*
	(0.0195)	(0.0195)	(0.0195)	(0.0195)
rol	0.0257	0.0289	0.0409*	0.0328
	(0.0232)	(0.0234)	(0.0239)	(0.0235)
voa	0.00575	0.00168	0.00796	0.00412
	(0.0195)	(0.0198)	(0.0197)	(0.0197)
regq	-0.0700***	-0.0663***	-0.0734***	-0.0695***
	(0.0204)	(0.0206)	(0.0208)	(0.0208)
gove	-0.0313*	-0.0319*	-0.0306*	-0.0288*
	(0.0168)	(0.0171)	(0.0169)	(0.0170)
popg	0.585***	0.552***	0.605***	0.595***
	(0.145)	(0.150)	(0.146)	(0.146)
myos	-0.107	-0.0449	-0.145	-0.0522
	(0.149)	(0.156)	(0.152)	(0.165)
D	5.598***	-0.223	-0.294*	0.143
	(1.774)	(0.203)	(0.163)	(0.234)
Constant	41.17***	40.77***	42.68***	42.39***
	(6.140)	(6.463)	(6.173)	(6.229)
Observations	600	600	600	600
R-squared	0.178	0.105	0.125	0.111
Number of c	40	40	40	40

*Notes: Dependent variable is income inequality. LSDV standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1 indicate significance level at 1, 5 and 10 percent level of significance. D stands for dummy variables, column 1 developed/developing countries dummy, column 2 covid-19 dummy, column 3 is the European sovereign debt crisis dummy, column 4 is the global financial crisis dummy. Independent variable Gross domestic savings (as % of GDP) (sav) is omitted by the model.*

Source: Author's calculation

In the four random effects models analyzed, the R-squared (within) values indicate that approximately 12.5% to 17.8% of the variation in the Gini index can be explained by the included independent variables, which is even less than the R-squared from the fixed effects models. This low explanatory power is suggesting that the remaining percentage of variance is attributed to other factors not accounted for in the models.

In all four models analyzed, the same variables from the fixed effects models are significant as well in the random effects models: economic globalization, remittances, unemployment rate, domestic consumption, political stability, regulatory quality, government effectiveness, and population growth are found to be statistically significant factors influencing income inequality across countries. These variables have a meaningful impact on the Gini index within the respective contexts represented by the dummy variables. However, the relationship between GDP per capita with income inequality is not statistically significant in any of the random effects models.

Additionally, the dummy variables representing the COVID-19 crisis and global financial crisis do not consistently show significant relationships with income inequality. Unlike the results from the fixed effects model, the random effects model shows significance in the development level dummy and the European sovereign debt crisis dummy. This indicated that the developed countries, as represented by the "dev" dummy variable, tend to have higher income inequality compared to developing countries.

It is important to note that these conclusions are based on the specific dataset and model used, and further research may be required to validate and generalize these findings.

5.4.3. The Hausman Test

The Hausman test was conducted for four models to determine whether the fixed effects model or the random effects model is more suitable for the given data. In all four models, the test statistic (chi-squared) was significant, indicating a systematic difference in coefficients between the fixed and random effects models. This suggests that unobserved individual-specific effects, correlated with the independent variables, are present in the data. Consequently, the fixed effects model is preferred as it allows for the inclusion of these unobserved individual-specific effects.

Table 13. Hausman Test Results

	Chi-Sq Statistic	*p*-Values	Type of regression model
Model 1	30.22	0.0248	Fixed effects
Model 2	35.88	0.0048	Fixed effects
Model 3	35.46	0.0054	Fixed effects
Model 4	35.89	0.0047	Fixed effects

Source: Author's calculations

Across the four models examined, compelling statistical evidence emerged to support the superiority of the fixed effects model over the random effects model. In Model 1, the test yielded a p-value of 0.0248, indicating a preference for the fixed effects model. Similarly, Model 2 presented a p-value of 0.0048, leading to the rejection of the null hypothesis in favor of the fixed effects model. Model 3 echoed this trend with a p-value of 0.0054, solidifying the appropriateness of the fixed effects model. Finally, in Model 4, the test's p-value was 0.0047, further affirming the superiority of the fixed effects model when compared to the random effects' alternative. This consistent pattern of results underscores the robustness of the findings in favor of the fixed effects model across various models and reinforces its appropriateness in the analyzed context.

Overall, the systematic differences in coefficients between the fixed and random effects models highlight the importance of selecting an appropriate modeling approach based on the specific dataset and underlying assumptions.

5.4.4. Baseline Regression Models' Comments

The results from the fixed and random effects analysis are presented as a baseline regression to establish a starting point for the analysis. The low R-squared values suggest that the independent variables included in the models explain only a small proportion of the variance in the dependent variable (income inequality). The purpose of showing these results is to demonstrate the limited explanatory power of the baseline models and highlight the need for additional analysis to improve the model's performance. This additional analysis is actually regression analysis using the more complex model of the Least Squares Dummy Variable (LSDV) as an extension of the baseline analysis.

The LSDV model is usually used to control for common external shocks and unobserved country-fixed effects, enabling the identification of individual-country specific and time effects. In this study, the LSDV regression, chosen based on Hausman test results favoring fixed effects, offers a nuanced approach to understanding the impact of various variables on income inequality. Unlike traditional fixed effects models, LSDV allows for the consideration of individual dummy variables for each country, accommodating country-specific effects. The inclusion of interaction terms allows for examining how the relationship between the independent variables and income inequality varies across different entities.

Additionally, the incorporation of interaction terms in LSDV permits a detailed examination of how each independent variable uniquely influences income inequality, providing a comprehensive and context-specific understanding of the dynamics at play. By adding a dummy variable for each country, the models estimate the pure effect of each explanatory variable while accounting for unobserved heterogeneity. Using interaction terms is useful when there is reason to believe that the relationship between the variables differs for different groups, something that this study tries to examine between the two set of countries. This complexity positions LSDV as a tailored version of fixed effects, involving dummy variables for each entity in the panel to capture unobserved heterogeneity.

By employing this technique, the study aims to enhance the robustness and validity of the estimated effects and gain deeper insights into the determinants of income inequality in the developed and developing countries in Europe during crisis periods.

5.5. Regression Analysis Using the Least Squares Dummy Variables (LSDV)

Prior to introducing the interaction terms, the study looks at the Least Squares Dummy Variables (LSDV) model results without interaction terms, introducing only the dummy variables in each of the models (Table 14). First are represented the results of the LSDV model with no dummy variables, followed by the four models where each of the dummy variables is introduced.

Table 14: LSDV Model (with no interaction terms)

VARIABLES	(1) MAIN	(2) DEV	(3) COV	(4) GFC	(5) EUSDC
log_gdppc	-0.907	-0.907	-0.907	-0.907	-0.907
	(0.794)	(0.794)	(0.794)	(0.794)	(0.794)
eglo	-0.189***	-0.189***	-0.189***	-0.189***	-0.189***
	(0.0377)	(0.0377)	(0.0377)	(0.0377)	(0.0377)
rem	0.152***	0.152***	0.152***	0.152***	0.152***
	(0.0563)	(0.0563)	(0.0563)	(0.0563)	(0.0563)
unempl	0.0773**	0.0773**	0.0773**	0.0773**	0.0773**
	(0.0308)	(0.0308)	(0.0308)	(0.0308)	(0.0308)
sav	-0.0726***	-0.0726***	-0.0726***	-0.0726***	-0.0726***
	(0.0239)	(0.0239)	(0.0239)	(0.0239)	(0.0239)
vat	-0.0596	-0.0596	-0.0596	-0.0596	-0.0596
	(0.0450)	(0.0450)	(0.0450)	(0.0450)	(0.0450)
gfcf	-0.00270	-0.00270	-0.00270	-0.00270	-0.00270
	(0.0229)	(0.0229)	(0.0229)	(0.0229)	(0.0229)
infl	0.0214	0.0214	0.0214	0.0214	0.0214
	(0.0174)	(0.0174)	(0.0174)	(0.0174)	(0.0174)
trd	0.00430	0.00430	0.00430	0.00430	0.00430
	(0.00633)	(0.00633)	(0.00633)	(0.00633)	(0.00633)
pols	0.0281***	0.0281***	0.0281***	0.0281***	0.0281***
	(0.00956)	(0.00956)	(0.00956)	(0.00956)	(0.00956)
cor	0.0418**	0.0418**	0.0418**	0.0418**	0.0418**
	(0.0201)	(0.0201)	(0.0201)	(0.0201)	(0.0201)
rol	0.0167	0.0167	0.0167	0.0167	0.0167
	(0.0253)	(0.0253)	(0.0253)	(0.0253)	(0.0253)
voa	0.00643	0.00643	0.00643	0.00643	0.00643
	(0.0204)	(0.0204)	(0.0204)	(0.0204)	(0.0204)
regq	-0.0854***	-0.0854***	-0.0854***	-0.0854***	-0.0854***
	(0.0225)	(0.0225)	(0.0225)	(0.0225)	(0.0225)
gove	-0.0467***	-0.0467***	-0.0467***	-0.0467***	-0.0467***
	(0.0174)	(0.0174)	(0.0174)	(0.0174)	(0.0174)
popg	0.539***	0.539***	0.539***	0.539***	0.539***
	(0.153)	(0.153)	(0.153)	(0.153)	(0.153)
myos	-0.251	-0.251	-0.251	-0.251	-0.251
	(0.212)	(0.212)	(0.212)	(0.212)	(0.212)
D	**-**	**17.91*** **	**0.685**	**0.398**	**0.786*** *
		(3.315)	**(0.449)**	**(0.383)**	**(0.383)**
Constant	49.86***	49.86***	49.86***	67.72***	49.86***
	(8.277)	(8.277)	(8.277)	(10.63)	(8.277)
Observations	600	600	600	600	600
R-squared	0.915	0.915	0.915	0.915	0.915

*Notes: Dependent variable is income inequality. LSDV standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1 indicate significance level at 1, 5 and 10 percent level of significance. D stands for dummy variables, column 1 developed/developing countries dummy, column 2 covid-19 dummy, column 3 is the European sovereign debt crisis dummy, column 4 is the global financial crisis dummy. Independent variable Domestic consumption expenditure (as % of GDP) (cons) is omitted by the model. Developed/developing country dummy is also omitted by the model.*

Source: Author's calculation

The overall model fit is good, as indicated by the high R-squared value of 0.9148, suggesting that 91.48% of the variation in the Gini index is explained by the included variables. The F-statistic of 81.17 is highly significant (p-value=0.0000), indicating that the model as a whole is statistically significant.

The results indicate several significant determinants of income inequality in the European countries. Variables such as economic globalization (eglo), remittances (rem), unemployment (unempl), gross domestic savings (sav), population growth (popg), and certain governance measures (political stability, control of corruption, regulatory quality, and government effectiveness) show significant associations with income inequality.

Economic globalization, measured by the economic globalization index (eglo), is found to have a statistically significant negative association with the Gini index. This suggests that increased economic integration through trade, FDI, and global supply chains can reduce inequality by increasing competition, innovation, and opportunities for poorer workers. The finding that economic globalization is associated with lower income inequality is consistent with some previous studies (Korzeniewicz and Moran, 2007) but contrasts with others (Firebaugh and Goesling, 2007; Higgins and Williamson, 1999; Blackman, 2007; Dorn, Fuest and Potrafke, 2022).

Unemployment (unempl) has a statistically significant positive correlation with income inequality. This aligns with theories that job losses and economic downturns disproportionately impact vulnerable groups, widening income gaps. Policy interventions to reduce unemployment may therefore be crucial in mitigating income disparity. High unemployment disproportionately impacts those with lower skills and education levels, who typically have fewer fallback options and savings. This increases income gaps between employed and unemployed workers as well as between high- and low-skilled workers. Targeted job programs, education/training incentives, and social safety nets can mitigate these inequality effects. The positive relationship between unemployment and inequality agrees with much of the existing literature (Cardoso, et al., 1995; Cornia, 2004; Stiglitz, 2012).

Remittances (as a % of GDP) (rem) likewise exhibit a statistically significant positive relationship with income inequality (Koczan and Loyola, 2018; Stark, et al., 1986). Large remittance inflows may accentuate economic divides within recipient countries depending on how the funds are utilized and distributed. This highlights the need for policy consideration of remittances' distributive effects. Remittances tend to benefit recipients in the upper half of the income distribution more than the poor, as poor households often lack the resources to effectively leverage remittances. Remittances can also cause real exchange rate appreciation that hurts exports and formal jobs for lower-income workers. Policies redirecting remittances to investment and labor-intensive sectors can reduce these unequal impacts.

Some of the measures of governance quality exhibit statistically significant negative associations with income inequality, suggesting that effective institutions and policies may play a role in equalizing incomes and opportunities (Rosser and Rosser, 2001; Samanchuk, 2016; Hung, et al., 2020; Khan, et al., 2023; Sanchari, 2023). However, other governance indicators like rule of law (rol) and voice and accountability (voa) were not found to significantly impact inequality in the studied countries. Effective regulations, market interventions, and public services tend to increase incomes at the bottom more than the top, reducing inequality. However, good governance alone is insufficient; it must be paired with redistributive policies and institutions that directly aim to equalize opportunities and outcomes.

Population growth rate (popg) shows a statistically significant positive correlation with inequality (Alderson and Nielsen, 1995; Deaton and Paxson, 1997, Buchevska, 2019, Sadiku, et, al. 2023), indicating that rapid demographic changes may compound existing economic disparities in these economies.

Overall, the results point to a mix of global, macroeconomic, and governance determinants of income disparities in the European context, highlighting diverse policy levers that can potentially mitigate inequality given context-specific conditions and constraints within the studied countries.

The second, third, fourth and fifth model show only the difference in the dummy variables, indicating if there are any differences in these effects between the countries or the time periods.

Model with Developed/Developing Country Dummy (DEV): In the model with the added variable "dev," which represents the developed/developing country dummy, the study analyzes whether there is a difference in the relationship patterns of income inequality and its determinants in European countries based on their development levels. The results show that the coefficient for the "dev" dummy variable is positive and statistically significant at 1% level, with an estimated value of approximately 17.91. This indicates that, on average, the income inequality in developed European countries is approximately 17.91 units higher than in developing European countries, holding all other factors constant. The presence of a statistically significant coefficient for the "dev" dummy suggests that there is indeed a difference in the relationship patterns of income inequality and its determinants between developed and developing European countries.

Model with COVID-19 Crisis Dummy (COV19): In the model with the added COVID-19 crisis dummy variable (cov19), the study investigates whether the COVID-19 pandemic has a significant impact on income inequality in European countries. The results indicate that the coefficient for cov19 is positive and insignificant, suggesting that the COVID-19 crisis may not have had an effect on income inequality in Europe.

Model with Global Financial Crisis Dummy (GFC): In the model with the added Global Financial Crisis dummy variable (gfc), the study investigates whether the Global Financial Crisis had a significant impact on income inequality in European countries. The results indicate that the coefficient for gfc is positive and insignificant, suggesting that the Global Financial Crisis may not have had a significant impact on income inequality in Europe during the period studied.

Model with European Sovereign Debt Crisis Dummy (EUSDC): In the model with the added European Sovereign Debt Crisis (eusdc) dummy variable, the study investigates whether this specific crisis had a significant impact on income inequality in European countries. The results indicate that the European sovereign debt crisis dummy (eusdc) is statistically significant suggesting that the crisis period was associated with higher income inequality. This indicates a unique impact of the European debt crisis on income inequality, distinct from other global economic shocks. This indicates that, after controlling for the other variables in the model, the European sovereign debt crisis period from 2009 to 2014 had a significant impact on the Gini coefficient and income inequality.

5.5.1. LSDV Model with Interaction Terms

The study continues with the LSDV model with the interaction terms to distinguish the effect of the economic development, macroeconomic, demographic and the governance variables on the income inequality, concerning the developed/developing countries, the COVID-19 period, the Eurozone sovereign debt crisis period and the global financial crisis period. To do this, in the models are included the interaction terms between the respective dummy variables and the continuous variables (Dauti & Elezi, 2022). By these interactions, the study tests the hypothesis that the effect of these variables on the income inequality is different among different periods distinguished with crisis factors and among countries with different development level.

Following are the LDSV regression models with interaction terms separately for the economic development variables, the macroeconomic variables, the demographic variables and the governance variables.

5.5.1.1.LSDV Model with the Interaction Terms Between Economic Development and Dummy Variables

Table 15 shows the results from the models with interaction term between the economic development variable, i.e. GDP per capita and all the dummy variables. These models investigate whether the impact of the economic development variable on income inequality differentiates regarding the development level of the countries and the crisis and non-crisis periods.

Table 15: LSDV Model with interaction terms between GDP per capita and dummy variables

	(1)	(2)	(3)	(4)
VARIABLES	EDEV_DEV	EDEV_COV	EDEV_EUSDC	EDEV_GFC
log_gdppc	-2.444**	-0.762	-0.430	-1.112
	(1.176)	(0.807)	(0.799)	(0.789)
eglo	-0.188***	-0.185***	-0.184***	-0.213***
	(0.0377)	(0.0379)	(0.0374)	(0.0381)
rem	0.101	0.153***	0.171***	0.174***
	(0.0631)	(0.0563)	(0.0560)	(0.0562)
unempl	0.0729**	0.0726**	0.0529*	0.0768**
	(0.0309)	(0.0312)	(0.0314)	(0.0306)
sav	-0.0725***	-0.0733***	-0.0740***	-0.0903***
	(0.0239)	(0.0239)	(0.0237)	(0.0243)
vat	-0.0588	-0.0569	-0.0426	-0.0583
	(0.0449)	(0.0451)	(0.0448)	(0.0446)
gfcf	-0.00702	-0.00768	-0.0144	0.0178
	(0.0230)	(0.0234)	(0.0229)	(0.0235)
infl	0.0165	0.0208	0.0248	0.0218
	(0.0176)	(0.0175)	(0.0173)	(0.0173)
trd	0.00304	0.00376	0.00347	0.00821
	(0.00635)	(0.00635)	(0.00627)	(0.00638)
pols	0.0287***	0.0277***	0.0284***	0.0304***
	(0.00954)	(0.00957)	(0.00946)	(0.00950)
cor	0.0364*	0.0421**	0.0451**	0.0457**
	(0.0203)	(0.0201)	(0.0199)	(0.0200)
rol	0.0158	0.0159	-0.000284	0.00505
	(0.0252)	(0.0253)	(0.0255)	(0.0253)
voa	0.00869	0.00552	0.00644	0.00238
	(0.0204)	(0.0204)	(0.0202)	(0.0202)
regq	-0.0858***	-0.0865***	-0.0875***	-0.0752***
	(0.0225)	(0.0225)	(0.0223)	(0.0225)
gove	-0.0451***	-0.0491***	-0.0430**	-0.0527***
	(0.0174)	(0.0176)	(0.0173)	(0.0173)
popg	0.456***	0.524***	0.445***	0.521***
	(0.160)	(0.154)	(0.154)	(0.152)
myos	-0.248	-0.235	-0.174	-0.252
	(0.211)	(0.212)	(0.211)	(0.210)
log_gdppc*D	2.020*	0.200	-0.441***	0.632***
	(1.142)	(0.202)	(0.129)	(0.194)
Constant	63.11***	64.92***	62.85***	65.35***
	(10.89)	(11.39)	(10.58)	(10.52)
Observations	600	600	600	600
R-squared	0.915	0.915	0.917	0.917

*Notes: Dependent variable is income inequality. LSDV standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1 indicate significance level at 1, 5 and 10 percent level of significance. D stands for dummy variables, column 1 developed/developing countries dummy, column 2 covid-19 dummy, column 3 is the European sovereign debt crisis dummy, column 4 is the global financial crisis dummy. Interaction terms are between economic development variables and dummy variables. Independent variable Domestic consumption expenditure (as % of GDP) (cons) is omitted by the model.*

Source: Author’s calculation

The overall model fit is good, as indicated by the high R-squared value of 0.915 (0.917), suggesting that 91.5% (91.7%) of the variation in the income inequality is explained by the economic development. The results indicate significant impact of the same determinants evaluated as significant in the previous models: economic globalization, remittances, unemployment, gross domestic savings, population growth, and the same governance indicators (political stability, control of corruption, regulatory quality and government effectiveness). The GDP per capita, as proxy for economic development, is significant only in the model incorporating the developed/developing country dummy.

More important, these models show the differences between the impact of the economic development variable between the developed and developing countries, as well as between the crises and non-crises periods. The results of the interaction terms are interpreted using the following formula:

$$\textit{Variable with Interaction Term} = \textit{Variable} + \textit{Dummy Variable} \times \textit{Interaction Coefficient}$$

The interaction term of the natural logarithm of GDP per capita (log_gdppc) with the developed/developing country dummy is positive and statistically significant at a 10% level of significance. The estimated coefficient of the interaction term between log_gdppc and developed countries is -0.424 (-2.444 + 2.020 × 1), whereas for the benchmark category of developing countries, the income inequality growth effect of log_gdppc is estimated to be -2.444 (-2.444 - 2.020 × 0). This suggests that a 10% increase in log_gdppc *decreases* income inequality in the developed countries by 4.24 percent, on average, while it *decreases* income inequality by 24.44% in developing countries, holding other variables constant.

The interaction term with the COVID-19 dummy is not statistically significant. Since the coefficient is not statistically significant, we cannot make any robust conclusions about the impact of log_gdppc on income inequality during the COVID-19 pandemic.

The interaction terms with the European sovereign debt crisis (EUSDC) and the global financial crisis (GFC) are statistically significant at a 1% level of significance. The estimated coefficients of the interaction terms between GDP per capita and the EUSDC and GFC periods are -0.871 (-0.430 – 0.441 × 1) and -0.480 (-1.112 + 0.632 × 1), respectively, whereas for the benchmark category of non-crisis years, the income inequality growth effect of the GDP per capita is estimated to be -0.430 (-0.430 – 0.441 × 0) for the EUSDC period and -1.112 (- 1.112

+ 0.632 × 0) for the GFC period. This indicates that during the European sovereign debt crisis and the global financial crisis, the effect of economic development proxied by GDP per capita on income inequality is estimated to be a decrease of 8.71% and 4.80%, respectively, while in non-crisis years, a decrease of 4.3% for the non-EUSDC period and 11.12% for the non-GFC period. Hence, an increase in economic development during the crises leads to a significant *increase* in income inequality, whereas in non-crisis years, economic development *decreases* income inequality.

5.5.1.2. LSDV Models with the Interaction Terms Between the Macroeconomic and the Dummy Variables

In the model with interaction term between the macroeconomic variables, i.e. economic globalization, remittances, unemployment, gross domestic savings, VAT, gross fixed capital formation, and inflation, with the dummy variables. This model investigates whether the impact of these set of variables on income inequality differentiates regarding the development level of the countries and the crisis and non-crisis periods.

The overall model fit is good, as indicated by the high R-squared values, suggesting that around 92.1% to 93.2% of the variation in the income inequality is explained by the macroeconomic variables.

Table 16: LSDV Model with interaction terms between macroeconomic and the dummy variables

VARIABLES	(1) MAC_DEV	(2) MAC_COV	(3) MAC_EUSDC	(4) MAC_GFC
log_gdppc	-1.007	-0.799	-1.000	0.340
	(0.810)	(0.851)	(0.799)	(0.751)
eglo	-0.195***	-0.186***	-0.189***	-0.169***
	(0.0646)	(0.0380)	(0.0382)	(0.0369)
rem	0.449***	0.152***	0.162***	0.0644
	(0.103)	(0.0569)	(0.0572)	(0.0628)
unempl	-0.0305	0.0793**	-0.0168	0.144***
	(0.0687)	(0.0322)	(0.0355)	(0.0290)
sav	-0.105*	-0.0739***	-0.0730***	-0.102***
	(0.0590)	(0.0244)	(0.0252)	(0.0244)
vat	-0.158	-0.0577	-0.0327	-0.0140
	(0.172)	(0.0452)	(0.0457)	(0.0505)
gfcf	-0.137**	0.00322	-0.0310	-0.00536
	(0.0589)	(0.0239)	(0.0240)	(0.0238)
infl	0.0106	0.0222	0.00985	0.0145
	(0.0304)	(0.0175)	(0.0256)	(0.0163)
trd	-0.0379*	-0.00182	0.00742	0.00571
	(0.0207)	(0.00671)	(0.00648)	(0.00612)
pols	0.0376***	0.0295***	0.0287***	0.0166*
	(0.00976)	(0.00966)	(0.00937)	(0.00881)
cor	0.0479**	0.0470**	0.0225	-0.00463
	(0.0212)	(0.0203)	(0.0201)	(0.0188)
rol	0.0343	0.0190	-0.0111	-0.00810
	(0.0258)	(0.0255)	(0.0256)	(0.0234)
voa	0.00921	0.00681	0.00983	-0.0223
	(0.0214)	(0.0206)	(0.0203)	(0.0189)
regq	-0.101***	-0.0878***	-0.0728***	-0.0204
	(0.0236)	(0.0233)	(0.0225)	(0.0215)
gove	-0.0569***	-0.0539***	-0.0345**	-0.0280*
	(0.0174)	(0.0177)	(0.0175)	(0.0161)
popg	0.207	0.484***	0.539***	0.635***
	(0.166)	(0.157)	(0.155)	(0.142)
myos	-0.220	-0.220	-0.0814	-0.551***
	(0.221)	(0.221)	(0.214)	(0.197)
eglo*D	-0.00534	-0.00333	-0.0111	-0.0104
	(0.0776)	(0.0329)	(0.0191)	(0.0251)
rem*D	-0.734***	-0.0542	-0.0239	0.0866
	(0.148)	(0.0879)	(0.0488)	(0.0550)
unempl*D	0.0912	0.0312	0.130***	-0.364***
	(0.0725)	(0.0524)	(0.0282)	(0.0386)
cons*D	-0.0509	0.00376	-0.0118	0.0678***
	(0.0521)	(0.0282)	(0.0177)	(0.0243)
sav*D	0.0177	0.0383	-0.0271	0.0168
	(0.0790)	(0.0386)	(0.0259)	(0.0263)
vat*D	0.0938	0.0575	-0.0513	-0.0483
	(0.178)	(0.0534)	(0.0377)	(0.0461)
gfcf*D	0.126**	-0.0703	0.0703**	-0.0505
	(0.0615)	(0.0513)	(0.0330)	(0.0399)
infl*D	0.00789	-0.00944	0.00359	0.0459
	(0.0361)	(0.0852)	(0.0318)	(0.0518)
trd*D	0.0387*	0.00330	0.00426	-0.00456
	(0.0212)	(0.00485)	(0.00313)	(0.00455)
Constant	53.48***	67.61***	50.35***	57.98***
	(9.151)	(10.95)	(8.347)	(10.13)
Observations	600	600	600	600
R-squared	0.921	0.917	0.921	0.932

*Notes: Dependent variable is income inequality. LSDV standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1 indicate significance level at 1, 5 and 10 percent level of significance. D stands for dummy variables, column 1 developed/developing countries dummy, column 2 covid-19 dummy, column 3 is the European sovereign debt crisis dummy, column 4 is the global financial crisis dummy. Interaction terms are between macroeconomic variables and dummy variables. Independent variable Domestic consumption expenditure (as % of GDP) (cons) is omitted by the model.*

Source: Author’s calculation

The results indicate significant impact of the same determinants evaluated as significant in the previous models: economic globalization, remittances, unemployment, gross domestic savings, population growth, and the same governance indicators (political stability, control of corruption, regulatory quality and government effectiveness). The GDP per capita, as proxy for economic development, however, is shown as insignificant in these models where interaction terms are included between the macroeconomic and the dummy variables. Additionally, there is significance shown in some new variables (gross fixed capital formation, and mean years of schooling), but only in one of the four models.

Furthermore, these models are important since they show the differences between the impact of these macroeconomic variables on income inequality between the developed and developing countries, as well as between the crises and non-crises periods.

The interaction term of remittances is negative and statistically significant at a 1% level of significance only with the DEV dummy. The estimated coefficient of remittances for the developed countries is -0.235 (0.499 - 0.734 × 1), whereas for the benchmark category of developing countries, the income inequality growth effect of the remittances is estimated to be 0.499 (0.499 - 0.734 × 0). Hence, a 10% increase in the remittances *decreases* income inequality by 2.35% in the developed countries, but *increases* income inequality by 4.99% in the developing countries, holding other variables constant.

The interaction term of unemployment with the EUSDC dummy, as well as the interaction term between unemployment and the GFC dummy are both statistically significant at 1% level of significance. The interaction term between unemployment and the ESUDC dummy is positive and statistically significant, while the interaction term of unemployment with the GFC dummy is negative and statistically significant. The estimated coefficient of unemployment for the European sovereign debt crisis dummy is 0.1132 (-0.0168 + 0.130 × 1), whereas for the non-crisis years, the income inequality growth effect of the unemployment rate is estimated to be -0.0168 (-0.0168 + 0.130 × 0). Hence, a 10% increase in the unemployment rate *increases* income inequality during the European sovereign debt crisis by 1.13%, on average, holding other variables constant, and *decreases* income inequality by 0.168% during the non-crisis years. On the other side, the estimated coefficient of unemployment for the global financial crisis period dummy is -0.220 (0.144 - 0.364 × 1), whereas for the non-crisis years, the income inequality growth effect of the unemployment rate is estimated to be 0.144 (0.144 - 0.364 × 0). Hence, a 10% increase in the unemployment rate *decreases* income inequality during the global financial crisis by 2.2%, on average, holding other variables constant, whereas during the non-crisis years it *increases* income inequality by 1.44%.

Gross fixed capital formation is also statistically significant at 5% level of significance in two of the models, with the DEV dummy and the EUSDC dummy. Both, the interaction term of gross fixed capital formation with the developed/developing country dummy, and the interaction term of gross fixed capital formation with the EUSDC dummy are positive and statistically significant. The estimated coefficient of the interaction term between gross fixed capital formation and developed countries is -0.011 (-0.137 + 0.126 × 1), whereas for the benchmark category of developing countries, the income inequality growth effect of gross fixed capital formation is estimated to be -0.137 (-0.137 + 0.126 × 0). This suggests that a 10% increase in gross fixed capital formation *decreases* income inequality in the developed countries by 0.11%, on average, and in developing countries by 1.37%, on average, holding other variables constant. The estimated coefficient of savings for the European sovereign debt crisis dummy is 0.0393 (-0.0310 + 0.0703 × 1), whereas for the benchmark category of non-crisis years, the income inequality growth effect of gross fixed capital formation is estimated to be -0.0310 (-0.0310 + 0.0703 × 0). Hence, a 10% increase in gross fixed capital formation *increases* income inequality during the European sovereign debt crisis by 0.393%, while it *decreases* income inequality in developing countries by 0.31%, on average, holding other variables constant.

The interaction terms of the other macroeconomic variables suggest that the impact of other macroeconomic variables on income inequality does not significantly differ based on development level or crisis periods.

5.5.1.3. LSDV Models with the Interaction Terms Between the Demographic and the Dummy Variables

In this model are added interaction term between the demographic variables, i.e. population growth and mean years of schooling, with the dummy variables. This model investigates whether the impact of these demographic variables on income inequality differentiates regarding the development level of the countries and the crisis and non-crisis periods.

Table 17: LSDV Model with the interaction terms between the demographic and dummy variables

VARIABLES	(1) DEM_DEV	(2) DEM_COV	(3) DEM_EUSDC	(4) DEM_GFC
log_gdppc	-0.283	-0.738	-0.817	-0.585
	(0.791)	(0.808)	(0.797)	(0.774)
eglo	-0.189***	-0.188***	-0.186***	-0.213***
	(0.0378)	(0.0380)	(0.0378)	(0.0369)
rem	0.125**	0.144**	0.171***	0.172***
	(0.0610)	(0.0565)	(0.0569)	(0.0547)
unempl	0.107***	0.0774**	0.0804**	0.0666**
	(0.0313)	(0.0316)	(0.0327)	(0.0300)
sav	-0.0849***	-0.0764***	-0.0686***	-0.0916***
	(0.0239)	(0.0240)	(0.0239)	(0.0234)
vat	-0.0557	-0.0508	-0.0540	-0.0267
	(0.0442)	(0.0452)	(0.0456)	(0.0443)
gfcf	0.0110	-0.00173	-0.00493	0.00749
	(0.0228)	(0.0230)	(0.0229)	(0.0229)
infl	0.0254	0.0220	0.0211	0.0182
	(0.0172)	(0.0174)	(0.0174)	(0.0169)
trd	0.00262	0.00406	0.00435	0.00762
	(0.00622)	(0.00634)	(0.00633)	(0.00616)
pols	0.0241**	0.0273***	0.0314***	0.0284***
	(0.00942)	(0.00956)	(0.00967)	(0.00926)
cor	0.0559***	0.0494**	0.0335	0.0422**
	(0.0200)	(0.0205)	(0.0205)	(0.0195)
rol	-0.00553	0.0206	0.00421	0.00504
	(0.0255)	(0.0254)	(0.0260)	(0.0248)
voa	0.00785	0.00955	0.00875	0.00691
	(0.0201)	(0.0206)	(0.0205)	(0.0198)
regq	-0.0760***	-0.0888***	-0.0788***	-0.0534**
	(0.0224)	(0.0226)	(0.0229)	(0.0224)
gove	-0.0434**	-0.0491***	-0.0470***	-0.0549***
	(0.0172)	(0.0176)	(0.0174)	(0.0169)
popg	1.986***	0.510***	0.521***	0.565***
	(0.433)	(0.161)	(0.155)	(0.154)
myos	0.357	-0.298	-0.120	-0.630***
	(0.279)	(0.213)	(0.223)	(0.218)
popg*D	-1.612***	0.264	0.0566	0.179
	(0.476)	(0.230)	(0.167)	(0.216)
myos*D	-1.033***	-0.254*	-0.178**	0.666***
	(0.307)	(0.148)	(0.0864)	(0.110)
Constant	66.66***	69.48***	68.21***	60.97***
	(10.43)	(11.07)	(10.74)	(10.36)
Observations	600	600	600	600
R-squared	0.918	0.915	0.916	0.920

*Notes: Dependent variable is income inequality. LSDV standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1 indicate significance level at 1, 5 and 10 percent level of significance. D stands for dummy variables, column 1 developed/developing countries dummy, column 2 covid-19 dummy, column 3 is the European sovereign debt crisis dummy, column 4 is the global financial crisis dummy. Interaction terms are between demographic variables and dummy variables. Independent variable Domestic consumption expenditure (as % of GDP) (cons) is omitted by the model.*

Source: Author’s calculation

The overall model fit is good, as indicated by the high R-squared values, suggesting that around 91.5% to 92% of the variation in the income inequality is explained by the macroeconomic variables.

The results indicate significant impact of the same determinants evaluated as significant in the previous models: economic globalization, remittances, unemployment, gross domestic savings, population growth, and the same governance indicators (political stability, control of corruption, regulatory quality and government effectiveness). The GDP per capita, is again insignificant in these models. Additionally, there is again significance shown in the mean years of schooling only in Model 4 (DEM_GFC).

The importance from these models comes from the fact that they show the differences between the impact of the demographic variables on income inequality between the developed and developing countries, as well as between the crises and non-crises periods.

Population growth has only one significant interaction term, and that one is with the developed/developing country dummy. This interaction term is negative and statistically significant at a 1% level of significance. The estimated coefficient of the interaction term between population growth and developed countries is 0.374 (1.986 – 1.612 × 1), whereas for the benchmark category of developing countries, the income inequality growth effect of population growth is estimated to be 1.986 (1.986 – 1.612 × 0). Hence, a 10% increase in population growth *increases* income inequality in the developed countries by 3.74%, and in developing countries by 19.86%, on average, holding other variables constant. These numbers show that there is a significant difference between the impact on the developed and on the developing countries.

Mean years of schooling, on the other side, has significant interaction terms in all four models. The interaction term of mean years of schooling with the developed/developing country dummy is negative and statistically significant at a 1% level of significance. The estimated coefficient of the interaction term between mean years of schooling and developed countries is -0.676 (0.357 – 1.033 × 1), whereas for the benchmark category of developing countries, the income inequality growth effect of mean years of schooling is estimated to be 0.357 (0.357 – 1.033 × 0). Hence, a 10% increase in mean years of schooling *decreases* income inequality in the developed countries by 6.76%, on average, while it *increases* income inequality in developing countries by 3.57%, on average, holding other variables constant. The interaction term of mean years of schooling with the COVID-19 dummy is statistically significant at a 10% level of significance. The estimated coefficient of the interaction term between mean years of schooling and the COVID-19 period is -0.552 (-0.298 - 0.254 × 1), whereas for the non-COVID-19 years, the income inequality growth effect of mean years of schooling is estimated to -0.298 (-0.298 - 0.254 × 0). This indicates that mean years of schooling is estimated to *decrease* income inequality by 5.52% during the COVID-19 pandemic, and by 2.98% in non-COVID-19 years. The interaction term of mean years of schooling with the European sovereign debt crisis dummy is negative and statistically significant at a 5% level of significance. The estimated coefficient of the interaction term between mean years of schooling and the European sovereign debt crisis period is -0.298 (-0.120 - 0.178 × 1), whereas for the benchmark category of non-EUSDC years, the income inequality growth effect of mean years of schooling is estimated to be is -0.120 (-0.120 - 0.178 × 0). This indicates that during the European sovereign debt crisis period, mean years of schooling *decreased* income inequality by 2.98%, and by 1.2% in the non-crisis years. Last, the interaction term of mean years of schooling with the global financial crisis dummy is positive and statistically significant at a 1% level of significance. The estimated coefficient of the interaction term between mean years of schooling and the global financial crisis period is 0.036 (-0.630 + 0.666 × 1), whereas for the non-GFC years, the income inequality growth effect of mean years of schooling is estimated to be is -0.630 (-0.630 + 0.666 × 0). This indicates that during the global financial crisis period, mean years of schooling *increased* income inequality by 0.36%, while it *decreased* income inequality by 6.3% in the non-crisis years.

5.5.1.4.LSDV Models with the Interaction Terms Between the Political and the Dummy Variables

The regression models with interaction term between the governance variables, i.e. political stability, control of corruption, rule of law, voice and accountability, regulatory quality, and government effectiveness, with the dummy variables investigate whether the impact of these set of variables on income inequality differentiates regarding the development level of the countries and the crisis and non-crisis periods.

Table 18: LSDV Model with the interaction terms between the political and the dummy variables

VARIABLES	(1) POL_DEV	(2) POL_COV	(3) POL_EUSDC	(4) POL_GFC
log_gdppc	-0.0973	-1.165	-1.729**	-1.009
	(0.807)	(0.826)	(0.802)	(0.795)
eglo	-0.210***	-0.180***	-0.192***	-0.192***
	(0.0371)	(0.0385)	(0.0367)	(0.0392)
rem	0.117**	0.138**	0.138**	0.189***
	(0.0563)	(0.0564)	(0.0547)	(0.0578)
unempl	0.0318	0.0788**	0.0702**	0.0620**
	(0.0315)	(0.0312)	(0.0302)	(0.0308)
sav	-0.0802***	-0.0641***	-0.0657***	-0.0866***
	(0.0241)	(0.0241)	(0.0229)	(0.0241)
vat	-0.0411	-0.0562	-0.0777*	-0.0936**
	(0.0435)	(0.0450)	(0.0434)	(0.0462)
gfcf	-0.0303	-0.00697	-0.0127	0.0170
	(0.0224)	(0.0240)	(0.0225)	(0.0240)
infl	0.0246	0.0178	-0.00151	0.0292*
	(0.0173)	(0.0177)	(0.0181)	(0.0175)
trd	0.00691	0.00497	0.00626	0.00483
	(0.00617)	(0.00637)	(0.00612)	(0.00643)
pols	0.00224	0.0234**	0.0241**	0.0215**
	(0.0193)	(0.00974)	(0.0102)	(0.00991)
cor	0.182***	0.0522**	0.0297	0.0488**
	(0.0308)	(0.0209)	(0.0204)	(0.0200)
rol	0.132***	0.00770	0.0277	0.00738
	(0.0504)	(0.0259)	(0.0257)	(0.0258)
voa	0.0608	0.0160	0.000131	0.0106
	(0.0434)	(0.0207)	(0.0218)	(0.0215)
regq	-0.108***	-0.0933***	-0.0940***	-0.0678***
	(0.0364)	(0.0239)	(0.0216)	(0.0230)
gove	-0.139***	-0.0504***	-0.0294	-0.0499***
	(0.0323)	(0.0189)	(0.0181)	(0.0180)
popg	0.493***	0.534***	0.500***	0.526***
	(0.149)	(0.156)	(0.151)	(0.153)
myos	-0.159	-0.236	-0.126	-0.176
	(0.214)	(0.215)	(0.206)	(0.212)
pols*D	0.0108	0.00862	-0.00454	0.0329***
	(0.0216)	(0.0184)	(0.00879)	(0.0119)
cor*D	-0.233***	-0.0396*	0.0691***	0.0343
	(0.0397)	(0.0210)	(0.0168)	(0.0271)
rol*D	-0.156***	0.0464	-0.118***	-0.0201
	(0.0574)	(0.0289)	(0.0193)	(0.0284)
voa*D	-0.0650	-0.0430	0.0423*	-0.0227
	(0.0496)	(0.0399)	(0.0228)	(0.0337)
regq*D	0.0855*	0.0338	-0.000152	-0.0420
	(0.0447)	(0.0248)	(0.0191)	(0.0287)
gove*D	0.136***	-0.00477	-0.00260	0.0304
	(0.0376)	(0.0253)	(0.0208)	(0.0284)
Constant	64.31***	69.86***	76.64***	67.69***
	(10.39)	(10.96)	(10.46)	(10.47)
Observations	600	600	600	600
R-squared	0.923	0.916	0.923	0.918

*Notes: Dependent variable is income inequality. LSDV standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1 indicate significance level at 1, 5 and 10 percent level of significance. D stands for dummy variables, column 1 developed/developing countries dummy, column 2 covid-19 dummy, column 3 is the European sovereign debt crisis dummy, column 4 is the global financial crisis dummy. Interaction terms are between governance variables and dummy variables. Independent variable Domestic consumption expenditure (as % of GDP) (cons) is omitted by the model.*

Source: Author’s calculation

The overall model fit is good, as indicated by the high R-squared values, suggesting that around 91.6% to 92.3% of the variation in the income inequality is explained by the macroeconomic variables.

The results from these models indicate significant impact of the same determinants evaluated as significant in the previous models: economic globalization, remittances, unemployment, gross domestic savings, population growth, and the same governance indicators (political stability, control of corruption, regulatory quality and government effectiveness). The GDP per capita is again significant only in the model that incorporates the interaction terms with the EUSDC dummy. Additionally, there is significance impact of the VAT variable on income inequality in the Model 3 (with the EUSDC interaction terms) and Model 4 (with the GFC interaction terms. Moreover, rule of law is found to have significant impact on income inequality in Model 1 (with the DEV interaction terms) and Model 3 (with the EUSDC interaction terms).

These models are important since that they represent the interaction terms between the governance indicators and the dummy variables, showing if there are differences between the impact of the political variables on income inequality between the developed and developing countries, as well as between the crises and non-crises periods.

Political stability has a significant interaction term only with the global financial crisis (GFC) dummy at a 1% level. The estimated coefficient of the interaction term between political stability and the global financial crisis period is 0.0544 ($0.0215 + 0.0329 \times 1$), whereas for the benchmark category of non-GFC years, the income inequality growth effect of political stability is estimated to be 0.0215 ($0.0215 + 0.0329 \times 0$). This indicates that during the global financial crisis period, the effect of political stability on income inequality is estimated to be an increase of 0.544%, whereas in non-GFC years, the impact is at 0.215%.

Corruption control has significant interaction terms in three of the models. The interaction term of corruption control with the developed/developing country dummy is negative and statistically significant at a 1% level of significance. The estimated coefficient of the interaction term between corruption control and developed countries is -0.051 ($0.182 - 0.233 \times 1$), whereas for the benchmark category of developing countries, the income inequality growth effect of corruption control is estimated to be 0.182 ($0.182 - 0.233 \times 0$). This suggests that a 10% increase in corruption control decreases income inequality in the developed countries by 0.51%, on average, while it increases income inequality in developing countries by 1.82%, on average, holding other variables constant. As for the other interaction terms with the crises periods dummies, the interaction term with the COVID19 crisis and the European sovereign debt crisis dummy are statistically significant at a 10% and 1% level of significance, respectively. The estimated coefficient of the interaction term between corruption control and the European sovereign debt crisis period is 0.0988 (0.0297 + 0.0691 × 1), whereas for the benchmark category of non-EUSDC years, the income inequality growth effect of corruption control is estimated to be 0.0297 (0.0297 + 0.0691 × 0). This indicates that during the European sovereign debt crisis period, the effect of corruption control on income inequality is estimated to be 0.988% increase in the crisis years and 0.297% in the non-crisis years. The estimated coefficient of the interaction term between corruption control and the Covid-19 crisis period is 0.0126 (0.0522 - 0.0396 × 1), whereas for the benchmark category of non-Covid19 years, the income inequality growth effect of corruption control is estimated to be 0. 0522 (0.0522 - 0.0396 × 0). This indicates that during the Covid-19 period, the effect of corruption control on income inequality is estimated to be 0.126% increase in the crisis years and 0.522% in the non-crisis years.

Rule of law has significant interaction term in two models, with the developed/developing country dummy and the European sovereign debt crisis dummy, both interaction terms negative and statistically significant at a 1% level of significance. The estimated coefficient of the interaction term between the rule of law and developed countries is -0.024 (0.132 - 0.156 × 1), whereas for the developing countries, the income inequality growth effect of the rule of law is estimated to be 0.132 (0.132 - 0.156 × 0). This indicates that a 10% improvement in the rule of law decreases income inequality in the developed countries by 0.24%, on average, while it increases income inequality in developing countries by 1.32%, on average, holding other variables constant. The estimated coefficient of the interaction term between the rule of law and the European sovereign debt crisis period is -0.0903 (0.0277 - 0.118 × 1), whereas for the benchmark category of non-EUSDC years, the income inequality growth effect of the rule of law is estimated to be 0.0277 (0.0277 - 0.118 × 0). This indicates that during the European sovereign debt crisis period, the effect of the rule of law on income inequality is estimated to be 0.903% decrease in the crisis years and 0.277% increase in the non-crisis years.

Voice and accountability show a positive and significant interaction term with the European sovereign debt crisis dummy at a 1% level of significance. The estimated coefficient of the interaction term between voice and accountability and the European sovereign debt crisis period is 0.0424 (0.000131 + 0.0423 × 1), whereas for the non-EUSDC years, the income inequality growth effect of voice and accountability is estimated to 0.000131 (0.000131 + 0.0423× 0). This indicates that during the European sovereign debt crisis period, the effect of voice and accountability on income inequality is estimated to be an increase of 0.424%, whereas in the non-crisis years, the impact is negligible at only 0.0013%.

Regulatory quality has a positive and statistically significant interaction term with the developed/developing country dummy at a 10% level of significance. The estimated coefficient of the interaction term between regulatory quality and developed countries is -0.0225 (-0.108+ 0.0855 × 1), whereas for the benchmark category of developing countries, the income inequality growth effect of regulatory quality is estimated to be -0.108 (-0.108+ 0.0855 × 0). This suggests that a 10% increase in regulatory quality decreases income inequality in the developed countries by 0.225%, and in the developing countries by 1.08%, on average, holding other variables constant.

Government effectiveness shows positive and statistical significance in the interaction term only with the developed/developing country dummy at a 1% level of significance. The estimated coefficient of the interaction term between government effectiveness and developed countries is -0.003 (-0.139 + 0.136 × 1), whereas for the benchmark category of developing countries, the income inequality growth effect of government effectiveness is estimated to be -0.139 (-0.139 + 0.136 × 0). This suggests that a 10% increase in government effectiveness decreases income inequality in the developed countries by 0.03%, on average, and by 1.39% in developing countries, holding other variables constant.

It is notable to mention that despite the significance in the interaction terms between the governance indicators and the dummy variables, showing differences in the impact of these variables on income inequality between the developed and developing countries, as well as the crisis and non-crisis periods of the countries, still the effect size of these variables size is relatively weak to almost negligible. This conclusion corresponds with the previous statement in this study that although it is important to have good governance, alone is insufficient since it must be paired with redistributive policies and institutions that directly aim to equalize opportunities and outcomes.

5.5.2. LSDV Models' Comments

The determinants which are found to have significant impact on income inequality in all models are: economic globalization, remittances, unemployment, gross domestic savings, population growth and some of the governance indicators (political stability, control of corruption, regulatory quality, and government effectiveness).

Economic globalization has negative effect on income inequality, suggesting that increased economic integration can reduce income disparities (Korzeniewicz and Moran, 2007).

Unemployment has a positive correlation with income inequality, emphasizing the need for policies to reduce joblessness to mitigate income disparities (Caardoso, et al., 1995; Parker, 1999, Cornia, 2004; Stiglitz, 2012, Buchevska, 2019, Sadiku, et al., 2023).

Remittances, when not effectively distributed, have a positive correlation with income inequality within recipient countries (Koczan and Loyola, 2018; Stark, et al., 1986).

Gross domestic savings is also found to be negative and statistically significant in all LSDV models with interaction terms (Nhan Dang, et al., 2020; Alvarez-Cuadrado and El-Attar Vilalta, 2018).

Governance indicators, when effective, are associated with lower income inequality. Furthermore, political stability (Khan, et al., 2023) and control of corruption (Rosser and Rosser, 2001; Samanchuk, 2016) showed positive impact on income inequality in the LSDV models with interaction terms, while regulatory quality (Sanchari, 2023), and government effectiveness (Le Doan, et al., 2020) stayed consistent with the negative effect on income inequality in all models.

Population growth is positively correlated with income inequality, indicating that rapid demographic changes can exacerbate economic disparities (Alderson and Nielsen, 1995; Deaton and Paxson, 1997, Buchevska, 2019, Sadiku, et, al. 2023).

Additionally, ***GDP per capita***, as proxy for economic development and mean years of schooling, as proxy for education, are found to have negative and statistically significant impact on income inequality in some of the models incorporating interaction terms, suggesting an influence on income inequality during certain crisis or development contexts (Shapiro and Willson, 2005; Barro, 2000; Li et al., 1998; De Gregorio and Lee, 2002, Buchevska, 2019).

Lastly, in only one of the models two other variables show statistical significance, ***rule of law*** which showed positive impact on income inequality, and ***VAT*** which showed negative impact on income inequality.

Finally, ***trade, domestic consumption and voice and accountability*** did not show any significant impact on income inequality in any of the models. The result for trade confirms Krugman (1981) who states that "In contrast to more conventional trade, trade caused by economies of scale and customer needs for variety has no significant effect on income inequality."

Next, the study conducted a series of LSDV regression models with interaction terms to examine the impact of various determinants on income inequality during different crisis periods and among countries with different development levels. Based on the regression models with interaction terms between the suggested determinants on income inequality and the set dummy variables, several conclusions can be drawn:

GDP per capita has a significant impact on income inequality in both developed and developing countries. In developed countries, a 10% increase in GDP per capita leads to 4.2% *decrease* in income inequality, while in developing countries this effect is almost five times larger, contributing to a decrease in income inequality of 24.44%, on average. In terms of the differences between the crises and non-crises periods, GDP per capita is consistent, i.e., it decreases income inequality in both the crises and the non-crises periods (Perotti, 1994; Kuznets, 1995).

Remittances have significant impact on income inequality in both developed and developing countries. They decrease income inequality by 2.35% in developed countries, and by 4.99% in the developing countries.

Unemployment has significant impact on income inequality with the EUSDC dummy. The results show that during the European sovereign debt crisis unemployment *increases* income inequality by 1.132%, but *decreases* it by 0.168% during non-crisis years. The situation is vice versa in terms of the global financial crisis, where unemployment *decreases* income inequality during the global financial crisis years by 2.2%, but *increases* income inequality by 1.44% during the non-crisis period.

Gross fixed capital formation has statistically significant negative impact on income inequality in both set of countries, *decreasing* income inequality by 0.11% in developed and by 1.37% in developing countries. Additionally, gross fixed capital formation has a significant coefficient with the EUSDC dummy, indicating that during the European sovereign debt crisis, gross fixed capital formation *increases* income inequality by 0.39%, however in the non-crisis periods it *decreases* income inequality by 0.31%.

Other macroeconomic variables, such as ***economic globalization, gross domestic savings, VAT, inflation, and trade***, do not show significant differentiation in their impact on income inequality across development levels or crisis periods.

Population growth, as one of the demographic variables, significantly *increases* income inequality in developed countries by 3.74% and by 18.86% in the developing countries.

Mean years of schooling, the other demographic variable shows several significant interaction terms. In terms of the difference on the impact between developed and developing countries, mean years of schooling, a proxy for education, *increases* income inequality by 3.75% in developing countries, but *decreases* income inequality by 6.76% in developed countries. This negative impact is confirmed with the statistically significant interaction terms with the crises periods dummies stating that mean years of schooling *decrease* income inequality during crises and non-crises years.

Political stability, has a slightly larger *positive* impact on income inequality during the global financial crisis (0.54%) compared to non-crisis years (0.215%).

Control of corruption has a significant negative impact on income inequality in developed countries, *decreasing* income inequality by 0.51%, but positive impact in developing countries, *increasing* income inequality by 1.82%. Additionally, corruption control *increases* income inequality during the European sovereign debt crisis slightly more (0.988%) than in the non-crisis period (0.297%).

The ***rule of law*** *decreases* income inequality in developed countries (by 0.504%), while *increases* it in developing countries (by 1.32%). Additionally, the rule of law is shown to *decrease* income inequality during the European sovereign debt crisis (by 0.903%), and *increases* income inequality during the non-European sovereign debt crisis period (by 0.277%).

Voice and accountability has *positive* impact (0.42%) on income inequality during the European sovereign, but a *negligible* impact of 0.0013% increase during the non-crisis years.

Regulatory quality *decreases* income inequality by 0.225% in the developed countries and by 1.08% in developing countries, holding other variables constant.

Government effectiveness *increases* income inequality in the developed countries by 0.323%, while it *decreases* income inequality by 1.39% in developing countries, on average, holding other variables constant.

Overall, the regression results reinforce the importance of considering specific country characteristics and economic contexts when assessing the impact of various factors on income inequality. The models highlight that the relationship between variables and income inequality can vary significantly depending on whether a country is developed or developing and whether it is experiencing a crisis or non-crisis period. This nuanced understanding can be valuable for policymakers aiming to design targeted interventions to address income inequality effectively in different situations.

5.6. Advanced Regression Analysis Using the Two-Step System Generalized Method of Moments (GMM)

To delve deeper into the dynamics of income inequality and enhance the precision of the analysis, the study choses to extend the investigation using the Two-Step System Generalized Method of Moments (GMM) models. While the LSDV models have provided valuable insights into the determinants of income inequality across different contexts, the Two-Step System GMM offers additional advantages. This approach allows to examine how income inequality evolves over time, capturing potential lagged effects of various determinants on income distribution. Moreover, the Two-Step System GMM is adept at managing heteroscedasticity and autocorrelation, providing a robust and accurate framework for understanding the intricate relationship between determinants and income inequality dynamics. By employing this advanced econometric technique, the analysis aims to offer a more nuanced understanding of the temporal aspects and lagged effects, contributing to a comprehensive assessment of the factors shaping income inequality in European countries. GMM offers a dynamic approach by introducing lagged effects, allowing for a more comprehensive understanding of how income inequality evolves over time (Arellano and Bover, 1995; Blundell and Bond, 1998). This modeling choice is particularly crucial for capturing persistence effects and revealing delayed impacts of various explanatory factors.

GMM is tailored for situations characterized by dynamic panel models, "small T, large N" panels, independent variables that are not strictly exogenous (indicating correlation with past and possibly current realizations of the error term), arbitrarily distributed fixed effects, heteroscedasticity, and autocorrelation within panels or groups. By accounting for these complexities, GMM enhances the robustness of the analysis and provides a more accurate representation of the factors influencing income inequality in Europe during crisis periods. With 15 years of data for 40 cross-sectional units (countries or entities), this dataset aligns with the concept of "small T, large N" in panel data analysis.

At the beginning of the study, a correlation matrix was performed and results showed that there is high correlation between the political variables. The use of GMM becomes particularly pertinent in these scenarios where there is correlation, thereby mitigating issues such as omitted variables bias, unobserved panel heterogeneity, and measurement errors, justifying its use in this study.

Table 19 show the system GMM estimates. These estimates report robust two - step GMM estimates which offers standard errors that are robust to heteroscedasticity and serial correlation (Roodman, 2006). The downward bias of standard errors is addressed in the two-step GMM by using the proposed correction term by Windmeijer (2005), which is implemented by the xtabond2 stata command. Following Roodman (2008) suggestion for choosing appropriate system GMM specification, we can choose the appropriate model of the robust system GMM estimates, for interpreting the results (Bowsher, 2002).

Table 19: Twostep System GMM Results

	(1)	(2)	(3)	(4)	(5)
VARIABLES	MAIN	DEV	COV	EUSDC	GFC
L.gini	0.605***	0.652***	0.600***	0.655***	0.635***
	(0.117)	(0.0859)	(0.114)	(0.0875)	(0.0850)
log_gdppc	1.167	1.409**	1.314	1.023	1.196*
	(0.819)	(0.651)	(1.119)	(0.648)	(0.695)
L.eglo	-0.00775	0.00184	-0.00621	-0.000480	0.00171
	(0.0365)	(0.0157)	(0.0377)	(0.0166)	(0.0158)
rem	-0.0135	0.00319	-0.0122	-0.0212	-0.0169
	(0.0467)	(0.0265)	(0.0492)	(0.0225)	(0.0225)
unempl	0.0871***	0.102***	0.0892***	0.0913***	0.0958***
	(0.0255)	(0.0248)	(0.0232)	(0.0224)	(0.0215)
vat	-0.0698	-0.0414	-0.0707	-0.0562*	-0.0566*
	(0.0546)	(0.0272)	(0.0514)	(0.0327)	(0.0314)
gfcf	-0.00932	0.0104	-0.00673	0.00585	0.00481
	(0.0265)	(0.0163)	(0.0281)	(0.0172)	(0.0176)
infl	-0.000477	-0.00103	0.000194	-0.00121	-0.00205
	(0.0131)	(0.0134)	(0.0138)	(0.0131)	(0.0137)
sav	-0.0241		-0.0274		-0.0296*
	(0.0302)		(0.0317)		(0.0179)
trd	-0.000130	-5.64e-05	0.000233	-5.18e-05	-0.000125
	(0.00444)	(0.00183)	(0.00458)	(0.00180)	(0.00180)
pols	-0.0185*	-0.0251**	-0.0200**	-0.0162**	-0.0200***
	(0.00938)	(0.0124)	(0.00985)	(0.00649)	(0.00652)
cor	-0.0494**	-0.0509***	-0.0502**	-0.0395***	-0.0416***
	(0.0206)	(0.0155)	(0.0225)	(0.0123)	(0.0126)
rol	0.0585***	0.0395***	0.0581***	0.0436***	0.0460***
	(0.0185)	(0.0122)	(0.0182)	(0.0136)	(0.0134)
voa	0.0731**	0.0602***	0.0762**	0.0551***	0.0579***
	(0.0305)	(0.0168)	(0.0319)	(0.0158)	(0.0153)
regq	-0.0902**	-0.0747***	-0.0955***	-0.0711***	-0.0772***
	(0.0347)	(0.0191)	(0.0342)	(0.0182)	(0.0183)
gove	-0.00380	-0.00996	-0.00411	-0.00492	-0.00507
	(0.0190)	(0.0109)	(0.0216)	(0.0115)	(0.0115)
popg	-0.00367	0.0455	-0.0153	0.0648	0.0480
	(0.161)	(0.111)	(0.196)	(0.108)	(0.110)
myos	-0.238	-0.190***	-0.233	-0.172***	-0.184***
	(0.170)	(0.0643)	(0.175)	(0.0621)	(0.0600)
pols_dev		0.00782			

		(0.0107)			
cor_dev		0.00688			
		(0.0110)			
pols_cov			0.00725		
			(0.00760)		
cor_cov			-0.00687		
			(0.00679)		
pols_eusdc				-0.00309	
				(0.00719)	
cor_eusdc				0.00212	
				(0.00663)	
pols_gfc					0.0110
					(0.0114)
cor_gfc					-0.00877
					(0.0107)
Constant	6.912	-1.017	5.760	2.582	4.697
	(7.455)	(7.617)	(9.892)	(8.337)	(7.278)
Observations	560	560	560	560	560
Number of c	40	40	40	40	40
AR test (1) in 1st difference	0.026	0.000	0.026	0.000	0.000
AR test (2) in 2nd difference	0.655	0.730	0.663	0.682	0.734
No of instruments	24	26	26	26	26
F statistics, p value	0.000	0.000	0.000	0.000	0.000
Sargan test overd.rest, p	0.386	0.682	0.352	0.672	0.633
Hansen test overd.rest. p	0.567	-	0.538	-	-
Diff. in Hans test for ex. of instr.					
Hans test for excluding groups	0.815	0.677	0.814	0.702	0.684
Difference	0.231	0.451	0.209	0.413	0.378
Gmm (*git*–1, col (1,2))					
Hans test for excluding groups	0.665	0.457	0.618	0.487	0.438
Difference	0.382	0.671	0.374	0.627	0.618
Gmm (*ogit*, col (2,4))					
Hans test for excluding groups	0.199	0.446	0.156	0.468	0.710
Difference	0.694	0.638	0.724	0.617	0.509

*Notes: Dependent variable is income inequality. Z-statistics in brackets, ***, ** and * indicate significance of coefficients at 1, 5 and 10 per cent, respectively. Internal instruments are used for endogenous variables (lagged dependent variable and output gap). Lag limits are 1/2 for the lagged dependent variable and 2/4 for endogenous regressors. The collapse option is always used.*

Source: Author's calculation

The Generalized Method of Moments (GMM) analysis provides valuable insights into the relationships between the main dependent variable and various explanatory factors.

The persistence of income inequality is a prominent finding across all model specifications, as evidenced by the consistently positive and significant coefficients of the lagged Gini coefficient (ranging from 0.600 to 0.655). These values indicate a high degree of persistence in income inequality. A one-unit increase in the Gini coefficient in the previous period leads to an increase in the current period's Gini coefficient by approximately 0.600 to 0.655 units, highlighting the lasting impact of inequality. This result underscores the enduring nature of income inequality, suggesting that higher levels of inequality in one period are likely to lead to higher levels in subsequent periods.

Another notable aspect is the mixed significance of the log of GDP per capita across different models. While it is significant at the 5% level in one model and at the 10% level in another, it remains insignificant in the rest. When significant, the coefficients suggest that a 1% increase in GDP per capita is associated with an increase in the Gini coefficient by about 1.196 to 1.409 units. This relationship, however, seems context-dependent as indicated by its varying significance. This indicates that the relationship between economic prosperity, as measured by GDP per capita, and income inequality is not straightforward and may depend on other contextual factors.

Unemployment emerges as a significant determinant of income inequality in all models. A percentage change in the unemployment rate is associated with an increase in the Gini coefficient by about 0.0871 to 0.102 units, demonstrating a clear positive relationship between unemployment and income inequality in the short-run, at the 1% significance level, on average ceteris paribus. The positive coefficients consistently observed imply that higher unemployment rates are invariably associated with greater income inequality, highlighting the social and economic ramifications of unemployment in the context of income distribution.

The governance indicators exhibit varying degrees of influence across different models. Determinants, such as political stability and absence of violence/terrorism, control of corruption, and regulatory quality, exhibit significant and negative associations with the dependent variable. A one-unit increase in the political stability index leads to a decrease in the Gini coefficient by about 0.0185 to 0.0251 units, indicating the positive impact of political stability on income distribution. A one-unit increase in the corruption control index results in a reduction of the Gini coefficient by approximately 0.0494 to 0.0509 units, highlighting the importance of anti-corruption measures in reducing income disparity. A one-unit improvement in regulatory quality reduces the Gini coefficient by about 0.0711 to 0.0955 units, underscoring the role of effective regulation in promoting more equitable income distribution. On the other side, rule of law, and voice and accountability significantly affect the dependent variable, displaying a positive relationship across all specifications. The positive coefficients here are somewhat counterintuitive, indicating that an increase in the rule of law is associated with an increase in income inequality. A one-unit improvement in the rule of law index increases the Gini coefficient by about 0.0395 to 0.0585 units. This could suggest complex interactions between legal frameworks and income distribution, possibly reflecting unequal access to legal resources. Similarly, a one-unit increase in the voice and accountability index increases the Gini coefficient by approximately 0.0551 to 0.0762 units. This result may point to complexities in how democratic processes and civic participation interact with economic distribution. Still, in general, improvements in all the political factors are associated with reductions in income inequality. This finding points to the crucial role of effective governance in mitigating income disparity.

Variable like the mean years of schooling and value-added tax, demonstrate mixed levels of significance across various models. The mean years of schooling negatively influences the dependent variable for specifications (2), (4) and (5), where it demonstrates negative significance at the 1% level. A one-unit increase in mean years of schooling leads to a reduction in the Gini coefficient by about 0.172 to 0.190 units, highlighting the importance of education in mitigating income disparity. The value-added tax despite its statistical significance in specifications (4) and (5), indicating a negative relationship with income inequality, has a level of significance at only 10%. A one-unit increase in VAT leads to a decrease in the Gini coefficient by approximately 0.0562 to 0.0566 units, suggesting that VAT may have a redistributive effect on income. This negative coefficient for VAT in some models suggests that higher VAT rates are associated with lower income inequality.

Other variables in the study, including lagged economic globalization, remittances, gross fixed capital formation, inflation, trade, population growth, and government effectiveness fail to show significant relationships with the dependent variable.

These results highlight the multifaceted nature of the factors influencing income inequality and the need for a holistic approach in policy formulation.

Furthermore, the diagnostic tests offer compelling evidence supporting the validity of the instruments. The AR (Arellano Bond) tests for autocorrelation in the second differences of variables show no evidence of significant autocorrelation in the model for all specifications.

The number of instruments used in the GMM estimation is higher than the number of groups, indicating that more instruments improve the efficiency and validity of the GMM estimates. Additionally, the F-test indicates that the joint significance of all independent variables in each specification is highly significant ($p < 0.001$), making the model overall statistically significant.

Furthermore, the Sargan test confirms the validity of over-identifying restrictions in the GMM model, as indicated by p-values ranging from 0.352 to 0.682, which suggest that the model's over-identifying restrictions hold in all specifications. The Hansen test for over-identifying restrictions and the Hansen test of the exogeneity of GMM instruments are non-significant ($p > 0.05$) in all models impling that the instruments used in the GMM estimation are correctly chosen and valid in the specifications.

The fact that some of the significant explanatory variables reported in the static panel models become insignificant in the system GMM specification, suggests that some of the explanatory power of the lagged dependent variable is misleadingly attributed to the other variables in the static specification. Therefore, the empirical results of the model imply that some lost dynamics exist in the static panel models, thus endorsing that the empirical findings of the static models should be recognized with vigilance.

Notably, the GMM analysis yields unique information compared to static panel models. It unveils dynamics that may be missed in static specifications, emphasizing the importance of lagged effects in understanding the determinants of income inequality. The lagged Gini coefficient consistently emerges as significant, indicating the persistence of income inequality over time. Key findings from the GMM analysis include varying significance of economic development across specifications, highlighting nuanced impacts. The unemployment rate maintains a consistent positive and significant association with income inequality in all specifications, emphasizing its role as a determinant. Governance indices, including political stability, control of corruption, regulatory quality, rule of law, and voice and accountability, demonstrate significant and distinct associations with income inequality in all specifications. GDP per capita maintains a positive and significant association with income inequality in specifications (2) and (5), while mean years of schooling demonstrate negative and significant association with income inequality in specifications (2), (4) and (5). Additionally, the value-added tax emerges as statistically significant with 10% in specifications (4) and (5), indicating a negative relationship with income inequality.

Since GMM is for short-run effects, the study also does the long-run effects estimation only for the significant variables in the twostep GMM "main" model with no interaction variables. The results from Table 20 offer an insightful comparison between the short-run and long-run effects of various determinants on income inequality, as measured by the Gini coefficient. This comparison is critical for understanding not just the immediate impact of these factors, but also their enduring influence over time.

Table 20: Short run vs long-run effects system GMM dynamic panel estimation results

Variables	Short-run effect	Long-run effect
log_gdppc	1.167	2.735
unempl	0.0871***	0.262***
vat	-0.0698	-0.153***
pols	-0.0185*	-0.057***
cor	-0.0494**	-0.113***
rol	0.0585***	0.132***
voa	0.0731**	0.161***
regq	-0.0902**	-0.205***
myos	-0.238	-0.276

Source: Author's calculation

The long-run estimates confirm the long-run significance of the unemployment rate, VAT, and the government indicators, but shows no long-run effects of GDP per capita and mean years of schooling on income inequality.

Unemployment rate stays as one of the most consistent and significant determinants at the 1% significance level. The short-run effect indicates that a one-unit increase in unemployment rate is associated with an increase in the Gini coefficient by about 0.0871 units, while in the long run, this effect grows to 0.262, on average ceteris paribus, showing a more pronounced impact of unemployment on income inequality over time. These results underscore the detrimental effect of unemployment on income distribution, suggesting that higher unemployment rates exacerbate income disparities, a trend that becomes increasingly evident over time.

VAT although statistically insignificant in the main short-run model, with a negative impact on income inequality, becomes significant in the long-run model. A percentage change in VAT is associated with 0.153 units decrease in income inequality in the long-run, at the 1% significance level, on average ceteris paribus. This long-run effect is both significant and larger in magnitude, suggesting that VAT's redistributive impact on income becomes more substantial over time. This suggests that while the immediate effect of VAT on reducing income inequality may be limited, its role in income redistribution becomes more substantial over time. It highlights VAT's potential as a tool for addressing income inequality, particularly in the long term.

The governance indicators remain statistically significant in the long run models.

The negative coefficients in both short and long run suggest that improvements in political stability are associated with reductions in income inequality, with a stronger effect observed in the long run In the short run, each percentage point increase in political stability decreases the Gini coefficient by 0.0185 units, a finding that is significant at the 10% level. This effect is more pronounced in the long run, where the same increase in political stability leads to a larger reduction in the Gini coefficient by 0.057 units, with this effect being significant at the 1% level. These results underscore the importance of political stability in mitigating income inequality, suggesting that a stable and predictable political environment can foster a more equitable distribution of income.

Corruption control is another critical factor. In the short run, improving corruption control decreases the Gini coefficient by 0.0494 units, significant at the 5% level. The long-run effects are even more substantial, with a decrease of 0.113 units in the Gini coefficient for the same improvement in corruption control, this time significant at the 1% level. This indicates that efforts to curb corruption not only have an immediate positive impact on reducing income inequality but also yield more significant benefits over time.

The influence of regulatory quality is significant and negative. In the short term, improved regulatory quality is associated with a 0.0902 unit decrease in the Gini coefficient, significant at the 5% level. The long-run effect is even stronger, with a 0.205 unit decrease in the Gini coefficient, significant at the 1% level. This indicates that effective and high-quality regulation plays a crucial role in promoting a more equitable income distribution, both in the immediate and longer-term scenarios.

Interestingly, the relationship between the rule of law and income inequality is positive in both time frames. In the short term, an enhancement in the rule of law corresponds to an increase of 0.0585 units in the Gini coefficient, with a higher long-term increase of 0.132 units, both significant at the 1% level. This counterintuitive finding suggests a complex interaction between legal structures and income distribution, potentially indicating that enhancements in legal frameworks might initially favor wealthier segments of society, thereby increasing inequality.

The study finds that higher levels of voice and accountability are correlated with increased income inequality. In the short run, a rise in voice and accountability leads to a 0.0731 unit increase in the Gini coefficient, significant at the 5% level. This effect escalates in the long run, where the increase in the Gini coefficient is 0.161 units, significant at the 1% level. This could reflect the complexities in democratic processes where the benefits of increased civic participation and democratic accountability may not immediately translate into reduced income inequality.

Hence income inequality and unemployment rate, VAT, political stability, control of corruption, regulatory quality, voice and accountability exhibit an inelastic relationship. Additionally, all of these variables have a larger effect on income inequality in the long-run than in the short-run.

Despite the results from these models showing the GDP per capita is statistically significant only in the models where there are interaction terms with the DEV and the GFC dummy variables, it is still worth noting the complex picture of the role of GDP per capita in the context of income inequality. In the short run main model, the analysis reveals that a 1% increase in GDP per capita is associated with an increase of 1.167 units in the Gini coefficient. Moving to the long run, the effect of GDP per capita on income inequality becomes more pronounced, with a significant increase of 2.735 units in the Gini coefficient for the same 1% increase in GDP per capita. This finding aligns with the broader economic narrative, where the initial benefits of economic growth might not be evenly distributed, leading to an increase in income inequality. Over time, as the economy matures and redistributive mechanisms potentially become more effective, the relationship between GDP per capita and income inequality might evolve.

5.7. The Kuznets's Curve Framework

In the study's analysis, the impact of GDP per capita on income inequality demonstrates notable variability across different model specifications, particularly in relation to the inclusion of various interaction terms. Notably, in models incorporating interaction terms with a developed/developing country dummy and those with a global financial crisis dummy variable, GDP per capita emerges as statistically significant. This significance suggests that the effect of economic growth on income distribution is contextually dependent, potentially influenced by a country's development status and specific economic conditions like those during a financial crisis.

Conversely, in models that include interaction terms with the European sovereign debt crisis dummy, the COVID-19 dummy, as well as in models without any interaction terms (across both Least Squares Dummy Variable [LSDV], GMM for short-term, and GMM for long-term effects), GDP per capita shows statistical insignificance. This variation implies that the relationship between GDP per capita and income inequality is not uniform across different economic or crisis conditions. Specifically, it suggests that during periods marked by the sovereign debt crisis or the COVID-19 pandemic, the direct influence of GDP per capita on income inequality may be overshadowed or altered by the overarching economic impacts of these specific events.

Given these observations, it becomes evident that the relationship between GDP per capita and income inequality in European countries may not be linear or straightforward. This leads us to propose a separate examination of this relationship, specifically testing for a quadratic function to validate the Kuznets curve theory. The Kuznets curve hypothesizes an inverted U-shaped relationship between income inequality and economic development: as an economy grows, inequality first increases and then decreases. By conducting this separate analysis, we aim to explore whether the initial rise in inequality observed with economic growth eventually reverses as GDP per capita continues to increase, thus providing empirical evidence for or against the Kuznets hypothesis in the European context. This approach not only addresses the variability in the significance of GDP per capita across different models but also logically leads to the suggestion of further analysis to explore the Kuznets curve hypothesis, which is a valuable addition to understanding the complexities of economic development and income distribution in Europe.

In order to delve deeper into the nature of the relationship between GDP per capita and income inequality in European countries, our study employed the Kuznets curve framework, a method akin to that used by Cassette, Fleury & Petit, (2012). This approach is particularly suited to investigating the hypothesized inverted U-shaped relationship between income levels and income inequality. The Kuznets curve posits that as an economy develops, income inequality initially increases to a certain point and then begins to decrease as the economy reaches higher levels of income.

To test this hypothesis, we conducted a robust analysis using the available European data, focusing on capturing the potentially non-linear relationship between GDP per capita and income inequality. The summary of our findings is presented in Table 21. This table offers a comprehensive view of the estimated relationship between income (as measured by GDP per capita) and income inequality across European nations, in the context of the Kuznets hypothesis. It includes coefficients that describe both the linear and quadratic terms of GDP per capita, allowing us to ascertain whether the data supports the presence of a Kuznets curve in this context.

The interpretation of these results is crucial for understanding the stages of economic development in Europe and their respective impacts on income distribution. It also offers valuable insights into whether the economic growth in these countries follows the path predicted by Kuznets, with implications for policy formulation aimed at mitigating income inequality during different phases of economic development.

Table 21. Kuznets's Curve Framework Results pursuit

```
Median regression
R-squared = .09672567
Number of obs = 600
Objective function = 1.7170297

                     Heteroskedasticity robust standard errors
------------------------------------------------------------------------------
        gini |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   log_gdppc |   28.59046   7.606074     3.76   0.000     13.65255    43.52838
  log_gdppc2 |  -1.525438   .3852327    -3.96   0.000    -2.282014   -.7688617
       _cons |  -100.3633   37.24539    -2.69   0.007    -173.5112   -27.21538
------------------------------------------------------------------------------

Machado-Santos Silva test for heteroskedasticity
         Ho: Constant variance
         Variables: Fitted values of gini and its squares

         chi2(2)      =  75.471
         Prob > chi2  =   0.000
```

Source: Author's calculations

The regression results reveal a nuanced dynamic between economic development and income distribution. The linear term of GDP per capita (log_gdppc) enters the model with a coefficient of 28.59046, which is statistically significant (p-value < 0.001). This positive coefficient indicates that, initially, as GDP per capita increases, there is a corresponding rise in the Gini coefficient, implying an increase in income inequality. The magnitude of this effect is substantial, with a one percent increase in GDP per capita expected to increase the Gini coefficient by approximately 28.59 units, holding other factors constant.

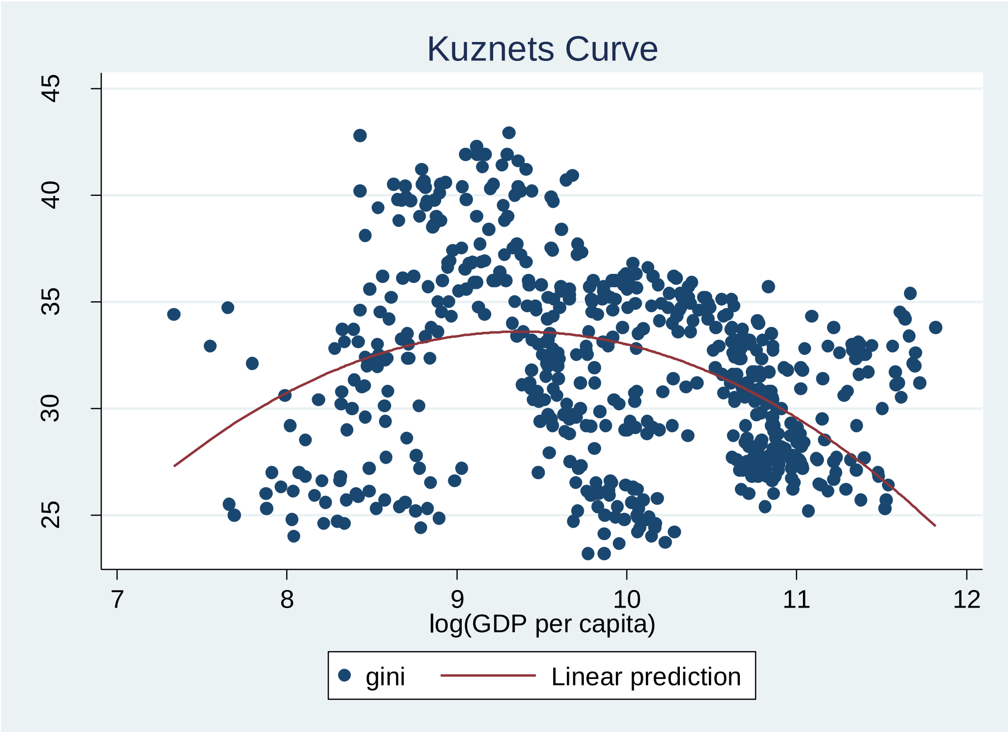
However, the inclusion of the quadratic term of GDP per capita (log_gdppc2) introduces a critical inflection point in this relationship. The quadratic term carries a coefficient of -1.525438, which is also statistically significant (p-value < 0.001). The negative sign of this coefficient suggests the presence of an inverted U-shaped relationship, as posited by Kuznets. As GDP per capita continues to rise, the rate of increase in income inequality diminishes, eventually leading to a reduction in inequality. This quadratic function is characterized by the coefficients -100.3, 28.5, and -1.5 for $\beta 0$, $\beta 1$, and $\beta 2$ respectively, all of which are significant at the zero threshold (p-values 0.000). Given that $\beta 1$ is positive, $\beta 2$ is negative, and the constant $\beta 0$ is significantly less than zero, the model suggests the existence of an inverted U-shaped curve, aligning with Kuznets' theory.

The R-squared value is approximately 0.097, which suggests that around 9.7% of the variation in the Gini coefficient is explained by the model. Although this R-squared value is relatively low, it is important to contextualize it within the broader scope of our study. The main analysis of the study considers seventeen other determinants that contribute to income inequality, beyond GDP per capita alone. The inclusion of these additional factors is predicated on the understanding that income inequality is a multifaceted issue, influenced by a complex interplay of various socio-economic and political factors. Therefore, while the GDP per capita is indeed a significant predictor as evidenced by its robust coefficients, its solitary explanatory power as reflected in the R-squared value should be viewed in light of the study's comprehensive analysis that encompasses a wider array of influencing variables.

Furthermore, the Machado–Santos Silva test for heteroskedasticity returns a chi-squared value of 75.471, with a p-value of 0.000, signaling the presence of heteroskedasticity within the model. This suggests that the variance of the residuals is not constant across the range of GDP per capita. However, the regression's robust standard errors have been adjusted to account for this heteroskedasticity, ensuring that the coefficient estimates remain reliable.

To visually complement the quantitative findings of our analysis, the results have been graphically represented to illustrate the quadratic relationship between GDP per capita and income inequality as predicted by the Kuznets curve (Figure 10). This graphical depiction serves to enhance the interpretability of the regression outcomes and to provide an intuitive understanding of the complex dynamics at play.

Figure 10. Illustrating the Kuznets Curve in European Countries



Source: Author's calculations

The scatter plot displays individual data points representing the Gini coefficient against the logarithm of GDP per capita for the observed European countries. Overlaying these data points is a fitted curve that depicts the predicted values based on our median regression model, which includes both the linear and quadratic terms of GDP per capita.

Observing the graph, one can see the initial upward slope of the curve as GDP per capita increases, corresponding to the positive coefficient of the linear term. This initial rise captures the essence of the Kuznets hypothesis — that income inequality tends to increase in the early stages of economic development. As GDP per capita continues to grow, the curve reaches a peak and then begins to descend, reflecting the negative coefficient of the quadratic term. This descent illustrates the reduction in income inequality at higher levels of income, completing the inverted U-shape predicted by the Kuznets curve.

It is important to note the dispersion of data points around the fitted curve, which reflects the variability in income inequality that cannot be explained by GDP per capita alone. This dispersion underscores the presence of other contributing factors to income inequality, consistent with the relatively low R-squared value from the regression analysis. Nevertheless, the clear inverted U-shaped trajectory of the curve provides a compelling visual confirmation of the Kuznets curve in the European context, aligning with the regression results that indicate a non-linear relationship between economic development and income distribution.

The empirical results from the previous analyses in the study using different models, which suggest that economic development decreases income inequality in both developed and developing countries—with a markedly stronger impact in the latter, are in coordination with the conclusion from this figure that there is an inverted U-shaped relationship between GDP per capita and income inequality. This resonates with the established theories of income distribution, particularly the Kuznets Curve hypothesis, which posits that income inequality will exhibit a particular trajectory through the stages of a country's economic development. The Kuznets Curve, proposed by economist Simon Kuznets, suggests that income inequality follows a specific pattern as a country undergoes economic development. According to this theory, in the early stages of economic development, income inequality tends to increase as some individuals and groups benefit more from economic growth than others. However, as a country continues to develop, income inequality is expected to decrease. This decrease is often attributed to factors like increased access to education, the growth of a middle class, and more equitable distribution of wealth. Furthermore, progressive taxation and other redistributive policies tend to become more effective and widespread as institutions mature and governance improves.

So, the results support the Kuznets Curve hypothesis and reinforce the idea that economic development can be a powerful force in reducing income inequality, especially in developing nations.

5.8. Discussion of the Results

The empirical findings from the regression analyses using the Least Squares Dummy Variable (LSDV) models and the Generalized Method of Moments (GMM) have provided a multifaceted view of the determinants of income inequality within European countries. The results have substantiated several significant relationships, affirming the complexity of factors that drive income disparities.

Economic globalization, unemployment, remittances, gross domestic savings, and certain governance indicators, alongside population growth, have been identified as impactful determinants across all models. These determinants, through their individual and interactive effects, reveal the interplay between macroeconomic forces, demographic shifts, and governance quality in shaping income distribution.

The observed negative effect of economic globalization on income inequality aligns with theories that suggest increased economic integration can lead to a more equitable distribution of wealth. Unemployment's positive correlation with income inequality underscores the social and economic importance of employment for achieving equitable growth. The influence of remittances, while context-dependent, has been noted to exacerbate income inequality when not effectively distributed. Governance quality measures have consistently shown an association with lower income inequality, emphasizing the role of political stability, control of corruption, regulatory quality, and government effectiveness. However, the rule of law and voice and accountability presented more nuanced impacts, with certain models indicating a positive relationship with income inequality.

GDP per capita's mixed significance across models brings to light the conditional nature of economic development's impact on inequality. The results indicate that during certain crises or developmental contexts, GDP per capita can have a significant influence on reducing income disparities. This highlights the need for a context-sensitive understanding of economic growth's role in influencing income distribution.

Further, the GMM analysis has provided insights into the dynamics of income inequality, illustrating the persistence of inequality over time as well as the significant short-run and long-run effects of various determinants. The consistently significant lagged Gini coefficient across all GMM models speaks to the enduring nature of income inequality, while the varied significance of GDP per capita suggests a complex relationship with economic prosperity

5.8.1. Answers to the Research Questions

The discussion of these results answers this study's research questions and research hypotheses.

a. Answer to the First Research Question

The first research question is "Which are the most significant determinants of income inequality in Europe in the period of crisis in the 21st century?". In response to this question, the empirical analysis has delineated a multifactorial landscape.

From the macroeconomic determinants, the most significant across all models were economic globalization, unemployment, remittances, and gross domestic savings. Economic globalization emerged as a significant determinant with a negative sign, suggesting that deeper economic integration could contribute to narrowing income disparities in Europe, in accordance with Korzeniewicz and Moran (2007). Domestic savings also negatively correlated with income inequality, aligning with findings by Nhan Dang et al. (2020) and Alvarez-Cuadro (2018), suggesting that higher savings rates may be indicative of a more equitable income distribution. Conversely, remittances showed a positive relationship with income inequality, a result that is consistent with the work of Koczan and Loyola (2018) and Stark et al. (1986), indicating that the impact of remittances on income distribution can be unequal. Unemployment was another determinant with a positive and significant correlation with income inequality, echoing the extensive literature on the subject (Cardoso et al., 1995; Parker, 1999; Cornia, 2004; Stiglitz, 2012; Buchevska, 2019; Sadiku et al., 2023). Other macroeconomic factors like gross fixed capital formation and value-added tax demonstrated significance in only a few of the models. Gross fixed capital formation exhibited a small but significant negative effect on income inequality in the static models, which was slightly more accentuated in developing countries, indicating that investments in capital assets may help reduce income disparities. Value-Added Tax, on the other side, demonstrated a significant negative impact on income inequality during the EUSDC and GFC years, both in the static and the dynamic models in the long-run model, suggesting its potential role as a fiscal tool for redistributive purposes during times of economic turmoil and as an effective tool against income inequality in the long-run. The rest of the macroeconomic determinants, such as, trade, inflation and gross domestic consumption, did not exhibit any significant impact on income inequality across any models. The insignificance of trade's impact on income inequality lends empirical support to Krugman's (1981) contention that certain forms of trade do not substantially affect income distribution.

From the demographic determinants, population growth has shown consistently positive and statistically significant impact in the context of income inequality, which corroborates the findings of Alderson and Nielsen (1995); Deaton and Paxson (1997); Buchevska, 2019; Sadiku et al. (2023), and many more. The other demographic determinant, mean years of schooling, which was used as a proxy for education, showed a significant negative impact on income inequality only in the short-run models with interaction terms, particularly during the European sovereign debt crisis (EUSDC) and the global financial crisis (GFC) (Shapiro and Willson, 2005; Barro, 2000; Li et al., 1998; De Gregorio and Lee, 2002).

From the political determinants, also known as governance indicators, the most significant across all models were regulatory quality, government effectiveness, political stability and control of corruption. Regulatory control and government effectiveness displayed consistent negative associations with income inequality, resonating with the research by Sanchari (2023) and Le Doan et al. (2020), respectively, highlighting the role of effective governance in promoting equity. Political stability and control of corruption, interestingly, presented positive impacts on income inequality in the models with interaction terms, a finding that invites further scrutiny (Khan et al., 2023; Rosser and Rosser, 2001; Samanchuk, 2016). From the other political variables that showed significance in only some of the models, is the rule of law, although with a bifurcated impact. In both static and dynamic models, rule of law showed a positive significant effect on income inequality in developed countries during non-crisis years and a negative effect in developing countries during the EUSDC (Sonora, 2019). The sixth governance indicator, voice and accountability, showed significant positive impact on income inequality only in the dynamic models.

The only determinant for economic development, the GDP per capita, exhibited a nuanced response across the various econometric models employed in this study. Its impact on income inequality within Europe throughout the crises of the 21st century was multifaceted, reflecting the intricate relationship between economic growth and income distribution. In the Least Squares Dummy Variable (LSDV) models, GDP per capita displayed a negative and statistically significant impact on income inequality in certain models, particularly those incorporating interaction terms. This suggests that economic development, to a certain extent, contributes to reducing income inequality, with the effect being contextually sensitive.

Notably, the negative impact was more pronounced in models capturing the dynamics of developing countries, indicating a differential effect of economic growth on income disparities based on the development stage of a country. Transitioning to the dynamic panel models, the Generalized Method of Moments (GMM) offered additional insights. In the short run, GDP per capita was significant in certain model specifications, illustrating that economic prosperity can indeed influence the distribution of income. However, the significance was not uniform across all models, indicating that other factors may play intervening roles in shaping this relationship. Notably, in the GMM long-run effects estimation, GDP per capita did not maintain a statistically significant impact on income inequality, suggesting that its effect may be more immediate and less persistent over time than other determinants. Further probing the nature of the relationship between GDP per capita and income inequality, a specific model tested the quadratic function, as per the Kuznets curve hypothesis. This analysis revealed an inverted U-shaped curve, confirming that while economic development initially correlates with rising income inequality, it eventually leads to a reduction in inequality as GDP per capita continues to increase. The coefficients for GDP per capita in the quadratic model were substantial and significant, with the linear term showing a positive coefficient and the quadratic term a negative one, suggesting that as nations achieve higher levels of economic development, the reducing effect on income inequality becomes more pronounced. The quadratic function entered the model with coefficients $\beta0$ (constant), $\beta1$ (linear term), and $\beta2$ (quadratic term) that significantly shaped the curve. While the linear term suggested an initial increase in inequality with economic growth, the quadratic term confirmed the eventual decrease, aligning with the Kuznets hypothesis. This pattern was visually corroborated by the graph illustrating the Kuznets curve, where the distribution of data points and the fitted line indicated the non-linear, inverted U-shaped relationship between GDP per capita and income inequality.

b. Answer to the Second Research Question

The second research question is “Is there a difference in the relationship patterns of the income inequality and its determinants in European countries based on their development level?”. The short response to this question is yes, there is a difference in the relationship patterns based on the development level of European countries, as revealed in the static LSDV model observations.

In terms of direction, the distinct patterns are visible in the mean years of schooling, remittances and control of corruption.

Mean years of schooling, a proxy for the level of education, exhibits a divergent impact based on the development status of European countries. In developed countries, an increase in the mean years of schooling correlates with a decrease in income inequality. A 10% increase in the mean years of schooling leads to a 6.76% decrease in income inequality in developed countries, while in developing countries, it leads to a 3.75% increase, on average. This relationship suggests that higher education levels may lead to more equitable income distribution, potentially due to better employment opportunities and higher wages for the educated populace. Conversely, in developing countries, an increase in mean years of schooling is associated with an increase in income inequality. This unexpected outcome might result from disparities in the quality of education, unequal access to educational resources, or the labor market's inability to absorb educated individuals effectively, leading to a surplus of educated but under- or unemployed individuals.

The governance indicators, such as control of corruption and the rule of law, also demonstrate contrasting effects. In developed countries, strengthening the control of corruption is associated with a modest decrease in income inequality, reflecting the possible enhancement of trust in public institutions and economic efficiency. On the contrary, in developing countries, efforts to control corruption unexpectedly show a correlation with increased income inequality. A 10% increase in corruption control decreases income inequality in the developed countries by 0.51%, on average, while it increases income inequality in developing countries by 1.82%, on average, holding other variables constant. This might be indicative of the disruptive nature of anti-corruption reforms on established informal economies before the benefits of a more formalized and equitable economic structure are realized. Similarly, the rule of law has a complex relationship with income inequality; it is associated with an increase in income inequality in developed countries but a decrease in developing countries. A 10% improvement in the rule of law increases income inequality in the developed countries by 0.504%, on average, while it decreases income inequality in developing countries by 1.32%, on average, holding other variables constant. This could be attributed to the differential effectiveness of legal institutions, with the rule of law in developed countries possibly favoring the protection of existing wealth disparities, while in developing countries, improvements in the rule of law may help to mitigate inequality by promoting fairer economic practices.

In terms of the magnitude of the effects, differences are visible in the economic development determinant, population growth, gross fixed capital formation, government effectiveness, and regulatory quality.

Regarding the magnitude of the effects, GDP per capita, as an indicator of economic development, demonstrates a stronger decrease in income inequality in developing countries compared to developed ones. A 10% increase in GDP per capita leads to an 4.24% decrease in income inequality in developed countries, and by 24.44% in developing countries. This observation supports the notion that economic growth in developing countries may lead to rapid reductions in inequality due to more significant opportunities for redistributive policies and structural economic changes.

Population growth's relationship with income inequality is markedly stronger in developing countries. A 10% increase in population growth leads to a 3.74% increase in income inequality in developed countries and by 18.86% increase in developing countries, on average. Rapid population increases in these countries can exacerbate structural challenges such as insufficient social services, education, and healthcare, which in turn can lead to greater income disparities.

The impact of gross fixed capital formation and government effectiveness in reducing income inequality is more pronounced in developing countries. This suggests that investments in infrastructure, technology, and other capital assets, alongside more effective governance, are particularly beneficial in environments with larger inequality gaps and more pressing development needs.

Global fixed capital formation, government effectiveness and regulatory quality are similar to the economic development situation, decreasing income inequality in both set of countries, with much stronger impact in developing countries, and almost negligible impact in the developed countries. In developed countries, a 10% increase in gross fixed capital formation leads to a 0.11% decrease in income inequality, and in developing countries by 1.37%, on average. A 10% increase in government effectiveness increases income inequality in the developed countries by 0.323%, on average, while it decreases income inequality by 1.39% in developing countries, holding other variables constant.

Regulatory quality's role in lessening income inequality also exhibits a more substantial effect in the developing countries of Europe. This finding indicates that regulatory improvements can have a more significant impact in settings with less mature regulatory frameworks, where there is a greater potential to reshape economic structures and promote inclusivity. A 10% increase in regulatory quality decreases income inequality in the developed countries by 0.225%, on average, while it decreases income inequality by 1.08% in developing countries, holding other variables constant.

These differences highlight the importance of considering the unique economic and social contexts of countries when designing and implementing policies aimed at reducing income inequality.

However, in the dynamic models, employing the Generalized Method of Moments (GMM), the interaction terms with the development level dummy variables did not yield statistically significant results. The absence of significant results for the interaction terms with development level dummies in the dynamic GMM models suggests that the relationship between income inequality and its determinants may not be as sensitive to the development level over time or within the framework of a dynamic analysis. This could imply that the persistence and inertia of income inequality, as captured by the lagged Gini coefficient in the GMM models, are powerful enough to overshadow the nuances that appear in static models. It may also indicate that the dynamic effects of economic development and other determinants evolve in a more homogenized manner across European countries, regardless of their development level. The short-run and long-run dynamics captured by the GMM suggest that the underlying forces driving changes in income inequality could be more uniform over time or that the short-run fluctuations and long-run trends tend to converge across different development levels when accounting for the endogeneity and time-dependent nature of these determinants.

c. Answer to the Third Research Question

The third research question that needed to be answered is “Is there a difference in the relationship between income inequality and its determinants in the period of global financial crisis vs the period of the sovereign debt crisis?”. The answer to this question is also affirmative, confirming that there are some differences in the relationship between income inequality and its determinants during the global financial crisis and the European sovereign debt crisis.

The role of unemployment in influencing income inequality exhibited a remarkable shift between the two crisis periods. During the European sovereign debt crisis, a 10% increase in the unemployment rate results in a 1.132% increase in income inequality. This could be attributed to the severe economic contractions and austerity measures implemented in many European countries during this period, which disproportionately affected lower-income groups and heightened income disparities. Conversely, during the global financial crisis, an increase in unemployment paradoxically corresponded with a decrease in income inequality of 2.2%, on average. This counterintuitive relationship might be explained by the broad-based nature of the GFC's impact, which affected a wider range of income groups, or by robust social safety nets and fiscal stimulus measures that cushioned the blow for lower-income populations.

The impact of education, measured by mean years of schooling, also varied between the crises. During the European sovereign debt crisis, a 10% increase in mean years of schooling decreased income inequality by 2.98%, possibly reflecting the role of education in providing resilience against economic shocks and the potential for educated individuals to adapt to changing labor market conditions. In contrast, during the global financial crisis period, the relationship was less pronounced, decreasing income inequality by 0.36%, indicating that the immediate economic turmoil might have overshadowed the longer-term benefits of education on income distribution.

Gross fixed capital formation demonstrated a positive impact on income inequality during the sovereign debt crisis, a 10% increase in gross fixed capital formation increases income inequality by 0.39%, suggesting that investments during this period may have been concentrated in sectors or regions already experiencing higher income levels, thereby exacerbating inequality. In contrast, its impact during the global financial crisis was not significant, possibly due to a general slowdown in investment activities or more evenly distributed investments across different economic sectors and regions.

The impact of political variables on income inequality also differs between the global financial crisis and the sovereign debt crisis. Political stability's positive effect on income inequality during the global financial crisis, with no significant impact during the sovereign debt crisis, could be indicative of the differing nature of the crises. The global financial crisis widespread impact might have amplified the importance of political stability in maintaining economic stability and confidence, whereas the sovereign debt crisis, more localized to certain countries, may have seen other factors play more significant roles. Control of corruption, and voice and accountability positively impacting income inequality during the sovereign debt crisis, but not during the global financial crisis, underscores the unique political and economic environments of the two periods. The sovereign debt crisis, with its focus on structural reforms and governance improvements in certain countries, may have led to changes that initially increased disparities before yielding longer-term benefits. The rule of law's negative impact on income inequality during the sovereign debt crisis and its insignificant effect during the global financial crisis suggest that legal and institutional reforms during the sovereign debt crisis might have had a more direct influence on income distribution, possibly through mechanisms such as improved business environments or more equitable legal protections, which were less pronounced during the global financial crisis.

These variations reflect the distinct economic, social, and political landscapes of each crisis. Understanding these differences is crucial for policymakers and international bodies in tailoring their responses to future economic crises, ensuring that measures taken are context-sensitive and address the unique challenges posed by different types of economic downturns.

5.8.2. Answers to the Research Hypotheses

Based on the comprehensive analysis, the study answers the research hypotheses which are correlated to the research questions.

a. Hypotheses Derived from the First Research Question

The hypotheses derived for the first research question aimed to ascertain the impact of various macroeconomic, demographic, and political determinants on income inequality during crisis periods in Europe.

Table 22. Hypotheses Derived from the First Research Question

HYPOTHESIS	STATUS	DESCRIPTION
H1: Economic development has no significant impact on income inequality.	REJECTED	Economic development, as measured by GDP per capita, was found to significantly influence income inequality, particularly in developing countries and in specific crisis contexts.
H2: Economic globalization has no significant impact on income inequality	REJECTED	Economic globalization was observed to have a significant negative impact on income inequality, suggesting that increased economic integration can lead to a more equitable income distribution.
H3: Remittances have no significant impact on income inequality.	REJECTED	Remittances were identified as having a significant impact, although the direction of their effect varied based on the specific context.
H4: Unemployment has no significant impact on income inequality.	REJECTED	Unemployment consistently showed a significant relationship with income inequality, emphasizing its crucial role in economic disparity.
H5: Value-added taxes have no significant impact on income inequality.	REJECTED	Value-added taxes emerged as an influential factor, particularly in the context of certain crisis periods.
H6: Domestic savings have no significant impact on income inequality.	REJECTED	Domestic savings were found to significantly influence income inequality, indicating their role in the economic dynamics of nations.
H7: Domestic consumption has no significant impact on income inequality.	*ACCEPTED*	The analysis did not find a significant impact of domestic consumption on income inequality.
H8: Inflation has no significant impact on income inequality.:	*ACCEPTED*	Inflation was not found to have a significant relationship with income inequality in the studied models.
H9: Trade has no significant impact on income inequality.	*ACCEPTED*	The impact of trade on income inequality was not significant in the analysis.
H10: Investments have no significant impact on income inequality.	REJECTED	Investments, particularly gross fixed capital formation, were identified as having a significant impact on income inequality.
H11: Population growth has no significant impact on income inequality.	REJECTED	Population growth showed a significant effect on income inequality, with notable differences based on the development level of countries.
H12: Education has no significant impact on income inequality.	REJECTED	Education, particularly mean years of schooling, was found to significantly affect income inequality, albeit in varying directions in developed versus developing countries.
H13: Political stability has no significant impact on income inequality.	REJECTED	Political stability, alongside other governance indicators, significantly influenced income inequality.
H14: Control of corruption has no significant impact on income inequality.	REJECTED	The study found that control of corruption had a significant impact on income inequality, with varying effects based on development status.
H15: Rule of law has no significant impact on income inequality.	REJECTED	The rule of law demonstrated a significant, albeit complex, relationship with income inequality.
H16: Government effectiveness has no significant impact on income inequality.	REJECTED	Government effectiveness was found to significantly affect income inequality, particularly in developing countries.
H17: Regulatory control has no significant impact on income inequality.	REJECTED	Regulatory quality was observed to have a significant impact on income inequality.
H18: Voice and accountability has no significant impact on income inequality.	*ACCEPTED*	Voice and accountability did not show a significant impact on income inequality in the models.

b. Hypotheses Derived from the Second Research Question

The second research question sought to explore whether the relationship patterns between income inequality and its determinants differ between developed and developing European countries. The null hypothesis posited that there is no difference in these patterns. However, the analysis resulted in the rejection of this null hypothesis. Significant distinctions were identified in the impact of certain determinants, such as mean years of schooling, corruption control, and the rule of law, highlighting the importance of considering the development level when examining the drivers of income inequality in European countries.

Table 23. Hypotheses Derived from the Second Research Question

HYPOTHESIS	STATUS	DESCRIPTION
H19: There is no difference between European developed and developing countries in the relationship patterns between income inequality and its determinants.	REJECTED	The analysis revealed clear differences in how various determinants affected income inequality in developed versus developing countries, both in terms of direction and magnitude.

In developed countries, different factors are vital in shaping income inequality. GDP per capita mostly shows a negative relationship with income inequity. Remittances also help in reducing income inequality, though to a lesser degree than GDP per capita. On the other hand, the effect of unemployment is complex since it lowers income inequality in the non-crisis period but increases it during the European sovereign debt crisis. Gross fixed capital formation often decreases income inequality, while during the European sovereign debt crisis, it has an opposite effect. Demographic factors including population growth and average number of school years are additional drivers of income inequality dynamics, where growth of population amplifies inequality while higher mean school years reduce it, especially during crisis times. Interestingly the political determinants such as control of corruption and rule of law have opposite effects on income inequality, with control of corruption being the reason why inequality decreases and the rule of law the reason why it is increased.

On the other hand, in developing countries, the factors which affect income inequality show both similarities and differences with developed countries. GDP per capita has a significant effect on the reduction of income inequality, particularly in developing countries. Remittances also do matter in reducing income inequality, with a greater impact compared to developed countries. Nevertheless, unemployment has a conflicting effect on income inequality, reducing it during the non-crisis periods and increasing it both during the global financial crisis and the European sovereign debt crisis. Gross fixed capital formation tends to bring down the level of income inequality although it increases during the European sovereign debt crisis. Demographic factors like population growth and mean years of schooling aggravate income inequality in developing countries. Similarly, political factors, such as corruption control, the rule of law, and voice and accountability, have complex relations with income inequality, with corruption control and the rule of law having different effects compared to developed countries.

c. Hypotheses Derived from the Third Research Question

The third research question aimed to investigate whether there is a difference in the relationship between income inequality and its determinants during the global financial crisis compared to the sovereign debt crisis. The null hypothesis suggested no such difference. However, the empirical results led to the rejection of this null hypothesis. Varied impacts were observed during these distinct crisis periods, particularly in the case of unemployment, mean years of schooling, gross fixed capital formation, and the political variables, emphasizing the importance of considering the temporal context when analyzing the determinants of income inequality in Europe.

Table 24. Hypotheses Derived from the Third Research Question

HYPOTHESIS	STATUS	DESCRIPTION
H20: There is no difference between the period of the global financial crisis and the period of the sovereign debt crisis in the relationship between income inequality and its determinants.	REJECTED	The empirical analysis revealed significant differences in the impacts of various determinants on income inequality between these two distinct crisis periods. The findings illustrate that the economic and social dynamics during the global financial crisis and the European sovereign debt crisis have distinctively influenced the effect of some of the determinants of income inequality. Such differences were seen in the difference of the effects of the unemployment rate, the mean years of schooling, the gross fixed capital formation, the political stability, the control of corruption, the voice and accountability, and the rule of law on income inequality during these two crises periods. These differences could be attributed to the different nature and scope of the two crises and their respective impacts on the economic structures.

In the course of these crisis periods, e.g. the global financial crisis and the European sovereign debt crisis, such additional complexities appear. Although GDP per capita consistently helps the income inequality during crisis, unemployment and other factors show different effect. Political stability during global financial crisis, for example, exacerbates income inequality thus, bringing to light the complex relationship between political and economic factors in such tumultuous times. In the same manner, during the European sovereign debt crisis, the various factors of unemployment, gross fixed capital formation, corruption control, rule of law, and voice and accountability show different impacts on income inequality, revealing the necessity of appropriate policy interventions instituted in the current crisis contexts.

6. CONCLUSION AND RECOMMENDATIONS

This doctoral dissertation examines the intricate dynamics of income inequality in Europe during the 21st century during the economic crisis periods (2007-2021). Through analyzing the multi-dimensional interconnections among macroeconomic, demographic, and political factors, this study aims to enhance the knowledge on the dynamics of income distributions in Europe. The literature review suggests a rich tapestry of studies on income inequality which stresses such factors as economic globalization, unemployment, remittances, governance quality, and demographic shifts. Nevertheless, most studies concentrate on one individual determinant, thus ignoring the complex interconnections that shape income distribution. Notably, there are a much fewer number of studies which examine the combined role of these determinants in one model, and even less which do that during periods of economic crisis that can affect income inequality to the deepest extent. This study manages to position itself by accomplishing this challenge by combining all these variables in one model and comparing their significance between different economic crises. The main contribution of this doctoral dissertation to the development of science and scientific thought is that according to the author's best knowledge, this is the only research done so far, that covers all possible variables, i.e. income inequality determinants in the literature review and a large pool of variables in the empirical analysis, compared to previous research which covered only a part of them.

Despite its many significant contributions, the study still holds its limitations. The methodology, being all-encompassing, may not capture the long-term dynamics and structural changes of the economies. These limitations are being addressed by adopting a holistic approach and using more advanced regression techniques such as the Least Squares Dummy Variable (LSDV) with interaction terms to distinguish the individual effect of each set of variables on income inequality during different periods and the Generalized Method of Moments (GMM) to capture the potential lagged effects of the determinants. These methodologies also help in an in-depth analysis of both short-term fluctuations and long-term trends thereby providing a holistic knowledge of income distribution variability in different crisis periods.

This study provides a number of empirical findings that are very useful for understanding the factors that contribute to income inequality in the developed and developing European countries. One of the factors which shows consistency in the impact on income inequality is the economic globalization variable. As a significant determinant, deeper economic integration is correlated with the reduction of income inequality gaps. This evidence complements the theories suggesting that increased economic integration might lead towards a fairer distribution of wealth. The unemployment variable is another significant determinant which is positively correlated with income inequality, thereby pointing to the social-economic implications of employment for the achievement of equitable growth. The adverse effect of unemployment on income distribution matches the abundant literature on the issue by also stressing the need for employment-oriented policies. Furthermore, governance indicators like regulatory quality, government effectiveness, political stability and corruption control are found to be negatively correlated with income inequality. This affirms the vital role of good governance in ensuring equity and the sustainable growth of economies. The connection between governance quality and income equality, as revealed by this study, also aligns with previous research and establishes the significance of stable institutional frameworks in tackling income inequities. The demographic determinants such as population growth and mean years of schooling which is a proxy for educational attainment, also provide a key role in determining the dynamics of income distribution. Whereas the correlation of population growth with income inequality is positive, the impact of educational attainment on income distribution is more complex, with a higher level of education being associated with lower income inequality in the developed countries but higher inequality in the developing ones.

In addition to this, the results stress the conditional nature of the role of economic development in reducing income inequality, particularly in the event of different crisis situations. Characteristically, the effect of GDP per capita on income distribution differs under different crises conditions, revealing a conditional character to its influence. Economic development in general terms can be associated with reduced income inequalities during the crisis. However, the strength and direction of the effect will depend on particular economic and socio-economic conditions during such a crisis period. In contrast with the other models, in those with the interaction terms containing a developed/developing country dummy and those with a global financial crisis dummy variable, GDP per capita is statistically significant. However, in the period of sovereign debt crisis and COVID-19 pandemic, the direct impact of GDP per capita on income inequality may be undermined or altered by the general economic effects of these specific events. This implies that the connection between economic development and income inequality in European nations is not a direct simple one and therefore needs to be further examined before validating the Kuznets curve theory. This brings the separate analysis of this relation and specifically checking for a quadratic function to confirm the Kuznets curve theory. The Kuznets curve hypothesizes an inverted U-shaped relationship between income inequality and economic development: as an economy is growing, it means inequality is first rising and then falling. This separate analysis was meant to establish whether the initial increase in inequality, which was associated with economic growth, gradually starts to reverse as GDP per-capita continues to increase, thus providing empirical evidence either for or against the Kuznets hypothesis with European context. The regression results show that initially when GDP per capita rises, income inequality also rises indicated by the positive coefficient in the linear term. The addition of a quadratic term, however, leads to an inflection point, after which the coefficient becomes negative, implying an inverted U-shaped relationship as the Kuznets hypothesis suggests. Visually illustrating this result by means of a scatter plot also indicates that the negative relationship between income inequality and economic development is an inverted U-shaped curve, with income inequality rising initially at lower income levels, and then starting to decrease at higher income levels. This change in direction is consistent with the regression results and contributes to the idea that economic development is a powerful weapon in tackling income inequality, especially in developing countries. This confirms the Kuznets hypothesis, which highlights the conditionality of economic development impact on income inequality, adding to a deeper understanding of the complex interactions between economic factors and income distribution dynamics.’

Apart from this distinction in the impact of GDP per capita on income inequality, the study further highlights a number of distinctions in the impact of some other determinants between different crisis periods. For instance, unemployment tends to reduce inequality amid non-crisis periods, but it increases inequality during shocks like the European sovereign debt crisis. Similarly, gross fixed capital formation usually diminishes income inequality but works in the opposite direction during the same European sovereign debt crisis. Moreover, political factors like control of corruption reduce income disparity, while others such as the rule of law and political stability aggravate it during the times of crisis. This however brings to light the need for specific and contextualized policy interventions for different crises. Strategic interventions such as improving governance quality, stimulating employment, and investing in education may help in reducing income gaps and promoting equitable growth in one type of crises, but might not be of much help in another type of crisis. This just confirms the notion that interventions have to be modified according to the specific contexts and crisis periods otherwise their effectiveness will be minimal.

Beside the many benefits that this study offers, it has some limitations as well. While the methodology this study employs is robust, it may not fully encapsulate the long-term dynamics and structural changes within economies over time. Additionally, the aggregate data used might hide the individual experiences of income distribution, while the omission of some determinants and contextual factors may limit the generalizability of the findings. These limitations imply that the findings of this study should be interpreted with some degree of caution. Future research could address some of these limitation by exploring additional determinants to provide a more detailed analysis of the income distribution dynamics in Europe. While it is subject to certain limitations, this study points the way for future studies aiming at promoting inclusive growth and reducing income inequality in Europe.

6.1. Recommendations

In order to tackle this issue, policy makers, researches and stakeholders need to engage in a multipronged approach to break the vicious circle of poverty in Europe. As economic crises affect income distribution in a multifaceted way, policymaker attention should be directed towards the development of interventions that correspond to the unique challenges faced during various crisis periods. This requires a sophisticated knowledge of the interworkings of the socioeconomic landscape which calls for measures such as provision of safety net programs, retraining of jobless people, and the placing of a level of support for the vulnerable communities in order to mitigate the negative effect of the economic stagnation.

The second thing would be to acknowledge that the governments are the key priority in the distribution of income. As such, regulatory reforms, strengthening of government accountability, and the fight against corruption are critical. Building up the integrity and openness of such institutions can create an environment that supports equality in the development, and thereby lowers income inequalities within the Europe nations.

One of the things that needs to be highlighted is the fact that education and employment-driven programs for all must be a key pillar of such development. Through adequate funding for quality education, vocational training and employment programs, policy makers can put into practice plans that will enable people to earn a living for their life and free themselves from inter-generational poverty. In addition, protection of just wage and labor rights is a priority. Meeting labor standards, paying equal pay for equal work, and allowing collective bargaining are the important steps of increasing the equity of the labor market and the reduction of income inequalities.

Moreover, ensuring fair globalization is very vital as well. Policy makers should focus on the opportunity that globalization brings and the challenge that comes with the distribution of incomes in a globalized society. This includes an emphasis on fair (trade) practices, protection of workers' rights in (global supply) chains, and collaboration at the international level to reduce global inequalities.

Lastly, population growth should be addressed proactively through careful administration of community-based policies. Through family planning programs, maternal healthcare, and educational offerings that equip individuals with information on reproductive decision-making, policymakers can empower these individuals with the know-how they need to make informed reproductive choices, thereby enabling them to boost sustainable population growth and reduce income inequality.

Implementing these suggestions as a whole can be a great opportunity to change and offer all European citizens more equality and prosperity.

References

1. Abdel-Ghany, M. (1996). Demographic and Economic Determinants of Household Income Polarization Among the States in America. Family Economics and Nutrition Review, 9(1), 14–23.
2. Acemoglu, D., & Robinson, J. TO. (2012). Why countries fail [_ 1]. Editorial Planeta Colombiana.
3. Acosta, P., Calderon, C., Fajnzylber, P., & Lopez, H. (2007). The Impact of Remittances on Poverty and Human Capital: Evidence from Latin American Household Surveys. World Bank. (Working Paper No. 4247). Retrieved from https://elibrary.worldbank.org/
4. Adelman, I., & Robinson, S. (1989). Income distribution and development. In Handbook of Development Economics, Vol.2. (Eds. Chenery and T. N. Srinivasan, North-Holland, Amsterdam, pp.949-1003).
5. Aghion, P., & Bolton, P. (1997). A Trickle-Down Theory of Growth and Development with Debt Overhang. Review of Economic Studies, 64, 151-72.
6. Aghion, P., & Howitt, P. (1998). Endogenous Growth Theory. MIT Press.
7. Aghion, P., Caroli, E., & Garcia-Penalosa, C. (1999). Inequality and Economic Growth: The Perspective of the New Growth Theories. Journal of Economic Literature, 37, 1615-60.
8. Aiyar, S., & Ebeke, C. H. (2019). Inequality of opportunity, inequality of income and economic growth. World Development, 136. https://doi.org/10.1016/j.worlddev.2020.105115
9. Alavuotunki, K., Haapanen, M., & Pirttilä, J. (2019). The Effects of the Value-Added Tax on Revenue and Inequality. Journal of Development Studies, 55(4), 490-508.
10. Albanesi, S. (2007). Inflation and inequality. Journal of Monetary Economics, 54(4), 1088-1114.
11. Alderson, A., & Doran, K. (2013). How has income inequality grown? The reshaping of the income distribution in LIS countries. In J. Gornick & M. Janti (Eds.), Income Inequality: Economic Disparities and the Middle Class in Affluent Countries (pp. 51-74). Stanford University Press.
12. Alderson, A. S., & Nielsen, F. (2002). Globalization and the great U-turn: Income inequality trends in 16 OECD countries. American Journal of Sociology.
13. Alderson, A. S., & Nielsen, F. (1995). Income inequality, development and dualism: Results from an unbalanced cross-national panel. American Sociological Review, 60, 674–701.
14. Alderson, A. S., Beckfield, J., & Nielsen, F. (2005). Exactly how has income inequality changed? Patterns of distributional change in core societies (LIS Working Paper Series, No. 422). Luxembourg Income Study (LIS).
15. Alesina, A., & Rodrik, D. (1994). Distributive Politics and Economic Growth. The Quarterly Journal of Economics, 109(2), 465-490. DOI: 10.2307/2118470
16. Alesina, A., & Perotti, R. (1996). Income distribution, political instability, and investment. European Economic Review, 40(6), 1203-1228.
17. Al-Marhubi, F. A. (1997). A Note on the Link between Income Inequality and Inflation. Economics Letters, 55, 317–319.
18. Altunbaş, Y., & Thornton, J. (2019). The impact of financial development on income inequality: A quantile regression approach. Economics Letters, 175, 51-56.
19. Alvarez-Cuadrado, F., & El-Attar Vilalta, M. (2018). Income Inequality and Saving. Oxford Bulletin of Economics and Statistics, 80(6), 1029–1061. https://doi.org/10.1111/obes.12236
20. Alves, J. D., Coelho, J. C., & Roxo, A. (2022). How Economic Growth Impinges on Income Inequalities?. Retrieved from SSRN: https://doi.org/10.2139/ssrn.4309205
21. Amornthum, S. (2004). Income Inequality, Inflation and Nonlinearity: The Case of Asian Economies.
22. Anand, S., & Kanbur, S. (1986). Inequality and Development: A Critique. Paper prepared for the Yale University Economic Growth Center Twenty-Fifth Anniversary Symposium on the State of Development Economics: Progress and Perspectives.
23. Anand, S., & Kanbur, S. (1993). Inequality and development: A critique. Journal of Development Economics, 41, 19-43.
24. Anand, S., & Segal, P. (2015). The global distribution of income. In A. Atkinson & F. Bourguignon (Eds.), Handbook of Income Distribution, Volume 2A. Amsterdam: Elsevier.

25. Ang, J. B. (2010). Finance and Inequality: The Case of India. Southern Economic Journal, 76(3), 738-761. http://www.jstor.org/stable/27751495
26. Arellano, M., & Bover, O. (1995). Another look at the instrumental variable estimation of error-components models. Journal of Econometrics, 68, 29-51.
27. Atkinson, A. B., Rainwater, L., & Smeeding, T. M. (1995). Income Distribution in OECD Countries. Social Policy Studies No. 18. Paris: Organisation for Economic Co-operation and Development.
28. Atkinson, A. B. (2015). Inequality: What can be done?. Harvard University Press.
29. Atkinson, A. B., & Morelli, S. (2014). Economic crises and inequality. Cambridge Journal of Economics, 38(5), 1101-1122.
30. Atkinson, A. (1970). On the Measurement of Inequality. Journal of Economic Theory, 2(3), 244-263. doi:10.1016/0022-0531(70)90039-6
31. Auci, S., & Trovato, G. (2018). The environmental Kuznets curve within European countries and sectors: Greenhouse emission, production function and technology. Economia Politica, 35(3), 895-915.
32. Auten, G., & Carroll, R. (1999). The Effect of Income Taxes on Household Income. The Review of Economics and Statistics, 81(4), 681-693. doi: https://doi.org/10.1162/003465399558409
33. Autor, D., Levy, F., & Murnane, R. (2003). The skill content of recent technological change: An empirical exploration. Quarterly Journal of Economics, 118, 1279-1333.
34. Azzoni, C. (2001). Economic growth and regional income inequality in Brazil. Retrieved from https://econpapers.repec.org/article/spranresc/v_3a35_3ay_3a2001_3ai_3a1_3ap_3a133-152.html
35. Bahmani-Oskooee, M., & Gelan, A. (2008). Kuznets inverted-U hypothesis revisited: A time-series approach using US data. Applied Economics Letters, 15(9), 677-681.
36. Baiocchi, G., & Distaso, W. (2004). The determinants of income inequality in the UK: A conditional distribution estimation approach.
37. Baligh, N., & Piraee, K. (2013). Financial development and income inequality relationship in Iran. Middle-East Journal of Scientific Research, 13, 56–64.
38. Bandelj, N., & Mahutga, M. C. (2010). How Socio-Economic Change Shapes Income Inequality in Post-Socialist Europe? Social Forces, 88(5), 2133-2161.
39. Banerjee, A. V., & Newman, A. F. (1993). Occupational choice and the process of development. Journal of Political Economy, 101(2), 274–298.
40. Barham, B., & Boucher, S. (1998). Migration, remittances, and inequality: Estimating the net effects of migration on income distribution. Journal of Development Economics, 55(2), 307-331.
41. Barro, R. J. (2000). Inequality and Growth in a Panel of Countries. Journal of Economic Growth, 5(1), 5-32.
42. Barro, R. (2008). Inequality and growth revisited. Asian Development Bank: Working Paper Series on Regional Economic Integration, 14. Retrieved from http://aric.adb.org/pdf/workingpaper/WP11_%20Inequality_and_Growth_Revisited.pdf
43. Bayarjargal, A. (2017). Income, social, and political inequality.
44. Baymul, Ç., & Sen, K. (2019). Kuznets revisited: What do we know about the relationship between structural transformation and inequality? Asian Development Review, 36(1), 136–167.
45. Beck, T., Demirgüç-Kunt, A., & Levine, R. (2007). Finance, inequality and the poor. Journal of Economic Growth, 12(1), 27-49.
46. Becker, G. S. (1962). Investment in Human Capital - a Theoretical Analysis. Journal of Political Economy, 70, 9-49.
47. Beckfield, J. (2009). Remapping Inequality in Europe: The Net Effect of Regional Integration on Total Income Inequality in the European Union. International Journal of Comparative Sociology, 55(5), 486-509.
48. Beetsma, R. M. J., & Van Der Ploeg, F. (1996). Does Inequality Cause Inflation? The Political Economy of Inflation, Taxation and Government Debt. Kluwer Academic Publishers, 87, 143-162.
49. Bénabou, R. (1996). Inequality and growth. In B. S. Bernanke & J. Rotemberg (Eds.), NBER Macroeconomics Annual 1996 (pp. 11-74). MIT Press.
50. Bennett, D. L., & Nikolaev, B. N. (2016). Factor endowments, the rule of law and structural inequality. Journal of Institutional Economics, 12, 773-795.
51. Berdiev, A. N., & Saunoris, J. W. (2019). On the Relationship Between Income Inequality and the Shadow Economy. Eastern Economic Journal, 45(2), 224–249. https://www.jstor.org/stable/48702876

52. Berry, C. R., & Glaeser, E. L. (2005). The Divergence of Human Capital Levels across Cities. Papers in Regional Science, 84, 407-444.
53. Bhagat, S. (2020). Economic Growth, Income Inequality, and the Rule of Law. ERN: Human Resources in Developing Economies.
54. Birdsall, N. (1998). Life is unfair: Inequality in the world. Foreign Policy, 112, 76-83.
55. Bishop, J. A., Formby, J. P., & Smith, W. J. (1997). Demographic Change and Income Inequality in the United States, 1976–1989. Southern Economic Journal, 64(1), 34–44.
56. Björklund, A. (1991). Unemployment and Income Distribution: Time-Series Evidence from Sweden. The Scandinavian Journal of Economics, 93(3), 457-465.
57. Blackman, T. (2007). Globalization and public policy. In The Blackwell companion to globalization (pp. 429-443).
58. Blanchard, O. (2000). What do we know about macroeconomics that Fisher and Wicksell did not? (Working Paper No. 7550). National Bureau of Economic Research. https://doi.org/10.3386/w7550
59. Blank, R. M., & Card, D. (1993). Poverty, Income Distribution and Growth: Are They Still Connected? Brookings Papers on Economic Activity, 2, 285–325.
60. Blažević, S. (2013). Is Employment Decreasing Due to Minimum Wage Increase? Ekonomska istraživanja-Economic Research, 26(1), 69-100.
61. Blejer, M. I., & Guerrero, I. (1990). The Impact of Macroeconomic Policies on Income Distribution: An Empirical Study of the Philippines. The Review of Economics and Statistics, 72(3), 414–423.
62. Blundell, R., & Bond, S. (1998). Initial conditions and moment restrictions in dynamic panel data models. Journal of Econometrics, 87, 115–143.
63. Bodea, C., Houle, C., & Kim, C. (2021). Do financial crises increase income inequality? World Development, 147, 105635. https://doi.org/10.1016/j.worlddev.2021.105635
64. Bollen, K. A., & Jackman, R. W. (1985). Political democracy and the size distribution of income. American Sociological Review, 50(4), 438. https://doi.org/10.2307/2095432
65. Borensztein, E., de Gregorio, J., & Lee, J. (1998). How Does Foreign Direct Investment Affect Economic Growth? Journal of International Economics, 45, 115–135.
66. Bourguignon, F. (1990). Growth and inequality in the dual model of development: the role of the demand factors. Review of Economic Studies, 57, 215±28.
67. Bourguignon, F., & Morrisson, C. (1990). Income distribution, development and foreign trade. European Economic Review, 34, 1113-1132.
68. Bourguignon, F., & Spadaro, A. (2003). From income to endowments: the difficult task of expanding the income poverty paradigm. World Bank, Working Paper, 3.
69. Bouvet, F. (2010). EMU and the Dynamics of Regional per Capita Income Inequality in Europe. Journal of Economic Inequalities, 8, 323–344.
70. Bowsher, C. G. (2002). On testing overidentifying restrictions in dynamic panel data models. Economics letters, 77(2), 211–220. https://doi.org/10.1016/S0165-1765(02)00130-1.
71. Breen, R., & Garcia-Peñalosa, C. (1999). Income Inequality and Macroeconomic Volatility: An Empirical Investigation. European University Institute.
72. Bresnahan, T. F. (1997). Computerization and Wage Dispersion: An Analytical Reinterpretation. Stanford Economics Department Working Paper 97031.
73. Brinkman, H.-J., Attree, L., & Hezir, S. (2013). Addressing horizontal inequalities as drivers of conflict in the post-2015 development agenda. Saferworld. Retrieved from https://www.saferworld.org.uk/resources/publications/725-addressing-horizontal-inequalities-as-drivers-of-conflict-in-the-post-2015-development-agenda
74. Brueckner, M., Dabla-Norris, E., & Gradstein, M. (2015). National income and its distribution. Journal of Economic Growth, 20(2), 149-175.
75. Brueckner, M., & Lederman, D. (2018). Inequality and economic growth: The role of initial income. Journal of Economic Growth, 23(3), 341-366.
76. Brueckner, M., & Lederman, D. (2015). Effects of income inequality on aggregate output. Policy Research Working Paper Series 7317. The World Bank.

77. Buba, S., Ishak, S., Habibullah, M. S., & Noor, Z. M. (2019). The determinants of income inequality in Europe: Do trade liberalisation and financial liberalisation matter? Jurnal Ekonomi dan Studi Pembangunan.
78. Bucevska, V. (2019). Determinants of income inequality in EU candidate countries: A panel analysis. Economic Times, 57(4), 397-413.
79. Bulir, A. (2001). Income inequality: Does inflation matter? IMF Working Paper, 48(1).
80. Bulir, A. (2008). Income inequality: Does inflation matter? IMF Working Paper, 2008/7, 48(1). Washington: International Monetary Fund.
81. Butler, E. (2022). An Introduction to Economic Inequality. London, England: The Institute of Economic Affairs. Retrieved from https://iea.org.uk/publications/an-introduction-to-economic-inequality/
82. Busemeyer, M. R. (2015). Skills and inequality: Partisan politics and the political economy of education reforms in Western welfare states. Cambridge University Press.
83. Cardoso, E., de Barros, R. P., & Urani, A. (1995). Inflation and unemployment as determinants of inequality in Brazil: The 1980s. In R. Dornbusch & S. Edwards (Eds.), Reform, Recovery and Growth: Latin American and Middle East (pp. 37-64). The University of Chicago Press.
84. Calderon, C., & Chong, A. (2001). External sector and income inequality in interdependent economies using a dynamic panel data approach. Economics Letters, 71(2), 225-231.
85. Calderon, C., & Serven, L. (2004). The effects of infrastructure development on growth and income distribution. World Bank Policy Research Working Paper Series No. 270. Washington, DC: World Bank.
86. Carroll, R., & Viard, A. D. (2010). Value Added Tax: Basic Concepts and Unresolved Issues. Tax Notes, 126(9). Retrieved from https://ssrn.com/abstract=2218440
87. Caselli, F., & Ventura, J. (2000). A representative consumer theory of distribution. American Economic Review, 90, 909-926.
88. Cassette, A., Fleury, N., & Petit, S. (2012). Income inequalities and international trade in goods and services: Short- and long-run evidence. International Trade Journal, 26(3), 223-254. https://doi.org/10.1080/08853908.2012.682023
89. Castaneda, A., Diaz-Gimenez, J., & Rios-Rull, J. V. (1998). Exploring the income distribution business cycle dynamics. Journal of Monetary Economics, 42(1), 93-130.
90. Castelló, A., & Domenech, R. (2002). Human capital inequality and economic growth: Some new evidence. The Economic Journal, 112(478), C187-C200. https://doi.org/10.1111/1468-0297.00024
91. Castells-Quintana, D., & Royuela, V. (2012). Unemployment and long-run economic growth: The role of income inequality and urbanization. Investigaciones Regionales, 24, 153-173.
92. Castells-Quintana, D., Ramos, R., & Royuela, V. (2015). Income inequality in European Regions: Recent trends and determinants. Revista de Estudios Regionales, 35, 123-146.
93. Celikay, F., & Sengur, M. (2016). Education expenditures and income distribution: An empirical analysis on European countries. Humanomics, 32(3), 248-257.
94. Chambers, D., & O'Reilly, C. (2022). Regulation and income inequality in the United States. European Journal of Political Economy, 72, 102101. https://doi.org/10.1016/j.ejpoleco.2021.102101
95. Chatterjee, S., & Turnovsky, S. J. (2012). Infrastructure and inequality. European Economic Review, 56(8), 1730-1745.
96. Checchi, D. (2000). Does educational achievement help to explain income inequality? Departmental Working Papers 2000-11, Department of Economics, University of Milan, Italy.
97. Checchi, D., & Garcia-Penalosa, C. (2008). Labor market institutions and income inequality. Economic Policy, 23(56), 601-649.
98. Chenery, H. B., Syrquin, M., & Elkington, H. (1975). Patterns of development, 1950-1970 (Vol. 3). London: Oxford University Press.
99. Chevan, A., & Stokes, R. (2000). Growth in family income inequality 1970-1990: Industrial restructuring and demographic change. Demography, 37(3), 365-380.
100. Chiswick, B. R. (1971). Earnings inequality and economic development. The Quarterly Journal of Economics, 85(1), 21-39.
101. Choi, C. (2006). Does foreign direct investment affect domestic income inequality? Applied Economics Letters, 13(12), 811-814.

102. Chu, H.-J. (2000). The impacts of educational expansion and schooling inequality on income distribution. Quarterly Journal of Business & Economics, 39(2), 39-49.
103. Clarke, G., Xu, L. C., & Zou, H. (2006). Finance and income inequality: What do the data tell us? Southern Economic Journal, 72(3), 578-596.
104. Clarke, G., Xu, L. C., & Zou, H. (2003). Finance and income inequality: Test of alternative theories. World Bank Policy Research Working Paper 2984.
105. Cline, W. R. (1975). Distribution and development: A survey of literature. Journal of Development Economics, 1(4), 359-400.
106. Cobham, A., & Sumner, A. (2013). Putting the Gini Back in the Bottle? 'The Palma' as a Policy-Relevant Measure of Inequality. King's International Development Institute, King's College London.
107. Coibion, O., Gorodnichenko, Y., Kueng, L., & Silvia, J. (2012). Innocent Bystanders? Monetary Policy and Inequality in the U.S. NBER Working Paper Series, No 18170.
108. Comin, A. A. (2019). Economic development and inequalities in Brazil: 1960–2010. In M. T. P. Lauridsen & H. O. Hansen (Eds.), Paths of Inequality in Brazil (pp. 287–307). Springer.
109. Conceição, P., & Galbraith, J. K. (2001). Towards a new Kuznets Hypothesis: Theory and evidence on growth and inequality. In J. K. Galbraith & M. Berner (Eds.), Inequality and Industrial Change: A Global View (pp. 139-160). Cambridge University Press.
110. Cornia, G. (2004). Inequality, growth, and poverty in an era of liberalization and globalization. Oxford University Press.
111. Cornia, G. A. (2015). Income Inequality in Latin America: Recent Decline and Prospects for its Further Reduction. WIDER Working Paper Series 020, World Institute for Development Economic Research (UNU-WIDER).
112. Cornia, G. A., & Kiiski, S. (2001). Trends in Income Distribution in the Post-World War II Period. UNU/WIDER Discussion Paper No. 2001/89.
113. Costantini, M., & Paradiso, A. (2018). What do panel data say on inequality and GDP? New evidence at US state-level. Economics Letters, 168, 115–117.
114. Cowell, F. (2000). Measurement of inequality. In A. Atkinson & F. Bourguignon (Eds.), Handbook of Income Distribution, Volume 1 (pp. 87-166). Elsevier.
115. Creedy, J., & van de Ven, J. (1997). The Distributional Effects of Inflation in Australia 1980–1995. The Australian Economic Review, 30(2), 125–143.
116. Crenshaw, E. M. (1993). Polity, Economy and Technoecology: Alternative Explanations for Income Inequality. Social Forces, Vol. 71, No. 3, pp. 807–816.
117. Cruces, G., Domench, G. C., & Gasparini, L. (2012). Inequality in Education: Evidence for Latin America. Centro de Estudios Distributivos, Laborales y Sociales Documento de Trabajo, No. 135.
118. Dabla-Norris, E., Kochhar, K., Ricka, F., Suphaphiphat, N., & Tsounta, E. (2015). Causes and Consequences of Income Inequality: A Global Perspective. IMF Staff Discussion Notes, 15(13), 1. Retrieved from https://www.imf.org/external/pubs/ft/sdn/2015/sdn1513.pdf
119. Dafermos, Y., & Papatheodorou, C. (2013). What drives inequality and poverty in the EU? Exploring the impact of macroeconomic and institutional factors. International Review of Applied Economics, 27(1), 1-22. Retrieved from http://dx.doi.org/10.1080/02692171.2012.696590
120. Dauti, B., & Elezi, I. (2022). Economic growth in the Central East European Union and the Western Balkan countries in the course of Stability and Growth Pact and COVID-19. Zbornik radova Ekonomskog fakulteta u Rijeci/Proceedings of Rijeka Faculty of Economics, University of Rijeka, Faculty of Economics and Business, 40(1), 29-61.
121. Davis, S. (1992). Cross-country patterns of change in relative wages. In O. Blanchard & S. Fisher (Eds.), NBER Macroeconomics Annual 1992 (pp. 239-292). MIT Press.
122. De Gregorio, J., & Lee, J. W. (2002). Education and Income Inequality: New Evidence from Cross-Country Data. Review of Income and Wealth, 48, 395-416.
123. de Mello, L. (1999). Foreign Direct Investment-Led Growth: Evidence from Time Series and Panel Data. Oxford Economic Papers, 51, 133-151.
124. de Jong, H. (2016). What are the main determinants of income inequality? (MSC Thesis). MSC International Economics & Business.

125. Deaton, A. (2013). The Great Escape: Health, Wealth, and the Origins of Inequality. Princeton University Press.
126. Deaton, A. S., & Paxson, C. H. (1997). The Effects of Economic and Population Growth on National Saving and Inequality. Demography, 34(1), 97-114.
127. Deininger, K., & Squire, L. (1996). A new data set measuring income inequality. The World Bank Economic Review, 10(3), 565.
128. Deininger, K., & Squire, L. (1998). New ways of looking at old issues: Inequality and growth. Journal of Development Economics, 57, 259-287.
129. Delis, M. D., Hasan, I., & Kazakis, P. (2012). Bank regulations and income inequality: Empirical evidence. Bank of Finland Research Discussion Papers, No. 18/2012.
130. Demirgüç-Kunt, A., & Levine, R. (2008). Finance and Economic Opportunity. World Bank Policy Research Working Paper Series, Working Paper 4468.
131. Dimelis, S., & Livada, A. (1999). Inequality and Business Cycles in the U.S. and European Union Countries. International Advances in Economic Research, 5(2), 321-338.
132. Doessel, D. B., & Valadkhani, A. (1998). Economic Development and Institutional Factors Affecting Income Distribution: The Case of Iran 1967-1993. International Journal of Social Economics, 25(2/3/4), 410-423.
133. Dollar, D., & Kraay, A. (2001). Growth Is Good for the Poor. World Bank Policy Research Working Paper Series No. 2587.
134. Dollar, D., & Kraay, A. (2002). Growth is Good for the Poor. Journal of Economic Growth, 7, 195-225.
135. Dorn, F., Fuest, C., & Potrafke, N. (2022). Trade openness and income inequality: New empirical evidence. Economic Inquiry, 60(1). Retrieved from https://doi.org/10.1111/ecin.13018
136. Duncan, G. J., Yeung, W. J., Brooks-Gunn, J., & Smith, J. R. (1998). How Much Does Childhood Poverty Affect the Life Chances of Children? American Sociological Review, 63(3), 406-423. https://doi.org/10.2307/2657556
137. Durham, J. B. (1999). Econometrics of Income Distribution: Toward More Comprehensive Specification of Institutional Correlates. Comparative Economic Studies, 41(1), 43-74.
138. Easterly, W. (2005). Globalization, Prosperity, and Poverty. In A. Harrison (Ed.), Globalization and Poverty (pp. -). University of Chicago Press for NBER.
139. Easterly, W., & Fischer, S. (2001). Inflation and the Poor. Journal of Money, Credit and Banking, 33(2), 160-178.
140. Hoover Jr., E. M. (1936). The Measurement of Industrial Localization. Review of Economics and Statistics, 18, 162-171.
141. Hoover Jr., E. M. (1984). An Introduction to Regional Economics. ISBN 0-07-554440-7.
142. Edwards, S. (1997). Trade Policy, Growth, and Income Distribution. American Economic Review, 87, 205-210.
143. Eklil, O. (2011). The rise of income inequality and the possible role of trade in the process (Master's thesis).
144. Ersoy, İ., & Baykal, B. (2016). The impact of selected economic determinants on income inequality: The case of the EU.
145. The Equality Trust[1]. (n.d.). How is economic inequality defined? Retrieved from https://equalitytrust.org.uk/how-economic-inequality-defined
146. The Equality Trust[2]. (n.d.). Notes on Statistical Sources and Methods – The Equality Trust.
147. The Equality Trust[3]. (n.d.). External Research – Page 2 – The Equality Trust.
148. Feenberg, D., & Poterba, J. (1993). Income Inequality and the Incomes of Very High Income Tax Payers: Evidence from Tax Returns. Tax Policy and the Economy, 7, 145-177.
149. Ferreira, F. H. G. (1999). Economic Transition and the Distribution of Income and Wealth. The Economics of Transition, 7(2), 377-410.
150. Fields, G. S. (1989). Changes in poverty and inequality in developing countries. The World Bank Research Observer, 4(2), 167-185.
151. Fields, G. S., & Ok, E. A. (1999). Measuring Movement of Incomes. Economica, 66(264), 455-471. http://www.jstor.org/stable/2555171
152. Filmer, D., & Pritchett, L. (1999). The Effect of Household Wealth on Educational Attainment: Evidence from 35 Countries. Population and Development Review, 25(1), 85-120.

153. Firebaugh, G., & Gosling, B. (2007). Globalization and public policy. In Globalization and Global Inequalities: Recent Trends (pp. 449-564).
154. Folger, R., Rosenfield, D., Grove, J., & Corkran, L. (1979). Effects of "voice" and peer opinions on responses to inequity. Journal of Personality and Social Psychology, 37(12), 2253-2261. https://doi.org/10.1037/0022-3514.37.12.2253
155. Forbes, K. J. (2000). A reassessment of the relationship between inequality and growth. American Economic Review, 90(4), 869-887.
156. Foster, J. E., & Ok, E. A. (1999). Lorenz dominance and the variance of logarithms. Econometrica, 67(4), 901-907. doi:10.1111/1468-0262.00057
157. Franco, C., & Gerussi, E. (2013). Trade, FDI and Income Inequality: Further Evidence from Transition Countries. The Journal of International Trade & Economic Development, 22(8), 1131-1160.
158. Freeman, R., & Katz, L. (1994). Rising wage inequality: The United States vs. other advanced countries. In R. Freeman, L. Katz, & O. Ashenfelter (Eds.), Differences and changes in wage structures.
159. Galbraith, J. K., Conceicao, P., & Ferreira, P. A. (2000). Inequality and Unemployment in Europe: The American Cure. UTIP Working Paper, No. 11.
160. Galor, O., & Zeira, J. (1993). Income distribution and macroeconomics. Review of Economic Studies, 60(1), 35-52.
161. Ganaie, A. A., Bhat, S. A., & Kamaiah, B. (2018). Macro-determinants of income inequality: An empirical analysis in the case of India. Economics Bulletin, 38(1), 309-325.
162. Gelan, A., & Price, G. N. (2003). African economies and the Kuznets curve: An exploratory investigation. Applied Economics Letters, 10(12), 747-751.
163. Gilens, M. (2005). Inequality and Democratic Responsiveness. The Public Opinion Quarterly, 69(5), 778-796. http://www.jstor.org/stable/3521574
164. Gimet, C., & Lagoarde-Segot, T. (2011). A closer look at financial development and income distribution. Journal of Banking & Finance, 35(7), 1698-1713.
165. Glomm, G., & Ravikumar, B. (2002). Public education and income inequality. European Journal of Political Economy, 19(2), 289-300.
166. Gobbin, N., & Rayp, G. (2004). Income inequality data in growth empirics: From cross-sections to time series. Working Papers of Faculty of Economics and Business Administration, Ghent University, Belgium 04/252.
167. Gosling, A., Machin, S., & Meghir, C. (2000). The changing distribution of male wages in the U.K. The Review of Economic Studies, 67(4), 635-666.
168. Gottschalk, P., & Smeeding, T. M. (1997). Cross-national comparisons of earnings and income inequality. Journal of Economic Literature, 35(2), 633-687.
169. Gradstein, M., & Milanovic, B. (2002). Does Liberté=Egalité? A survey of empirical evidence on the links between political democracy and income inequality. World Bank Policy Research Working Paper 2875.
170. Gradstein, M., Milanovic, B., & Ying, Y. (2001). Democracy and income inequality: An empirical analysis. World Bank Research Working Paper 2411.
171. Greene, W. H. (2012). Econometric Analysis (7th ed.). Prentice Hall.
172. Greene, W. H. (2013). Econometric Analysis (5th ed.). Upper Saddle River, N.J.: Prentice Hall.
173. Greenwood, J., & Jovanovic, B. (1990). Financial development, growth, and the distribution of income. Journal of Political Economy, 98(5), 1076-1107.
174. Gruber, L., & Kosack, S. (2014). The Tertiary Tilt: Education and Inequality in the Developing World. World Development, 54(C), 253-272.
175. Guilera, J. (2010). Extending the Kuznets curve. Documents de Treball de la Facultat d'Economia i Empresa, E11/257.
176. Gunatilaka, R., & Chotikapanich, D. (2006). Inequality Trends and Determinants in Sri Lanka 1980–2002: A Shapley Approach to Decomposition. Monash University, Department of Econometrics and Business Statistics. (No. 6/06).
177. Gupta, S., Davoodi, H., & Alonso-Terme, R. (2002). Does Corruption Affect Income Inequality and Poverty? Economics of Governance, 3(1), 23-45.
178. Gustafsson, B., & Johansson, M. (1999). In search of smoking guns: What makes income inequality vary over time in different countries? American Sociological Review, 64(4), 585-605.

179. Harrison, A. (2005). Has Globalization Eroded Labor's Share? Some Cross-Country Evidence. MPRA Paper 39649, University Library of Munich, Germany.
180. Helpman, E. (1998). The Size of Regions. In D. Pines, E. Sadka, & I. Zilcha (Eds.), Topics in Public Economics: Theoretical and Applied Analysis (pp. 33-54). Cambridge University Press.
181. Hendel, I., Shapiro, J., & Willen, P. (2005). Educational opportunity and income inequality. Journal of Public Economics, 89, 841-870.
182. Henderson, D. (2014). An Unintended Case for More Capitalism. Cato Institute: Working Papers, 58-61.
183. Herzer, D., & Nunnenkamp, P. (2011). Inward and outward FDI and income inequality: Evidence from Europe. Review of World Economics, 149(2), 395-422.
184. Higgins, M., & Williamson, J. G. (1999). Explaining inequality the world round: Cohort size, Kuznets curves, and openness. National Bureau of Economic Research Working Paper 7224:57. Retrieved from http://www.nber.org/papers/w7224.
185. Hodler, R. (2008). Redistribution and Inequality in a Heterogeneous society. Economica, 76(304), 704-718.
186. Hovhannisyan, A., Castillo-Ponce, R. A., & Valdez, R. I. (2019). The Determinants of Income Inequality: The Role of Education. Scientific Annals of Economics and Business, 66(4), 451-464. https://doi.org/10.47743/saeb-2019-0040
187. Huber, E., Gunderson, J., & Stephens, J. D. (2002). Private education and inequality in the knowledge economy. Policy and Society, (39), 171-188.
188. Hung, N. T., Yen, N. T. H., Duc, L. D. M., Thuy, V. H. N., & Vu, N. T. (2020). Relationship between government quality, economic growth and income inequality: Evidence from Vietnam. Cogent Business & Management, 7(1), 1-10. https://doi.org/10.1080/23311975.2020.1736847
189. Huynh, C. M., & Nguyen, T. L. (2020). Shadow economy and income inequality: New empirical evidence from Asian developing countries. Journal of the Asia Pacific Economy, 25(1), 175-192.
190. Iradian, G. (2005). Inequality, Poverty, and Growth: Cross-Country Evidence. IMF Working Paper 05/28. Washington: International Monetary Fund.
191. Ivaschenko, O. (2002). Growth and inequality: Evidence from transitional economics. CESIFO Working Paper 2002:746.
192. Jäntti, M. A. (1994). More Efficient Estimate of the Effects of Macroeconomic Activity on the Distribution of Income. The Review of Economics and Statistics, 76(2), 372-378.
193. Jauch, S., & Watzka, S. (2016). Financial development and income inequality: A panel data approach. Empirical Economics, 51(1), 291-314.
194. Jaumotte, F., Lall, S., & Papageorgiou, C. (2008). Rising income inequality: Technology, or trade and financial globalization? IMF Working Papers, 08/185.
195. Jianu, I., Gavril, I. A., Iacob, S. E., & Hrebenciuc, A. (2021). Income Inequalities and their Social Determinants: an Analysis over Developed vs. Developing EU Member States. Economic Computation and Economic Cybernetics Studies and Research, 55(2), 125-142.
196. Johnson, D. S., & Shipp, S. (1999). Inequality and the Business Cycle: A Consumption Viewpoint. Empirical Economics, 24(1), 173-180.
197. Johnson, D., & Shipp, S. (1999). Inequality and the business cycle: A consumption viewpoint. Empirical Economics, 24, 173-180.
198. Kaasa, A. (2005, January 1). Factors of Income Inequality and Their Influence Mechanisms: A Theoretical Overview. SSRN. https://doi.org/10.2139/ssrn.868491
199. Kahneman, D., Knetsch, J. L., & Thaler, R. (1986). Fairness as a Constraint on Profit Seeking: Entitlements in the Market. The American Economic Review, 76(4), 728–741.
200. Kanbur, R. (2017). Structural transformation and income distribution: Kuznets and beyond.
201. Khan, A. Q., Hafeez, M. H., Saleem, N., & Azam, M. (2018). Exploring the Impact of Financial Development on Inequality: Evidence from Three Asian Countries. Review of Economics and Development Studies, 4(2), 341–355.
202. Khan, H., Weili, L., & Khan, I. (2023). The effect of political stability, carbon dioxide emission and economic growth on income inequality: evidence from developing, high income and Belt Road initiative countries. Environmental science and pollution research international, 30(3), 6758–6785. https://doi.org/10.1007/s11356-022-22675-9

203. Kharlamova, G., Stavytskyy, A., & Zarotiadis, G. (2018). The impact of technological changes on income inequality: the EU states case study. Journal of International Studies, 11(2), 76-94.
204. Kiatrungwilaikun, N., & Suriya, K. (2015). Rethinking inequality and growth: The Kuznets curve after the millennium. International Journal of Intelligent Technologies and Applied Statistics, 8(2), 159–169.
205. Kim, D. H., & Lin, S. C. (2011). Nonlinearity in the financial development–income inequality nexus. Journal of Comparative Economics, 39(3), 310–325.
206. Klugman, J., Kolb, H., & Morton, M. (2014). Persistent Gender Inequality in the World of Work. The Fletcher Forum of World Affairs, 38(2), 133–152.
207. Knight, J. B., & Sabot, R. H. (1983). Educational Expansion and the Kuznets Effect. American Economic Review, 73, 1132-1136.
208. Koczan, Z., & Loyola, F. (2018). How Do Migration and Remittances Affect Inequality? A Case Study of Mexico. IMF Working Paper, WP/18/122.
209. Korpi, W., & Palme, J. (1998). The Paradox of Redistribution and Strategies of Equality: Welfare State Institutions, Inequality and Poverty in the Western Countries. LIS Working Paper Series, No. 174, Luxembourg Income Study (LIS), Luxembourg.
210. Korzeniewicz, R., & Moran, T. (2007). World inequality in the twenty-first century: Patterns and tendencies. In The Blackwell companion to globalization (pp. 565-592).
211. Korzeniewicz, R. P., & Moran, T. P. (2005). Theorizing the relationship between inequality and economic growth. , 34(3), 277–316. doi:10.1007/s11186-005-4575-6
212. Kremer, M., & Maskin, E. (1996). Wage Inequality and Segregation by Skill. NBER Working Papers 5718, National Bureau of Economic Research, Inc.
213. Krugman, P. R. (1981). Intraindustry Specialisation and the Gains from Trade. Journal of Political Economy, 89(5).
214. Kuznets, S. (1955). Economic growth and income inequality. American Economic Review, 45(1), 1-28.
215. Lagerlöf, A. (2021). Income Inequality and Economic Growth, An Empirical Investigation of the European Union 1991–2019. Bachelor's Thesis. Lund University. Retrieved from https://lup.lub.lu.se/luur/download?func=downloadFile&recordOId=9049513&fileOId=9049723
216. Laskowska, P. (2021). Determinants of income inequality in 26 European Union countries. In Proceedings of the 37th International Business Information Management Association (IBIMA), 30-31 May 2021, Cordoba, Spain (pp. 195-226). ISBN: 978-0-9998551-6-4. Retrieved from https://www.researchgate.net/publication/354254357
217. Lee, W., & Roemer, J. E. (1998). Income distribution, redistributive politics, and economic growth. Journal of Economic Growth, 3, 217-240. https://doi.org/10.1023/A:1009762720862
218. Lee, C. C., & Lee, C. C. (2018). The impact of country risk on income inequality: A multilevel analysis. Social Indicators Research, 136, 139-162. https://doi.org/10.1007/s11205-016-1534-8
219. Lemieux, T. (2016). Inequality and changes in task prices: Within and between occupation effects. In P. Gregg & J. Wadsworth (Eds.), Inequality: Causes and Consequences (pp. 195-226). Emerald Group Publishing Limited.
220. Levernier, W., Rickman, D. S., & Partridge, M. D. (1995). Variation in U.S. state income inequality: 1960-1990. International Regional Science Review, 18(3), 355-378. https://doi.org/10.1177/016001769501800305
221. Levine, R. (1997). Financial development and economic growth: Views and agenda. Journal of Economic Literature, 35, 688-726.
222. Levine, R. (2005). Finance and growth: Theory and evidence. In P. Aghion & S. Durlauf (Eds.), Handbook of Economic Growth (pp. 865-934). North-Holland Elsevier Publishers.
223. Li, H., & Zou, H. F. (2002). Inflation, growth, and income distribution: A cross-country study. Annals of Economics and Finance, 3(1), 85-101.
224. Li, H., & Zou, H. (1998). Income inequality is not harmful for growth: Theory and evidence. Review of Development Economics, 2(3), 318-334.
225. Li, H., Squire, L., & Zou, H. (1998). Explaining international and intertemporal variations in income inequality. The Economic Journal, 108(446), 26-43.
226. Lim, G. C., & McNelis, P. (2014). Income inequality, trade and financial openness. New Perspectives.

227. Lin, S. C., Huang, H. C., & Weng, H. W. (2006). A semi-parametric partially linear investigation of the Kuznets' hypothesis. Journal of Comparative Economics, 34, 634–647.
228. Lin, S., Kim, D., & Wu, J. (2013). Foreign direct investment and income inequality: Human capital matters. Journal of Regional Science, 53(5), 874–896.
229. Litwin, C. (1998). Trade and Income Distribution in Developing Countries. Göteborg University Working Papers In Economics No. 9.
230. Lopez, M., Jesús, A. & Cowell, F. (2013). Inequality And Economic Growth. Vicious Or Virtuous Circles?, Revista Galega de Economía, University of Santiago de Compostela. Faculty of Economics and Business., vol. 22(ex).
231. Lopez, J. H. (2004). Pro-poor growth: a review of what we know (and of what we don't). The World Bank.
232. Lundberg, M., & Squire, L. (2003). The Simultaneous Evolution of Growth and Inequality. The Economic Journal, 113(487), 326–344.
233. Maestri, V., & Roventini, A. (2012). Inequality and macroeconomic factors: a time-series analysis for a set of OECD countries. LEM Papers Series 2012/21, Laboratory of Economics and Management (LEM), Sant'Anna School of Advanced Studies, Pisa, Italy.
234. Magessi, N. T., & Antunes, L. (2015). Shadow Economy and Wealth Distribution. In Frédéric Amblard, Francisco J. Miguel, Adrien Blanchet, & Benoit Gaudou (Eds.), Advances in Artificial Economics (pp. 169-179). Springer.
235. Magness, P. W., & Murphy, R. P. (2015). Challenging the empirical contribution of Thomas Piketty's capital in the 21st century. Journal of Private Enterprise, 30, 1–43.
236. Maldonado, J. E. (2017). Financial Systems and Income Inequality. Bruges European Economic Research Papers 36/2017.
237. Malul, M., Shapira, D., & Shoham, A. (2013). Practical modified Gini index. Applied Economics Letters, 20(4), 324–327.
238. Martinez, R., Ayala, L., & Ruiz-Huerta, J. (2001). The impact of unemployment on inequality and poverty in OECD countries. Economics in Transition, 9(2), 417-447.
239. Martínez-Navarro, D., Amate-Fortes, I., & Guarnido-Rueda, A. (2020). Inequality and development: is the Kuznets curve in effect today? Economia Politica, 37, 703–735. https://doi.org/10.1007/s40888-020-00190-9
240. Matins-Bekat, M. C., & Kulkarni, K. G. (2009). Income distribution and economic growth: the case of Brazil. The Journal of Developing Areas, 43(1), 341-351.
241. Matos, C. (2019). Inequality and crisis: conspicuous consumption as the missing link in the Portuguese case. Journal of Economic Issues, 53(1), 26–38.
242. Maxwell, N. L. (1990). Changing Female Labor Force Participation: Influences on Income Inequality and Distribution. Social Forces, 68(4), 1251–1266.
243. McCloskey, D. N. (2014). Measured, Unmeasured, Mismeasured, and Unjustifed pessimissim: A Review Essay of Thomas Piketty's Capital in the twenty-frst century. Erasmus Journal for Philosophy and Economics, 7(2), 73–115.
244. Mdingi, K., & Ho, S.-Y. (2021). Literature review on income inequality and economic growth. MethodsX, Published September 24, 2021. DOI: 10.1016/j.mex.2021.101402.
245. Mehic, A. (2018). Industrial Employment and Income Inequality: Evidence from Panel Data. Structural Change and Economic Dynamics, 45, 84-93.
246. Mekenbayeva, K., & Karakus, S. B. (2011). Income inequality and economic growth: Enhancing or retarding impact? A panel Data Analysis. In Department of Economics, EGE University, The 14th International Student Conference on Economics.
247. Meneejuk, P., & Yamada, W. (2016). Analyzing the relationship between income inequality and economic growth: does the Kuznets curve exist in Thailand?
248. Milanovic, B. (2000). Determinants of cross-country income inequality: An 'augmented' Kuznets hypothesis. In Equality, participation, transition (pp. 48–79). UK: Palgrave Macmillan.
249. Milanovic, B. (2016). Global Inequality: A New Approach for the Age of Globalization. Cambridge: Harvard University Press.
250. Milanovic, B., & Squire, L. (2005). Does Tariff Liberalization Increase Wage Inequality? Some Empirical Evidence. World Bank Policy Research Working Paper, No. 3571, World Bank, Washington, DC.

251. Mincer, J. (1958). Investment in Human Capital and Personal Income Distribution. Journal of Political Economy, 66, 281-302.
252. Mirguseinova, E. (2015). Determinants of income inequality in Spain [Manuscript]: bachelor thesis: economics. Vilnius, ISM University of Management and Economics.
253. Mocan, N. H. (1999). Structural Unemployment, Cyclical Unemployment and Income Inequality. The Review of Economics and Statistics, 81(1), 122-134.
254. Moffatt, M. (2019). Essential Economics Terms: Kuznets Curve. Retrieved from https://www.thoughtco.com/kuznets-curve-in-economics-1146122.
255. Moller, S., Huber, E., Stephens, J., Bradley, D., & Nielsen, F. (2003). Determinants of relative poverty in advanced capitalist economies. American Sociological Review, 68(1), 22–61.
256. Moore, E. G., & Pacey, M. A. (2003). Changing income inequality and immigration in Canada, 1980-1995. Canadian Public Policy/Analyse de Politiques, 33-52.
257. Mughal, M. Y., & Diawara, B. (2011). Explaining Income Inequalities in Developing Countries: The Role of Human Capital. Working Papers 2011-2012_2, CATT -UPPA - Université de Pau et des Pays de l'Adour, revised Dec 2011.
258. Müller, E. N. (1988). Democracy, Economic Development, and Income Inequality. The American Sociological Review, 53(1), 50–68.
259. Munir, K., & Sultan, M. (2017). Macroeconomic determinants of income inequality in India and Pakistan. Theoretical and Applied Economics, 25(4), 109-120.
260. Muschinski, D. W., & Pickering, K. (2000). Inequality in Income Distributions: Does Culture Matter? Journal of Economic Issues, 34(2), 403–412.
261. Nahum, R. (2005). Income Inequality and Growth: a Panel Study of Swedish Counties 1960-2000. Arbetsrapport.
262. Nesta, L., & Metu, A. (2021). Determinants of Income Inequality in Nigeria. Journal of Economic Studies, 18(1), 2021.
263. Niehues, J. (2010). Social Spending Generosity and Income Inequality: A Dynamic Panel Approach. IZA Discussion Paper, No. 5178.
264. Nielsen, F. (1994). Income Inequality and Industrial Development: Dualism Revisited. American Sociological Review, 59, 654–677.
265. Nielsen, F. (2017). Inequality and inequity. Social Science Research, 62, 29–35.
266. Nielsen, F., & Alderson, A. S. (1995). Income Inequality, Development and Dualism: Results from an Unbalanced Cross-National Panel. American Sociological Review, 60, 674–701.
267. Nielsen, F., & Alderson, A. S. (1997). The Kuznets Curve and the Great U-Turn: Income Inequality in U.S. Counties, 1970 to 1990. American Sociological Review, 62, 12–33.
268. Nikoloski, Z. (2009). Economic and political determinants of income inequality. University College London.
269. Oczki, J., Muszyńska, J., & Nicolaus, E. W. (2017). Kuznets's hypothesis of income inequality: Empirical evidence from EU. Research Institute of Applied Economics Working Paper, WP/2017/07.
270. Odedokun, M. O., & Round, J. I. (2001). Determinants of income inequality and its effects on economic growth: Evidence from African countries. WIDER Discussion Paper, No. 2001/103, ISBN 929190029X, The United Nations University World Institute for Development Economics Research (UNU-WIDER).
271. O'Rourke, K. O. (2001). Globalization and Inequality: Historical Trends. NBER Working Paper Series, Working Paper 8339, National Bureau of Economic Research.
272. Ortega, D., & Rodriguez, F. (2006). Are Capital Shares Higher in Poor Countries? Evidence from Industrial Surveys. Wesleyan Economics Working Papers 2006–023, Wesleyan University, Department of Economics.
273. Palaz, S., Senergin, O., & Oksuzler, O. (2013). The effect of differences in educational level on income distribution. Journal of Entrepreneurship and Development, 8(2), 119–131.
274. Palma, J. G. (2011). Homogeneous middles vs. heterogeneous tails, and the end of the 'Inverted-U': the share of the rich is what it's all about. Cambridge Working Papers in Economics (CWPE) 1111, Cambridge University.
275. Pan, X., Wang, H., Wang, Z., Lin, L., Zhang, Q., Zheng, X., & Chen, W. (December 2019). Carbon Palma Ratio: A new indicator for measuring the distribution inequality of carbon emissions among individuals. Journal of Cleaner Production, 241, 118418. https://doi.org/10.1016/j.jclepro.2019.118418

276. Panizza, U. (2002). Income inequality and economic growth: Evidence from American data. Journal of Economic Growth, 7(1), 25-41.
277. Papanek, G. F., & Kyn, O. (1987). Flattening the Kuznets curve: The consequences for income distribution of development strategy, government intervention, income and the rate of growth. The Pakistan Development Review, 26(1), 1-54.
278. Parker, S. C. (1999). Income Inequality and the Business Cycle: a Survey of the Evidence and Some New Results. Journal of Post Keynesian Economics, 21(2), 201–225.
279. Partridge, M. D. (1997). Is Inequality Harmful for Growth? Comment. American Economic Review, 87(5), 1019-1032.
280. Partridge, J. S., Partridge, M. D., & Rickman, D. S. (1998). State Patterns in Family Income Inequality. Contemporary Economic Policy, 16(3), 277–294.
281. Paukert, F. (1973). Income Distribution at Different Levels of Development: A Survey of Evidence. International Labor Review, 108, 97-125.
282. Perotti, R. (1993). Political equilibrium, income distribution and growth. Review of Economic Studies, 60(4), 755–776.
283. Perotti, R. (1994). Income distribution and investment. European Economic Review, 38(3-4), 827-835.
284. Piketty, T. (2014). Capital in the twenty-first century. Harvard University Press.
285. Prados de la Escosura, L. (2008). Inequality, poverty and the Kuznets curve in Spain, 1850–2000. European Review of Economic History, 12, 38. https://doi.org/10.1017/S1361491608002311
286. Przychodzen, J., & Przychodzen, W. K. (2009). Grey Market and the Income Inequalities in the Post-Socialist Economies. Retrieved from SSRN: http://dx.doi.org/10.2139/ssrn.1720583
287. Rajan, R., & Zingales, L. (2003). Saving capitalism from the capitalists. Crown Business.
288. Rattan, D. (2012). Exploring the Kuznets Curve and the 'Latin American Effect' in Latin America. In K. Kulkarni (Ed.), International economic review: Post recession challenges & analyses (pp. 277–287). Daryaganj: Matrix Publishers.
289. Ravallion, M., & Chen, S. (1997). What can new survey data tell us about recent changes in distribution and poverty? The World Bank Economic Review, 11(2), 357-382.
290. Renaud, B., Buda, M., Lewis, B. D., & Pujol, J. F. (1975, September 15). Effects of 5,6-dihydroxytryptamine on tyrosine-hydroxylase activity in central catecholaminergic neurons of the rat. Biochemical Pharmacology, 24(18), 1739–1742. doi:10.1016/0006-2952(75)90018-0
291. Reuveny, R., & Li, Q. (2003). Economic Openness, Democracy, and Income Inequality: An Empirical Analysis. Comparative Political Studies, 36(5), 575-601.
292. Richardson, J. D. (1995). Income Inequality and Trade: How to Think, What to Conclude. Journal of Economic Perspectives, 9(3), 33-55.
293. Ris, M. M., Deitrich, R. A., & Von Wartburg, J. P. (1975, October 15). Inhibition of aldehyde reductase isoenzymes in human and rat brain. Biochemical Pharmacology, 24(20), 1865-1869. doi:10.1016/0006-2952(75)90405-0
294. Robbins, D. (1996). Evidence of trade and wages in the developing world. OECD Development Center Technical Papers No. 119.
295. Rubinson, R. (1976). The world economy and the distribution of income within states: A cross-national study. American Sociological Review, 41(4), 638-659.
296. Røed, K., & Strøm, S. (2002). Progressive taxes and the labour market: Is the trade-off between equality and efficiency inevitable? Journal of Economic Surveys, 16(1), 77-110.
297. Roine, J., Vlachos, J., & Waldenström, D. (2009). The long-run determinants of inequality: What can we learn from top income data? Journal of Public Economics, 93, 974-988.
298. Roodman, D. (2006). How to Do Xtabond2: An Introduction to "Difference" and "System" GMM in Stata. Stata Journal, 1(9), 86–136. doi:10.2139/ssrn.982943
299. Roodman, D. (2008). A Note on the Theme of Too Many Instruments. Oxford Bulletin of Economics and Statistics, 71(1), 135–158. doi:10.1111/j.1468-0084.2008.00542.x
300. Rossana, G., & Hoeven, R. V. D. (2011). Is inflation bad for income inequality? The importance of the initial rate of inflation. Journal of Risk and Financial Management, 4, 50-89.

301. Rosser, J. B., & Rosser, M. V. (2001). Another failure of the Washington Consensus on transition countries: Inequality and underground economics. Challenge, 44(2), 39-50.
302. Rubin, A., & Segal, D. (2015). The effects of economic growth on income inequality in the US. Journal of Macroeconomics, 45, 258-273.
303. Sachs, J., Schatz, H., Deardorff, A., & Hall, R. (1994). Trade and jobs in U.S. manufacturing. Brookings Papers on Economic Activity, 1994(1), 1-84.
304. Sadiku, et al. (2023). Empirical evidence of the macroeconomic determinants of income inequality for Central and Eastern European countries. Proceedings of the 23rd International Joint Conference Central and Eastern Europe in the Changing Business Environment, pp. 213-224. DOI: 10.18267/pr.2023.kre.2490.17
305. Saggi, K. (1999). Foreign direct investment, licensing, and incentives for innovation. Review of International Economics, 7, 699–714.
306. Sala-i-Martin, X. (2006). The world distribution of income: Falling poverty and... convergence, period. The Quarterly Journal of Economics, 121(2), 351-397.
307. Samanchuk, K. (2016). Determinants of income inequality in post-communist Central and Eastern European countries: Role of corruption [Master's thesis, Charles University, Prague]. Charles University.
308. Sarel, M. (1997). How macroeconomic factors affect income distribution: The cross-country evidence. IMF Working Paper, 1-25.
309. Sarkar, J. (2008). Mortality, fertility, and persistent income inequality. Southern Economic Journal, 75(2), 332-350.
310. Sayed, A., & Peng, B. (2020). The income inequality curve in the last 100 years: What happened to the inverted-U? Research in Economics, 74, 63-72.
311. Schultz, T. W. (1961). Investment in human capital. American Economic Review, 51, 1-17.
312. Sen, A. (1997). Inequality, unemployment and contemporary Europe. International Labour Review, 136(2), 155-171.
313. Shahabadi, A., Nemati, M., & Hosseinidoust, S. E. (2017). The Effect of Knowledge Economy Factors on Income Inequality in the Selected Islamic Countries. Journal of Knowledge Economy, 8, 1174-1188. https://doi.org/10.1007/s13132-016-0431-3
314. Shahbaz, M. (2010). Income inequality-economic growth and non-linearity: A case of Pakistan. International Journal of Social Economics, 37(8), 613-636.
315. Shao, L. F. (2021). Robust determinants of income distribution across and within countries. PLoS ONE, 16(7), e0253291. https://doi.org/10.1371/journal.pone.0253291
316. Shapiro, J. M. (2006). Smart Cities: Quality of Life, Productivity, and the Growth Effects of Human Capital. Review of Economics and Statistics, 88, 324-335.
317. Sharma, S. K. (2013). Making of the social world: A retrospect. Ekonomska istraživanja- Economic Research, 26(1), 243-256.
318. Sharpe, A., & Zyblock, M. (1997). Macroeconomic Performance and Income Distribution in Canada. North American Journal of Economics & Finance, 8(2), 167-199.
319. Shavit, Y. (1994). Persistent inequality: Changing educational attainment in thirteen countries. Westview Press.
320. Shchepeleva, M., et al. (2021). Has the Global Financial Crisis Increased Wealth Inequality?
321. Sianesi, B., & Van Reenen, J. (2003). The Returns to Education: Macroeconomics. Journal of Economic Surveys, 17, 157-200.
322. Sirowy, L., & Inkeles, A. (1990). The Effects of Democracy on Economic Growth and Inequality: A Review. Studies in Comparative International Development, 25(1), 126-157.
323. Škare, M., & Stjepanović, S. (2014). Income Distribution Determinants and Inequality – International Comparison. Amfiteatru Economic Journal, 16(37), 980-993.
324. Smeeding, T. M., Thompson, J., & Morelli, S. (2015). Post-1970 trends in within-country inequality and poverty. In A. Atkinson & F. Bourguignon (Eds.), Handbook of Income Distribution, Volume 2A. Elsevier.
325. Snower, D. J. (1999). Causes of Changing Earnings Inequality. IZA Discussion Paper No. 29.
326. Sonora, R. J. (2019). Income Inequality, Poverty, and the Rule of Law: Latin America vs the Rest of the World.
327. Spilimbergo, A., Londoño, J., & Székely, M. (1997). Income Distribution, Factor Endowments, and Trade Openness. Inter-American Development Bank, Office of the Chief Economist, Working Paper No. 356.

328. Stack, S. (1978). The Effect of Direct Government Involvement in the Economy on the Degree of Income Inequality: A Cross-National Study. American Sociological Review, 43, 880-888.
329. Stark, O., Taylor, J., & Yitzhaki, S. (1986). Remittances and inequality. Economic Journal, 96(383), 722–740.
330. Stewart, F., & Berry, A. (2000). Globalization, Liberalization, and Inequality: Real Causes. Challenges, 43(1), 44–92.
331. Stiglitz, J. E., & Emran, M. S. (2007). Equity and Efficiency in Tax Reform in Developing Countries. Retrieved from http://dx.doi.org/10.2139/ssrn.1001269
332. Stiglitz, J. E. (2012). The Price of Inequality: How Today's Divided Society Endangers Our Future. Norton.
333. Stolper, F. W., & Samuelson, P. A. (1941). Protection and real wages. Review of Economic Studies, 9, 58-73.
334. Stuart, J. (2012). The determinants of income inequality: A cross-country investigation. McGill University.
335. Sulkowski, A., & White, D. S. (2016). A happiness Kuznets curve? Using model-based cluster analysis to group countries based on happiness, development, income, and carbon emissions. Environment, Development and Sustainability, 18(4), 1095–1111.
336. Summers, R., Kravis, I., & Heston, A. (1984). Changes in the World Income Distribution. Policy Modeling, 6, 237-269.
337. Sylwester, K. (2002). Can Education Expenditures Reduce Income Inequality? Economics of Education Review, 21(1), 43–52.
338. Tanninen, H. (1999). Income inequality, government expenditures and growth. Applied Economics, 31(9), 1109-1117.
339. Tanzi, V., & Chu, K. (1998). Income Distribution and High-Quality Growth. MIT Press.
340. Taylor, J. E. (1999). The new economics of labor migration and the role of remittances in the migration process. International Migration, 37(1), 63-88.
341. Thalassinos, E., Ugurlu, E., & Muratoglu, Y. (2012). Income Inequality and Inflation in the EU. European Research Studies, 15(1), 127-140.
342. Tinbergen, J. (1975). Income Distribution: Analysis and Policies. North Holland Publishing Co.
343. Tomat, G. M. (2010). Trade and Wage Inequality, Mirage or Reality? Luxembourg Income Study Working Paper Series, Working Paper No. 533.
344. Trapeznikova, I. (2019). Measuring income inequality. IZA World of Labor. doi:10.15185/izawol.462
345. Treisman, D. (2000). The causes of corruption: A cross-national study. Journal of Public Economics, 76(3), 399-457.
346. Tsaurai, K. (2020). An Empirical Study of the Determinants of Income Inequality in Transitional Economies Using Panel Data Analysis Methods. Academy of Accounting and Financial Studies Journal, 24(6).
347. UNCTAD. (2013). Growth and poverty eradication: Why addressing inequality matters. UNCTAD Post-2015 Policy Brief Series No. 2. UNCTAD/PRESS/PB/2013/4. Geneva.
348. UNCTAD. (2014). Tackling inequality through trade and development in the post-2015 development agenda. TD/B/61/7. Geneva.
349. United Nations Department of Economic and Social Affairs. (2014). World Economic Situation and Prospects 2014: Country Classification. Retrieved from https://www.un.org/en/development/desa/policy/wesp/wesp_current/2014wesp_country_classification.pdf
350. Utari, G. D., & Cristina, R. (2015). Growth and inequality in Indonesia: Does Kuznets curve hold? Journal of Modern Accounting and Auditing, 11(2), 93–111.
351. VanHeuvelen, T. (2018). Recovering the missing middle: A mesocomparative analysis of within-group inequality, 1970–2011. American Journal of Sociology, 123(4), 1064–1116.
352. Vanhoudt, P. (2000). An assessment of the macroeconomic determinants of inequality. Applied Economics, 32(7), 877-883.
353. Vicente, J., & Borge, L. (2000). Inequality and growth: inverted and uninverted U-shapes. Applied Economics Letters, 7(8), 497–500.
354. Vivarelli, M. (2004). Globalization, Skills and Within-Country Income Inequality in Developing Countries. In E. Lee & M. Vivarelli (Eds.), Understanding Globalization, Employment and Poverty Reduction (pp. 211-243). Palgrave Macmillan.
355. Walker et al. (2019). The Power of Education to Fight Inequality: How Increasing Educational Equality and Quality is Crucial to Fighting Economic and Gender Inequality. Oxfam briefing Paper.

356. Wan et al. (2006). The inequality-growth nexus in the short and long run: Empirical evidence from China. Journal of Comparative Economics, 34(4), 654-667.
357. Wilkie (1996). Through-Time Changes in Family Income Inequality – the Effect of Non-synchronous Regional Growth. Applied Economics, 28(12), 1515-1527.
358. Williams (1998). Voice, Trust, and Memory: Marginalized Groups and the Failings of Liberal Representation.
359. Williamson (1991). Inequality, Poverty, and History: The Kuznets Memorial Lectures of the Economic Growth Center, Yale University. Oxford: Basil Blackwell.
360. Williamson (1997). Growth, Distribution and Demography: Some Lessons from History. NBER Working Paper 6244.
361. Windmeijer (2005). A finite sample correction for the variance of linear efficient two-step GMM estimators. Journal of Econometrics, 126(1), 25-51. doi: 10.1016/j.jeconom.2004.02.005
362. Wood (1994). North-South trade, employment, and inequality: Changing fortunes in a skill-driven world. Clarendon Press, Oxford.
363. Wood (1995). How trade hurt unskilled workers. Journal of Economic Perspectives, 9, 57-80.
364. Wood (1998). Globalisation and the rise in labour market inequalities. Economic Journal, 108, 1463-1482.
365. World Bank (2002). "Achieving Education for All by 2015: Simulation Results for 47 Low-Income Countries." Washington, DC: Human Development Network, Africa Region and Education Department, World Bank: 76.
366. World Bank (2023) Retrieved from: https://data.worldbank.org/indicator
367. Gu et al. (2015). Inequality and Saving: Further Evidence from Integrated Economies. ERN: Equity.
368. Xu and Zou (2000). Explaining the Changes of Income Distribution in China. China Economic Review, 11(2), 149-170.
369. Yang and Greaney (2017). Economic growth and income inequality in the Asia-Pacific region: A comparative study of China, Japan, South Korea, and the United States. https://doi.org/10.1016/j.asieco.2016.10.008
370. Yue (2011). Income Inequality, Economic Growth and Inflation: A Study on Korea. International Journal of Economics and Research, 2(5), 14-21.
371. Yusuf et al. (2014). Twenty years of expenditure inequality in Indonesia, 1993–2013. Bulletin of Indonesian Economic Studies, 50(2), 243–254.
372. Zhang (2014). Has China crossed the threshold of the Kuznets curve? The University of Texas inequality project working paper. Retrieved from http://utip.gov.utexas.edu/papers.html.
373. Zulkarnaen (2017). Socio-Political and Economic Determinants of Income Inequality in Indonesia. Indonesian Journal of Development Planning, 1(3), 224-239.

Appendices

Appendix A – Descriptive statistics

Descriptive statistics (dev=0)

Variable	Obs	Mean	Std. Dev.	Min	Max
log_gdppc	90	8.410013	.3392168	7.334127	9.128587
eglo	90	64.47589	4.185599	53.14	73.38
rem	90	10.571	6.246151	2.81	33.88
unempl	90	15.61389	8.585431	3.73	34.93
cons	90	93.789	8.630597	77.69	113.56
sav	90	6.211	8.630597	-13.56	22.31
vat	90	18.73722	2.736805	11.91	25.79
gfcf	90	22.49511	4.522922	12.44	36.38
infl	90	4.892667	6.601045	-1.58	48.7
trd	90	94.44778	17.47055	59.95	148.47
pols	90	36.33089	12.99006	5.24	61.43
cor	90	35.14133	12.04115	10.9	56.4
rol	90	40.72589	8.973327	20.67	57.21
voa	90	51.93878	9.611093	30.33	70.19
regq	90	47.63944	5.804413	36.23	57.35
gove	90	41.06467	11.69666	12.98	58.65
popg	90	-.5017778	.5100024	-1.79	.21
myos	90	10.31896	1.324417	6.45	11.85
cov19	90	.1333333	.341839	0	1

Descriptive statistics (dev=1)

Variable	Obs	Mean	Std. Dev.	Min	Max
log_gdppc	510	10.19163	.7661882	8.462876	11.81808
eglo	510	76.78831	9.378694	47	91.31
rem	510	1.599941	2.092821	.04	13.52
unempl	510	8.039667	4.511036	2.01	27.47
cons	510	74.28404	9.56173	36.28	112.12
sav	510	25.71596	9.56173	-12.12	63.72
vat	510	13.48731	3.797348	5.28	39.37
gfcf	510	22.2829	4.6639	10.58	53.59
infl	510	2.82798	4.594995	-4.48	59.22
trd	510	117.2113	63.56625	45.42	388.12
pols	510	69.91035	20.57071	4.76	100
cor	510	75.74326	20.24639	11	100
rol	510	78.71204	20.61354	11.48	100
voa	510	79.94761	17.9017	6.8	100
regq	510	78.36657	22.09081	5.16	100
gove	510	78.43212	18.09795	8.13	100
popg	510	.3007059	.8322398	-3.74	3.93
myos	510	11.82366	1.410264	6.142	14.13
cov19	510	.1333333	.3402684	0	1

Appendix B – Correlation tests

Correlations (macroeconomic and demographic vs political variables)

	log_g~pc	eglo	rem	unempl	cons	sav	vat	gfcf	infl	cpi	trd	popg
log_gdppc	1.0000											
eglo	0.6810	1.0000										
rem	-0.6639	-0.3235	1.0000									
unempl	-0.4642	-0.3152	0.2890	1.0000								
cons	-0.6845	-0.4525	0.6709	0.5817	1.0000							
sav	0.6845	0.4525	-0.6709	-0.5817	-1.0000	1.0000						
vat	-0.4805	-0.1382	0.5239	0.3294	0.5028	-0.5028	1.0000					
gfcf	-0.1346	-0.1180	0.1156	-0.1624	-0.1357	0.1357	-0.0639	1.0000				
infl	-0.3485	-0.4465	0.1173	-0.0760	0.0338	-0.0338	0.0048	0.2784	1.0000			
cpi	-0.2397	-0.2970	0.0494	-0.0945	-0.0569	0.0569	-0.0580	0.0552	0.2983	1.0000		
trd	0.2285	0.5393	-0.0175	-0.2277	-0.4806	0.4806	-0.0107	0.0075	-0.0718	-0.0143	1.0000	
popg	0.6104	0.3283	-0.3921	-0.3495	-0.5368	0.5368	-0.3932	0.0501	-0.0799	-0.0730	0.3273	1.0000
myos	0.4239	0.4356	-0.1873	-0.5484	-0.4097	0.4097	-0.2477	-0.0566	-0.1274	0.0196	0.1754	0.0559

	myos
myos	1.0000

	pols	cor	rol	voa	regq	gove
pols	1.0000					
cor	0.7773	1.0000				
rol	0.7915	0.9214	1.0000			
voa	0.7421	0.8845	0.9427	1.0000		
regq	0.7936	0.9009	0.9371	0.9392	1.0000	
gove	0.7770	0.9353	0.9198	0.9240	0.9166	1.0000

Appendix C – Regression models - Fixed and Random effects

Fixed effects (dev dummy)

```
note: sav omitted because of collinearity
note: dev omitted because of collinearity

Fixed-effects (within) regression               Number of obs      =       600
Group variable: c                               Number of groups   =        40

R-sq:  within  = 0.2010                         Obs per group: min =        15
       between = 0.0770                                        avg =      15.0
       overall = 0.0807                                        max =        15

                                                F(17,543)          =      8.03
corr(u_i, Xb)  = -0.5224                        Prob > F           =    0.0000

------------------------------------------------------------------------------
        gini |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   log_gdppc |  -1.049072   .5640705    -1.86   0.063      -2.1571    .0589554
        eglo |  -.1366862   .0328536    -4.16   0.000     -.201222   -.0721505
         rem |   .1423161   .0552848     2.57   0.010     .0337177    .2509144
      unempl |   .0854331   .0274405     3.11   0.002     .0315306    .1393356
        cons |   .0449852   .0218941     2.05   0.040     .0019776    .0879927
         sav |          0  (omitted)
         vat |  -.0262153   .0432521    -0.61   0.545    -.1111773    .0587467
        gfcf |   .0008457   .0213403     0.04   0.968     -.041074    .0427655
        infl |   .0107264   .0163717     0.66   0.513    -.0214332     .042886
         trd |   .0078008   .0056019     1.39   0.164    -.0032033    .0188049
        pols |   .0208057   .0089167     2.33   0.020     .0032902    .0383212
         cor |   .0394414   .0199586     1.98   0.049     .0002359     .078647
         rol |   .0144772   .0238127     0.61   0.543    -.0322991    .0612534
         voa |  -.0080616   .0197743    -0.41   0.684    -.0469051    .0307819
        regq |  -.0780082   .0220356    -3.54   0.000    -.1212937   -.0347226
        gove |  -.0332727   .0168659    -1.97   0.049    -.0664031   -.0001423
        popg |   .6100706   .1460165     4.18   0.000     .3232442     .896897
        myos |  -.0490372   .1566409    -0.31   0.754    -.3567335    .2586592
         dev |          0  (omitted)
       _cons |   51.23172   7.030344     7.29   0.000     37.42172    65.04173
-------------+----------------------------------------------------------------
     sigma_u |  4.7694397
     sigma_e |  1.3761029
         rho |  .92315073   (fraction of variance due to u_i)
------------------------------------------------------------------------------
F test that all u_i=0:     F(39, 543) =    76.61             Prob > F = 0.0000
```

Random effects (dev dummy)

```
Random-effects GLS regression                   Number of obs      =       600
Group variable: c                               Number of groups   =        40

R-sq:  within  = 0.1965                         Obs per group: min =        15
       between = 0.1773                                        avg =      15.0
       overall = 0.1782                                        max =        15

                                                Wald chi2(18)      =    139.50
corr(u_i, X)   = 0 (assumed)                    Prob > chi2        =    0.0000

------------------------------------------------------------------------------
        gini |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   log_gdppc |  -.6979583   .5244338    -1.33   0.183     -1.72583     .329913
        eglo |  -.1183828   .0320128    -3.70   0.000    -.1811267    -.055639
         rem |   .1417733   .0539228     2.63   0.009     .0360866      .24746
      unempl |   .1074586   .0266483     4.03   0.000     .0552289    .1596884
        cons |   .0441296    .021672     2.04   0.042     .0016532     .086606
         sav |          0  (omitted)
         vat |  -.0309495   .0425728    -0.73   0.467    -.1143907    .0524917
        gfcf |   .0039488   .0212439     0.19   0.853    -.0376884    .0455861
        infl |    .009711   .0164494     0.59   0.555    -.0225292    .0419513
         trd |   .0052699   .0050967     1.03   0.301    -.0047195    .0152592
        pols |   .0159028   .0088437     1.80   0.072    -.0014306    .0332362
         cor |   .0250526     .01946     1.29   0.198    -.0130883    .0631935
         rol |    .025711   .0232001     1.11   0.268    -.0197603    .0711823
         voa |   .0057499   .0195111     0.29   0.768    -.0324911    .0439908
        regq |  -.0700422   .0204437    -3.43   0.001     -.110111   -.0299733
        gove |  -.0313374   .0168269    -1.86   0.063    -.0643175    .0016427
        popg |   .5852383   .1451151     4.03   0.000      .300818    .8696586
        myos |  -.1069092   .1485728    -0.72   0.472    -.3981065    .1842881
         dev |   5.598334   1.773863     3.16   0.002     2.121626    9.075043
       _cons |   41.17304   6.139672     6.71   0.000      29.1395    53.20657
-------------+----------------------------------------------------------------
     sigma_u |  3.4251552
     sigma_e |  1.3761029
         rho |  .86101938   (fraction of variance due to u_i)
------------------------------------------------------------------------------
```

Hausman test (dev dummy)

```
                 ---- Coefficients ----
             |      (b)          (B)            (b-B)     sqrt(diag(V_b-V_B))
             |     fixed        random       Difference          S.E.
-------------+----------------------------------------------------------------
   log_gdppc |   -1.049072    -.6979583       -.3511138         .207713
        eglo |   -.1366862    -.1183828       -.0183034        .0073853
         rem |    .1423161     .1417733        .0005428        .0121963
      unempl |    .0854331     .1074586       -.0220255        .0065458
        cons |    .0449852     .0441296        .0008556        .0031107
         vat |   -.0262153    -.0309495        .0047342        .0076356
        gfcf |    .0008457     .0039488       -.0031031        .0020266
        infl |    .0107264      .009711        .0010154               .
         trd |    .0078008     .0052699        .0025309         .002325
        pols |    .0208057     .0159028        .0049029        .0011387
         cor |    .0394414     .0250526        .0143888        .0044334
         rol |    .0144772      .025711       -.0112338        .0053665
         voa |   -.0080616     .0057499       -.0138115        .0032158
        regq |   -.0780082    -.0700422        -.007966        .0082235
        gove |   -.0332727    -.0313374       -.0019353        .0011466
        popg |    .6100706     .5852383        .0248323           .0162
        myos |   -.0490372    -.1069092        .0578721        .0496236
------------------------------------------------------------------------------
                           b = consistent under Ho and Ha; obtained from xtreg
            B = inconsistent under Ha, efficient under Ho; obtained from xtreg

    Test:  Ho:  difference in coefficients not systematic

                 chi2(17) = (b-B)'[(V_b-V_B)^(-1)](b-B)
                          =       36.91
                Prob>chi2 =      0.0035
                (V_b-V_B is not positive definite)
```

Fixed effects (cov19 dummy)

```
Fixed-effects (within) regression               Number of obs      =       600
Group variable: c                               Number of groups   =        40

R-sq:  within  = 0.2024                         Obs per group: min =        15
       between = 0.0730                                        avg =      15.0
       overall = 0.0772                                        max =        15

                                                F(18,542)          =      7.64
corr(u_i, Xb)  = -0.5080                        Prob > F           =    0.0000

------------------------------------------------------------------------------
        gini |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   log_gdppc |  -.8711351   .5921735    -1.47   0.142    -2.034371    .2921012
        eglo |   -.132985   .0330675    -4.02   0.000    -.1979412   -.0680288
         rem |   .1483602    .055624     2.67   0.008     .0390951    .2576252
      unempl |   .0830341   .0275485     3.01   0.003     .0289192    .1371489
        cons |   .0464899   .0219476     2.12   0.035     .0033771    .0896027
         sav |          0  (omitted)
         vat |  -.0269485   .0432595    -0.62   0.534    -.1119254    .0580283
        gfcf |   .0016282   .0213555     0.08   0.939    -.0403216     .043578
        infl |   .0104307   .0163748     0.64   0.524    -.0217352    .0425966
         trd |    .007512   .0056097     1.34   0.181    -.0035074    .0185315
        pols |   .0199484   .0089591     2.23   0.026     .0023496    .0375473
         cor |   .0408606   .0200108     2.04   0.042     .0015524    .0801687
         rol |   .0123515   .0239104     0.52   0.606    -.0346169    .0593198
         voa |  -.0106917   .0199534    -0.54   0.592    -.0498871    .0285037
        regq |  -.0755512   .0221762    -3.41   0.001    -.1191131   -.0319893
        gove |  -.0353989   .0170032    -2.08   0.038    -.0687991   -.0019986
        popg |   .5734655   .1506531     3.81   0.000     .2775301    .8694009
        myos |   .0028757   .1652333     0.02   0.986    -.3217004    .3274519
       cov19 |  -.2014974   .2040825    -0.99   0.324    -.6023869    .1993921
       _cons |   48.81946   7.442936     6.56   0.000     34.19893       63.44
-------------+----------------------------------------------------------------
     sigma_u |  4.7316377
     sigma_e |  1.3761348
         rho |  .92201071   (fraction of variance due to u_i)
------------------------------------------------------------------------------
F test that all u_i=0:     F(39, 542) =    76.43             Prob > F = 0.0000
```

Random effects (cov19 dummy)

```
Random-effects GLS regression                   Number of obs      =       600
Group variable: c                               Number of groups   =        40

R-sq:  within  = 0.1948                         Obs per group: min =        15
       between = 0.0992                                        avg =      15.0
       overall = 0.1051                                        max =        15

                                                Wald chi2(18)      =    129.29
corr(u_i, X)   = 0 (assumed)                    Prob > chi2        =    0.0000
```

gini	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
log_gdppc	-.3515969	.546043	-0.64	0.520	-1.421822	.7186278
eglo	-.1115971	.0323752	-3.45	0.001	-.1750513	-.0481429
rem	.1243199	.0540095	2.30	0.021	.0184633	.2301765
unempl	.1079832	.0269514	4.01	0.000	.0551594	.1608069
cons	.0416986	.0218152	1.91	0.056	-.0010583	.0844556
sav	0	(omitted)				
vat	-.0337716	.0428446	-0.79	0.431	-.1177454	.0502023
gfcf	.0053486	.021375	0.25	0.802	-.0365455	.0472428
infl	.0121643	.0165216	0.74	0.462	-.0202175	.0445461
trd	.0053158	.0051503	1.03	0.302	-.0047785	.0154101
pols	.0158092	.0089519	1.77	0.077	-.0017362	.0333546
cor	.0337868	.0195012	1.73	0.083	-.0044348	.0720083
rol	.0288757	.0233735	1.24	0.217	-.0169354	.0746868
voa	.0016783	.019811	0.08	0.932	-.0371505	.0405071
regq	-.0662898	.0206365	-3.21	0.001	-.1067365	-.025843
gove	-.0319316	.0170734	-1.87	0.061	-.0653949	.0015316
popg	.5517286	.1501632	3.67	0.000	.257414	.8460431
myos	-.0449452	.1562241	-0.29	0.774	-.3511388	.2612484
cov19	-.2228489	.2030463	-1.10	0.272	-.6208123	.1751145
_cons	40.77474	6.463236	6.31	0.000	28.10703	53.44245
sigma_u	3.5136509					
sigma_e	1.3761348					
rho	.86700738	(fraction of variance due to u_i)				

Hausman (cov19 dummy)

	---- Coefficients ---- (b) fixed	(B) random	(b-B) Difference	sqrt(diag(V_b-V_B)) S.E.
log_gdppc	-.8711351	-.3515969	-.5195382	.254265
eglo	-.132985	-.1115971	-.0213879	.0091202
rem	.1483602	.1243199	.0240403	.0168571
unempl	.0830341	.1079832	-.0249491	.0076696
cons	.0464899	.0416986	.0047912	.0047411
vat	-.0269485	-.0337716	.006823	.0100267
gfcf	.0016282	.0053486	-.0037204	.0038684
infl	.0104307	.0121643	-.0017336	.0021108
trd	.007512	.0053158	.0021962	.0024563
pols	.0199484	.0158092	.0041392	.0017055
cor	.0408606	.0337868	.0070738	.0058311
rol	.0123515	.0288757	-.0165242	.0067221
voa	-.0106917	.0016783	-.01237	.0044103
regq	-.0755512	-.0662898	-.0092614	.0091078
gove	-.0353989	-.0319316	-.0034672	.0027606
popg	.5734655	.5517286	.0217369	.0305508
myos	.0028757	-.0449452	.0478209	.0619806
cov19	-.2014974	-.2228489	.0213515	.043177

```
                         b = consistent under Ho and Ha; obtained from xtreg
          B = inconsistent under Ha, efficient under Ho; obtained from xtreg

    Test:  Ho:  difference in coefficients not systematic

                 chi2(17) = (b-B)'[(V_b-V_B)^(-1)](b-B)
                          =       35.88
                Prob>chi2 =      0.0048
                (V_b-V_B is not positive definite)
```

Fixed effects (eusdc dummy)

```
Fixed-effects (within) regression               Number of obs      =       600
Group variable: c                               Number of groups   =        40

R-sq:  within  = 0.2048                         Obs per group: min =        15
       between = 0.0886                                        avg =      15.0
       overall = 0.0915                                        max =        15

                                                F(18,542)          =      7.75
corr(u_i, Xb)  = -0.5292                        Prob > F           =    0.0000

------------------------------------------------------------------------------
        gini |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   log_gdppc |  -.9113533   .5696522    -1.60   0.110     -2.03035    .2076433
        eglo |  -.1562415   .0349674    -4.47   0.000    -.2249297   -.0875533
         rem |   .1442314   .0552158     2.61   0.009     .0357682    .2526947
      unempl |   .1022638    .029314     3.49   0.001     .0446808    .1598468
        cons |   .0536143   .0225049     2.38   0.018     .0094067    .0978219
         sav |          0  (omitted)
         vat |  -.0353419   .0435562    -0.81   0.417    -.1209015    .0502176
        gfcf |  -.0081256   .0220206    -0.37   0.712    -.0513819    .0351306
        infl |     .01136   .0163522     0.69   0.488    -.0207614    .0434814
         trd |   .0079155   .0055941     1.41   0.158    -.0030733    .0189043
        pols |   .0228578   .0089937     2.54   0.011      .005191    .0405246
         cor |   .0362956    .020024     1.81   0.070    -.0030385    .0756298
         rol |   .0236207   .0244419     0.97   0.334    -.0243918    .0716332
         voa |  -.0051118   .0198293    -0.26   0.797    -.0440635      .03384
        regq |   -.084181   .0223324    -3.77   0.000    -.1280497   -.0403123
        gove |  -.0344844   .0168576    -2.05   0.041    -.0675987     -.00137
        popg |   .6235603   .1460395     4.27   0.000     .3366874    .9104331
        myos |  -.1026117   .1598869    -0.64   0.521    -.4166855    .2114622
       eusdc |  -.2652327    .164193    -1.62   0.107    -.5877654       .0573
       _cons |   51.28305   7.020021     7.31   0.000     37.49327    65.07283
-------------+----------------------------------------------------------------
     sigma_u |  4.7627992
     sigma_e |  1.3740681
         rho |  .92316301   (fraction of variance due to u_i)
------------------------------------------------------------------------------
F test that all u_i=0:     F(39, 542) =    76.69             Prob > F = 0.0000
```

Random effects (eusdc dummy)

```
Random-effects GLS regression                   Number of obs      =       600
Group variable: c                               Number of groups   =        40

R-sq:  within  = 0.1965                         Obs per group: min =        15
       between = 0.1207                                        avg =      15.0
       overall = 0.1246                                        max =        15

                                                Wald chi2(18)      =    131.82
corr(u_i, X)   = 0 (assumed)                    Prob > chi2        =    0.0000

------------------------------------------------------------------------------
        gini |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   log_gdppc |  -.3702193   .5304638    -0.70   0.485    -1.409909    .6694706
        eglo |  -.1362353    .034183    -3.99   0.000    -.2032327   -.0692379
         rem |   .1206124    .053686     2.25   0.025     .0153898     .225835
      unempl |   .1296932   .0286305     4.53   0.000     .0735785     .185808
        cons |   .0493653   .0223235     2.21   0.027     .0056119    .0931186
         sav |          0  (omitted)
         vat |  -.0436357   .0431517    -1.01   0.312    -.1282114      .04094
        gfcf |  -.0048503   .0219798    -0.22   0.825      -.04793    .0382294
        infl |   .0138476   .0164884     0.84   0.401     -.018469    .0461642
         trd |   .0059553   .0051423     1.16   0.247    -.0041234    .0160339
        pols |   .0195019   .0089903     2.17   0.030     .0018813    .0371224
         cor |   .0296374   .0195016     1.52   0.129    -.0085851    .0678599
         rol |   .0408776   .0238692     1.71   0.087    -.0059051    .0876604
         voa |   .0079607   .0196854     0.40   0.686    -.0306219    .0465433
        regq |  -.0733849   .0207965    -3.53   0.000    -.1141452   -.0326245
        gove |  -.0306362   .0168956    -1.81   0.070     -.063751    .0024785
        popg |   .6048091   .1459239     4.14   0.000     .3188035    .8908148
        myos |   -.144799   .1521342    -0.95   0.341    -.4429765    .1533786
       eusdc |  -.2943947   .1632437    -1.80   0.071    -.6143465    .0255572
       _cons |   42.67892   6.172945     6.91   0.000     30.58017    54.77768
-------------+----------------------------------------------------------------
     sigma_u |  3.5137048
     sigma_e |  1.3740681
         rho |  .86735713   (fraction of variance due to u_i)
------------------------------------------------------------------------------
```

Hausman (eusdc dummy)

	Coefficients (b) fixed	Coefficients (B) random	(b-B) Difference	sqrt(diag(V_b-V_B)) S.E.
log_gdppc	-.9113533	-.3702193	-.5411341	.2325753
eglo	-.1562415	-.1362353	-.0200062	.0097782
rem	.1442314	.1206124	.0236191	.0164243
unempl	.1022638	.1296932	-.0274295	.0082874
cons	.0536143	.0493653	.004249	.0050267
vat	-.0353419	-.0436357	.0082937	.009963
gfcf	-.0081256	-.0048503	-.0032754	.0042664
infl	.01136	.0138476	-.0024876	.002139
trd	.0079155	.0059553	.0019602	.002431
pols	.0228578	.0195019	.0033559	.0016731
cor	.0362956	.0296374	.0066582	.0058492
rol	.0236207	.0408776	-.0172569	.0069196
voa	-.0051118	.0079607	-.0130724	.004358
regq	-.084181	-.0733849	-.0107961	.0091169
gove	-.0344844	-.0306362	-.0038482	.0028869
popg	.6235603	.6048091	.0187512	.0274838
myos	-.1026117	-.144799	.0421873	.0573056
eusdc	-.2652327	-.2943947	.0291619	.0349713

```
                           b = consistent under Ho and Ha; obtained from xtreg
            B = inconsistent under Ha, efficient under Ho; obtained from xtreg

    Test:  Ho:  difference in coefficients not systematic

                 chi2(17) = (b-B)'[(V_b-V_B)^(-1)](b-B)
                          =       35.46
                Prob>chi2 =      0.0054
```

Fixed effects (gfc dummy)

```
Fixed-effects (within) regression               Number of obs      =       600
Group variable: c                               Number of groups   =        40

R-sq:  within  = 0.2012                         Obs per group: min =        15
       between = 0.0772                                        avg =      15.0
       overall = 0.0808                                        max =        15

                                                F(18,542)          =      7.58
corr(u_i, Xb)  = -0.5192                        Prob > F           =    0.0000

------------------------------------------------------------------------------
        gini |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   log_gdppc |  -1.038168   .5653001    -1.84   0.067    -2.148615      .07228
        eglo |   -.137151   .0329041    -4.17   0.000    -.2017862   -.0725157
         rem |   .1420212   .0553348     2.57   0.011     .0333243    .2507181
      unempl |   .0880883   .0283975     3.10   0.002     .0323056    .1438711
        cons |   .0454345   .0219457     2.07   0.039     .0023255    .0885436
         sav |          0  (omitted)
         vat |  -.0284252   .0437026    -0.65   0.516    -.1142725     .057422
        gfcf |  -.0017204   .0224706    -0.08   0.939    -.0458605    .0424197
        infl |   .0099997   .0165037     0.61   0.545    -.0224194    .0424188
         trd |   .0080094   .0056351     1.42   0.156    -.0030599    .0190787
        pols |   .0201483   .0091015     2.21   0.027     .0022698    .0380268
         cor |   .0394471   .0199745     1.97   0.049     .0002101    .0786841
         rol |   .0154594   .0239812     0.64   0.519     -.031648    .0625668
         voa |  -.0083262   .0198032    -0.42   0.674    -.0472266    .0305741
        regq |  -.0788853   .0221821    -3.56   0.000    -.1224588   -.0353119
        gove |  -.0328877   .0169118    -1.94   0.052    -.0661085    .0003331
        popg |   .6131243   .1463692     4.19   0.000      .325604    .9006447
        myos |   -.022179   .1729752    -0.13   0.898    -.3619629     .317605
         gfc |   .0856065   .2330236     0.37   0.713    -.3721335    .5433465
       _cons |   50.87128   7.104032     7.16   0.000     36.91647    64.82608
-------------+----------------------------------------------------------------
     sigma_u |  4.7578848
     sigma_e |  1.3772004
         rho |  .92269221   (fraction of variance due to u_i)
------------------------------------------------------------------------------
F test that all u_i=0:     F(39, 542) =    75.11             Prob > F = 0.0000
```

Random effects (gfc dummy)

```
Random-effects GLS regression                   Number of obs      =       600
Group variable: c                               Number of groups   =        40

R-sq:  within  = 0.1931                         Obs per group: min =        15
       between = 0.1056                                        avg =      15.0
       overall = 0.1107                                        max =        15

                                                Wald chi2(18)      =    128.27
corr(u_i, X)   = 0 (assumed)                    Prob > chi2        =    0.0000

------------------------------------------------------------------------------
        gini |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   log_gdppc |  -.5040207   .5257996    -0.96   0.338    -1.534569    .5265275
        eglo |  -.1160828   .0322596    -3.60   0.000    -.1793105   -.0528551
         rem |   .1182257   .0538168     2.20   0.028     .0127466    .2237048
      unempl |   .1154644   .0276552     4.18   0.000     .0612612    .1696676
        cons |   .0407856   .0218116     1.87   0.061    -.0019643    .0835354
         sav |          0  (omitted)
         vat |  -.0367657   .0432522    -0.85   0.395    -.1215384     .048007
        gfcf |   .0003479    .022555     0.02   0.988     -.043859    .0445549
        infl |   .0115222   .0166642     0.69   0.489     -.021139    .0441834
         trd |   .0058789   .0051779     1.14   0.256    -.0042696    .0160273
        pols |   .0157991    .009087     1.74   0.082    -.0020112    .0336093
         cor |   .0324524   .0194828     1.67   0.096    -.0057333    .0706381
         rol |   .0327923   .0234577     1.40   0.162     -.013184    .0787686
         voa |   .0041217   .0196625     0.21   0.834    -.0344162    .0426595
        regq |  -.0694998   .0208102    -3.34   0.001    -.1102872   -.0287125
        gove |  -.0287902   .0169507    -1.70   0.089     -.062013    .0044325
        popg |   .5954859   .1463261     4.07   0.000     .3086919    .8822799
        myos |  -.0522402   .1645922    -0.32   0.751     -.374835    .2703547
         gfc |   .1433559    .234142     0.61   0.540    -.3155541    .6022659
       _cons |   42.39412   6.228526     6.81   0.000     30.18643     54.6018
-------------+----------------------------------------------------------------
     sigma_u |  3.5136231
     sigma_e |  1.3772004
         rho |  .86682696   (fraction of variance due to u_i)
```

Hausman (gfc dummy)

	(b) fixed	(B) random	(b-B) Difference	sqrt(diag(V_b-V_B)) S.E.
log_gdppc	-1.038168	-.5040207	-.5341469	.2076031
eglo	-.137151	-.1160828	-.0210682	.0064807
rem	.1420212	.1182257	.0237955	.0128718
unempl	.0880883	.1154644	-.0273761	.0064507
cons	.0454345	.0407856	.0046489	.0024227
vat	-.0284252	-.0367657	.0083404	.0062585
gfcf	-.0017204	.0003479	-.0020683	.
infl	.0099997	.0115222	-.0015225	.
trd	.0080094	.0058789	.0021305	.0022235
pols	.0201483	.0157991	.0043493	.0005131
cor	.0394471	.0324524	.0069947	.0044046
rol	.0154594	.0327923	-.0173329	.0049831
voa	-.0083262	.0041217	-.0124479	.002356
regq	-.0788853	-.0694998	-.0093855	.0076798
gove	-.0328877	-.0287902	-.0040975	.
popg	.6131243	.5954859	.0176384	.0035487
myos	-.022179	-.0522402	.0300612	.0531961
gfc	.0856065	.1433559	-.0577494	.

```
                      ---- Coefficients ----
                 b = consistent under Ho and Ha; obtained from xtreg
  B = inconsistent under Ha, efficient under Ho; obtained from xtreg

    Test:  Ho:  difference in coefficients not systematic

                 chi2(18) = (b-B)'[(V_b-V_B)^(-1)](b-B)
                          =      110.35
                Prob>chi2 =      0.0000
                (V_b-V_B is not positive definite)
```

Appendix D – Regression models – Least Square Dummy Variables

Robust LSDV with country and year dummies (all variables)

Source	SS	df	MS
Model	10651.1736	70	152.159623
Residual	991.680598	529	1.87463251
Total	11642.8542	599	19.4371523

Number of obs	= 600
F(70, 529)	= 81.17
Prob > F	= 0.0000
R-squared	= 0.9148
Adj R-squared	= 0.9036
Root MSE	= 1.3692

gini	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
log_gdppc	-.9070997	.7940847	-1.14	0.254	-2.467046	.6528467
eglo	-.1890901	.0377246	-5.01	0.000	-.2631984	-.1149818
rem	.1521854	.0563101	2.70	0.007	.0415666	.2628043
unempl	.0772989	.03085	2.51	0.013	.0166955	.1379024
cons	0	(omitted)				
sav	-.0725596	.0239104	-3.03	0.003	-.1195306	-.0255886
vat	-.0596338	.0449825	-1.33	0.186	-.148	.0287325
gfcf	-.0026983	.0228838	-0.12	0.906	-.0476527	.042256
infl	.0214343	.0174394	1.23	0.220	-.0128247	.0556932
trd	.0043012	.0063259	0.68	0.497	-.0081257	.0167281
pols	.0281208	.009557	2.94	0.003	.0093465	.0468952
cor	.0417582	.0201086	2.08	0.038	.0022558	.0812606
rol	.0167103	.0252788	0.66	0.509	-.0329489	.0663695
voa	.0064271	.0203792	0.32	0.753	-.0336071	.0464613
regq	-.0854337	.0225091	-3.80	0.000	-.1296518	-.0412155
gove	-.0467385	.0174092	-2.68	0.007	-.080938	-.0125389
popg	.5388071	.1533065	3.51	0.000	.2376428	.8399715
myos	-.2507603	.2118335	-1.18	0.237	-.6668985	.165378
dc1	10.99692	2.431735	4.52	0.000	6.219881	15.77397
dc2	17.15319	2.547874	6.73	0.000	12.148	22.15838
dc3	17.80255	2.533767	7.03	0.000	12.82507	22.78003
dc4	7.612082	2.207276	3.45	0.001	3.275981	11.94818
dc5	15.03717	2.207408	6.81	0.000	10.70081	19.37353
dc6	12.60775	2.328479	5.41	0.000	8.033548	17.18195
dc7	13.43319	2.390942	5.62	0.000	8.736284	18.1301
dc8	12.29843	2.410276	5.10	0.000	7.563545	17.03332
dc9	11.19803	2.289851	4.89	0.000	6.699717	15.69635
dc10	16.89362	2.150619	7.86	0.000	12.66882	21.11842
dc11	11.80884	2.304487	5.12	0.000	7.281768	16.33591
dc12	14.04016	2.201259	6.38	0.000	9.715872	18.36444
dc13	5.865299	1.920236	3.05	0.002	2.093076	9.637523
dc14	17.90981	3.3149	5.40	0.000	11.39782	24.42179
dc15	15.33205	1.946869	7.88	0.000	11.50751	19.1566
dc16	14.29653	2.0112	7.11	0.000	10.34561	18.24745
dc17	8.006169	1.818862	4.40	0.000	4.43309	11.57925
dc18	11.40248	2.461347	4.63	0.000	6.567265	16.23769
dc19	15.56686	2.056895	7.57	0.000	11.52618	19.60755
dc20	14.60902	1.787419	8.17	0.000	11.09771	18.12033
dc21	13.67527	1.750132	7.81	0.000	10.2372	17.11333
dc22	16.53341	1.685198	9.81	0.000	13.22291	19.84392
dc23	10.97347	1.558169	7.04	0.000	7.912514	14.03443
dc24	16.99893	1.702798	9.98	0.000	13.65385	20.34401
dc25	15.5271	1.858854	8.35	0.000	11.87546	19.17874
dc26	6.364997	1.821146	3.50	0.001	2.787431	9.942564

dc27	11.19016	1.755295	6.38	0.000	7.741959	14.63837
dc28	13.45323	1.192755	11.28	0.000	11.11012	15.79635
dc29	13.73068	1.294177	10.61	0.000	11.18833	16.27304
dc30	13.74008	1.450155	9.47	0.000	10.89132	16.58885
dc31	-2.331846	1.801807	-1.29	0.196	-5.871421	1.207729
dc32	13.89661	1.825704	7.61	0.000	10.31009	17.48314
dc33	15.94777	1.603404	9.95	0.000	12.79795	19.09759
dc34	9.908008	1.473745	6.72	0.000	7.012897	12.80312
dc35	5.152012	.9321144	5.53	0.000	3.320912	6.983112
dc36	13.52161	1.122754	12.04	0.000	11.31601	15.72721
dc37	2.831002	1.203331	2.35	0.019	.4671076	5.194897
dc38	.3390117	1.067198	0.32	0.751	-1.757454	2.435478
dc39	8.501662	1.506477	5.64	0.000	5.54225	11.46107
dc40	0	(omitted)				
dy1	.3490635	.3371932	1.04	0.301	-.3133386	1.011466
dy2	0	(omitted)				
dy3	-.1034854	.3477614	-0.30	0.766	-.7866482	.5796774
dy4	-.1485357	.3441495	-0.43	0.666	-.8246032	.5275318
dy5	-.0490574	.3412459	-0.14	0.886	-.7194209	.6213061
dy6	.0327912	.3507132	0.09	0.926	-.6561703	.7217526
dy7	.3251845	.3645995	0.89	0.373	-.3910561	1.041425
dy8	.785677	.3834337	2.05	0.041	.0324374	1.538917
dy9	.8279685	.3944672	2.10	0.036	.0530541	1.602883
dy10	.8141633	.4032475	2.02	0.044	.0220003	1.606326
dy11	.7330734	.4017339	1.82	0.069	-.0561161	1.522263
dy12	.6355531	.4101671	1.55	0.122	-.1702033	1.441309
dy13	.5363052	.4151185	1.29	0.197	-.2791778	1.351788
dy14	.1858326	.4113639	0.45	0.652	-.6222747	.9939398
dy15	.6849094	.4491005	1.53	0.128	-.19733	1.567149
_cons	49.85804	8.276624	6.02	0.000	33.59896	66.11713

LSDV (dev dummy)

Source	SS	df	MS		
Model	10651.1736	70	152.159623	Number of obs =	600
Residual	991.680598	529	1.87463251	F(70, 529) =	81.17
Total	11642.8542	599	19.4371523	Prob > F =	0.0000
				R-squared =	0.9148
				Adj R-squared =	0.9036
				Root MSE =	1.3692

gini	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
log_gdppc	-.9070997	.7940847	-1.14	0.254	-2.467046	.6528467
eglo	-.1890901	.0377246	-5.01	0.000	-.2631984	-.1149818
rem	.1521854	.0563101	2.70	0.007	.0415666	.2628043
unempl	.0772989	.03085	2.51	0.013	.0166955	.1379024
cons	0	(omitted)				
sav	-.0725596	.0239104	-3.03	0.003	-.1195306	-.0255886
vat	-.0596338	.0449825	-1.33	0.186	-.148	.0287325
gfcf	-.0026983	.0228838	-0.12	0.906	-.0476527	.042256
infl	.0214343	.0174394	1.23	0.220	-.0128247	.0556932
trd	.0043012	.0063259	0.68	0.497	-.0081257	.0167281
pols	.0281208	.009557	2.94	0.003	.0093465	.0468952
cor	.0417582	.0201086	2.08	0.038	.0022558	.0812606
rol	.0167103	.0252788	0.66	0.509	-.0329489	.0663695
voa	.0064271	.0203792	0.32	0.753	-.0336071	.0464613
regq	-.0854337	.0225091	-3.80	0.000	-.1296518	-.0412155
gove	-.0467385	.0174092	-2.68	0.007	-.080938	-.0125389
popg	.5388071	.1533065	3.51	0.000	.2376428	.8399715
myos	-.2507603	.2118335	-1.18	0.237	-.6668985	.165378
dev	17.90981	3.3149	5.40	0.000	11.39782	24.42179
dc1	-6.912882	1.801529	-3.84	0.000	-10.45191	-3.373854
dc2	-.756615	1.283599	-0.59	0.556	-3.278192	1.764962
dc3	-.1072562	1.568028	-0.07	0.945	-3.187581	2.973069
dc4	-10.29772	1.841678	-5.59	0.000	-13.91562	-6.679824
dc5	-2.872634	1.942876	-1.48	0.140	-6.689334	.9440664
dc6	-5.302057	1.785269	-2.97	0.003	-8.809145	-1.79497
dc7	-4.476616	1.520742	-2.94	0.003	-7.464051	-1.48918
dc8	-5.611375	1.644715	-3.41	0.001	-8.84235	-2.3804
dc9	-6.711771	1.876866	-3.58	0.000	-10.3988	-3.024746
dc10	-1.016189	1.995977	-0.51	0.611	-4.937204	2.904826
dc11	-6.100969	1.493469	-4.09	0.000	-9.034828	-3.167111
dc12	-3.869651	1.780766	-2.17	0.030	-7.367892	-.37141
dc13	-12.04451	1.849785	-6.51	0.000	-15.67833	-8.410681
dc14	0	(omitted)				
dc15	-2.577751	2.279649	-1.13	0.259	-7.056028	1.900525
dc16	-3.613279	2.097479	-1.72	0.086	-7.733688	.5071309
dc17	-9.903638	2.027673	-4.88	0.000	-13.88692	-5.920357
dc18	-6.507327	1.430354	-4.55	0.000	-9.317199	-3.697455
dc19	-2.342943	1.941927	-1.21	0.228	-6.157778	1.471892
dc20	-3.300788	2.250265	-1.47	0.143	-7.721339	1.119764
dc21	-4.234541	2.259628	-1.87	0.061	-8.673486	.2044036
dc22	-1.376391	2.066557	-0.67	0.506	-5.436057	2.683275
dc23	-6.936334	2.366321	-2.93	0.004	-11.58487	-2.287795
dc24	-.9108764	2.146077	-0.42	0.671	-5.126756	3.305003
dc25	-2.382704	2.375384	-1.00	0.316	-7.049048	2.28364
dc26	-11.54481	1.83512	-6.29	0.000	-15.14983	-7.939792
dc27	-6.719643	2.039355	-3.29	0.001	-10.72587	-2.713415

dc28	-4.456572	2.61177	-1.71	0.089	-9.587286	.6741428
dc29	-4.179124	2.774126	-1.51	0.133	-9.628779	1.270531
dc30	-4.169721	3.136176	-1.33	0.184	-10.33061	1.991166
dc31	-20.24165	3.282967	-6.17	0.000	-26.6909	-13.7924
dc32	-4.013192	3.297896	-1.22	0.224	-10.49177	2.465388
dc33	-1.962037	2.803354	-0.70	0.484	-7.469111	3.545036
dc34	-8.001799	2.349775	-3.41	0.001	-12.61783	-3.385764
dc35	5.152012	.9321144	5.53	0.000	3.320912	6.983112
dc36	13.52161	1.122754	12.04	0.000	11.31601	15.72721
dc37	2.831002	1.203331	2.35	0.019	.4671076	5.194897
dc38	.3390117	1.067198	0.32	0.751	-1.757454	2.435478
dc39	8.501662	1.506477	5.64	0.000	5.54225	11.46107
dc40	0	(omitted)				
dy1	.3490635	.3371932	1.04	0.301	-.3133386	1.011466
dy2	0	(omitted)				
dy3	-.1034854	.3477614	-0.30	0.766	-.7866482	.5796774
dy4	-.1485357	.3441495	-0.43	0.666	-.8246032	.5275318
dy5	-.0490574	.3412459	-0.14	0.886	-.7194209	.6213061
dy6	.0327912	.3507132	0.09	0.926	-.6561703	.7217526
dy7	.3251845	.3645995	0.89	0.373	-.3910561	1.041425
dy8	.785677	.3834337	2.05	0.041	.0324374	1.538917
dy9	.8279685	.3944672	2.10	0.036	.0530541	1.602883
dy10	.8141633	.4032475	2.02	0.044	.0220003	1.606326
dy11	.7330734	.4017339	1.82	0.069	-.0561161	1.522263
dy12	.6355531	.4101671	1.55	0.122	-.1702033	1.441309
dy13	.5363052	.4151185	1.29	0.197	-.2791778	1.351788
dy14	.1858326	.4113639	0.45	0.652	-.6222747	.9939398
dy15	.6849094	.4491005	1.53	0.128	-.19733	1.567149
_cons	49.85804	8.276624	6.02	0.000	33.59896	66.11713

LSDV (cov19 dummy)

```
      Source |       SS       df       MS              Number of obs =     600
-------------+------------------------------           F( 70,   529) =   81.17
       Model |  10651.1736    70  152.159623           Prob > F      =  0.0000
    Residual |  991.680598   529  1.87463251           R-squared     =  0.9148
-------------+------------------------------           Adj R-squared =  0.9036
       Total |  11642.8542   599  19.4371523           Root MSE      =  1.3692

------------------------------------------------------------------------------
        gini |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   log_gdppc |  -.9070997   .7940847    -1.14   0.254    -2.467046    .6528467
        eglo |  -.1890901   .0377246    -5.01   0.000    -.2631984   -.1149818
         rem |   .1521854   .0563101     2.70   0.007     .0415666    .2628043
      unempl |   .0772989     .03085     2.51   0.013     .0166955    .1379024
        cons |          0  (omitted)
         sav |  -.0725596   .0239104    -3.03   0.003    -.1195306   -.0255886
         vat |  -.0596338   .0449825    -1.33   0.186        -.148    .0287325
        gfcf |  -.0026983   .0228838    -0.12   0.906    -.0476527     .042256
        infl |   .0214343   .0174394     1.23   0.220    -.0128247    .0556932
         trd |   .0043012   .0063259     0.68   0.497    -.0081257    .0167281
        pols |   .0281208    .009557     2.94   0.003     .0093465    .0468952
         cor |   .0417582   .0201086     2.08   0.038     .0022558    .0812606
         rol |   .0167103   .0252788     0.66   0.509    -.0329489    .0663695
         voa |   .0064271   .0203792     0.32   0.753    -.0336071    .0464613
        regq |  -.0854337   .0225091    -3.80   0.000    -.1296518   -.0412155
        gove |  -.0467385   .0174092    -2.68   0.007     -.080938   -.0125389
        popg |   .5388071   .1533065     3.51   0.000     .2376428    .8399715
        myos |  -.2507603   .2118335    -1.18   0.237    -.6668985     .165378
       cov19 |   .6849094   .4491005     1.53   0.128      -.19733    1.567149
         dc1 |   10.99692   2.431735     4.52   0.000     6.219881    15.77397
         dc2 |   17.15319   2.547874     6.73   0.000       12.148    22.15838
         dc3 |   17.80255   2.533767     7.03   0.000     12.82507    22.78003
         dc4 |   7.612082   2.207276     3.45   0.001     3.275981    11.94818
         dc5 |   15.03717   2.207408     6.81   0.000     10.70081    19.37353
         dc6 |   12.60775   2.328479     5.41   0.000     8.033548    17.18195
         dc7 |   13.43319   2.390942     5.62   0.000     8.736284     18.1301
         dc8 |   12.29843   2.410276     5.10   0.000     7.563545    17.03332
         dc9 |   11.19803   2.289851     4.89   0.000     6.699717    15.69635
        dc10 |   16.89362   2.150619     7.86   0.000     12.66882    21.11842
        dc11 |   11.80884   2.304487     5.12   0.000     7.281768    16.33591
        dc12 |   14.04016   2.201259     6.38   0.000     9.715872    18.36444
        dc13 |   5.865299   1.920236     3.05   0.002     2.093076    9.637523
        dc14 |   17.90981     3.3149     5.40   0.000     11.39782    24.42179
        dc15 |   15.33205   1.946869     7.88   0.000     11.50751     19.1566
        dc16 |   14.29653     2.0112     7.11   0.000     10.34561    18.24745
        dc17 |   8.006169   1.818862     4.40   0.000      4.43309    11.57925
        dc18 |   11.40248   2.461347     4.63   0.000     6.567265    16.23769
        dc19 |   15.56686   2.056895     7.57   0.000     11.52618    19.60755
        dc20 |   14.60902   1.787419     8.17   0.000     11.09771    18.12033
        dc21 |   13.67527   1.750132     7.81   0.000      10.2372    17.11333
        dc22 |   16.53341   1.685198     9.81   0.000     13.22291    19.84392
        dc23 |   10.97347   1.558169     7.04   0.000     7.912514    14.03443
        dc24 |   16.99893   1.702798     9.98   0.000     13.65385    20.34401
        dc25 |    15.5271   1.858854     8.35   0.000     11.87546    19.17874
        dc26 |   6.364997   1.821146     3.50   0.001     2.787431    9.942564
        dc27 |   11.19016   1.755295     6.38   0.000     7.741959    14.63837
```

dc28	13.45323	1.192755	11.28	0.000	11.11012	15.79635
dc29	13.73068	1.294177	10.61	0.000	11.18833	16.27304
dc30	13.74008	1.450155	9.47	0.000	10.89132	16.58885
dc31	-2.331846	1.801807	-1.29	0.196	-5.871421	1.207729
dc32	13.89661	1.825704	7.61	0.000	10.31009	17.48314
dc33	15.94777	1.603404	9.95	0.000	12.79795	19.09759
dc34	9.908008	1.473745	6.72	0.000	7.012897	12.80312
dc35	5.152012	.9321144	5.53	0.000	3.320912	6.983112
dc36	13.52161	1.122754	12.04	0.000	11.31601	15.72721
dc37	2.831002	1.203331	2.35	0.019	.4671076	5.194897
dc38	.3390117	1.067198	0.32	0.751	-1.757454	2.435478
dc39	8.501662	1.506477	5.64	0.000	5.54225	11.46107
dc40	0	(omitted)				
dy1	.3490635	.3371932	1.04	0.301	-.3133386	1.011466
dy2	0	(omitted)				
dy3	-.1034854	.3477614	-0.30	0.766	-.7866482	.5796774
dy4	-.1485357	.3441495	-0.43	0.666	-.8246032	.5275318
dy5	-.0490574	.3412459	-0.14	0.886	-.7194209	.6213061
dy6	.0327912	.3507132	0.09	0.926	-.6561703	.7217526
dy7	.3251845	.3645995	0.89	0.373	-.3910561	1.041425
dy8	.785677	.3834337	2.05	0.041	.0324374	1.538917
dy9	.8279685	.3944672	2.10	0.036	.0530541	1.602883
dy10	.8141633	.4032475	2.02	0.044	.0220003	1.606326
dy11	.7330734	.4017339	1.82	0.069	-.0561161	1.522263
dy12	.6355531	.4101671	1.55	0.122	-.1702033	1.441309
dy13	.5363052	.4151185	1.29	0.197	-.2791778	1.351788
dy14	-.4990768	.3424151	-1.46	0.146	-1.171737	.1735835
dy15	0	(omitted)				
_cons	49.85804	8.276624	6.02	0.000	33.59896	66.11713

LSDV (gfc dummy)

Source	SS	df	MS
Model	10651.1736	70	152.159623
Residual	991.680598	529	1.87463251
Total	11642.8542	599	19.4371523

Number of obs	=	600
F(70, 529)	=	81.17
Prob > F	=	0.0000
R-squared	=	0.9148
Adj R-squared	=	0.9036
Root MSE	=	1.3692

gini	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
log_gdppc	-.9070997	.7940847	-1.14	0.254	-2.467046	.6528467
eglo	-.1890901	.0377246	-5.01	0.000	-.2631984	-.1149818
rem	.1521854	.0563101	2.70	0.007	.0415666	.2628043
unempl	.0772989	.03085	2.51	0.013	.0166955	.1379024
cons	0	(omitted)				
sav	-.0725596	.0239104	-3.03	0.003	-.1195306	-.0255886
vat	-.0596338	.0449825	-1.33	0.186	-.148	.0287325
gfcf	-.0026983	.0228838	-0.12	0.906	-.0476527	.042256
infl	.0214343	.0174394	1.23	0.220	-.0128247	.0556932
trd	.0043012	.0063259	0.68	0.497	-.0081257	.0167281
pols	.0281208	.009557	2.94	0.003	.0093465	.0468952
cor	.0417582	.0201086	2.08	0.038	.0022558	.0812606
rol	.0167103	.0252788	0.66	0.509	-.0329489	.0663695
voa	.0064271	.0203792	0.32	0.753	-.0336071	.0464613
regq	-.0854337	.0225091	-3.80	0.000	-.1296518	-.0412155
gove	-.0467385	.0174092	-2.68	0.007	-.080938	-.0125389
popg	.5388071	.1533065	3.51	0.000	.2376428	.8399715
myos	-.2507603	.2118335	-1.18	0.237	-.6668985	.165378
gfc	.3981209	.3825409	1.04	0.298	-.3533648	1.149607
dc1	-6.912882	1.801529	-3.84	0.000	-10.45191	-3.373854
dc2	-.756615	1.283599	-0.59	0.556	-3.278192	1.764962
dc3	-.1072562	1.568028	-0.07	0.945	-3.187581	2.973069
dc4	-10.29772	1.841678	-5.59	0.000	-13.91562	-6.679824
dc5	-2.872634	1.942876	-1.48	0.140	-6.689334	.9440664
dc6	-5.302057	1.785269	-2.97	0.003	-8.809145	-1.79497
dc7	-4.476616	1.520742	-2.94	0.003	-7.464051	-1.48918
dc8	-5.611375	1.644715	-3.41	0.001	-8.84235	-2.3804
dc9	-6.711771	1.876866	-3.58	0.000	-10.3988	-3.024746
dc10	-1.016189	1.995977	-0.51	0.611	-4.937204	2.904826
dc11	-6.100969	1.493469	-4.09	0.000	-9.034828	-3.167111
dc12	-3.869651	1.780766	-2.17	0.030	-7.367892	-.37141
dc13	-12.04451	1.849785	-6.51	0.000	-15.67833	-8.410681
dc14	0	(omitted)				
dc15	-2.577751	2.279649	-1.13	0.259	-7.056028	1.900525
dc16	-3.613279	2.097479	-1.72	0.086	-7.733688	.5071309
dc17	-9.903638	2.027673	-4.88	0.000	-13.88692	-5.920357
dc18	-6.507327	1.430354	-4.55	0.000	-9.317199	-3.697455
dc19	-2.342943	1.941927	-1.21	0.228	-6.157778	1.471892
dc20	-3.300788	2.250265	-1.47	0.143	-7.721339	1.119764
dc21	-4.234541	2.259628	-1.87	0.061	-8.673486	.2044036
dc22	-1.376391	2.066557	-0.67	0.506	-5.436057	2.683275
dc23	-6.936334	2.366321	-2.93	0.004	-11.58487	-2.287795
dc24	-.9108764	2.146077	-0.42	0.671	-5.126756	3.305003
dc25	-2.382704	2.375384	-1.00	0.316	-7.049048	2.28364
dc26	-11.54481	1.83512	-6.29	0.000	-15.14983	-7.939792
dc27	-6.719643	2.039355	-3.29	0.001	-10.72587	-2.713415

dc28	-4.456572	2.61177	-1.71	0.089	-9.587286	.6741428
dc29	-4.179124	2.774126	-1.51	0.133	-9.628779	1.270531
dc30	-4.169721	3.136176	-1.33	0.184	-10.33061	1.991166
dc31	-20.24165	3.282967	-6.17	0.000	-26.6909	-13.7924
dc32	-4.013192	3.297896	-1.22	0.224	-10.49177	2.465388
dc33	-1.962037	2.803354	-0.70	0.484	-7.469111	3.545036
dc34	-8.001799	2.349775	-3.41	0.001	-12.61783	-3.385764
dc35	-12.75779	3.103128	-4.11	0.000	-18.85376	-6.661827
dc36	-4.388196	2.720019	-1.61	0.107	-9.73156	.9551686
dc37	-15.0788	3.090281	-4.88	0.000	-21.14953	-9.008075
dc38	-17.57079	3.227449	-5.44	0.000	-23.91098	-11.23061
dc39	-9.408144	2.906247	-3.24	0.001	-15.11735	-3.698941
dc40	-17.90981	3.3149	-5.40	0.000	-24.42179	-11.39782
dy1	0	(omitted)				
dy2	-.3490635	.3371932	-1.04	0.301	-1.011466	.3133386
dy3	-.054428	.3573386	-0.15	0.879	-.7564049	.6475489
dy4	-.0994783	.3270744	-0.30	0.761	-.7420024	.5430459
dy5	0	(omitted)				
dy6	.0818486	.3104509	0.26	0.792	-.5280193	.6917165
dy7	.3742419	.3153111	1.19	0.236	-.2451737	.9936575
dy8	.8347344	.3351381	2.49	0.013	.1763694	1.493099
dy9	.8770259	.3618708	2.42	0.016	.1661457	1.587906
dy10	.8632207	.3720111	2.32	0.021	.1324202	1.594021
dy11	.7821308	.3701266	2.11	0.035	.0550324	1.509229
dy12	.6846105	.3738718	1.83	0.068	-.0498451	1.419066
dy13	.5853626	.3845987	1.52	0.129	-.1701655	1.340891
dy14	.23489	.3791164	0.62	0.536	-.5098684	.9796483
dy15	.7339668	.4027271	1.82	0.069	-.0571739	1.525107
_cons	67.71879	10.6341	6.37	0.000	46.82855	88.60903

LSDV (eusdc dummy)

Source	SS	df	MS
Model	10651.1736	70	152.159623
Residual	991.680598	529	1.87463251
Total	11642.8542	599	19.4371523

Number of obs	=	600
F(70, 529)	=	81.17
Prob > F	=	0.0000
R-squared	=	0.9148
Adj R-squared	=	0.9036
Root MSE	=	1.3692

gini	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
log_gdppc	-.9070997	.7940847	-1.14	0.254	-2.467046	.6528467
eglo	-.1890901	.0377246	-5.01	0.000	-.2631984	-.1149818
rem	.1521854	.0563101	2.70	0.007	.0415666	.2628043
unempl	.0772989	.03085	2.51	0.013	.0166955	.1379024
cons	0	(omitted)				
sav	-.0725596	.0239104	-3.03	0.003	-.1195306	-.0255886
vat	-.0596338	.0449825	-1.33	0.186	-.148	.0287325
gfcf	-.0026983	.0228838	-0.12	0.906	-.0476527	.042256
infl	.0214343	.0174394	1.23	0.220	-.0128247	.0556932
trd	.0043012	.0063259	0.68	0.497	-.0081257	.0167281
pols	.0281208	.009557	2.94	0.003	.0093465	.0468952
cor	.0417582	.0201086	2.08	0.038	.0022558	.0812606
rol	.0167103	.0252788	0.66	0.509	-.0329489	.0663695
voa	.0064271	.0203792	0.32	0.753	-.0336071	.0464613
regq	-.0854337	.0225091	-3.80	0.000	-.1296518	-.0412155
gove	-.0467385	.0174092	-2.68	0.007	-.080938	-.0125389
popg	.5388071	.1533065	3.51	0.000	.2376428	.8399715
myos	-.2507603	.2118335	-1.18	0.237	-.6668985	.165378
eusdc	.785677	.3834337	2.05	0.041	.0324374	1.538917
dc1	10.99692	2.431735	4.52	0.000	6.219881	15.77397
dc2	17.15319	2.547874	6.73	0.000	12.148	22.15838
dc3	17.80255	2.533767	7.03	0.000	12.82507	22.78003
dc4	7.612082	2.207276	3.45	0.001	3.275981	11.94818
dc5	15.03717	2.207408	6.81	0.000	10.70081	19.37353
dc6	12.60775	2.328479	5.41	0.000	8.033548	17.18195
dc7	13.43319	2.390942	5.62	0.000	8.736284	18.1301
dc8	12.29843	2.410276	5.10	0.000	7.563545	17.03332
dc9	11.19803	2.289851	4.89	0.000	6.699717	15.69635
dc10	16.89362	2.150619	7.86	0.000	12.66882	21.11842
dc11	11.80884	2.304487	5.12	0.000	7.281768	16.33591
dc12	14.04016	2.201259	6.38	0.000	9.715872	18.36444
dc13	5.865299	1.920236	3.05	0.002	2.093076	9.637523
dc14	17.90981	3.3149	5.40	0.000	11.39782	24.42179
dc15	15.33205	1.946869	7.88	0.000	11.50751	19.1566
dc16	14.29653	2.0112	7.11	0.000	10.34561	18.24745
dc17	8.006169	1.818862	4.40	0.000	4.43309	11.57925
dc18	11.40248	2.461347	4.63	0.000	6.567265	16.23769
dc19	15.56686	2.056895	7.57	0.000	11.52618	19.60755
dc20	14.60902	1.787419	8.17	0.000	11.09771	18.12033
dc21	13.67527	1.750132	7.81	0.000	10.2372	17.11333
dc22	16.53341	1.685198	9.81	0.000	13.22291	19.84392
dc23	10.97347	1.558169	7.04	0.000	7.912514	14.03443
dc24	16.99893	1.702798	9.98	0.000	13.65385	20.34401
dc25	15.5271	1.858854	8.35	0.000	11.87546	19.17874
dc26	6.364997	1.821146	3.50	0.001	2.787431	9.942564

dc27	11.19016	1.755295	6.38	0.000	7.741959	14.63837
dc28	13.45323	1.192755	11.28	0.000	11.11012	15.79635
dc29	13.73068	1.294177	10.61	0.000	11.18833	16.27304
dc30	13.74008	1.450155	9.47	0.000	10.89132	16.58885
dc31	-2.331846	1.801807	-1.29	0.196	-5.871421	1.207729
dc32	13.89661	1.825704	7.61	0.000	10.31009	17.48314
dc33	15.94777	1.603404	9.95	0.000	12.79795	19.09759
dc34	9.908008	1.473745	6.72	0.000	7.012897	12.80312
dc35	5.152012	.9321144	5.53	0.000	3.320912	6.983112
dc36	13.52161	1.122754	12.04	0.000	11.31601	15.72721
dc37	2.831002	1.203331	2.35	0.019	.4671076	5.194897
dc38	.3390117	1.067198	0.32	0.751	-1.757454	2.435478
dc39	8.501662	1.506477	5.64	0.000	5.54225	11.46107
dc40	0	(omitted)				
dy1	.3490635	.3371932	1.04	0.301	-.3133386	1.011466
dy2	0	(omitted)				
dy3	-.8891624	.3897607	-2.28	0.023	-1.654831	-.1234937
dy4	-.9342126	.3540699	-2.64	0.009	-1.629768	-.2386569
dy5	-.8347344	.3351381	-2.49	0.013	-1.493099	-.1763694
dy6	-.7528858	.3260356	-2.31	0.021	-1.393369	-.1124024
dy7	-.4604924	.3186989	-1.44	0.149	-1.086563	.1655783
dy8	0	(omitted)				
dy9	.8279685	.3944672	2.10	0.036	.0530541	1.602883
dy10	.8141633	.4032475	2.02	0.044	.0220003	1.606326
dy11	.7330734	.4017339	1.82	0.069	-.0561161	1.522263
dy12	.6355531	.4101671	1.55	0.122	-.1702033	1.441309
dy13	.5363052	.4151185	1.29	0.197	-.2791778	1.351788
dy14	.1858326	.4113639	0.45	0.652	-.6222747	.9939398
dy15	.6849094	.4491005	1.53	0.128	-.19733	1.567149
_cons	49.85804	8.276624	6.02	0.000	33.59896	66.11713

Appendix E – Regression models – Least Square Dummy Variables with interaction terms

LSDV with interaction terms (dev dummy)

Source	SS	df	MS
Model	10862.7487	87	124.859181
Residual	780.105482	512	1.52364352
Total	11642.8542	599	19.4371523

Number of obs =	600
F(87, 512) =	81.95
Prob > F =	0.0000
R-squared =	0.9330
Adj R-squared =	0.9216
Root MSE =	1.2344

gini	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
log_gdppc	-2.646176	1.30506	-2.03	0.043	-5.210108	-.0822444
eglo	-.2690592	.0699992	-3.84	0.000	-.4065803	-.1315382
rem	.1276403	.1293063	0.99	0.324	-.126396	.3816765
unempl	-.0968232	.0751231	-1.29	0.198	-.2444107	.0507643
cons	.1698811	.0675301	2.52	0.012	.0372109	.3025513
sav	0	(omitted)				
vat	-.1082914	.1820919	-0.59	0.552	-.4660307	.2494479
gfcf	-.0684586	.0776947	-0.88	0.379	-.2210982	.0841811
infl	.0113639	.0318219	0.36	0.721	-.0511538	.0738815
trd	-.0175803	.0248684	-0.71	0.480	-.066437	.0312764
pols	.0050506	.0248278	0.20	0.839	-.0437263	.0538276
cor	.2407178	.0387086	6.22	0.000	.1646706	.316765
rol	.0702338	.0505282	1.39	0.165	-.0290343	.1695018
voa	.0942054	.0567535	1.66	0.098	-.0172931	.2057038
regq	-.0866591	.0483008	-1.79	0.073	-.1815512	.008233
gove	-.137771	.0339742	-4.06	0.000	-.2045171	-.0710249
popg	1.691756	.5067555	3.34	0.001	.6961805	2.687332
myos	.81769	.411185	1.99	0.047	.0098726	1.625507
log_gdppcdev	3.884442	1.341358	2.90	0.004	1.249199	6.519684
eglodev	.1143103	.0805209	1.42	0.156	-.0438818	.2725023
remdev	-.3845953	.1640161	-2.34	0.019	-.7068226	-.062368
unempldev	.1618278	.0803623	2.01	0.045	.0039475	.3197082
consdev	-.1546066	.1411262	-1.10	0.274	-.4318643	.122651
savdev	-.0511452	.1672555	-0.31	0.760	-.3797366	.2774463
vatdev	.0743434	.1866276	0.40	0.691	-.2923067	.4409935
gfcfdev	.0426563	.0794858	0.54	0.592	-.1135022	.1988148
popgdev	-1.631631	.5320102	-3.07	0.002	-2.676822	-.5864392
infldev	.0047078	.0367544	0.13	0.898	-.0675002	.0769157
trddev	.0173915	.0251599	0.69	0.490	-.0320378	.0668208
myosdev	-1.640899	.4523391	-3.63	0.000	-2.529568	-.7522301
pols_dev	.0109599	.0266641	0.41	0.681	-.0414246	.0633445
cor_dev	-.3097289	.0458545	-6.75	0.000	-.3998151	-.2196427
rol_dev	-.0967387	.0573957	-1.69	0.093	-.2094987	.0160214
voa_dev	-.0756837	.0610471	-1.24	0.216	-.1956173	.0442499
regq_dev	.059173	.0545678	1.08	0.279	-.0480313	.1663773
gove_dev	.1352664	.038652	3.50	0.001	.0593304	.2112025
dc1	7.618243	2.813304	2.71	0.007	2.091203	13.14528
dc2	13.66303	2.748673	4.97	0.000	8.262963	19.06309
dc3	15.06348	2.861799	5.26	0.000	9.441164	20.68579
dc4	5.864308	2.498075	2.35	0.019	.9565691	10.77205
dc5	13.16132	2.59543	5.07	0.000	8.062313	18.26032
dc6	10.07557	2.736392	3.68	0.000	4.699636	15.45151
dc7	10.22263	2.746635	3.72	0.000	4.826563	15.61869
dc8	9.470898	2.760935	3.43	0.001	4.046743	14.89505

dc9	8.727391	2.710647	3.22	0.001	3.402032	14.05275
dc10	14.38242	2.60566	5.52	0.000	9.26332	19.50152
dc11	9.339193	2.655077	3.52	0.000	4.123007	14.55538
dc12	11.07773	2.607921	4.25	0.000	5.954183	16.20127
dc13	4.314796	2.062617	2.09	0.037	.2625608	8.367031
dc14	16.09217	3.273769	4.92	0.000	9.660497	22.52384
dc15	11.05326	2.467458	4.48	0.000	6.205669	15.90084
dc16	11.06906	2.465818	4.49	0.000	6.224696	15.91343
dc17	6.064148	2.190358	2.77	0.006	1.760953	10.36734
dc18	8.978416	2.684719	3.34	0.001	3.703996	14.25284
dc19	15.35599	2.318124	6.62	0.000	10.80179	19.9102
dc20	8.710891	2.445801	3.56	0.000	3.90585	13.51593
dc21	8.353955	2.366773	3.53	0.000	3.704173	13.00374
dc22	15.54465	2.108004	7.37	0.000	11.40325	19.68605
dc23	10.38501	1.864617	5.57	0.000	6.721771	14.04826
dc24	16.16304	2.134649	7.57	0.000	11.96929	20.35679
dc25	11.09601	2.398339	4.63	0.000	6.38421	15.8078
dc26	4.307171	2.175919	1.98	0.048	.0323433	8.581998
dc27	9.530758	2.016587	4.73	0.000	5.568954	13.49256
dc28	16.60811	2.002918	8.29	0.000	12.67316	20.54306
dc29	11.59365	1.775708	6.53	0.000	8.105084	15.08223
dc30	9.708393	1.495735	6.49	0.000	6.76986	12.64693
dc31	0	(omitted)				
dc32	11.02559	1.707957	6.46	0.000	7.670126	14.38106
dc33	15.57203	2.027268	7.68	0.000	11.58924	19.55482
dc34	8.580076	1.877534	4.57	0.000	4.891457	12.2687
dc35	9.079686	1.754715	5.17	0.000	5.632358	12.52701
dc36	16.46032	2.232368	7.37	0.000	12.07459	20.84605
dc37	6.856909	2.101809	3.26	0.001	2.727678	10.98614
dc38	5.217967	1.936508	2.69	0.007	1.413487	9.022446
dc39	12.49484	3.539399	3.53	0.000	5.54131	19.44837
dc40	0	(omitted)				
dy1	-.1362111	.4216975	-0.32	0.747	-.9646814	.6922592
dy2	-.6336244	.394449	-1.61	0.109	-1.408562	.1413133
dy3	-.6824696	.3935569	-1.73	0.084	-1.455655	.0907155
dy4	-.7661041	.3686859	-2.08	0.038	-1.490427	-.0417807
dy5	-.5884536	.3592806	-1.64	0.102	-1.294299	.1173919
dy6	-.3218527	.3471886	-0.93	0.354	-1.003942	.3602368
dy7	-.018079	.3407346	-0.05	0.958	-.6874889	.651331
dy8	.3582152	.3201527	1.12	0.264	-.2707594	.9871898
dy9	.6691268	.3167522	2.11	0.035	.0468328	1.291421
dy10	.741204	.3065432	2.42	0.016	.1389668	1.343441
dy11	.4590329	.2950587	1.56	0.120	-.1206419	1.038708
dy12	.365175	.2933805	1.24	0.214	-.2112026	.9415526
dy13	.2986948	.2897039	1.03	0.303	-.2704598	.8678493
dy14	0	(omitted)				
dy15	.1923755	.3199142	0.60	0.548	-.4361305	.8208814
_cons	38.28274	16.30225	2.35	0.019	6.255213	70.31026

LSDV with interaction terms (cov19 dummy)

Source	SS	df	MS
Model	10702.6185	87	123.018603
Residual	940.235752	512	1.83639795
Total	11642.8542	599	19.4371523

Number of obs	600
F(87, 512)	66.99
Prob > F	0.0000
R-squared	0.9192
Adj R-squared	0.9055
Root MSE	1.3551

gini	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
log_gdppc	-1.575766	.8830653	-1.78	0.075	-3.310644	.1591107
eglo	-.1851825	.039468	-4.69	0.000	-.2627216	-.1076434
rem	.1227109	.0574279	2.14	0.033	.0098877	.2355342
unempl	.0787171	.03293	2.39	0.017	.0140226	.1434117
cons	0	(omitted)				
sav	-.0694231	.0247478	-2.81	0.005	-.1180429	-.0208033
vat	-.0519126	.0450908	-1.15	0.250	-.1404984	.0366731
gfcf	.0103787	.0251239	0.41	0.680	-.0389799	.0597374
infl	.015959	.0177858	0.90	0.370	-.0189831	.050901
trd	-.001994	.0067445	-0.30	0.768	-.0152444	.0112563
pols	.0237838	.0099323	2.39	0.017	.0042706	.0432969
cor	.0567334	.0212025	2.68	0.008	.0150788	.0983881
rol	.0175687	.0260454	0.67	0.500	-.0336004	.0687378
voa	.023207	.0212944	1.09	0.276	-.0186282	.0650422
regq	-.1028221	.0244854	-4.20	0.000	-.1509263	-.0547179
gove	-.0545505	.0190018	-2.87	0.004	-.0918816	-.0172194
popg	.5185709	.1670811	3.10	0.002	.1903221	.8468198
myos	-.2327721	.2232411	-1.04	0.298	-.6713532	.2058091
log_gdppccov19	-1.396521	.9353951	-1.49	0.136	-3.234206	.4411636
eglocov19	-.0408378	.0597874	-0.68	0.495	-.1582965	.0766209
remcov19	-.0392371	.0988808	-0.40	0.692	-.2334992	.1550249
unemplcov19	.0688858	.069591	0.99	0.323	-.0678333	.2056048
conscov19	.1299779	.0973193	1.34	0.182	-.0612164	.3211721
savcov19	.2271395	.1198303	1.90	0.059	-.00828	.4625591
vatcov19	.0192857	.0632724	0.30	0.761	-.1050198	.1435911
gfcfcov19	-.0663348	.0603219	-1.10	0.272	-.1848437	.052174
popgcov19	-.2387554	.3943332	-0.61	0.545	-1.013466	.5359548
inflcov19	.0787703	.1141189	0.69	0.490	-.1454285	.3029691
trdcov19	.0022194	.0065265	0.34	0.734	-.0106027	.0150414
myoscov19	-.0930735	.2488082	-0.37	0.709	-.581884	.395737
polscov19	.0107912	.0228281	0.47	0.637	-.0340571	.0556394
corcov19	-.0240798	.0288635	-0.83	0.405	-.0807852	.0326256
rolcov19	.050957	.0341755	1.49	0.137	-.0161846	.1180985
govecov19	-.0230836	.031549	-0.73	0.465	-.0850651	.0388978
voacov19	-.0379844	.051428	-0.74	0.460	-.1390202	.0630514
regqcov19	.077832	.0390213	1.99	0.047	.0011704	.1544936
dc1	-8.627355	1.887638	-4.57	0.000	-12.33582	-4.918887
dc2	-2.241012	1.35125	-1.66	0.098	-4.895688	.4136646
dc3	-1.452685	1.64665	-0.88	0.378	-4.687707	1.782337
dc4	-11.86864	1.929263	-6.15	0.000	-15.65889	-8.078397
dc5	-4.943449	2.06913	-2.39	0.017	-9.00848	-.878419
dc6	-7.274788	1.893892	-3.84	0.000	-10.99554	-3.554033
dc7	-6.115405	1.604541	-3.81	0.000	-9.267699	-2.963111
dc8	-7.437361	1.739482	-4.28	0.000	-10.85476	-4.019961
dc9	-8.844129	1.998345	-4.43	0.000	-12.77009	-4.918165
dc10	-3.199196	2.114192	-1.51	0.131	-7.352755	.954362

dc11	-7.540751	1.577208	-4.78	0.000	-10.63935	-4.442155
dc12	-5.72997	1.879337	-3.05	0.002	-9.422132	-2.037808
dc13	-13.99476	1.990157	-7.03	0.000	-17.90464	-10.08489
dc14	0	(omitted)				
dc15	-5.050439	2.409867	-2.10	0.037	-9.784884	-.3159953
dc16	-5.782311	2.207046	-2.62	0.009	-10.11829	-1.446331
dc17	-12.10343	2.203287	-5.49	0.000	-16.43203	-7.774839
dc18	-7.503663	1.513264	-4.96	0.000	-10.47663	-4.530693
dc19	-4.814072	2.130818	-2.26	0.024	-9.000295	-.6278496
dc20	-5.404717	2.36075	-2.29	0.022	-10.04267	-.7667676
dc21	-6.570076	2.39548	-2.74	0.006	-11.27626	-1.863896
dc22	-3.682064	2.246882	-1.64	0.102	-8.096306	.7321775
dc23	-9.630513	2.573172	-3.74	0.000	-14.68579	-4.575239
dc24	-3.51605	2.335244	-1.51	0.133	-8.103888	1.071789
dc25	-4.763984	2.497011	-1.91	0.057	-9.669632	.1416641
dc26	-13.43088	2.003187	-6.70	0.000	-17.36636	-9.4954
dc27	-9.014855	2.209938	-4.08	0.000	-13.35652	-4.673194
dc28	-6.820924	2.851065	-2.39	0.017	-12.42215	-1.219698
dc29	-7.278383	2.981695	-2.44	0.015	-13.13625	-1.420521
dc30	-6.864132	3.356394	-2.05	0.041	-13.45813	-.2701334
dc31	-23.12601	3.548932	-6.52	0.000	-30.09827	-16.15375
dc32	-7.473886	3.487963	-2.14	0.033	-14.32637	-.6214048
dc33	-5.120519	3.007151	-1.70	0.089	-11.02839	.7873548
dc34	-10.46731	2.533525	-4.13	0.000	-15.44469	-5.489926
dc35	-15.76534	3.369745	-4.68	0.000	-22.38557	-9.145109
dc36	-7.073529	2.936095	-2.41	0.016	-12.8418	-1.305253
dc37	-18.20683	3.310129	-5.50	0.000	-24.70994	-11.70373
dc38	-20.49073	3.530289	-5.80	0.000	-27.42636	-13.55509
dc39	-12.79156	3.163843	-4.04	0.000	-19.00727	-6.575844
dc40	-20.58979	3.617159	-5.69	0.000	-27.69609	-13.48349
dy1	.2276603	.3392937	0.67	0.503	-.4389188	.8942395
dy2	0	(omitted)				
dy3	-.2593523	.3500985	-0.74	0.459	-.9471587	.428454
dy4	-.2380114	.3445412	-0.69	0.490	-.9148998	.438877
dy5	-.0112237	.3417186	-0.03	0.974	-.6825668	.6601194
dy6	.0553993	.3508872	0.16	0.875	-.6339565	.7447551
dy7	.3643304	.3658633	1.00	0.320	-.3544476	1.083108
dy8	.8304784	.3842961	2.16	0.031	.0754871	1.58547
dy9	.7690967	.4004542	1.92	0.055	-.0176388	1.555832
dy10	.7343899	.4117658	1.78	0.075	-.0745685	1.543348
dy11	.7303356	.4087309	1.79	0.075	-.0726605	1.533332
dy12	.6712998	.4177726	1.61	0.109	-.1494596	1.492059
dy13	.5501055	.4226284	1.30	0.194	-.2801937	1.380405
dy14	-.3533164	.4845073	-0.73	0.466	-1.305183	.5985506
dy15	0	(omitted)				
_cons	76.26156	11.35028	6.72	0.000	53.96271	98.56041

LSDV with interaction terms (eusdc dummy)

Source	SS	df	MS
Model	10811.5743	87	124.270969
Residual	831.279946	512	1.62359364
Total	11642.8542	599	19.4371523

Number of obs	= 600
F(87, 512)	= 76.54
Prob > F	= 0.0000
R-squared	= 0.9286
Adj R-squared	= 0.9165
Root MSE	= 1.2742

gini	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
log_gdppc	-1.34503	.8593693	-1.57	0.118	-3.033354	.3432941
eglo	-.2187665	.0392567	-5.57	0.000	-.2958905	-.1416424
rem	.1561774	.0570723	2.74	0.006	.0440527	.268302
unempl	.0084216	.0364291	0.23	0.817	-.0631473	.0799906
cons	0	(omitted)				
sav	-.065838	.0253772	-2.59	0.010	-.1156943	-.0159817
vat	-.0631814	.0445528	-1.42	0.157	-.1507101	.0243473
gfcf	-.0292256	.0237225	-1.23	0.219	-.075831	.0173798
infl	.0325847	.0267378	1.22	0.224	-.0199447	.085114
trd	.0099539	.0064011	1.56	0.121	-.0026217	.0225295
pols	.0227638	.0102787	2.21	0.027	.0025702	.0429575
cor	.019506	.0211329	0.92	0.356	-.0220118	.0610239
rol	.0197276	.0258956	0.76	0.447	-.031147	.0706023
voa	.0237273	.0222861	1.06	0.288	-.0200561	.0675108
regq	-.1004856	.0229465	-4.38	0.000	-.1455664	-.0554047
gove	-.0320658	.0186047	-1.72	0.085	-.0686167	.0044851
popg	.2894972	.1682197	1.72	0.086	-.0409887	.6199831
myos	-.3221938	.2200387	-1.46	0.144	-.7544836	.110096
log_gdppceusdc	-.8859964	.4758341	-1.86	0.063	-1.820824	.0488311
egloeusdc	.0439641	.0341969	1.29	0.199	-.0232193	.1111476
remeusdc	-.0634868	.0513517	-1.24	0.217	-.1643728	.0373991
unempleusdc	.1046568	.0314181	3.33	0.001	.0429326	.1663811
conseusdc	.0352272	.0477779	0.74	0.461	-.0586377	.1290922
saveusdc	.0198909	.0643507	0.31	0.757	-.106533	.1463147
vateusdc	-.0133824	.039786	-0.34	0.737	-.0915463	.0647815
gfcfeusdc	.0389774	.0437377	0.89	0.373	-.0469501	.1249048
popgeusdc	.8193458	.2405095	3.41	0.001	.3468388	1.291853
infleusdc	-.052149	.0356641	-1.46	0.144	-.122215	.0179169
trdeusdc	-.0000755	.0041718	-0.02	0.986	-.0082714	.0081204
myoseusdc	.2774229	.1221922	2.27	0.024	.0373631	.5174828
polseusdc	-.0044185	.0111532	-0.40	0.692	-.0263302	.0174932
coreusdc	.0625284	.0198423	3.15	0.002	.0235462	.1015107
roleusdc	-.1003015	.0200288	-5.01	0.000	-.1396502	-.0609528
goveeusdc	.0097713	.0228645	0.43	0.669	-.0351483	.054691
voaeusdc	.0097195	.0247708	0.39	0.695	-.0389455	.0583844
regqeusdc	.0040856	.0233837	0.17	0.861	-.0418543	.0500254
dc1	14.27666	2.426888	5.88	0.000	9.50878	19.04455
dc2	19.58369	2.545038	7.69	0.000	14.58369	24.5837
dc3	20.57566	2.509151	8.20	0.000	15.64616	25.50515
dc4	10.66002	2.2093	4.83	0.000	6.319616	15.00043
dc5	17.48417	2.188562	7.99	0.000	13.18451	21.78384
dc6	15.58349	2.312165	6.74	0.000	11.04099	20.12599
dc7	15.86157	2.368889	6.70	0.000	11.20764	20.51551
dc8	15.1057	2.391365	6.32	0.000	10.40761	19.8038
dc9	14.12283	2.270249	6.22	0.000	9.662676	18.58298
dc10	19.22462	2.120253	9.07	0.000	15.05915	23.39009
dc11	14.0583	2.276122	6.18	0.000	9.586609	18.52999

dc12	16.91904	2.192878	7.72	0.000	12.6109	21.22719
dc13	7.609676	1.890641	4.02	0.000	3.895307	11.32404
dc14	19.88843	3.302326	6.02	0.000	13.40065	26.3762
dc15	17.69585	1.933953	9.15	0.000	13.89639	21.49531
dc16	16.89253	2.00296	8.43	0.000	12.9575	20.82756
dc17	9.524268	1.789106	5.32	0.000	6.009377	13.03916
dc18	12.70592	2.441438	5.20	0.000	7.90945	17.50239
dc19	17.10156	2.021011	8.46	0.000	13.13106	21.07205
dc20	16.63514	1.75512	9.48	0.000	13.18702	20.08326
dc21	15.71654	1.701811	9.24	0.000	12.37315	19.05993
dc22	17.80941	1.659776	10.73	0.000	14.5486	21.07022
dc23	12.13368	1.520083	7.98	0.000	9.147313	15.12005
dc24	18.36693	1.679516	10.94	0.000	15.06734	21.66652
dc25	17.83624	1.844964	9.67	0.000	14.21161	21.46087
dc26	7.248615	1.776643	4.08	0.000	3.758208	10.73902
dc27	12.03148	1.714646	7.02	0.000	8.662874	15.40009
dc28	14.42114	1.160237	12.43	0.000	12.14173	16.70055
dc29	14.75694	1.26812	11.64	0.000	12.26559	17.2483
dc30	13.51405	1.406489	9.61	0.000	10.75085	16.27725
dc31	-2.278125	1.757187	-1.30	0.195	-5.73031	1.174059
dc32	14.1404	1.832609	7.72	0.000	10.54004	17.74076
dc33	17.57835	1.585695	11.09	0.000	14.46308	20.69362
dc34	11.0138	1.432878	7.69	0.000	8.198756	13.82884
dc35	5.477353	.9010547	6.08	0.000	3.707134	7.247573
dc36	14.00337	1.081796	12.94	0.000	11.87806	16.12867
dc37	3.809654	1.201478	3.17	0.002	1.449221	6.170086
dc38	-.1753189	1.031864	-0.17	0.865	-2.202528	1.85189
dc39	8.470207	1.500675	5.64	0.000	5.521968	11.41845
dc40	0	(omitted)				
dy1	.4150045	.3286985	1.26	0.207	-.2307592	1.060768
dy2	0	(omitted)				
dy3	-.9717687	.386603	-2.51	0.012	-1.731292	-.2122454
dy4	-.9751082	.3407418	-2.86	0.004	-1.644532	-.305684
dy5	-.6363981	.3307641	-1.92	0.055	-1.28622	.0134238
dy6	-.7424176	.315499	-2.35	0.019	-1.36225	-.1225857
dy7	-.5060111	.3031864	-1.67	0.096	-1.101654	.0896314
dy8	0	(omitted)				
dy9	.8085863	.4076178	1.98	0.048	.0077771	1.609395
dy10	.7738371	.420889	1.84	0.067	-.0530449	1.600719
dy11	.6345608	.4064077	1.56	0.119	-.163871	1.432993
dy12	.482675	.4110825	1.17	0.241	-.3249409	1.290291
dy13	.3947803	.4186898	0.94	0.346	-.4277811	1.217342
dy14	.147242	.4229331	0.35	0.728	-.6836557	.9781398
dy15	.5561928	.4443132	1.25	0.211	-.3167085	1.429094
_cons	56.57286	8.868405	6.38	0.000	39.14991	73.9958

LSDV with interaction terms (gfc dummy)

```
      Source |       SS       df       MS              Number of obs =     600
-------------+------------------------------           F( 87,   512) =   87.57
       Model |   10909.714    87  125.399011           Prob > F      =  0.0000
    Residual |   733.14025   512  1.43191455           R-squared     =  0.9370
-------------+------------------------------           Adj R-squared =  0.9263
       Total |  11642.8542   599  19.4371523           Root MSE      =  1.1966

------------------------------------------------------------------------------
        gini |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   log_gdppc |  -.1674773   .7459264    -0.22   0.822     -1.63293    1.297976
        eglo |  -.1657898   .0368095    -4.50   0.000    -.2381061   -.0934735
         rem |   .1234329    .062834     1.96   0.050    -.0000114    .2468771
      unempl |   .1485595   .0294783     5.04   0.000     .0906461    .2064728
        cons |          0  (omitted)
         sav |  -.0924283   .0239818    -3.85   0.000    -.1395431   -.0453135
         vat |  -.0153241   .0511778    -0.30   0.765    -.1158685    .0852203
        gfcf |   .0031032    .023526     0.13   0.895    -.0431161    .0493226
        infl |   .0214001   .0159809     1.34   0.181    -.0099961    .0527963
         trd |    .001794   .0061012     0.29   0.769    -.0101925    .0137805
        pols |   .0186052    .009018     2.06   0.040     .0008883    .0363222
         cor |   -.002452    .018637    -0.13   0.895    -.0390664    .0341625
         rol |   .0048742   .0233296     0.21   0.835    -.0409594    .0507077
         voa |  -.0031961   .0197474    -0.16   0.871    -.0419921    .0355998
        regq |  -.0112739    .021237    -0.53   0.596    -.0529962    .0304484
        gove |  -.0315134   .0161583    -1.95   0.052    -.0632581    .0002313
        popg |   .6281588   .1476876     4.25   0.000     .3380105    .9183071
        myos |  -.6101972   .2058331    -2.96   0.003    -1.014579   -.2058159
log_gdppcgfc |   1.897767   .6443649     2.95   0.003     .6318427    3.163691
     eglogfc |   .0953099   .0558769     1.71   0.089    -.0144663    .2050862
      remgfc |   .0952717   .0614099     1.55   0.121    -.0253746    .2159181
   unemplgfc |  -.3888631   .0473458    -8.21   0.000     -.481879   -.2958472
     consgfc |  -.1441393   .0615113    -2.34   0.019    -.2649849   -.0232938
      savgfc |  -.2370997   .0723019    -3.28   0.001    -.3791447   -.0950548
      vatgfc |  -.0338857   .0510246    -0.66   0.507     -.134129    .0663576
     gfcfgfc |  -.0011118   .0452209    -0.02   0.980    -.0899532    .0877296
     popggfc |  -.5212807   .3286595    -1.59   0.113    -1.166968    .1244065
     inflgfc |   .0670375   .0625625     1.07   0.284    -.0558733    .1899482
      trdgfc |  -.0063086   .0063037    -1.00   0.317    -.0186929    .0060756
     myosgfc |   .0729815   .1699683     0.43   0.668    -.2609396    .4069026
     polsgfc |  -.0122544   .0152257    -0.80   0.421     -.042167    .0176583
      corgfc |   .0136599   .0282026     0.48   0.628    -.0417471    .0690669
      rolgfc |  -.0779315   .0287697    -2.71   0.007    -.1344527   -.0214104
     govegfc |   .0628913   .0284497     2.21   0.028     .0069987    .1187838
      voagfc |  -.1004372    .034523    -2.91   0.004    -.1682614    -.032613
     regqgfc |   .0112114   .0303918     0.37   0.712    -.0484965    .0709194
         dc1 |  -7.730243   1.750439    -4.42   0.000    -11.16917   -4.291316
         dc2 |   -1.09444   1.234464    -0.89   0.376    -3.519678    1.330798
         dc3 |  -.2989997   1.519683    -0.20   0.844    -3.284582    2.686582
         dc4 |  -10.80473   1.755195    -6.16   0.000      -14.253   -7.356457
         dc5 |   -2.46085   1.901179    -1.29   0.196    -6.195922    1.274222
         dc6 |  -6.297539   1.721855    -3.66   0.000    -9.680309   -2.914769
         dc7 |  -5.292542   1.461162    -3.62   0.000    -8.163152   -2.421931
         dc8 |  -6.540179   1.596732    -4.10   0.000    -9.677131   -3.403226
         dc9 |  -7.519846     1.8197    -4.13   0.000    -11.09484   -3.944848
        dc10 |  -1.710764   1.924578    -0.89   0.374    -5.491805    2.070278
```

dc11	-7.152558	1.411244	-5.07	0.000	-9.925099	-4.380017
dc12	-4.673735	1.71159	-2.73	0.007	-8.036338	-1.311131
dc13	-11.79629	1.755245	-6.72	0.000	-15.24466	-8.347918
dc14	0	(omitted)				
dc15	-4.363017	2.138535	-2.04	0.042	-8.5644	-.1616337
dc16	-4.80022	1.997304	-2.40	0.017	-8.724139	-.8763011
dc17	-9.114567	1.931546	-4.72	0.000	-12.9093	-5.319836
dc18	-7.281469	1.323552	-5.50	0.000	-9.881731	-4.681208
dc19	-1.859902	1.854638	-1.00	0.316	-5.503538	1.783734
dc20	-5.147337	2.119797	-2.43	0.016	-9.311906	-.982767
dc21	-6.56059	2.123824	-3.09	0.002	-10.73307	-2.388108
dc22	-.983964	1.963327	-0.50	0.616	-4.841133	2.873205
dc23	-5.870301	2.26502	-2.59	0.010	-10.32018	-1.420425
dc24	-.8250723	2.040458	-0.40	0.686	-4.833773	3.183629
dc25	-4.281288	2.234697	-1.92	0.056	-8.671592	.109016
dc26	-11.26228	1.729868	-6.51	0.000	-14.6608	-7.863769
dc27	-5.946524	1.925947	-3.09	0.002	-9.730255	-2.162793
dc28	-4.041443	2.464252	-1.64	0.102	-8.882732	.7998466
dc29	-3.606216	2.612275	-1.38	0.168	-8.738313	1.52588
dc30	-2.007428	2.975726	-0.67	0.500	-7.853564	3.838708
dc31	-15.66415	3.152912	-4.97	0.000	-21.85839	-9.469919
dc32	-3.305874	3.073085	-1.08	0.283	-9.343282	2.731533
dc33	-.7872779	2.621909	-0.30	0.764	-5.938301	4.363745
dc34	-8.178369	2.228278	-3.67	0.000	-12.55606	-3.800676
dc35	-12.70088	2.904428	-4.37	0.000	-18.40695	-6.994823
dc36	-4.698916	2.558102	-1.84	0.067	-9.724584	.3267522
dc37	-15.07236	2.913874	-5.17	0.000	-20.79698	-9.347743
dc38	-17.29022	3.033779	-5.70	0.000	-23.25041	-11.33003
dc39	-8.747745	2.711679	-3.23	0.001	-14.07513	-3.420359
dc40	-16.7402	3.159391	-5.30	0.000	-22.94717	-10.53324
dy1	.8655535	.3735569	2.32	0.021	.1316606	1.599446
dy2	0	(omitted)				
dy3	-1.292713	.4510529	-2.87	0.004	-2.178855	-.4065705
dy4	-1.306555	.4102775	-3.18	0.002	-2.112589	-.5005203
dy5	-1.186278	.3642755	-3.26	0.001	-1.901936	-.4706193
dy6	-1.053968	.3638512	-2.90	0.004	-1.768793	-.3391434
dy7	-.7502729	.3505854	-2.14	0.033	-1.439036	-.06151
dy8	-.2863034	.330535	-0.87	0.387	-.9356751	.3630684
dy9	-.1041422	.3610659	-0.29	0.773	-.8134952	.6052108
dy10	-.0184521	.3480493	-0.05	0.958	-.7022326	.6653285
dy11	-.0505365	.3135147	-0.16	0.872	-.66647	.565397
dy12	-.0287567	.2923886	-0.10	0.922	-.6031856	.5456722
dy13	-.0426608	.295907	-0.14	0.885	-.6240021	.5386805
dy14	-.4323094	.3027133	-1.43	0.154	-1.027022	.1624036
dy15	0	(omitted)				
_cons	61.94731	10.21151	6.07	0.000	41.88569	82.00893

LSDV with interaction terms between the macroeconomic variables and the dev dummy

Source	SS	df	MS		
Model	10721.7265	78	137.458032	Number of obs =	600
Residual	921.127735	521	1.76799949	F(78, 521) =	77.75
				Prob > F =	0.0000
Total	11642.8542	599	19.4371523	R-squared =	0.9209
				Adj R-squared =	0.9090
				Root MSE =	1.3297

gini	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
log_gdppc	-1.007415	.8099185	-1.24	0.214	-2.598523	.5836921
eglo	-.195014	.0645787	-3.02	0.003	-.3218806	-.0681474
rem	.4486122	.102546	4.37	0.000	.2471577	.6500667
unempl	-.0305386	.0686505	-0.44	0.657	-.1654045	.1043272
cons	0	(omitted)				
sav	-.1049888	.0589552	-1.78	0.076	-.220808	.0108304
vat	-.1576433	.1718391	-0.92	0.359	-.4952258	.1799393
gfcf	-.137287	.0589118	-2.33	0.020	-.2530208	-.0215532
infl	.0106392	.0304218	0.35	0.727	-.0491253	.0704036
trd	-.0379375	.0207005	-1.83	0.067	-.0786042	.0027292
pols	.0376408	.0097602	3.86	0.000	.0184665	.056815
cor	.0478831	.0211603	2.26	0.024	.0063131	.0894531
rol	.0343321	.0257859	1.33	0.184	-.016325	.0849893
voa	.0092136	.0214495	0.43	0.668	-.0329245	.0513517
regq	-.1008441	.0236112	-4.27	0.000	-.1472289	-.0544592
gove	-.056851	.0174341	-3.26	0.001	-.0911008	-.0226013
popg	.2072599	.1658673	1.25	0.212	-.118591	.5331107
myos	-.2203029	.2210305	-1.00	0.319	-.6545234	.2139175
eglodev	-.0053374	.0776097	-0.07	0.945	-.1578038	.1471291
remdev	-.7337909	.1482448	-4.95	0.000	-1.025022	-.4425599
unempldev	.0912051	.0724698	1.26	0.209	-.0511637	.2335739
consdev	-.0509496	.0520541	-0.98	0.328	-.1532113	.0513122
savdev	.017671	.0790149	0.22	0.823	-.1375559	.1728979
vatdev	.0938324	.1780725	0.53	0.598	-.255996	.4436608
gfcfdev	.1264149	.0615381	2.05	0.040	.0055216	.2473083
infldev	.0078905	.0360891	0.22	0.827	-.0630075	.0787885
trddev	.0386727	.0211904	1.83	0.069	-.0029564	.0803018
dc1	12.79395	2.760927	4.63	0.000	7.370035	18.21787
dc2	19.33085	2.752111	7.02	0.000	13.92426	24.73745
dc3	19.91559	2.853912	6.98	0.000	14.30901	25.52218
dc4	10.21605	2.438549	4.19	0.000	5.42545	15.00664
dc5	17.11271	2.581299	6.63	0.000	12.04167	22.18374
dc6	15.08838	2.713927	5.56	0.000	9.756798	20.41997
dc7	15.76668	2.737312	5.76	0.000	10.38916	21.14421
dc8	14.59427	2.738554	5.33	0.000	9.214302	19.97423
dc9	13.36793	2.684568	4.98	0.000	8.094023	18.64184
dc10	19.49663	2.579161	7.56	0.000	14.4298	24.56346
dc11	15.52924	2.636486	5.89	0.000	10.34979	20.70869
dc12	16.40251	2.572897	6.38	0.000	11.34798	21.45704
dc13	8.357634	2.043514	4.09	0.000	4.343093	12.37217
dc14	21.74856	3.338879	6.51	0.000	15.18924	28.30788
dc15	18.0059	2.375221	7.58	0.000	13.33972	22.67209
dc16	17.03641	2.402299	7.09	0.000	12.31703	21.75579
dc17	10.39392	2.175512	4.78	0.000	6.120067	14.66777
dc18	15.56661	2.665701	5.84	0.000	10.32977	20.80346
dc19	18.48801	2.353326	7.86	0.000	13.86483	23.11118

dc20	17.27843	2.26235	7.64	0.000	12.83398	21.72288
dc21	16.77661	2.212146	7.58	0.000	12.43079	21.12244
dc22	19.95817	2.083974	9.58	0.000	15.86414	24.05219
dc23	13.65649	1.833016	7.45	0.000	10.05548	17.2575
dc24	20.95943	2.118282	9.89	0.000	16.79801	25.12086
dc25	17.99623	2.283881	7.88	0.000	13.50948	22.48298
dc26	9.790814	2.139829	4.58	0.000	5.587061	13.99457
dc27	14.29445	2.003881	7.13	0.000	10.35777	18.23113
dc28	21.33318	2.02616	10.53	0.000	17.35273	25.31362
dc29	16.48163	1.697176	9.71	0.000	13.14749	19.81578
dc30	15.93527	1.366825	11.66	0.000	13.25011	18.62044
dc31	0	(omitted)				
dc32	16.67925	1.580913	10.55	0.000	13.5735	19.785
dc33	18.92781	1.9809	9.56	0.000	15.03628	22.81934
dc34	14.34214	1.798873	7.97	0.000	10.8082	17.87607
dc35	9.293433	1.474195	6.30	0.000	6.397335	12.18953
dc36	18.62993	1.711394	10.89	0.000	15.26785	21.99201
dc37	7.38705	1.783018	4.14	0.000	3.884262	10.88984
dc38	4.957058	1.473471	3.36	0.001	2.062385	7.851732
dc39	17.21881	2.555253	6.74	0.000	12.19894	22.23867
dc40	0	(omitted)				
dy1	.2872143	.330611	0.87	0.385	-.3622802	.9367087
dy2	0	(omitted)				
dy3	-.2398621	.3396069	-0.71	0.480	-.9070293	.4273052
dy4	-.2762538	.3371526	-0.82	0.413	-.9385994	.3860919
dy5	-.0488941	.33383	-0.15	0.884	-.7047124	.6069242
dy6	.0593699	.3442828	0.17	0.863	-.6169833	.735723
dy7	.371128	.3589646	1.03	0.302	-.3340679	1.076324
dy8	.8503812	.3773237	2.25	0.025	.1091183	1.591644
dy9	.896329	.3926974	2.28	0.023	.124864	1.667794
dy10	.8743929	.4014432	2.18	0.030	.0857466	1.663039
dy11	.7875552	.3991039	1.97	0.049	.0035045	1.571606
dy12	.6520108	.4076746	1.60	0.110	-.1488772	1.452899
dy13	.528621	.4134637	1.28	0.202	-.2836399	1.340882
dy14	.0677087	.4087552	0.17	0.868	-.7353022	.8707196
dy15	.5804212	.4422923	1.31	0.190	-.2884743	1.449317
_cons	53.47786	9.15051	5.84	0.000	35.50143	71.45429

LSDV with interaction terms between the macroeconomic variables and the cov19 dummy

Source	SS	df	MS
Model	10670.8532	78	136.805811
Residual	972.000975	521	1.86564487
Total	11642.8542	599	19.4371523

Number of obs =	600
F(78, 521) =	73.33
Prob > F =	0.0000
R-squared =	0.9165
Adj R-squared =	0.9040
Root MSE =	1.3659

gini	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
log_gdppc	-.7991921	.8512597	-0.94	0.348	-2.471515	.8731312
eglo	-.1858806	.0380072	-4.89	0.000	-.2605468	-.1112144
rem	.1523473	.0569072	2.68	0.008	.0405515	.264143
unempl	.0793221	.0322451	2.46	0.014	.0159756	.1426686
cons	0	(omitted)				
sav	-.0738958	.0244244	-3.03	0.003	-.1218782	-.0259133
vat	-.0576811	.0452081	-1.28	0.203	-.1464937	.0311315
gfcf	.0032166	.0239419	0.13	0.893	-.0438178	.0502511
infl	.0221817	.0175053	1.27	0.206	-.0122078	.0565713
trd	-.0018218	.0067059	-0.27	0.786	-.0149958	.0113521
pols	.0294889	.0096636	3.05	0.002	.0105044	.0484734
cor	.0469764	.0203317	2.31	0.021	.0070343	.0869186
rol	.0190435	.0255326	0.75	0.456	-.031116	.069203
voa	.0068117	.0205933	0.33	0.741	-.0336444	.0472678
regq	-.0878471	.0233032	-3.77	0.000	-.1336268	-.0420673
gove	-.0539037	.017677	-3.05	0.002	-.0886308	-.0191767
popg	.484137	.1568855	3.09	0.002	.1759311	.7923429
myos	-.2202686	.2209183	-1.00	0.319	-.6542688	.2137315
eglocov19	-.0033304	.0328755	-0.10	0.919	-.0679153	.0612545
remcov19	-.0541977	.0879088	-0.62	0.538	-.226897	.1185015
unemplcov19	.0312188	.0524494	0.60	0.552	-.0718195	.1342571
conscov19	.0037583	.0282129	0.13	0.894	-.0516668	.0591834
savcov19	.0382865	.0385688	0.99	0.321	-.037483	.114056
vatcov19	.0575212	.0534165	1.08	0.282	-.047417	.1624594
gfcfcov19	-.0702827	.0513489	-1.37	0.172	-.171159	.0305937
inflcov19	-.0094393	.0851763	-0.11	0.912	-.1767704	.1578918
trdcov19	.0032963	.0048476	0.68	0.497	-.006227	.0128197
dc1	-8.259553	1.869598	-4.42	0.000	-11.93243	-4.586675
dc2	-1.35256	1.322089	-1.02	0.307	-3.949841	1.244721
dc3	-1.140832	1.623697	-0.70	0.483	-4.33063	2.048965
dc4	-11.42739	1.903874	-6.00	0.000	-15.16761	-7.68718
dc5	-4.090878	2.02056	-2.02	0.043	-8.060324	-.1214315
dc6	-6.554918	1.862612	-3.52	0.000	-10.21407	-2.895766
dc7	-5.382363	1.577879	-3.41	0.001	-8.482151	-2.282575
dc8	-6.813326	1.714971	-3.97	0.000	-10.18243	-3.444217
dc9	-8.048629	1.958357	-4.11	0.000	-11.89587	-4.201383
dc10	-2.352281	2.076716	-1.13	0.258	-6.432046	1.727484
dc11	-6.848558	1.547989	-4.42	0.000	-9.889626	-3.807491
dc12	-4.971729	1.84803	-2.69	0.007	-8.602234	-1.341224
dc13	-12.89758	1.924347	-6.70	0.000	-16.67801	-9.117147
dc14	0	(omitted)				
dc15	-3.782388	2.346703	-1.61	0.108	-8.392551	.8277744
dc16	-4.871058	2.166997	-2.25	0.025	-9.128183	-.6139326
dc17	-10.67991	2.112821	-5.05	0.000	-14.83061	-6.529215
dc18	-6.361004	1.471438	-4.32	0.000	-9.251686	-3.470323
dc19	-3.192877	2.039406	-1.57	0.118	-7.199347	.8135922

dc20	-4.539278	2.310361	-1.96	0.050	-9.078046	-.0005102
dc21	-5.481246	2.326138	-2.36	0.019	-10.05101	-.9114841
dc22	-2.243473	2.147486	-1.04	0.297	-6.46227	1.975323
dc23	-8.065718	2.474687	-3.26	0.001	-12.92731	-3.204127
dc24	-1.976072	2.23555	-0.88	0.377	-6.367872	2.415729
dc25	-3.473849	2.446865	-1.42	0.156	-8.280783	1.333086
dc26	-12.13849	1.910325	-6.35	0.000	-15.89138	-8.385606
dc27	-7.413953	2.124949	-3.49	0.001	-11.58847	-3.239432
dc28	-5.25344	2.737033	-1.92	0.055	-10.63042	.1235367
dc29	-5.259431	2.867654	-1.83	0.067	-10.89302	.3741549
dc30	-5.246167	3.207493	-1.64	0.103	-11.54737	1.055042
dc31	-21.16616	3.392023	-6.24	0.000	-27.82988	-14.50243
dc32	-4.978839	3.357256	-1.48	0.139	-11.57426	1.616583
dc33	-2.921649	2.89117	-1.01	0.313	-8.601431	2.758134
dc34	-9.08203	2.439133	-3.72	0.000	-13.87377	-4.290284
dc35	-13.63444	3.215865	-4.24	0.000	-19.9521	-7.31679
dc36	-5.322531	2.823702	-1.88	0.060	-10.86977	.2247095
dc37	-16.09719	3.181884	-5.06	0.000	-22.34809	-9.846289
dc38	-18.30443	3.373805	-5.43	0.000	-24.93236	-11.6765
dc39	-10.18514	2.994081	-3.40	0.001	-16.0671	-4.303188
dc40	-18.61807	3.475203	-5.36	0.000	-25.4452	-11.79094
dy1	.3481013	.3391207	1.03	0.305	-.3181107	1.014313
dy2	0	(omitted)				
dy3	-.1430275	.3491675	-0.41	0.682	-.8289768	.5429218
dy4	-.1438291	.344578	-0.42	0.677	-.8207622	.5331039
dy5	-.0132112	.342726	-0.04	0.969	-.6865059	.6600835
dy6	.0923066	.3520108	0.26	0.793	-.5992283	.7838416
dy7	.376197	.3667446	1.03	0.305	-.3442829	1.096677
dy8	.8393317	.3851609	2.18	0.030	.0826724	1.595991
dy9	.9055887	.3992824	2.27	0.024	.1211874	1.68999
dy10	.8841314	.4090558	2.16	0.031	.0805299	1.687733
dy11	.8130971	.4072149	2.00	0.046	.0131122	1.613082
dy12	.7137553	.4159514	1.72	0.087	-.1033926	1.530903
dy13	.603887	.4208987	1.43	0.152	-.2229801	1.430754
dy14	-.4127382	.3960953	-1.04	0.298	-1.190878	.365402
dy15	0	(omitted)				
_cons	67.61428	10.94665	6.18	0.000	46.10928	89.11929

LSDV with interaction terms between the macroeconomic variables and the eusdc dummy

Source	SS	df	MS
Model	10725.7839	78	137.51005
Residual	917.070323	521	1.76021175
Total	11642.8542	599	19.4371523

Number of obs =	600
F(78, 521) =	78.12
Prob > F =	0.0000
R-squared =	0.9212
Adj R-squared =	0.9094
Root MSE =	1.3267

gini	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
log_gdppc	-.9995983	.7993071	-1.25	0.212	-2.569859	.5706627
eglo	-.1894374	.0382428	-4.95	0.000	-.2645664	-.1143084
rem	.1621706	.0572138	2.83	0.005	.0497726	.2745686
unempl	-.0167655	.0355472	-0.47	0.637	-.0865989	.053068
cons	0	(omitted)				
sav	-.0730004	.0252382	-2.89	0.004	-.1225816	-.0234191
vat	-.0327273	.0456661	-0.72	0.474	-.1224396	.056985
gfcf	-.0310048	.0240223	-1.29	0.197	-.0781973	.0161876
infl	.009848	.025572	0.39	0.700	-.040389	.0600849
trd	.0074247	.0064848	1.14	0.253	-.0053149	.0201643
pols	.0287058	.0093728	3.06	0.002	.0102927	.0471188
cor	.0224986	.0200746	1.12	0.263	-.0169385	.0619357
rol	-.0111216	.0255764	-0.43	0.664	-.0613672	.0391239
voa	.0098328	.0202636	0.49	0.628	-.0299756	.0496411
regq	-.0728225	.0225366	-3.23	0.001	-.1170963	-.0285487
gove	-.0345425	.0174776	-1.98	0.049	-.0688778	-.0002072
popg	.5386339	.1549969	3.48	0.001	.2341382	.8431296
myos	-.0814165	.2139745	-0.38	0.704	-.5017753	.3389424
egloeusdc	-.0111064	.019146	-0.58	0.562	-.0487194	.0265065
remeusdc	-.0239285	.0488477	-0.49	0.624	-.1198912	.0720342
unempleusdc	.1297652	.0281817	4.60	0.000	.0744015	.1851289
conseusdc	-.011762	.0177198	-0.66	0.507	-.046573	.023049
saveusdc	-.0270768	.0258525	-1.05	0.295	-.0778647	.0237111
vateusdc	-.0513445	.0377128	-1.36	0.174	-.1254324	.0227435
gfcfeusdc	.0703268	.0330499	2.13	0.034	.0053993	.1352543
infleusdc	.0035912	.0317532	0.11	0.910	-.0587888	.0659713
trdeusdc	.0042613	.003131	1.36	0.174	-.0018897	.0104122
dc1	12.91667	2.448797	5.27	0.000	8.105938	17.7274
dc2	18.84808	2.577615	7.31	0.000	13.78428	23.91187
dc3	19.33515	2.533545	7.63	0.000	14.35793	24.31236
dc4	9.316841	2.220383	4.20	0.000	4.954837	13.67884
dc5	16.49803	2.197791	7.51	0.000	12.18041	20.81565
dc6	14.55846	2.335089	6.23	0.000	9.971111	19.14581
dc7	14.97809	2.390261	6.27	0.000	10.28236	19.67383
dc8	14.03254	2.412738	5.82	0.000	9.292653	18.77244
dc9	13.13541	2.292845	5.73	0.000	8.631047	17.63976
dc10	18.5301	2.138819	8.66	0.000	14.32833	22.73187
dc11	13.27739	2.303608	5.76	0.000	8.751886	17.80289
dc12	15.84471	2.210707	7.17	0.000	11.50172	20.18771
dc13	6.966973	1.920162	3.63	0.000	3.194761	10.73918
dc14	18.76222	3.364823	5.58	0.000	12.15193	25.3725
dc15	17.61595	1.975972	8.92	0.000	13.7341	21.49781
dc16	16.39804	2.024542	8.10	0.000	12.42078	20.37531
dc17	8.878099	1.814086	4.89	0.000	5.314276	12.44192
dc18	12.08781	2.498703	4.84	0.000	7.179042	16.99658
dc19	16.61267	2.038868	8.15	0.000	12.60725	20.61808

dc20	16.04479	1.795361	8.94	0.000	12.51775	19.57182
dc21	15.18441	1.748233	8.69	0.000	11.74996	18.61886
dc22	17.31954	1.675217	10.34	0.000	14.02853	20.61055
dc23	11.80649	1.540745	7.66	0.000	8.779658	14.83333
dc24	17.87682	1.692355	10.56	0.000	14.55214	21.2015
dc25	17.53959	1.870817	9.38	0.000	13.86432	21.21486
dc26	6.835184	1.814276	3.77	0.000	3.27099	10.39938
dc27	11.96854	1.746008	6.85	0.000	8.53846	15.39862
dc28	14.58577	1.187537	12.28	0.000	12.25282	16.91872
dc29	14.80201	1.288328	11.49	0.000	12.27105	17.33296
dc30	13.71002	1.435722	9.55	0.000	10.88951	16.53054
dc31	-1.826531	1.789935	-1.02	0.308	-5.342909	1.689847
dc32	15.97351	1.861851	8.58	0.000	12.31585	19.63117
dc33	17.42144	1.608655	10.83	0.000	14.2612	20.58169
dc34	10.81839	1.467423	7.37	0.000	7.935593	13.70118
dc35	5.649977	.9209163	6.14	0.000	3.840811	7.459142
dc36	14.33546	1.110869	12.90	0.000	12.15313	16.51779
dc37	4.466455	1.233363	3.62	0.000	2.043479	6.88943
dc38	.152395	1.060145	0.14	0.886	-1.930289	2.235079
dc39	9.953023	1.524953	6.53	0.000	6.95721	12.94884
dc40	0	(omitted)				
dy1	-.2403849	.396836	-0.61	0.545	-1.01998	.5392105
dy2	-.5736465	.4129352	-1.39	0.165	-1.384869	.2375761
dy3	-.8593233	.3918337	-2.19	0.029	-1.629091	-.0895552
dy4	-.9225413	.3478483	-2.65	0.008	-1.605899	-.2391837
dy5	-.8524998	.3282634	-2.60	0.010	-1.497382	-.2076173
dy6	-.8203211	.3193219	-2.57	0.010	-1.447638	-.1930044
dy7	-.5308602	.3099144	-1.71	0.087	-1.139696	.0779752
dy8	0	(omitted)				
dy9	.1255636	.3017876	0.42	0.678	-.4673065	.7184336
dy10	0	(omitted)				
dy11	-.1815678	.3088903	-0.59	0.557	-.7883914	.4252557
dy12	-.3549635	.3329888	-1.07	0.287	-1.009129	.2992023
dy13	-.4772737	.3338538	-1.43	0.153	-1.133139	.1785913
dy14	-.7411163	.3248028	-2.28	0.023	-1.3792	-.1030321
dy15	-.2588321	.3960781	-0.65	0.514	-1.036938	.5192742
_cons	50.34783	8.347065	6.03	0.000	33.94979	66.74587

LSDV with interaction terms between the macroeconomic variables and the gfc dummy

Source	SS	df	MS
Model	10845.6406	78	139.046674
Residual	797.21362	521	1.5301605
Total	11642.8542	599	19.4371523

Number of obs	= 600
F(78, 521)	= 90.87
Prob > F	= 0.0000
R-squared	= 0.9315
Adj R-squared	= 0.9213
Root MSE	= 1.237

gini	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
log_gdppc	.3400634	.7514773	0.45	0.651	-1.136235	1.816361
eglo	-.1694281	.0368915	-4.59	0.000	-.2419025	-.0969537
rem	.0644273	.062827	1.03	0.306	-.058998	.1878527
unempl	.1441071	.0290043	4.97	0.000	.0871274	.2010868
cons	0	(omitted)				
sav	-.1019547	.0244049	-4.18	0.000	-.1498987	-.0540107
vat	-.0139675	.0504835	-0.28	0.782	-.1131438	.0852088
gfcf	-.0053613	.0237586	-0.23	0.822	-.0520357	.0413131
infl	.0144881	.0162698	0.89	0.374	-.0174744	.0464506
trd	.0057085	.0061178	0.93	0.351	-.00631	.017727
pols	.0166159	.0088098	1.89	0.060	-.0006912	.0339231
cor	-.0046268	.0188061	-0.25	0.806	-.0415719	.0323184
rol	-.0081035	.0234351	-0.35	0.730	-.0541425	.0379354
voa	-.0222572	.018942	-1.18	0.241	-.0594693	.0149549
regq	-.0204078	.0215499	-0.95	0.344	-.0627431	.0219276
gove	-.0279644	.0160829	-1.74	0.083	-.0595596	.0036309
popg	.6345388	.1419567	4.47	0.000	.355661	.9134166
myos	-.5509521	.1973216	-2.79	0.005	-.9385958	-.1633085
eglogfc	-.0103599	.0251177	-0.41	0.680	-.0597044	.0389845
remgfc	.0866189	.0550014	1.57	0.116	-.0214329	.1946707
unemplgfc	-.3640733	.0386357	-9.42	0.000	-.4399741	-.2881725
consgfc	.0678069	.0243057	2.79	0.005	.0200576	.1155561
savgfc	.0168031	.0263167	0.64	0.523	-.0348967	.068503
vatgfc	-.048283	.0461479	-1.05	0.296	-.1389418	.0423757
gfcfgfc	-.0505171	.0398901	-1.27	0.206	-.1288823	.0278482
inflgfc	.0458694	.0518441	0.88	0.377	-.0559798	.1477186
trdgfc	-.0045575	.0045503	-1.00	0.317	-.0134967	.0043817
dc1	-6.82455	1.73218	-3.94	0.000	-10.22747	-3.421634
dc2	-.5719324	1.215231	-0.47	0.638	-2.959287	1.815422
dc3	.425194	1.49448	0.28	0.776	-2.510753	3.361141
dc4	-10.20608	1.743518	-5.85	0.000	-13.63127	-6.780885
dc5	-1.643636	1.858377	-0.88	0.377	-5.294469	2.007198
dc6	-5.157553	1.713012	-3.01	0.003	-8.522812	-1.792294
dc7	-4.37784	1.456411	-3.01	0.003	-7.238999	-1.51668
dc8	-5.604503	1.590078	-3.52	0.000	-8.728256	-2.480751
dc9	-6.364977	1.812401	-3.51	0.000	-9.925489	-2.804466
dc10	-.8885326	1.909785	-0.47	0.642	-4.640358	2.863293
dc11	-6.403873	1.410645	-4.54	0.000	-9.175125	-3.632621
dc12	-3.754735	1.704714	-2.20	0.028	-7.103694	-.4057767
dc13	-11.38777	1.75978	-6.47	0.000	-14.84491	-7.930637
dc14	0	(omitted)				
dc15	-3.687685	2.148061	-1.72	0.087	-7.90761	.5322406
dc16	-3.907203	1.987774	-1.97	0.050	-7.81224	-.0021666
dc17	-8.492885	1.929935	-4.40	0.000	-12.2843	-4.701475
dc18	-6.99572	1.35626	-5.16	0.000	-9.660131	-4.331309
dc19	-.7742857	1.853302	-0.42	0.676	-4.415149	2.866578

dc20	-4.847747	2.126098	-2.28	0.023	-9.024526	-.6709681
dc21	-6.352743	2.147639	-2.96	0.003	-10.57184	-2.133646
dc22	-.2377588	1.964473	-0.12	0.904	-4.097021	3.621503
dc23	-5.310417	2.259128	-2.35	0.019	-9.748535	-.8722981
dc24	.1570501	2.053414	0.08	0.939	-3.876938	4.191038
dc25	-3.435023	2.25333	-1.52	0.128	-7.861753	.9917068
dc26	-10.91665	1.742683	-6.26	0.000	-14.3402	-7.493105
dc27	-5.566092	1.94848	-2.86	0.004	-9.393935	-1.738249
dc28	-3.11148	2.486937	-1.25	0.211	-7.997137	1.774177
dc29	-2.938922	2.629232	-1.12	0.264	-8.104121	2.226277
dc30	-2.948407	2.948524	-1.00	0.318	-8.740865	2.844051
dc31	-16.58571	3.125836	-5.31	0.000	-22.7265	-10.44491
dc32	-3.296256	3.097622	-1.06	0.288	-9.38162	2.789108
dc33	-.1680888	2.659965	-0.06	0.950	-5.393665	5.057487
dc34	-7.494159	2.241989	-3.34	0.001	-11.89861	-3.089709
dc35	-11.79828	2.945792	-4.01	0.000	-17.58537	-6.011193
dc36	-3.913394	2.590478	-1.51	0.131	-9.002461	1.175672
dc37	-14.39556	2.957834	-4.87	0.000	-20.20631	-8.584817
dc38	-17.27107	3.058099	-5.65	0.000	-23.27879	-11.26335
dc39	-8.297367	2.756992	-3.01	0.003	-13.71355	-2.88118
dc40	-15.602	3.181998	-4.90	0.000	-21.85313	-9.350882
dy1	.7341008	.3335454	2.20	0.028	.0788416	1.38936
dy2	0	(omitted)				
dy3	.0208489	.3258272	0.06	0.949	-.6192478	.6609455
dy4	-.0374586	.296821	-0.13	0.900	-.6205716	.5456545
dy5	0	(omitted)				
dy6	.1288964	.280792	0.46	0.646	-.4227272	.68052
dy7	.4011687	.2857377	1.40	0.161	-.1601711	.9625084
dy8	.872297	.3073477	2.84	0.005	.2685039	1.47609
dy9	1.131821	.3319958	3.41	0.001	.4796061	1.784036
dy10	1.180591	.342001	3.45	0.001	.5087205	1.852461
dy11	1.103603	.3414906	3.23	0.001	.4327348	1.77447
dy12	1.06487	.3461664	3.08	0.002	.3848166	1.744924
dy13	1.067131	.3572164	2.99	0.003	.3653693	1.768893
dy14	.6739734	.3502603	1.92	0.055	-.0141227	1.362069
dy15	1.022058	.3719803	2.75	0.006	.2912923	1.752824
_cons	57.9825	10.12538	5.73	0.000	38.09091	77.8741

LSDV with interaction terms between the demographic variables and the dev dummy

Source	SS	df	MS
Model	10691.3681	72	148.491223
Residual	951.486159	527	1.80547658
Total	11642.8542	599	19.4371523

Number of obs =	600
F(72, 527) =	82.24
Prob > F =	0.0000
R-squared =	0.9183
Adj R-squared =	0.9071
Root MSE =	1.3437

gini	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
log_gdppc	-.2831703	.7910242	-0.36	0.721	-1.837118	1.270777
eglo	-.1893813	.0378005	-5.01	0.000	-.2636394	-.1151231
rem	.1252398	.0609773	2.05	0.040	.0054513	.2450283
unempl	.1067807	.0312545	3.42	0.001	.0453819	.1681794
cons	0	(omitted)				
sav	-.0849034	.0238675	-3.56	0.000	-.1317904	-.0380164
vat	-.0556953	.0441539	-1.26	0.208	-.1424345	.031044
gfcf	.0109847	.022831	0.48	0.631	-.0338663	.0558356
infl	.0253971	.017155	1.48	0.139	-.0083036	.0590977
trd	.0026235	.0062225	0.42	0.673	-.0096004	.0148475
pols	.0241481	.0094227	2.56	0.011	.0056375	.0426588
cor	.0558648	.0199754	2.80	0.005	.0166237	.0951059
rol	-.0055261	.0255337	-0.22	0.829	-.0556865	.0446344
voa	.0078521	.020139	0.39	0.697	-.0317105	.0474146
regq	-.0760055	.0223843	-3.40	0.001	-.119979	-.032032
gove	-.0434416	.0171675	-2.53	0.012	-.0771666	-.0097165
popg	1.986367	.4330755	4.59	0.000	1.135601	2.837134
myos	.3572591	.2788921	1.28	0.201	-.1906176	.9051359
popgdev	-1.612007	.4761885	-3.39	0.001	-2.547468	-.6765468
myosdev	-1.03297	.3073948	-3.36	0.001	-1.636839	-.4291003
dc1	-7.630338	1.788301	-4.27	0.000	-11.14341	-4.117264
dc2	-1.563222	1.271484	-1.23	0.219	-4.061022	.9345778
dc3	-.4180375	1.552364	-0.27	0.788	-3.467619	2.631544
dc4	-10.94392	1.817108	-6.02	0.000	-14.51359	-7.37426
dc5	-2.978902	1.926842	-1.55	0.123	-6.764137	.8063324
dc6	-6.122646	1.761898	-3.48	0.001	-9.583851	-2.661441
dc7	-5.206736	1.501822	-3.47	0.001	-8.157029	-2.256444
dc8	-6.343879	1.628463	-3.90	0.000	-9.542955	-3.144802
dc9	-7.503566	1.855185	-4.04	0.000	-11.14803	-3.8591
dc10	-1.566432	1.967845	-0.80	0.426	-5.432216	2.299351
dc11	-7.034941	1.483362	-4.74	0.000	-9.94897	-4.120913
dc12	-4.634061	1.756485	-2.64	0.009	-8.084633	-1.183489
dc13	-12.14647	1.816945	-6.69	0.000	-15.71581	-8.577124
dc14	0	(omitted)				
dc15	-4.552868	2.282671	-1.99	0.047	-9.03712	-.0686153
dc16	-5.033365	2.080459	-2.42	0.016	-9.120375	-.9463542
dc17	-9.61966	1.992571	-4.83	0.000	-13.53402	-5.705304
dc18	-7.041164	1.448528	-4.86	0.000	-9.886761	-4.195566
dc19	-2.11407	1.908421	-1.11	0.268	-5.863117	1.634978
dc20	-5.131288	2.245451	-2.29	0.023	-9.542423	-.7201537
dc21	-5.847429	2.249009	-2.60	0.010	-10.26555	-1.429305
dc22	-1.343302	2.029777	-0.66	0.508	-5.330749	2.644146
dc23	-6.862286	2.323931	-2.95	0.003	-11.42759	-2.29698
dc24	-.9605983	2.106453	-0.46	0.649	-5.098673	3.177477
dc25	-4.462316	2.384738	-1.87	0.062	-9.147076	.2224436
dc26	-11.5473	1.801452	-6.41	0.000	-15.08621	-8.008396

dc27	-6.715727	2.002079	-3.35	0.001	-10.64876	-2.782691
dc28	-4.741878	2.611558	-1.82	0.070	-9.87222	.3884637
dc29	-4.600895	2.724892	-1.69	0.092	-9.953878	.7520876
dc30	-3.868247	3.081941	-1.26	0.210	-9.922646	2.186152
dc31	-20.14305	3.223562	-6.25	0.000	-26.47566	-13.81044
dc32	-5.996424	3.279002	-1.83	0.068	-12.43794	.4450969
dc33	-1.490451	2.753215	-0.54	0.588	-6.899074	3.918172
dc34	-8.636734	2.313356	-3.73	0.000	-13.18127	-4.092203
dc35	-23.23403	4.736591	-4.91	0.000	-32.53895	-13.92911
dc36	-15.26194	4.561424	-3.35	0.001	-24.22275	-6.301138
dc37	-24.04365	4.585961	-5.24	0.000	-33.05266	-15.03464
dc38	-28.23453	4.881553	-5.78	0.000	-37.82422	-18.64484
dc39	-20.4487	4.419473	-4.63	0.000	-29.13065	-11.76675
dc40	-27.85569	5.18046	-5.38	0.000	-38.03258	-17.67881
dy1	.379863	.3320202	1.14	0.253	-.2723825	1.032109
dy2	0	(omitted)				
dy3	-.0407125	.3415939	-0.12	0.905	-.7117653	.6303403
dy4	-.0656806	.3386165	-0.19	0.846	-.7308845	.5995233
dy5	.0274797	.3363596	0.08	0.935	-.6332905	.6882499
dy6	.1634348	.3459454	0.47	0.637	-.5161665	.8430361
dy7	.4700386	.3598237	1.31	0.192	-.2368262	1.176903
dy8	.9926728	.3791526	2.62	0.009	.2478368	1.737509
dy9	1.154062	.3932964	2.93	0.003	.3814405	1.926683
dy10	1.155749	.4024165	2.87	0.004	.3652113	1.946286
dy11	1.092705	.4019762	2.72	0.007	.3030321	1.882377
dy12	1.005912	.4115111	2.44	0.015	.1975087	1.814316
dy13	.9474647	.4181376	2.27	0.024	.1260436	1.768886
dy14	.5673387	.4130111	1.37	0.170	-.2440114	1.378689
dy15	1.01115	.4491169	2.25	0.025	.1288709	1.893429
_cons	66.6566	10.43485	6.39	0.000	46.15759	87.15561

LSDV with interaction terms between the demographic variables and the cov19 dummy

Source	SS	df	MS
Model	10658.3269	72	148.032317
Residual	984.527358	527	1.86817335
Total	11642.8542	599	19.4371523

Number of obs =	600
F(72, 527) =	79.24
Prob > F =	0.0000
R-squared =	0.9154
Adj R-squared =	0.9039
Root MSE =	1.3668

gini	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
log_gdppc	-.7379672	.8075174	-0.91	0.361	-2.324315	.8483811
eglo	-.1876686	.0380434	-4.93	0.000	-.262404	-.1129333
rem	.1437497	.0565063	2.54	0.011	.0327445	.254755
unempl	.077375	.031604	2.45	0.015	.0152896	.1394603
cons	0	(omitted)				
sav	-.0763858	.0239562	-3.19	0.002	-.1234471	-.0293245
vat	-.0508464	.0452478	-1.12	0.262	-.1397346	.0380418
gfcf	-.0017349	.0230157	-0.08	0.940	-.0469487	.043479
infl	.0219649	.0174178	1.26	0.208	-.012252	.0561817
trd	.0040628	.0063388	0.64	0.522	-.0083896	.0165152
pols	.0273086	.0095638	2.86	0.004	.0085208	.0460964
cor	.0493817	.0204558	2.41	0.016	.0091968	.0895667
rol	.0206325	.025423	0.81	0.417	-.0293104	.0705753
voa	.0095456	.0205705	0.46	0.643	-.0308646	.0499558
regq	-.0888323	.0226346	-3.92	0.000	-.1332974	-.0443672
gove	-.0491026	.0175733	-2.79	0.005	-.083625	-.0145802
popg	.5099702	.1607503	3.17	0.002	.1941802	.8257602
myos	-.2982307	.213304	-1.40	0.163	-.7172611	.1207997
popgcov19	.2643628	.2297741	1.15	0.250	-.1870229	.7157484
myoscov19	-.2537395	.1477865	-1.72	0.087	-.5440624	.0365834
dc1	-6.997554	1.799227	-3.89	0.000	-10.53209	-3.463016
dc2	-.8210461	1.282531	-0.64	0.522	-3.340547	1.698455
dc3	-.0489327	1.565854	-0.03	0.975	-3.125015	3.027149
dc4	-10.32553	1.838723	-5.62	0.000	-13.93765	-6.713401
dc5	-2.737746	1.940752	-1.41	0.159	-6.550307	1.074815
dc6	-5.411527	1.783283	-3.03	0.003	-8.914743	-1.908311
dc7	-4.54699	1.518618	-2.99	0.003	-7.530278	-1.563701
dc8	-5.743637	1.643304	-3.50	0.001	-8.971867	-2.515406
dc9	-6.827453	1.874905	-3.64	0.000	-10.51066	-3.144248
dc10	-1.050955	1.992808	-0.53	0.598	-4.965779	2.863868
dc11	-6.104781	1.491375	-4.09	0.000	-9.03455	-3.175011
dc12	-3.930446	1.778291	-2.21	0.028	-7.423855	-.4370371
dc13	-11.83046	1.85197	-6.39	0.000	-15.46861	-8.192307
dc14	0	(omitted)				
dc15	-2.593302	2.286904	-1.13	0.257	-7.08587	1.899266
dc16	-3.689055	2.096382	-1.76	0.079	-7.807346	.429237
dc17	-9.547198	2.036138	-4.69	0.000	-13.54714	-5.547253
dc18	-6.443509	1.442145	-4.47	0.000	-9.276568	-3.610449
dc19	-2.117012	1.944675	-1.09	0.277	-5.937278	1.703253
dc20	-3.14728	2.249066	-1.40	0.162	-7.565516	1.270956
dc21	-4.050755	2.261687	-1.79	0.074	-8.493785	.3922741
dc22	-1.015523	2.073959	-0.49	0.625	-5.089765	3.05872
dc23	-6.548732	2.373891	-2.76	0.006	-11.21218	-1.885282
dc24	-.5943442	2.15088	-0.28	0.782	-4.819696	3.631008
dc25	-2.484091	2.376859	-1.05	0.296	-7.153372	2.185191
dc26	-11.09908	1.851124	-6.00	0.000	-14.73557	-7.462592

dc27	-6.384879	2.046333	-3.12	0.002	-10.40485	-2.364909
dc28	-3.920092	2.632216	-1.49	0.137	-9.091016	1.250831
dc29	-3.765366	2.782128	-1.35	0.177	-9.23079	1.700057
dc30	-3.237784	3.170568	-1.02	0.308	-9.466288	2.99072
dc31	-19.47262	3.304175	-5.89	0.000	-25.96359	-12.98165
dc32	-3.890768	3.321579	-1.17	0.242	-10.41593	2.634393
dc33	-1.632881	2.814361	-0.58	0.562	-7.161625	3.895863
dc34	-7.581927	2.359632	-3.21	0.001	-12.21737	-2.946487
dc35	-12.03945	3.132688	-3.84	0.000	-18.19354	-5.88536
dc36	-3.838434	2.738293	-1.40	0.162	-9.217744	1.540875
dc37	-14.70428	3.105257	-4.74	0.000	-20.80448	-8.60408
dc38	-16.58303	3.266468	-5.08	0.000	-22.99992	-10.16613
dc39	-8.995623	2.943846	-3.06	0.002	-14.77874	-3.212509
dc40	-16.97987	3.348887	-5.07	0.000	-23.55868	-10.40106
dy1	-3.44441	1.89857	-1.81	0.070	-7.174106	.2852848
dy2	-3.808656	1.890189	-2.01	0.044	-7.521886	-.0954257
dy3	-3.885488	1.899425	-2.05	0.041	-7.616863	-.1541141
dy4	-3.930965	1.886942	-2.08	0.038	-7.637816	-.2241136
dy5	-3.844623	1.874861	-2.05	0.041	-7.527741	-.1615039
dy6	-3.745592	1.873472	-2.00	0.046	-7.425981	-.0652025
dy7	-3.45296	1.867813	-1.85	0.065	-7.122234	.216313
dy8	-2.996332	1.860618	-1.61	0.108	-6.65147	.6588071
dy9	-2.916519	1.857317	-1.57	0.117	-6.565173	.732135
dy10	-2.932334	1.848524	-1.59	0.113	-6.563714	.6990462
dy11	-3.018816	1.835379	-1.64	0.101	-6.624374	.5867415
dy12	-3.129389	1.831298	-1.71	0.088	-6.72693	.4681515
dy13	-3.226708	1.83021	-1.76	0.078	-6.822111	.3686956
dy14	-.5441458	.3430146	-1.59	0.113	-1.21799	.129698
dy15	0	(omitted)				
_cons	69.47901	11.07403	6.27	0.000	47.72435	91.23368

LSDV with interaction terms between the demographic variables and the eusdc dummy

```
      Source |       SS       df       MS              Number of obs =     600
-------------+------------------------------           F( 72,   527) =   79.32
       Model |  10659.2037    72  148.044495           Prob > F      =  0.0000
    Residual |  983.650552   527  1.86650959           R-squared     =  0.9155
-------------+------------------------------           Adj R-squared =  0.9040
       Total |  11642.8542   599  19.4371523           Root MSE      =  1.3662

------------------------------------------------------------------------------
        gini |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   log_gdppc |  -.8166721   .7967098    -1.03   0.306    -2.381789    .7484449
        eglo |  -.1856337   .0378446    -4.91   0.000    -.2599786   -.1112888
         rem |   .1705648   .0569064     3.00   0.003     .0587736    .2823561
      unempl |   .0803729   .0327294     2.46   0.014     .0160768     .144669
        cons |          0  (omitted)
         sav |  -.0686442   .0239331    -2.87   0.004    -.1156603   -.0216282
         vat |  -.0540106   .0455618    -1.19   0.236    -.1435157    .0354945
        gfcf |   -.004927   .0228984    -0.22   0.830    -.0499104    .0400564
        infl |   .0211019    .017406     1.21   0.226    -.0130917    .0552955
         trd |   .0043497   .0063278     0.69   0.492    -.0080812    .0167806
        pols |   .0314105   .0096709     3.25   0.001     .0124122    .0504088
         cor |   .0335283   .0204597     1.64   0.102    -.0066643    .0737209
         rol |   .0042084   .0259824     0.16   0.871    -.0468333    .0552502
         voa |    .008755   .0204824     0.43   0.669    -.0314822    .0489921
        regq |     -.0788   .0229424    -3.43   0.001    -.1238697   -.0337302
        gove |  -.0469538   .0173911    -2.70   0.007    -.0811181   -.0127895
        popg |   .5208677   .1548959     3.36   0.001     .2165785    .8251568
        myos |  -.1203395   .2232932    -0.54   0.590    -.5589935    .3183146
  popgeusdc |   .0566135    .167016     0.34   0.735    -.2714855    .3847124
  myoseusdc |  -.1783924   .0864293    -2.06   0.040    -.3481806   -.0086041
         dc1 |  -6.673426   1.804747    -3.70   0.000    -10.21881   -3.128045
         dc2 |  -.5100737   1.286503    -0.40   0.692    -3.037378     2.01723
         dc3 |   .0728405   1.568585     0.05   0.963    -3.008606    3.154287
         dc4 |  -10.02498   1.844809    -5.43   0.000    -13.64906   -6.400901
         dc5 |  -2.596869   1.946828    -1.33   0.183    -6.421365    1.227628
         dc6 |  -5.008244   1.788411    -2.80   0.005    -8.521534   -1.494955
         dc7 |  -4.180554   1.526059    -2.74   0.006    -7.178459   -1.182649
         dc8 |  -5.317063    1.65285    -3.22   0.001    -8.564048   -2.070079
         dc9 |  -6.387844   1.881228    -3.40   0.001    -10.08347   -2.692217
        dc10 |  -.6347992   2.001812    -0.32   0.751     -4.56731    3.297712
        dc11 |  -5.849158    1.49526    -3.91   0.000     -8.78656   -2.911755
        dc12 |  -3.554663   1.784511    -1.99   0.047    -7.060291   -.0490351
        dc13 |  -11.82619   1.848786    -6.40   0.000    -15.45809   -8.194298
        dc14 |          0  (omitted)
        dc15 |  -2.121941   2.294649    -0.92   0.356    -6.629723     2.38584
        dc16 |  -3.169956   2.104004    -1.51   0.133    -7.303221    .9633094
        dc17 |  -9.786401   2.024595    -4.83   0.000    -13.76367   -5.809134
        dc18 |  -6.316892    1.43449    -4.40   0.000    -9.134912   -3.498871
        dc19 |  -2.141488   1.940548    -1.10   0.270    -5.953646    1.670671
        dc20 |  -3.224718   2.248519    -1.43   0.152    -7.641879    1.192444
        dc21 |  -4.092773   2.259731    -1.81   0.071    -8.531961    .3464144
        dc22 |  -1.271255   2.062708    -0.62   0.538    -5.323394    2.780884
        dc23 |  -6.826682   2.362151    -2.89   0.004    -11.46707   -2.186295
        dc24 |  -.8266129   2.142222    -0.39   0.700    -5.034956     3.38173
        dc25 |  -1.920685   2.382814    -0.81   0.421    -6.601666    2.760296
        dc26 |  -11.60586   1.834075    -6.33   0.000    -15.20885   -8.002862
```

dc27	-6.639103	2.035757	-3.26	0.001	-10.6383	-2.639908
dc28	-4.458483	2.618896	-1.70	0.089	-9.603239	.6862743
dc29	-4.025204	2.772828	-1.45	0.147	-9.472358	1.421949
dc30	-4.34622	3.13804	-1.39	0.167	-10.51082	1.818383
dc31	-20.15972	3.286427	-6.13	0.000	-26.61582	-13.70361
dc32	-3.439657	3.332597	-1.03	0.302	-9.986463	3.107148
dc33	-1.535491	2.810581	-0.55	0.585	-7.05681	3.985827
dc34	-8.043538	2.345833	-3.43	0.001	-12.65187	-3.435206
dc35	-12.98798	3.109267	-4.18	0.000	-19.09605	-6.879896
dc36	-4.423434	2.721343	-1.63	0.105	-9.769446	.9225775
dc37	-14.96686	3.106088	-4.82	0.000	-21.0687	-8.86503
dc38	-17.84407	3.227953	-5.53	0.000	-24.1853	-11.50283
dc39	-9.216712	2.944418	-3.13	0.002	-15.00095	-3.432475
dc40	-18.20147	3.315692	-5.49	0.000	-24.71507	-11.68788
dy1	-2.431892	1.055066	-2.30	0.022	-4.504543	-.3592405
dy2	-2.778142	1.043573	-2.66	0.008	-4.828215	-.728068
dy3	-.8983554	.3893366	-2.31	0.021	-1.663198	-.1335131
dy4	-.9446214	.35343	-2.67	0.008	-1.638926	-.2503168
dy5	-.846935	.3345123	-2.53	0.012	-1.504076	-.1897937
dy6	-.7581859	.3254483	-2.33	0.020	-1.397521	-.1188508
dy7	-.4758358	.3182909	-1.49	0.136	-1.101111	.149439
dy8	0	(omitted)				
dy9	-2.0298	1.062698	-1.91	0.057	-4.117445	.0578446
dy10	-2.061761	1.074252	-1.92	0.055	-4.172103	.0485815
dy11	-2.167171	1.086002	-2.00	0.046	-4.300597	-.0337461
dy12	-2.275308	1.093729	-2.08	0.038	-4.423912	-.1267036
dy13	-2.380408	1.099575	-2.16	0.031	-4.540496	-.2203201
dy14	-2.726039	1.09628	-2.49	0.013	-4.879655	-.5724236
dy15	-2.255758	1.118379	-2.02	0.044	-4.452786	-.0587289
_cons	68.20864	10.73867	6.35	0.000	47.11278	89.3045

LSDV with interaction terms between the demographic variables and the gfc dummy

Source	SS	df	MS
Model	10716.0084	72	148.833451
Residual	926.845767	527	1.75872062
Total	11642.8542	599	19.4371523

Number of obs = 600
F(72, 527) = 84.63
Prob > F = 0.0000
R-squared = 0.9204
Adj R-squared = 0.9095
Root MSE = 1.3262

gini	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
log_gdppc	-.585312	.7740142	-0.76	0.450	-2.105844	.93522
eglo	-.2132282	.0369047	-5.78	0.000	-.2857266	-.1407298
rem	.1716204	.0546974	3.14	0.002	.0641686	.2790721
unempl	.0666013	.0299884	2.22	0.027	.0076898	.1255129
cons	0	(omitted)				
sav	-.0916096	.0234388	-3.91	0.000	-.1376546	-.0455647
vat	-.0267155	.0443422	-0.60	0.547	-.1138247	.0603937
gfcf	.0074947	.0228791	0.33	0.743	-.0374507	.0524401
infl	.018184	.0169008	1.08	0.282	-.0150172	.0513851
trd	.0076204	.0061587	1.24	0.217	-.0044783	.0197191
pols	.0283849	.009257	3.07	0.002	.0101997	.0465701
cor	.0421571	.019533	2.16	0.031	.0037851	.0805291
rol	.0050355	.0248268	0.20	0.839	-.0437362	.0538072
voa	.0069138	.0197593	0.35	0.727	-.0319028	.0457305
regq	-.0534263	.0224421	-2.38	0.018	-.0975132	-.0093394
gove	-.0548542	.0169317	-3.24	0.001	-.0881161	-.0215923
popg	.5654265	.1543174	3.66	0.000	.2622736	.8685793
myos	-.6295322	.2177564	-2.89	0.004	-1.057309	-.2017551
popggfc	.1787877	.2161039	0.83	0.408	-.2457431	.6033184
myosgfc	.6657709	.1102514	6.04	0.000	.4491848	.882357
dc1	-6.587193	1.746503	-3.77	0.000	-10.01816	-3.15623
dc2	-.5885463	1.2468	-0.47	0.637	-3.037855	1.860763
dc3	.8083805	1.531259	0.53	0.598	-2.19974	3.816501
dc4	-10.22366	1.788919	-5.71	0.000	-13.73795	-6.709373
dc5	-1.764999	1.899761	-0.93	0.353	-5.497033	1.967035
dc6	-4.951246	1.730693	-2.86	0.004	-8.351151	-1.551341
dc7	-4.056952	1.475353	-2.75	0.006	-6.955248	-1.158657
dc8	-5.269814	1.594464	-3.31	0.001	-8.402099	-2.137529
dc9	-6.290539	1.820151	-3.46	0.001	-9.866181	-2.714898
dc10	-.3327167	1.939469	-0.17	0.864	-4.142756	3.477323
dc11	-5.90482	1.451019	-4.07	0.000	-8.755312	-3.054329
dc12	-3.569294	1.726425	-2.07	0.039	-6.960814	-.1777748
dc13	-11.48234	1.803159	-6.37	0.000	-15.02461	-7.940081
dc14	0	(omitted)				
dc15	-2.419479	2.210999	-1.09	0.274	-6.762932	1.923974
dc16	-3.352749	2.034498	-1.65	0.100	-7.349471	.6439725
dc17	-8.92938	1.984061	-4.50	0.000	-12.82702	-5.031741
dc18	-7.160373	1.389738	-5.15	0.000	-9.89048	-4.430266
dc19	-1.354084	1.899974	-0.71	0.476	-5.086537	2.378369
dc20	-3.579221	2.186876	-1.64	0.102	-7.875285	.716843
dc21	-4.240977	2.193251	-1.93	0.054	-8.549566	.0676118
dc22	-.4539478	2.024958	-0.22	0.823	-4.431929	3.524033
dc23	-6.155626	2.314098	-2.66	0.008	-10.70161	-1.609637
dc24	-.0222283	2.096166	-0.01	0.992	-4.140095	4.095638
dc25	-2.812705	2.302457	-1.22	0.222	-7.335826	1.710416
dc26	-10.84126	1.79956	-6.02	0.000	-14.37645	-7.306065

dc27	-5.913379	1.990065	-2.97	0.003	-9.822812	-2.003945
dc28	-3.802168	2.562407	-1.48	0.138	-8.835954	1.231617
dc29	-3.654517	2.704149	-1.35	0.177	-8.966751	1.657718
dc30	-2.324756	3.09075	-0.75	0.452	-8.396459	3.746946
dc31	-18.57137	3.24921	-5.72	0.000	-24.95437	-12.18838
dc32	-3.796185	3.201652	-1.19	0.236	-10.08575	2.493382
dc33	-1.077709	2.724115	-0.40	0.693	-6.429165	4.273748
dc34	-7.55283	2.291694	-3.30	0.001	-12.05481	-3.050854
dc35	-12.72126	3.032261	-4.20	0.000	-18.67806	-6.764455
dc36	-4.051271	2.655832	-1.53	0.128	-9.268588	1.166046
dc37	-15.4958	3.014682	-5.14	0.000	-21.41807	-9.573529
dc38	-17.14256	3.166519	-5.41	0.000	-23.36311	-10.92201
dc39	-9.050853	2.831173	-3.20	0.001	-14.61262	-3.489083
dc40	-17.86774	3.262415	-5.48	0.000	-24.27668	-11.45881
dy1	.3893791	.3266768	1.19	0.234	-.2523696	1.031128
dy2	0	(omitted)				
dy3	7.456129	1.29131	5.77	0.000	4.919382	9.992875
dy4	7.474566	1.300282	5.75	0.000	4.920193	10.02894
dy5	7.566854	1.298409	5.83	0.000	5.016161	10.11755
dy6	7.726346	1.313136	5.88	0.000	5.146723	10.30597
dy7	8.054406	1.322052	6.09	0.000	5.457268	10.65154
dy8	8.618535	1.342941	6.42	0.000	5.980359	11.25671
dy9	8.722373	1.356312	6.43	0.000	6.05793	11.38682
dy10	8.733646	1.362869	6.41	0.000	6.056323	11.41097
dy11	8.669144	1.365008	6.35	0.000	5.98762	11.35067
dy12	8.596014	1.371104	6.27	0.000	5.902515	11.28951
dy13	8.531081	1.378216	6.19	0.000	5.823609	11.23855
dy14	8.173375	1.376792	5.94	0.000	5.468702	10.87805
dy15	8.646017	1.38341	6.25	0.000	5.928342	11.36369
_cons	60.96667	10.36318	5.88	0.000	40.60846	81.32488

LSDV with interaction terms between the economic development variable and the dev dummy

```
      Source |       SS       df       MS              Number of obs =     600
-------------+------------------------------           F( 71,   528) =   80.39
       Model |  10657.0123    71  150.098765           Prob > F      =  0.0000
    Residual |  985.841895   528   1.8671248           R-squared     =  0.9153
-------------+------------------------------           Adj R-squared =  0.9039
       Total |  11642.8542   599  19.4371523           Root MSE      =  1.3664

------------------------------------------------------------------------------
        gini |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   log_gdppc |  -2.444095   1.176218    -2.08   0.038    -4.754736   -.1334535
        eglo |  -.1884867   .0376505    -5.01   0.000    -.2624498   -.1145236
         rem |   .1013359   .0631267     1.61   0.109    -.0226745    .2253463
      unempl |   .0728931   .0308888     2.36   0.019     .0122131    .1335731
        cons |          0  (omitted)
         sav |  -.0724799   .0238625    -3.04   0.003    -.1193571   -.0256028
         vat |  -.0588106   .0448947    -1.31   0.191    -.1470048    .0293837
        gfcf |  -.0070231   .0229685    -0.31   0.760    -.0521441    .0380978
        infl |   .0165317   .0176239     0.94   0.349    -.0180898    .0511532
         trd |   .0030377   .0063535     0.48   0.633    -.0094436    .0155189
        pols |   .0286656   .0095428     3.00   0.003      .009919    .0474122
         cor |   .0363825   .0202972     1.79   0.074    -.0034907    .0762556
         rol |   .0158171   .0252332     0.63   0.531    -.0337527    .0653869
         voa |   .0086943   .0203788     0.43   0.670    -.0313391    .0487278
        regq |  -.0857856   .0224649    -3.82   0.000    -.1299171   -.0416542
        gove |    -.04509   .0173993    -2.59   0.010    -.0792702   -.0109097
        popg |   .4561378    .159982     2.85   0.005     .1418584    .7704172
        myos |  -.2478273   .2114154    -1.17   0.242    -.6631459    .1674914
log_gdppcdev |   2.019784   1.142177     1.77   0.078    -.2239852    4.263554
         dc1 |  -7.283107   1.810066    -4.02   0.000    -10.83892   -3.727291
         dc2 |  -.8185521   1.281505    -0.64   0.523    -3.336026    1.698922
         dc3 |  -.3995059   1.573587    -0.25   0.800    -3.490766    2.691754
         dc4 |  -10.37181   1.838464    -5.64   0.000    -13.98341   -6.760209
         dc5 |  -2.997655    1.94027    -1.54   0.123    -6.809253    .8139421
         dc6 |  -5.409987   1.782736    -3.03   0.003    -8.912114   -1.907861
         dc7 |   -4.57786   1.518774    -3.01   0.003    -7.561441   -1.594279
         dc8 |  -5.804809   1.645059    -3.53   0.000    -9.036474   -2.573144
         dc9 |  -6.843791   1.874591    -3.65   0.000    -10.52636   -3.161218
        dc10 |  -1.132154   1.993056    -0.57   0.570    -5.047446    2.783138
        dc11 |  -5.982427   1.491982    -4.01   0.000    -8.913377   -3.051477
        dc12 |  -3.961708   1.777959    -2.23   0.026     -7.45445   -.4689668
        dc13 |  -11.79025   1.851668    -6.37   0.000    -15.42779   -8.152715
        dc14 |          0  (omitted)
        dc15 |  -2.480264   2.275748    -1.09   0.276    -6.950895    1.990367
        dc16 |  -3.643114   2.093342    -1.74   0.082    -7.755416    .4691879
        dc17 |  -9.619863   2.029962    -4.74   0.000    -13.60766   -5.632069
        dc18 |  -5.960556    1.46059    -4.08   0.000    -8.829836   -3.091275
        dc19 |  -1.907017    1.95365    -0.98   0.329    -5.744897    1.930863
        dc20 |  -3.414765   2.246679    -1.52   0.129    -7.828291    .9987616
        dc21 |  -4.148284   2.255626    -1.84   0.066    -8.579386    .2828187
        dc22 |  -.9504531   2.076432    -0.46   0.647    -5.029536     3.12863
        dc23 |  -6.493199   2.374836    -2.73   0.006    -11.15849   -1.827912
        dc24 |  -.4270727   2.159179    -0.20   0.843    -4.668708    3.814563
        dc25 |  -2.218306   2.372445    -0.94   0.350    -6.878896    2.442285
        dc26 |  -11.13032    1.84638    -6.03   0.000    -14.75747   -7.503163
        dc27 |  -6.228228   2.054151    -3.03   0.003    -10.26354   -2.192916
```

dc28	-3.206637	2.700673	-1.19	0.236	-8.512021	2.098747
dc29	-3.666282	2.783713	-1.32	0.188	-9.134795	1.802231
dc30	-3.887935	3.133943	-1.24	0.215	-10.04446	2.268594
dc31	-19.25007	3.324024	-5.79	0.000	-25.78	-12.72013
dc32	-3.360804	3.311897	-1.01	0.311	-9.866916	3.145309
dc33	-1.234835	2.827796	-0.44	0.663	-6.789948	4.320278
dc34	-7.475725	2.363859	-3.16	0.002	-12.11945	-2.832002
dc35	5.59159	10.82877	0.52	0.606	-15.68116	26.86434
dc36	14.46843	11.00342	1.31	0.189	-7.147428	36.08428
dc37	3.60281	11.00532	0.33	0.744	-18.01678	25.2224
dc38	.0663386	10.48091	0.01	0.995	-20.52306	20.65574
dc39	8.973762	10.79193	0.83	0.406	-12.22663	30.17415
dc40	.3345516	10.83452	0.03	0.975	-20.94951	21.61861
dy1	.3366848	.3365901	1.00	0.318	-.3245354	.997905
dy2	0	(omitted)				
dy3	-.1312578	.3474195	-0.38	0.706	-.8137519	.5512363
dy4	-.1698968	.3436721	-0.49	0.621	-.8450293	.5052356
dy5	-.0634058	.3406586	-0.19	0.852	-.7326184	.6058067
dy6	.036859	.3500177	0.11	0.916	-.6507393	.7244573
dy7	.3191826	.3638845	0.88	0.381	-.3956565	1.034022
dy8	.7594538	.3829523	1.98	0.048	.0071565	1.511751
dy9	.8271752	.3936767	2.10	0.036	.0538102	1.60054
dy10	.8041192	.4024793	2.00	0.046	.0134619	1.594776
dy11	.7180431	.4010187	1.79	0.074	-.0697449	1.505831
dy12	.6161456	.4094921	1.50	0.133	-.1882881	1.420579
dy13	.5313121	.414296	1.28	0.200	-.2825588	1.345183
dy14	.1783808	.4105609	0.43	0.664	-.6281526	.9849143
dy15	.6596286	.4484283	1.47	0.142	-.221294	1.540551
_cons	63.10513	10.89121	5.79	0.000	41.7097	84.50056

LSDV with interaction terms between the economic development variable and the cov19 dummy

Source	SS	df	MS
Model	10653.0139	71	150.042449
Residual	989.840347	528	1.87469763
Total	11642.8542	599	19.4371523

Number of obs	= 600
F(71, 528)	= 80.04
Prob > F	= 0.0000
R-squared	= 0.9150
Adj R-squared	= 0.9036
Root MSE	= 1.3692

gini	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
log_gdppc	-.7620366	.8074835	-0.94	0.346	-2.348311	.824238
eglo	-.1851583	.0379334	-4.88	0.000	-.2596772	-.1106395
rem	.1534606	.0563258	2.72	0.007	.0428105	.2641107
unempl	.0725691	.0312177	2.32	0.020	.011243	.1338952
cons	0	(omitted)				
sav	-.0732666	.0239215	-3.06	0.002	-.1202595	-.0262737
vat	-.0569301	.045066	-1.26	0.207	-.1454607	.0316005
gfcf	-.0076784	.0234298	-0.33	0.743	-.0537054	.0383486
infl	.0208064	.0174512	1.19	0.234	-.0134759	.0550887
trd	.0037559	.0063499	0.59	0.554	-.0087182	.0162301
pols	.0277171	.0095659	2.90	0.004	.0089252	.0465089
cor	.0420964	.0201118	2.09	0.037	.0025875	.0816054
rol	.0158955	.0252926	0.63	0.530	-.033791	.065582
voa	.005522	.0204001	0.27	0.787	-.0345532	.0455973
regq	-.0864933	.0225349	-3.84	0.000	-.1307623	-.0422243
gove	-.0491302	.017576	-2.80	0.005	-.0836578	-.0146027
popg	.5242711	.1540096	3.40	0.001	.2217243	.8268179
myos	-.2352225	.2124169	-1.11	0.269	-.6525085	.1820636
log_gdppccov19	.200399	.2022659	0.99	0.322	-.1969457	.5977438
dc1	-6.943965	1.801833	-3.85	0.000	-10.48361	-3.404322
dc2	-.7034526	1.284742	-0.55	0.584	-3.227286	1.820381
dc3	-.1199688	1.568107	-0.08	0.939	-3.200464	2.960526
dc4	-10.26799	1.841954	-5.57	0.000	-13.88645	-6.649533
dc5	-2.870036	1.942912	-1.48	0.140	-6.686822	.9467506
dc6	-5.273527	1.785533	-2.95	0.003	-8.781147	-1.765907
dc7	-4.451723	1.520976	-2.93	0.004	-7.439632	-1.463815
dc8	-5.629589	1.644847	-3.42	0.001	-8.860837	-2.398342
dc9	-6.675675	1.877252	-3.56	0.000	-10.36347	-2.987875
dc10	-1.043594	1.996204	-0.52	0.601	-4.96507	2.877883
dc11	-6.056298	1.494176	-4.05	0.000	-8.991557	-3.121039
dc12	-3.829326	1.781262	-2.15	0.032	-7.328556	-.3300955
dc13	-11.9332	1.853225	-6.44	0.000	-15.5738	-8.292602
dc14	0	(omitted)				
dc15	-2.43053	2.284526	-1.06	0.288	-6.918407	2.057347
dc16	-3.561006	2.098178	-1.70	0.090	-7.682809	.5607962
dc17	-9.746751	2.033882	-4.79	0.000	-13.74225	-5.751256
dc18	-6.297052	1.446039	-4.35	0.000	-9.137747	-3.456356
dc19	-2.192869	1.947859	-1.13	0.261	-6.019374	1.633635
dc20	-3.275904	2.250444	-1.46	0.146	-7.696826	1.145019
dc21	-4.168949	2.260636	-1.84	0.066	-8.609895	.2719963
dc22	-1.227452	2.072053	-0.59	0.554	-5.297933	2.843028
dc23	-6.791607	2.370866	-2.86	0.004	-11.4491	-2.134118
dc24	-.7869472	2.149756	-0.37	0.714	-5.010073	3.436178
dc25	-2.233479	2.380196	-0.94	0.348	-6.909295	2.442337
dc26	-11.38258	1.842442	-6.18	0.000	-15.002	-7.763164
dc27	-6.579284	2.044305	-3.22	0.001	-10.59525	-2.563314

dc28	-4.228115	2.621975	-1.61	0.107	-9.378897	.9226681
dc29	-4.016236	2.779041	-1.45	0.149	-9.475572	1.443099
dc30	-4.101171	3.136994	-1.31	0.192	-10.26369	2.061349
dc31	-20.07977	3.287088	-6.11	0.000	-26.53714	-13.62239
dc32	-3.722716	3.310959	-1.12	0.261	-10.22699	2.781553
dc33	-1.75011	2.811552	-0.62	0.534	-7.27331	3.773091
dc34	-7.881055	2.352974	-3.35	0.001	-12.50339	-3.258716
dc35	-12.44814	3.118881	-3.99	0.000	-18.57508	-6.321201
dc36	-4.18649	2.727674	-1.53	0.125	-9.544916	1.171936
dc37	-14.82797	3.100688	-4.78	0.000	-20.91917	-8.736771
dc38	-17.34624	3.235453	-5.36	0.000	-23.70218	-10.9903
dc39	-9.034693	2.930639	-3.08	0.002	-14.79184	-3.277549
dc40	-17.68598	3.322646	-5.32	0.000	-24.21321	-11.15875
dy1	1.777878	2.190819	0.81	0.417	-2.525915	6.08167
dy2	1.415746	2.167269	0.65	0.514	-2.841781	5.673274
dy3	1.314198	2.179177	0.60	0.547	-2.966723	5.595118
dy4	1.264184	2.165065	0.58	0.560	-2.989014	5.517382
dy5	1.35249	2.144057	0.63	0.528	-2.85944	5.56442
dy6	1.442409	2.152275	0.67	0.503	-2.785664	5.670483
dy7	1.724768	2.139777	0.81	0.421	-2.478754	5.92829
dy8	2.176732	2.127796	1.02	0.307	-2.003252	6.356716
dy9	2.237422	2.152553	1.04	0.299	-1.991197	6.466041
dy10	2.210601	2.137137	1.03	0.301	-1.987733	6.408936
dy11	2.116212	2.117374	1.00	0.318	-2.0433	6.275723
dy12	2.002318	2.097283	0.95	0.340	-2.117726	6.122362
dy13	1.90386	2.09853	0.91	0.365	-2.218632	6.026352
dy14	-.4509841	.3458444	-1.30	0.193	-1.130384	.2284159
dy15	0	(omitted)				
_cons	64.91787	11.38681	5.70	0.000	42.54887	87.28688

LSDV with interaction terms between the economic development variable and the eusdc dummy

```
      Source |       SS       df       MS              Number of obs =     600
-------------+------------------------------           F( 71,   528) =   81.80
       Model |  10672.6112    71  150.318467           Prob > F      =  0.0000
    Residual |  970.243031   528   1.8375815           R-squared     =  0.9167
-------------+------------------------------           Adj R-squared =  0.9055
       Total |  11642.8542   599  19.4371523           Root MSE      =  1.3556

------------------------------------------------------------------------------
          gini |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
---------------+--------------------------------------------------------------
     log_gdppc |  -.4300867   .7985061    -0.54   0.590    -1.998726    1.138552
          eglo |  -.1837798   .0373822    -4.92   0.000     -.257216   -.1103436
           rem |   .1705955   .0560108     3.05   0.002     .0605641    .2806268
        unempl |   .0529414    .031365     1.69   0.092    -.0086742    .1145569
          cons |          0  (omitted)
           sav |   -.073967   .0236765    -3.12   0.002    -.1204788   -.0274553
           vat |   -.042571   .0448151    -0.95   0.343    -.1306087    .0454666
          gfcf |  -.0144307   .0229155    -0.63   0.529    -.0594474     .030586
          infl |   .0247942   .0172942     1.43   0.152    -.0091797     .058768
           trd |    .003467   .0062678     0.55   0.580    -.0088459    .0157799
          pols |   .0283711   .0094624     3.00   0.003     .0097826    .0469597
           cor |   .0450596   .0199323     2.26   0.024     .0059033     .084216
           rol |  -.0002839   .0255175    -0.01   0.991    -.0504123    .0498444
           voa |   .0064368   .0201769     0.32   0.750    -.0331999    .0460736
          regq |  -.0875064   .0222938    -3.93   0.000    -.1313018   -.0437109
          gove |  -.0430125   .0172708    -2.49   0.013    -.0769403   -.0090846
          popg |   .4454668   .1542245     2.89   0.004     .1424979    .7484356
          myos |   -.173596    .210943    -0.82   0.411    -.5879866    .2407945
log_gdppceusdc |  -.4409982   .1291137    -3.42   0.001    -.6946379   -.1873586
           dc1 |  -6.965962   1.783705    -3.91   0.000    -10.46999   -3.461933
           dc2 |  -.5749781   1.271963    -0.45   0.651    -3.073707    1.923751
           dc3 |  -.0888628   1.552464    -0.06   0.954    -3.138627    2.960902
           dc4 |   -10.3121   1.823392    -5.66   0.000    -13.89409   -6.730103
           dc5 |  -2.940774   1.923684    -1.53   0.127    -6.719788    .8382399
           dc6 |  -5.201276   1.767785    -2.94   0.003    -8.674032    -1.72852
           dc7 |  -4.432819   1.505694    -2.94   0.003    -7.390705   -1.474933
           dc8 |  -5.709297   1.628633    -3.51   0.000    -8.908693   -2.509901
           dc9 |  -6.674305   1.858258    -3.59   0.000    -10.32479   -3.023818
          dc10 |  -1.105694   1.976328    -0.56   0.576    -4.988126    2.776737
          dc11 |  -6.001051   1.478926    -4.06   0.000    -8.906353   -3.095749
          dc12 |  -3.751891   1.763417    -2.13   0.034    -7.216066   -.2877155
          dc13 |   -11.9428   1.831656    -6.52   0.000    -15.54103   -8.344575
          dc14 |          0  (omitted)
          dc15 |  -1.954693   2.264368    -0.86   0.388     -6.40297    2.493584
          dc16 |  -3.405156   2.077541    -1.64   0.102    -7.486417     .676105
          dc17 |  -9.660559   2.008797    -4.81   0.000    -13.60677   -5.714345
          dc18 |  -6.045946   1.422577    -4.25   0.000    -8.840551   -3.251341
          dc19 |  -2.206046   1.923058    -1.15   0.252    -5.983831    1.571739
          dc20 |  -3.265756    2.22794    -1.47   0.143     -7.64247    1.110958
          dc21 |  -4.044254    2.23788    -1.81   0.071    -8.440495    .3519867
          dc22 |  -1.325254   2.046088    -0.65   0.517    -5.344726    2.694219
          dc23 |  -6.913201   2.342829    -2.95   0.003    -11.51561   -2.310789
          dc24 |  -.9771525   2.124852    -0.46   0.646    -5.151354    3.197049
          dc25 |  -1.963146   2.354999    -0.83   0.405    -6.589463    2.663172
          dc26 |  -11.40835   1.817333    -6.28   0.000    -14.97844   -7.838261
          dc27 |  -6.677833   2.019138    -3.31   0.001    -10.64436   -2.711303
```

dc28	-4.223753	2.58673	-1.63	0.103	-9.305298	.8577923
dc29	-3.956752	2.747346	-1.44	0.150	-9.353823	1.440319
dc30	-4.474148	3.106308	-1.44	0.150	-10.57639	1.628092
dc31	-20.4287	3.250824	-6.28	0.000	-26.81484	-14.04256
dc32	-3.435362	3.269522	-1.05	0.294	-9.858231	2.987506
dc33	-1.296586	2.782342	-0.47	0.641	-6.762406	4.169234
dc34	-8.154535	2.326868	-3.50	0.000	-12.72559	-3.58348
dc35	-12.59216	3.072692	-4.10	0.000	-18.62836	-6.555957
dc36	-4.316546	2.693087	-1.60	0.110	-9.607026	.9739341
dc37	-14.5908	3.062924	-4.76	0.000	-20.60781	-8.573786
dc38	-17.64674	3.195472	-5.52	0.000	-23.92414	-11.36934
dc39	-8.612357	2.886801	-2.98	0.003	-14.28338	-2.941331
dc40	-18.12245	3.282569	-5.52	0.000	-24.57095	-11.67395
dy1	.4132729	.3343732	1.24	0.217	-.2435924	1.070138
dy2	0	(omitted)				
dy3	4.302853	1.335226	3.22	0.001	1.679845	6.925861
dy4	4.251461	1.332514	3.19	0.002	1.633782	6.86914
dy5	4.341042	1.328979	3.27	0.001	1.730307	6.951778
dy6	4.425332	1.332083	3.32	0.001	1.8085	7.042165
dy7	4.711953	1.334105	3.53	0.000	2.091147	7.332758
dy8	5.166138	1.3375	3.86	0.000	2.538663	7.793613
dy9	.8522212	.390614	2.18	0.030	.0848728	1.61957
dy10	.7898121	.3993063	1.98	0.048	.005388	1.574236
dy11	.6366048	.3987456	1.60	0.111	-.1467178	1.419927
dy12	.4747899	.4088121	1.16	0.246	-.328308	1.277888
dy13	.3795969	.4135486	0.92	0.359	-.4328058	1.192
dy14	.0488303	.4092488	0.12	0.905	-.7551255	.8527861
dy15	.4526757	.4498088	1.01	0.315	-.4309588	1.33631
_cons	62.84513	10.58189	5.94	0.000	42.05734	83.63291

LSDV with interaction terms between the economic development variable and the gfc dummy

Source	SS	df	MS
Model	10670.6891	71	150.291396
Residual	972.165107	528	1.84122179
Total	11642.8542	599	19.4371523

Number of obs	= 600
F(71, 528)	= 81.63
Prob > F	= 0.0000
R-squared	= 0.9165
Adj R-squared	= 0.9053
Root MSE	= 1.3569

gini	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
log_gdppc	-1.112088	.7894913	-1.41	0.160	-2.663017	.4388419
eglo	-.212763	.0380874	-5.59	0.000	-.2875845	-.1379416
rem	.1737318	.0561971	3.09	0.002	.0633344	.2841291
unempl	.0768469	.0305741	2.51	0.012	.016785	.1369087
cons	0	(omitted)				
sav	-.0903173	.024316	-3.71	0.000	-.1380853	-.0425493
vat	-.0583292	.0445816	-1.31	0.191	-.1459083	.02925
gfcf	.0177564	.0235332	0.75	0.451	-.0284738	.0639865
infl	.0217704	.0172836	1.26	0.208	-.0121827	.0557234
trd	.0082082	.0063831	1.29	0.199	-.0043311	.0207476
pols	.0303569	.0094963	3.20	0.001	.0117017	.0490122
cor	.0457082	.0199655	2.29	0.022	.0064867	.0849297
rol	.005049	.0253073	0.20	0.842	-.0446664	.0547643
voa	.0023828	.020235	0.12	0.906	-.0373681	.0421338
regq	-.0752433	.0225261	-3.34	0.001	-.1194951	-.0309914
gove	-.05269	.0173499	-3.04	0.003	-.0867733	-.0186067
popg	.5213028	.1520293	3.43	0.001	.2226461	.8199594
myos	-.2520168	.2099377	-1.20	0.231	-.6644325	.1603989
log_gdppcgfc	.6316894	.1940291	3.26	0.001	.2505256	1.012853
dc1	-6.535033	1.789171	-3.65	0.000	-10.0498	-3.020265
dc2	-.5255527	1.274087	-0.41	0.680	-3.028455	1.97735
dc3	.2688427	1.55828	0.17	0.863	-2.792346	3.330032
dc4	-10.43122	1.825653	-5.71	0.000	-14.01766	-6.844789
dc5	-2.63687	1.926846	-1.37	0.172	-6.422096	1.148356
dc6	-4.988305	1.771912	-2.82	0.005	-8.469167	-1.507443
dc7	-4.173919	1.509995	-2.76	0.006	-7.140254	-1.207583
dc8	-5.286948	1.633036	-3.24	0.001	-8.494994	-2.078902
dc9	-6.448702	1.86182	-3.46	0.001	-10.10619	-2.791218
dc10	-.7295667	1.980069	-0.37	0.713	-4.619347	3.160213
dc11	-6.123468	1.480117	-4.14	0.000	-9.031109	-3.215827
dc12	-3.67402	1.765848	-2.08	0.038	-7.142971	-.2050692
dc13	-12.3054	1.834977	-6.71	0.000	-15.91015	-8.700646
dc14	0	(omitted)				
dc15	-2.512949	2.259331	-1.11	0.267	-6.95133	1.925432
dc16	-3.484597	2.079079	-1.68	0.094	-7.568879	.5996857
dc17	-10.0116	2.009797	-4.98	0.000	-13.95978	-6.063418
dc18	-7.018522	1.426221	-4.92	0.000	-9.820286	-4.216759
dc19	-2.452094	1.924836	-1.27	0.203	-6.233371	1.329184
dc20	-3.610503	2.23215	-1.62	0.106	-7.995488	.7744817
dc21	-4.573372	2.241818	-2.04	0.042	-8.977349	-.1693939
dc22	-1.777041	2.051753	-0.87	0.387	-5.807642	2.253559
dc23	-7.374538	2.348999	-3.14	0.002	-11.98907	-2.760008
dc24	-1.212218	2.12888	-0.57	0.569	-5.394332	2.969897
dc25	-2.53476	2.354585	-1.08	0.282	-7.160264	2.090745
dc26	-12.02616	1.824693	-6.59	0.000	-15.6107	-8.441607
dc27	-6.984428	2.022736	-3.45	0.001	-10.95803	-3.01083

dc28	-5.587467	2.611596	-2.14	0.033	-10.71786	-.4570728
dc29	-4.802329	2.75595	-1.74	0.082	-10.2163	.6116439
dc30	-4.753227	3.113266	-1.53	0.127	-10.86914	1.362682
dc31	-21.58674	3.279708	-6.58	0.000	-28.02962	-15.14386
dc32	-4.528547	3.272206	-1.38	0.167	-10.95669	1.899594
dc33	-2.203758	2.779253	-0.79	0.428	-7.663508	3.255992
dc34	-8.567287	2.33521	-3.67	0.000	-13.15473	-3.979844
dc35	-14.13484	3.104302	-4.55	0.000	-20.23314	-8.036541
dc36	-5.407914	2.713807	-1.99	0.047	-10.7391	-.0767307
dc37	-16.62646	3.099293	-5.36	0.000	-22.71492	-10.538
dc38	-18.96707	3.227183	-5.88	0.000	-25.30676	-12.62737
dc39	-10.37255	2.895426	-3.58	0.000	-16.06052	-4.684583
dc40	-19.81678	3.337037	-5.94	0.000	-26.37228	-13.26128
dy1	.4205518	.3348955	1.26	0.210	-.2373395	1.078443
dy2	0	(omitted)				
dy3	6.252133	1.982375	3.15	0.002	2.357822	10.14644
dy4	6.233514	1.989754	3.13	0.002	2.324708	10.14232
dy5	6.326666	1.987348	3.18	0.002	2.422586	10.23075
dy6	6.411914	1.989994	3.22	0.001	2.502636	10.32119
dy7	6.741414	2.003654	3.36	0.001	2.805302	10.67753
dy8	7.293768	2.034817	3.58	0.000	3.296438	11.2911
dy9	7.300796	2.026258	3.60	0.000	3.320279	11.28131
dy10	7.297255	2.031046	3.59	0.000	3.307333	11.28718
dy11	7.240246	2.038005	3.55	0.000	3.236653	11.24384
dy12	7.168896	2.047532	3.50	0.001	3.146587	11.1912
dy13	7.061689	2.046117	3.45	0.001	3.04216	11.08122
dy14	6.675108	2.034504	3.28	0.001	2.678391	10.67182
dy15	7.210956	2.053352	3.51	0.000	3.177214	11.2447
_cons	65.35155	10.51988	6.21	0.000	44.6856	86.0175

LSDV with interaction terms between the political variables and the dev dummy

Source	SS	df	MS
Model	10745.8687	76	141.393009
Residual	896.985502	523	1.71507744
Total	11642.8542	599	19.4371523

Number of obs =	600
F(76, 523) =	82.44
Prob > F =	0.0000
R-squared =	0.9230
Adj R-squared =	0.9118
Root MSE =	1.3096

gini	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
log_gdppc	-.0973408	.8073508	-0.12	0.904	-1.68339	1.488708
eglo	-.2095959	.0371291	-5.65	0.000	-.2825363	-.1366555
rem	.1168783	.0563228	2.08	0.038	.0062315	.2275251
unempl	.0317788	.031451	1.01	0.313	-.030007	.0935645
cons	0	(omitted)				
sav	-.0801742	.0240663	-3.33	0.001	-.1274526	-.0328958
vat	-.0410879	.0435377	-0.94	0.346	-.1266181	.0444423
gfcf	-.0302609	.0223559	-1.35	0.176	-.0741793	.0136575
infl	.024583	.0173012	1.42	0.156	-.0094054	.0585715
trd	.0069096	.0061684	1.12	0.263	-.0052083	.0190276
pols	.0022381	.0192639	0.12	0.908	-.035606	.0400823
cor	.1824788	.0307921	5.93	0.000	.1219875	.2429701
rol	.1318155	.0503894	2.62	0.009	.032825	.2308059
voa	.0607729	.0433794	1.40	0.162	-.0244464	.1459921
regq	-.1083556	.0364107	-2.98	0.003	-.1798849	-.0368263
gove	-.138891	.0323157	-4.30	0.000	-.2023756	-.0754064
popg	.4930621	.1486581	3.32	0.001	.2010217	.7851025
myos	-.1593976	.2144856	-0.74	0.458	-.5807566	.2619615
pols_dev	.0108131	.0215852	0.50	0.617	-.0315914	.0532175
cor_dev	-.2334992	.0397444	-5.88	0.000	-.3115775	-.1554208
rol_dev	-.1558502	.0574324	-2.71	0.007	-.2686767	-.0430237
voa_dev	-.0650251	.0495568	-1.31	0.190	-.16238	.0323298
regq_dev	.0855124	.044687	1.91	0.056	-.0022757	.1733005
gove_dev	.1357725	.0376201	3.61	0.000	.0618675	.2096775
dc1	-6.53567	1.748908	-3.74	0.000	-9.971418	-3.099923
dc2	-.0073169	1.243824	-0.01	0.995	-2.450823	2.436189
dc3	.463909	1.510908	0.31	0.759	-2.504284	3.432102
dc4	-9.804435	1.794971	-5.46	0.000	-13.33067	-6.278195
dc5	-2.350566	1.869316	-1.26	0.209	-6.022856	1.321724
dc6	-4.199844	1.733503	-2.42	0.016	-7.605329	-.7943595
dc7	-3.834393	1.470408	-2.61	0.009	-6.723025	-.9457614
dc8	-4.869597	1.597188	-3.05	0.002	-8.007288	-1.731906
dc9	-5.515451	1.818622	-3.03	0.003	-9.088153	-1.94275
dc10	-.6278019	1.936469	-0.32	0.746	-4.432015	3.176411
dc11	-5.679028	1.45537	-3.90	0.000	-8.538116	-2.81994
dc12	-3.190043	1.719508	-1.86	0.064	-6.568034	.1879478
dc13	-11.82155	1.788136	-6.61	0.000	-15.33436	-8.308735
dc14	0	(omitted)				
dc15	-2.05539	2.234658	-0.92	0.358	-6.445398	2.334618
dc16	-2.992519	2.048994	-1.46	0.145	-7.017789	1.032751
dc17	-9.804509	1.970789	-4.97	0.000	-13.67614	-5.932874
dc18	-6.659617	1.394769	-4.77	0.000	-9.399656	-3.919579
dc19	-1.206919	1.880633	-0.64	0.521	-4.90144	2.487603
dc20	-4.754049	2.230923	-2.13	0.034	-9.136719	-.3713788
dc21	-5.605576	2.23634	-2.51	0.012	-9.998889	-1.212263
dc22	-1.318286	1.99308	-0.66	0.509	-5.233713	2.597141

dc23	-6.634224	2.282697	-2.91	0.004	-11.11861	-2.149843
dc24	-.755284	2.080462	-0.36	0.717	-4.842374	3.331806
dc25	-1.774139	2.307863	-0.77	0.442	-6.307959	2.759681
dc26	-12.17205	1.772163	-6.87	0.000	-15.65349	-8.690622
dc27	-6.577512	1.984281	-3.31	0.001	-10.47565	-2.679373
dc28	-3.586652	2.551251	-1.41	0.160	-8.59861	1.425306
dc29	-4.37021	2.700868	-1.62	0.106	-9.676094	.9356735
dc30	-7.500703	3.122695	-2.40	0.017	-13.63527	-1.366137
dc31	-18.90558	3.322822	-5.69	0.000	-25.4333	-12.37786
dc32	-3.586945	3.239135	-1.11	0.269	-9.950259	2.776369
dc33	-1.046998	2.799193	-0.37	0.709	-6.54604	4.452044
dc34	-8.37584	2.282539	-3.67	0.000	-12.85991	-3.891768
dc35	-19.86493	4.771912	-4.16	0.000	-29.2394	-10.49046
dc36	-14.09264	4.472064	-3.15	0.002	-22.87805	-5.307219
dc37	-25.8006	4.417642	-5.84	0.000	-34.4791	-17.1221
dc38	-22.54519	4.322162	-5.22	0.000	-31.03612	-14.05425
dc39	-19.69162	4.589747	-4.29	0.000	-28.70823	-10.67502
dc40	-25.87741	4.678578	-5.53	0.000	-35.06853	-16.6863
dy1	.5683907	.3255759	1.75	0.081	-.0712065	1.207988
dy2	0	(omitted)				
dy3	-.0287673	.333721	-0.09	0.931	-.6843656	.6268311
dy4	-.1778896	.3307249	-0.54	0.591	-.8276022	.4718229
dy5	-.1617602	.3298598	-0.49	0.624	-.8097731	.4862527
dy6	.0209602	.3378629	0.06	0.951	-.642775	.6846955
dy7	.3109475	.3509742	0.89	0.376	-.3785448	1.00044
dy8	.7239301	.3709204	1.95	0.052	-.0047468	1.452607
dy9	.8284697	.383407	2.16	0.031	.0752627	1.581677
dy10	.9164986	.3962274	2.31	0.021	.1381058	1.694891
dy11	.6480698	.3940776	1.64	0.101	-.1260997	1.422239
dy12	.5237618	.4019073	1.30	0.193	-.2657892	1.313313
dy13	.4358526	.4102203	1.06	0.289	-.3700293	1.241735
dy14	.1611763	.4045417	0.40	0.690	-.63355	.9559025
dy15	.3843306	.4384781	0.88	0.381	-.4770641	1.245725
_cons	64.3074	10.3949	6.19	0.000	43.88652	84.72828

LSDV with interaction terms between the political variables and the cov19 dummy

```
      Source |       SS       df       MS              Number of obs =     600
-------------+------------------------------           F( 76,   523) =   75.53
       Model |  10670.5914    76  140.402519           Prob > F      =  0.0000
    Residual |  972.262776   523  1.85901104           R-squared     =  0.9165
-------------+------------------------------           Adj R-squared =  0.9044
       Total |  11642.8542   599  19.4371523           Root MSE      =  1.3635

------------------------------------------------------------------------------
        gini |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   log_gdppc |  -1.164954   .8261485    -1.41   0.159    -2.787931    .4580236
        eglo |    -.18009   .0385108    -4.68   0.000    -.2557448   -.1044352
         rem |   .1382253   .0564367     2.45   0.015     .0273548    .2490958
      unempl |   .0788005   .0312196     2.52   0.012     .0174693    .1401317
        cons |          0  (omitted)
         sav |  -.0640848    .024053    -2.66   0.008    -.1113371   -.0168325
         vat |  -.0561958   .0449819    -1.25   0.212    -.1445633    .0321717
        gfcf |  -.0069671   .0240335    -0.29   0.772    -.0541811     .040247
        infl |   .0178106   .0176781     1.01   0.314    -.0169182    .0525393
         trd |   .0049735   .0063654     0.78   0.435    -.0075314    .0174785
        pols |   .0233806   .0097428     2.40   0.017     .0042408    .0425203
         cor |   .0522307   .0209297     2.50   0.013      .011114    .0933473
         rol |   .0076969   .0259006     0.30   0.766    -.0431851    .0585789
         voa |   .0159694   .0207249     0.77   0.441    -.0247448    .0566836
        regq |  -.0933243   .0239038    -3.90   0.000    -.1402835   -.0463651
        gove |  -.0503685   .0188732    -2.67   0.008    -.0874451    -.013292
        popg |   .5336418   .1556942     3.43   0.001     .2277789    .8395048
        myos |  -.2356015   .2146197    -1.10   0.273    -.6572241    .1860211
    pols_cov |   .0086199   .0183771     0.47   0.639    -.0274822     .044722
     cor_cov |  -.0395947   .0209789    -1.89   0.060     -.080808    .0016186
     rol_cov |   .0463728   .0289166     1.60   0.109    -.0104343    .1031798
     voa_cov |  -.0430091   .0399139    -1.08   0.282    -.1214203    .0354022
    regq_cov |   .0338317   .0247588     1.37   0.172    -.0148072    .0824707
    gove_cov |  -.0047746   .0253403    -0.19   0.851    -.0545558    .0450066
         dc1 |  -6.591687   1.803221    -3.66   0.000    -10.13413   -3.049242
         dc2 |  -.8659369   1.296529    -0.67   0.504    -3.412982    1.681108
         dc3 |   .0897051   1.574288     0.06   0.955       -3.003     3.18241
         dc4 |  -9.933236   1.844136    -5.39   0.000    -13.55606   -6.310411
         dc5 |  -2.822686   1.951703    -1.45   0.149    -6.656826    1.011454
         dc6 |  -5.153389   1.796361    -2.87   0.004    -8.682358   -1.624419
         dc7 |  -4.471691     1.5325    -2.92   0.004    -7.482302   -1.461079
         dc8 |   -5.50139   1.649873    -3.33   0.001    -8.742581   -2.260198
         dc9 |  -6.545603   1.886813    -3.47   0.001    -10.25227   -2.838939
        dc10 |  -.9553283   2.001472    -0.48   0.633     -4.88724    2.976583
        dc11 |  -6.091563   1.511328    -4.03   0.000    -9.060583   -3.122543
        dc12 |  -3.727088   1.786587    -2.09   0.037    -7.236856     -.21732
        dc13 |   -12.0818   1.860374    -6.49   0.000    -15.73653   -8.427079
        dc14 |          0  (omitted)
        dc15 |   -2.58892   2.297309    -1.13   0.260    -7.102008    1.924168
        dc16 |  -3.494413   2.105204    -1.66   0.098    -7.630108    .6412823
        dc17 |  -10.01192   2.059372    -4.86   0.000    -14.05758   -5.966259
        dc18 |  -6.683552   1.469593    -4.55   0.000    -9.570582   -3.796521
        dc19 |  -2.648066   1.977884    -1.34   0.181     -6.53364    1.237508
        dc20 |  -3.170765   2.260563    -1.40   0.161    -7.611664    1.270134
        dc21 |  -4.245552   2.275593    -1.87   0.063    -8.715977     .224873
        dc22 |  -1.515199   2.091426    -0.72   0.469    -5.623827     2.59343
```

dc23	-7.068227	2.392461	-2.95	0.003	-11.76824	-2.368212
dc24	-1.112359	2.176832	-0.51	0.610	-5.388767	3.164049
dc25	-2.360373	2.397797	-0.98	0.325	-7.070871	2.350124
dc26	-11.74841	1.867084	-6.29	0.000	-15.41632	-8.080508
dc27	-7.076653	2.076225	-3.41	0.001	-11.15542	-2.997888
dc28	-4.512572	2.669443	-1.69	0.092	-9.756719	.7315763
dc29	-4.477051	2.808396	-1.59	0.112	-9.994174	1.040071
dc30	-4.419418	3.165418	-1.40	0.163	-10.63791	1.799079
dc31	-20.6291	3.32839	-6.20	0.000	-27.16776	-14.09044
dc32	-4.304286	3.344172	-1.29	0.199	-10.87395	2.265374
dc33	-2.282478	2.838001	-0.80	0.422	-7.85776	3.292805
dc34	-8.096336	2.377978	-3.40	0.001	-12.7679	-3.424775
dc35	-12.94558	3.163287	-4.09	0.000	-19.15989	-6.731271
dc36	-4.632804	2.759523	-1.68	0.094	-10.05391	.7883069
dc37	-15.3553	3.143172	-4.89	0.000	-21.5301	-9.18051
dc38	-17.94483	3.272862	-5.48	0.000	-24.3744	-11.51525
dc39	-9.96955	2.986601	-3.34	0.001	-15.83676	-4.102341
dc40	-17.96429	3.36196	-5.34	0.000	-24.5689	-11.35969
dy1	.2500354	1.025541	0.24	0.807	-1.764651	2.264721
dy2	-.0392438	1.026672	-0.04	0.970	-2.056151	1.977663
dy3	-.195095	1.010487	-0.19	0.847	-2.180206	1.790016
dy4	-.2618379	1.00094	-0.26	0.794	-2.228194	1.704518
dy5	-.1363784	1.003763	-0.14	0.892	-2.108281	1.835524
dy6	-.0673105	.9993785	-0.07	0.946	-2.0306	1.895979
dy7	.2274489	.9915365	0.23	0.819	-1.720435	2.175333
dy8	.6808529	.972866	0.70	0.484	-1.230352	2.592058
dy9	.6548581	.9657942	0.68	0.498	-1.242454	2.552171
dy10	.6149491	.9480322	0.65	0.517	-1.24747	2.477368
dy11	.5540833	.9432177	0.59	0.557	-1.298877	2.407044
dy12	.4631701	.9423224	0.49	0.623	-1.388032	2.314372
dy13	.3655004	.9390612	0.39	0.697	-1.479295	2.210296
dy14	0	(omitted)				
dy15	.4799909	.3454968	1.39	0.165	-.198741	1.158723
_cons	69.86438	10.9554	6.38	0.000	48.34238	91.38638

LSDV with interaction terms between the political variables and the eusdc dummy

```
      Source |       SS       df       MS              Number of obs =     600
-------------+------------------------------           F( 76,   523) =   82.54
       Model |  10746.9082    76  141.406687           Prob > F      =  0.0000
    Residual |  895.945986   523  1.71308984           R-squared     =  0.9230
-------------+------------------------------           Adj R-squared =  0.9119
       Total |  11642.8542   599  19.4371523           Root MSE      =  1.3089

------------------------------------------------------------------------------
        gini |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   log_gdppc |  -1.728554   .8016979    -2.16   0.032    -3.303497   -.1536102
        eglo |  -.1917295   .0366802    -5.23   0.000    -.2637881   -.1196708
         rem |   .1382371   .0547477     2.52   0.012     .0306847    .2457896
      unempl |   .0702163   .0302284     2.32   0.021     .0108322    .1296004
        cons |          0  (omitted)
         sav |  -.0657378    .022947    -2.86   0.004    -.1108175   -.0206581
         vat |  -.0777206   .0434327    -1.79   0.074    -.1630446    .0076033
        gfcf |  -.0126786    .022468    -0.56   0.573    -.0568172      .03146
        infl |  -.0015097   .0180892    -0.08   0.934    -.0370462    .0340267
         trd |     .00626   .0061215     1.02   0.307    -.0057656    .0182857
        pols |   .0241197   .0101711     2.37   0.018     .0041384     .044101
         cor |   .0296942   .0204482     1.45   0.147    -.0104765    .0698648
         rol |   .0276648   .0256615     1.08   0.282    -.0227474    .0780771
         voa |   .0001309   .0217852     0.01   0.995    -.0426663    .0429281
        regq |  -.0940113   .0216337    -4.35   0.000    -.1365109   -.0515116
        gove |  -.0293768   .0180532    -1.63   0.104    -.0648425    .0060889
        popg |   .4999274   .1506619     3.32   0.001     .2039505    .7959043
        myos |  -.1262068   .2055572    -0.61   0.539     -.530026    .2776124
  pols_eusdc |   -.004541   .0087932    -0.52   0.606    -.0218152    .0127333
   cor_eusdc |   .0690958   .0168156     4.11   0.000     .0360613    .1021302
   rol_eusdc |  -.1183161    .019331    -6.12   0.000     -.156292   -.0803401
   voa_eusdc |   .0422974   .0227651     1.86   0.064    -.0024249    .0870197
  regq_eusdc |  -.0001516   .0190894    -0.01   0.994    -.0376529    .0373498
  gove_eusdc |  -.0026041   .0208189    -0.13   0.901     -.043503    .0382948
         dc1 |  -6.573386   1.735243    -3.79   0.000    -9.982289   -3.164483
         dc2 |  -.8815973   1.253363    -0.70   0.482    -3.343841    1.580646
         dc3 |   -.277558   1.512833    -0.18   0.855    -3.249534    2.694418
         dc4 |  -10.15489   1.774168    -5.72   0.000    -13.64026   -6.669523
         dc5 |  -3.568132   1.877842    -1.90   0.058    -7.257172    .1209075
         dc6 |  -5.277592   1.732041    -3.05   0.002    -8.680204    -1.87498
         dc7 |  -4.765697   1.479593    -3.22   0.001    -7.672373   -1.859021
         dc8 |  -5.716962   1.590669    -3.59   0.000    -8.841847   -2.592077
         dc9 |  -6.756448   1.819509    -3.71   0.000    -10.33089   -3.182005
        dc10 |  -1.438594   1.928128    -0.75   0.456    -5.226421    2.349234
        dc11 |  -6.427229   1.456808    -4.41   0.000    -9.289144   -3.565315
        dc12 |  -3.818859   1.726404    -2.21   0.027    -7.210398   -.4273202
        dc13 |  -12.84552   1.800814    -7.13   0.000    -16.38324   -9.307802
        dc14 |          0  (omitted)
        dc15 |  -2.988032   2.214169    -1.35   0.178    -7.337789    1.361725
        dc16 |  -3.871532   2.027102    -1.91   0.057    -7.853794    .1107305
        dc17 |  -10.80355   1.983555    -5.45   0.000    -14.70027   -6.906837
        dc18 |  -6.989389   1.409922    -4.96   0.000    -9.759196   -4.219583
        dc19 |  -3.491087   1.904854    -1.83   0.067    -7.233192     .251017
        dc20 |  -3.710066   2.174357    -1.71   0.089    -7.981611    .5614804
        dc21 |  -4.810388   2.189122    -2.20   0.028    -9.110941   -.5098351
        dc22 |  -2.795984    2.01978    -1.38   0.167    -6.763863    1.171894
```

dc23	-8.331365	2.30557	-3.61	0.000	-12.86068	-3.802049
dc24	-2.165089	2.095355	-1.03	0.302	-6.281435	1.951257
dc25	-2.670519	2.312636	-1.15	0.249	-7.213716	1.872677
dc26	-12.97123	1.802318	-7.20	0.000	-16.51191	-9.430561
dc27	-8.135934	2.003488	-4.06	0.000	-12.07181	-4.200062
dc28	-5.956662	2.558049	-2.33	0.020	-10.98198	-.9313478
dc29	-5.478286	2.705635	-2.02	0.043	-10.79353	-.1630386
dc30	-6.494056	3.061905	-2.12	0.034	-12.5092	-.4789122
dc31	-22.6261	3.21632	-7.03	0.000	-28.94459	-16.3076
dc32	-5.511503	3.213263	-1.72	0.087	-11.82399	.8009844
dc33	-2.431459	2.733038	-0.89	0.374	-7.800541	2.937623
dc34	-9.309591	2.290654	-4.06	0.000	-13.8096	-4.809577
dc35	-14.63023	3.031044	-4.83	0.000	-20.58475	-8.675718
dc36	-6.262228	2.654194	-2.36	0.019	-11.47642	-1.048036
dc37	-16.41502	3.001669	-5.47	0.000	-22.31183	-10.51821
dc38	-19.84662	3.154832	-6.29	0.000	-26.04432	-13.64892
dc39	-11.53921	2.862648	-4.03	0.000	-17.16291	-5.915511
dc40	-19.65251	3.22785	-6.09	0.000	-25.99366	-13.31137
dy1	-.113897	.3890717	-0.29	0.770	-.8782324	.6504384
dy2	-.359511	.3974216	-0.90	0.366	-1.14025	.4212277
dy3	.3588875	.6514856	0.55	0.582	-.9209626	1.638738
dy4	.3206727	.6365136	0.50	0.615	-.9297646	1.57111
dy5	.579545	.6495318	0.89	0.373	-.6964669	1.855557
dy6	.6030665	.6318578	0.95	0.340	-.6382245	1.844358
dy7	.8649974	.6323931	1.37	0.172	-.3773452	2.10734
dy8	1.440521	.6211742	2.32	0.021	.2202177	2.660824
dy9	.021541	.296641	0.07	0.942	-.5612132	.6042952
dy10	0	(omitted)				
dy11	-.0172307	.3029911	-0.06	0.955	-.6124598	.5779984
dy12	-.0657298	.3255808	-0.20	0.840	-.7053366	.573877
dy13	-.1724505	.3250169	-0.53	0.596	-.8109495	.4660484
dy14	-.5296655	.3195451	-1.66	0.098	-1.157415	.0980841
dy15	.0900136	.3848391	0.23	0.815	-.6660068	.8460339
_cons	76.64486	10.459	7.33	0.000	56.09805	97.19166

LSDV with interaction terms between the political variables and the gfc dummy

Source	SS	df	MS		
Model	10685.8032	76	140.602674	Number of obs =	600
Residual	957.050965	523	1.82992536	F(76, 523) =	76.84
Total	11642.8542	599	19.4371523	Prob > F =	0.0000
				R-squared =	0.9178
				Adj R-squared =	0.9059
				Root MSE =	1.3527

gini	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
log_gdppc	-1.009024	.7950307	-1.27	0.205	-2.57087	.5528217
eglo	-.1921404	.0392282	-4.90	0.000	-.2692046	-.1150762
rem	.1886283	.0578066	3.26	0.001	.0750668	.3021899
unempl	.0620466	.030816	2.01	0.045	.0015082	.122585
cons	0	(omitted)				
sav	-.0865641	.02407	-3.60	0.000	-.1338499	-.0392784
vat	-.0936124	.0461577	-2.03	0.043	-.1842896	-.0029352
gfcf	.0170346	.0240338	0.71	0.479	-.03018	.0642492
infl	.0292428	.0175009	1.67	0.095	-.0051379	.0636234
trd	.0048294	.0064268	0.75	0.453	-.0077961	.017455
pols	.0215026	.0099083	2.17	0.030	.0020377	.0409676
cor	.0487903	.0200357	2.44	0.015	.0094301	.0881506
rol	.007382	.0258438	0.29	0.775	-.0433885	.0581524
voa	.010584	.0214897	0.49	0.623	-.0316328	.0528007
regq	-.0677591	.022962	-2.95	0.003	-.1128682	-.0226501
gove	-.0498943	.0180045	-2.77	0.006	-.0852642	-.0145243
popg	.5256443	.1525425	3.45	0.001	.225973	.8253157
myos	-.1762944	.2122288	-0.83	0.407	-.5932201	.2406313
pols_gfc	.0329427	.0119244	2.76	0.006	.0095172	.0563682
cor_gfc	.0342803	.0270661	1.27	0.206	-.0188914	.087452
rol_gfc	-.020107	.0283894	-0.71	0.479	-.0758783	.0356642
voa_gfc	-.0227018	.0337214	-0.67	0.501	-.0889478	.0435442
regq_gfc	-.0419799	.028716	-1.46	0.144	-.0983928	.014433
gove_gfc	.0304244	.0283929	1.07	0.284	-.0253538	.0862026
dc1	-7.111001	1.803666	-3.94	0.000	-10.65432	-3.56768
dc2	-.9117329	1.282148	-0.71	0.477	-3.430526	1.60706
dc3	-.6253757	1.589198	-0.39	0.694	-3.747371	2.49662
dc4	-10.61324	1.836734	-5.78	0.000	-14.22153	-7.004961
dc5	-3.520069	1.961707	-1.79	0.073	-7.373862	.3337235
dc6	-5.584438	1.795092	-3.11	0.002	-9.110914	-2.057961
dc7	-4.713611	1.532687	-3.08	0.002	-7.724591	-1.702632
dc8	-5.812227	1.65087	-3.52	0.000	-9.055379	-2.569075
dc9	-6.971957	1.886844	-3.70	0.000	-10.67868	-3.265231
dc10	-1.434286	2.005306	-0.72	0.475	-5.37373	2.505159
dc11	-6.516949	1.499351	-4.35	0.000	-9.462439	-3.571458
dc12	-4.110582	1.781273	-2.31	0.021	-7.609911	-.6112534
dc13	-12.11049	1.84405	-6.57	0.000	-15.73315	-8.487839
dc14	0	(omitted)				
dc15	-2.451633	2.274069	-1.08	0.281	-6.919065	2.015798
dc16	-3.909153	2.095804	-1.87	0.063	-8.026381	.208076
dc17	-10.0822	2.031454	-4.96	0.000	-14.07301	-6.091389
dc18	-6.432145	1.431926	-4.49	0.000	-9.245178	-3.619112
dc19	-2.725985	1.96131	-1.39	0.165	-6.578999	1.127029
dc20	-3.32014	2.245198	-1.48	0.140	-7.730855	1.090575
dc21	-3.959125	2.25587	-1.76	0.080	-8.390804	.4725536
dc22	-1.668068	2.074553	-0.80	0.422	-5.743549	2.407413

dc23	-7.204376	2.370431	-3.04	0.002	-11.86111	-2.547641
dc24	-.9429373	2.160063	-0.44	0.663	-5.186403	3.300528
dc25	-2.260496	2.361165	-0.96	0.339	-6.899028	2.378035
dc26	-11.76822	1.842137	-6.39	0.000	-15.38712	-8.149322
dc27	-6.530377	2.044893	-3.19	0.001	-10.54759	-2.513165
dc28	-4.95397	2.644072	-1.87	0.062	-10.14828	.2403363
dc29	-4.281799	2.773725	-1.54	0.123	-9.730811	1.167213
dc30	-3.925876	3.134046	-1.25	0.211	-10.08274	2.23099
dc31	-20.29536	3.292022	-6.17	0.000	-26.76257	-13.82815
dc32	-3.675721	3.290288	-1.12	0.264	-10.13953	2.788084
dc33	-1.450722	2.792998	-0.52	0.604	-6.937594	4.03615
dc34	-7.891962	2.35689	-3.35	0.001	-12.5221	-3.261827
dc35	-12.96905	3.131835	-4.14	0.000	-19.12157	-6.816526
dc36	-4.342407	2.741709	-1.58	0.114	-9.728523	1.043708
dc37	-14.93519	3.119909	-4.79	0.000	-21.06429	-8.806099
dc38	-17.85285	3.235422	-5.52	0.000	-24.20887	-11.49683
dc39	-9.14302	2.922952	-3.13	0.002	-14.88519	-3.40085
dc40	-18.93063	3.360798	-5.63	0.000	-25.53295	-12.3283
dy1	0	(omitted)				
dy2	-.454875	.3366485	-1.35	0.177	-1.116224	.2064745
dy3	-.0287155	.874377	-0.03	0.974	-1.746438	1.689007
dy4	-.010197	.8771192	-0.01	0.991	-1.733307	1.712913
dy5	.0980745	.8811567	0.11	0.911	-1.632967	1.829116
dy6	.1949434	.8839981	0.22	0.826	-1.54168	1.931567
dy7	.5284032	.8987747	0.59	0.557	-1.237249	2.294055
dy8	1.022974	.9207069	1.11	0.267	-.7857644	2.831712
dy9	.9934361	.9057969	1.10	0.273	-.7860111	2.772883
dy10	.9740431	.9122234	1.07	0.286	-.8180291	2.766115
dy11	.8865303	.9254186	0.96	0.339	-.9314639	2.704525
dy12	.7959752	.9420977	0.84	0.399	-1.054785	2.646736
dy13	.6657176	.9448691	0.70	0.481	-1.190487	2.521923
dy14	.284267	.9343849	0.30	0.761	-1.551342	2.119876
dy15	.8167018	.9641663	0.85	0.397	-1.077413	2.710816
_cons	67.68949	10.46749	6.47	0.000	47.126	88.25299

Appendix F – Regression models – GMM Dynamic panel model

GMM Dynamic panel model (lag limits 2 3)

```
Dynamic panel-data estimation, two-step system GMM
------------------------------------------------------------------------------
Group variable: c                               Number of obs      =       560
Time variable : y                               Number of groups   =        40
Number of instruments = 23                      Obs per group: min =        14
F(18, 39)     =   4094.64                                      avg =     14.00
Prob > F      =     0.000                                      max =        14
------------------------------------------------------------------------------
             |              Corrected
        gini |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        gini |
         L1. |   .6122879   .1316113     4.65   0.000     .3460788    .8784969
             |
   log_gdppc |   1.164988   .8304291     1.40   0.169    -.5147136    2.844689
             |
        eglo |
         L1. |   -.004715   .0368829    -0.13   0.899    -.0793176    .0698877
             |
         rem |  -.0143031    .048097    -0.30   0.768    -.1115884    .0829822
      unempl |   .0840209   .0305401     2.75   0.009     .0222478     .145794
         sav |  -.0245062   .0300519    -0.82   0.420     -.085292    .0362796
         vat |  -.0713143   .0553399    -1.29   0.205    -.1832499    .0406213
        gfcf |  -.0091162   .0265929    -0.34   0.734    -.0629055     .044673
        infl |   .0004941   .0137153     0.04   0.971    -.0272477    .0282359
         trd |  -.0002078   .0045165    -0.05   0.964    -.0093432    .0089276
        pols |  -.0179459   .0098047    -1.83   0.075    -.0377777    .0018859
         cor |   -.049476   .0211217    -2.34   0.024    -.0921986   -.0067533
         rol |   .0561906   .0224932     2.50   0.017     .0106937    .1016874
         voa |   .0738347   .0307166     2.40   0.021     .0117046    .1359648
        regq |   -.090157   .0357435    -2.52   0.016     -.162455   -.0178589
        gove |  -.0038344   .0189654    -0.20   0.841    -.0421955    .0345267
        popg |  -.0148386   .1656527    -0.09   0.929    -.3499029    .3202257
        myos |  -.2399799   .1690439    -1.42   0.164    -.5819034    .1019435
       _cons |   6.665029   7.627703     0.87   0.388    -8.763456    22.09351
------------------------------------------------------------------------------
Instruments for orthogonal deviations equation
  Standard
    FOD.(L.eglo rem unempl cons sav vat gfcf infl trd pols cor rol voa regq
    gove popg myos)
  GMM-type (missing=0, separate instruments for each period unless collapsed)
    L(2/3).log_gdppc collapsed
    L(1/2).L.gini collapsed
Instruments for levels equation
  Standard
    L.eglo rem unempl cons sav vat gfcf infl trd pols cor rol voa regq gove
    popg myos
    _cons
  GMM-type (missing=0, separate instruments for each period unless collapsed)
    DL.log_gdppc collapsed
    D.L.gini collapsed
------------------------------------------------------------------------------
Arellano-Bond test for AR(1) in first differences: z =  -2.27  Pr > z =  0.023
Arellano-Bond test for AR(2) in first differences: z =   0.47  Pr > z =  0.641
```

```
------------------------------------------------------------------------------
Sargan test of overid. restrictions: chi2(4)    =   4.90  Prob > chi2 =  0.297
  (Not robust, but not weakened by many instruments.)
Hansen test of overid. restrictions: chi2(4)    =   3.78  Prob > chi2 =  0.437
  (Robust, but weakened by many instruments.)

Difference-in-Hansen tests of exogeneity of instrument subsets:
  GMM instruments for levels
    Hansen test excluding group:     chi2(2)    =   0.49  Prob > chi2 =  0.782
    Difference (null H = exogenous): chi2(2)    =   3.29  Prob > chi2 =  0.193
  gmm(L.gini, collapse lag(1 2))
    Hansen test excluding group:     chi2(1)    =   0.81  Prob > chi2 =  0.369
    Difference (null H = exogenous): chi2(3)    =   2.97  Prob > chi2 =  0.396
  gmm(log_gdppc, collapse lag(2 3))
    Hansen test excluding group:     chi2(1)    =   1.65  Prob > chi2 =  0.199
    Difference (null H = exogenous): chi2(3)    =   2.13  Prob > chi2 =  0.546
```

GMM Dynamic panel model (lag limits 2 4)

```
Dynamic panel-data estimation, two-step system GMM
------------------------------------------------------------------------------
Group variable: c                               Number of obs      =       560
Time variable : y                               Number of groups   =        40
Number of instruments = 24                      Obs per group: min =        14
F(18, 39)     =   5346.79                                      avg =     14.00
Prob > F      =     0.000                                      max =        14
------------------------------------------------------------------------------
             |              Corrected
        gini |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        gini |
         L1. |   .6052296   .1171452     5.17   0.000     .3682811     .842178
             |
   log_gdppc |   1.166822   .8187094     1.43   0.162     -.489174    2.822818
             |
        eglo |
         L1. |  -.0077546   .0365448    -0.21   0.833    -.0816734    .0661641
             |
         rem |    -.01348   .0467266    -0.29   0.775    -.1079935    .0810335
      unempl |   .0871484   .0254521     3.42   0.001     .0356668    .1386301
         sav |  -.0240619   .0302189    -0.80   0.431    -.0851854    .0370616
         vat |  -.0697507   .0545849    -1.28   0.209    -.1801591    .0406578
        gfcf |  -.0093159   .0265207    -0.35   0.727    -.0629591    .0443273
        infl |  -.0004768   .0130738    -0.04   0.971    -.0269211    .0259675
         trd |  -.0001303   .0044439    -0.03   0.977    -.0091189    .0088584
        pols |  -.0184925   .0093776    -1.97   0.056    -.0374606    .0004755
         cor |  -.0494432   .0206025    -2.40   0.021    -.0911157   -.0077707
         rol |   .0584733   .0185334     3.16   0.003      .020986    .0959606
         voa |   .0731481   .0304824     2.40   0.021     .0114917    .1348046
        regq |  -.0902044   .0347146    -2.60   0.013    -.1604212   -.0199875
        gove |  -.0038035   .0189769    -0.20   0.842    -.0421878    .0345808
        popg |  -.0036731   .1609102    -0.02   0.982    -.3291447    .3217985
        myos |  -.2378164   .1695289    -1.40   0.169     -.580721    .1050881
       _cons |   6.912171   7.454847     0.93   0.360    -8.166679    21.99102
------------------------------------------------------------------------------
```

```
Instruments for orthogonal deviations equation
  Standard
    FOD.(L.eglo rem unempl cons sav vat gfcf infl trd pols cor rol voa regq
    gove popg myos)
  GMM-type (missing=0, separate instruments for each period unless collapsed)
    L(2/4).log_gdppc collapsed
    L(1/2).L.gini collapsed
Instruments for levels equation
  Standard
    L.eglo rem unempl cons sav vat gfcf infl trd pols cor rol voa regq gove
    popg myos
    _cons
  GMM-type (missing=0, separate instruments for each period unless collapsed)
    DL.log_gdppc collapsed
    D.L.gini collapsed
------------------------------------------------------------------------------
Arellano-Bond test for AR(1) in first differences: z =  -2.23  Pr > z =  0.026
Arellano-Bond test for AR(2) in first differences: z =   0.45  Pr > z =  0.655
------------------------------------------------------------------------------
Sargan test of overid. restrictions: chi2(5)    =   5.25  Prob > chi2 =  0.386
  (Not robust, but not weakened by many instruments.)
Hansen test of overid. restrictions: chi2(5)    =   3.88  Prob > chi2 =  0.567
  (Robust, but weakened by many instruments.)

Difference-in-Hansen tests of exogeneity of instrument subsets:
  GMM instruments for levels
    Hansen test excluding group:     chi2(3)    =   0.94  Prob > chi2 =  0.815
    Difference (null H = exogenous): chi2(2)    =   2.93  Prob > chi2 =  0.231
  gmm(L.gini, collapse lag(1 2))
    Hansen test excluding group:     chi2(2)    =   0.82  Prob > chi2 =  0.665
    Difference (null H = exogenous): chi2(3)    =   3.06  Prob > chi2 =  0.382
  gmm(log_gdppc, collapse lag(2 4))
    Hansen test excluding group:     chi2(1)    =   1.65  Prob > chi2 =  0.199
    Difference (null H = exogenous): chi2(4)    =   2.23  Prob > chi2 =  0.694
```

GMM Dynamic panel model (lag limits 2 4) with cov19 dummy

```
Dynamic panel-data estimation, two-step system GMM
------------------------------------------------------------------------------
Group variable: c                               Number of obs      =       560
Time variable : y                               Number of groups   =        40
Number of instruments = 26                      Obs per group: min =        14
F(20, 39)     =   5471.62                                      avg =     14.00
Prob > F      =     0.000                                      max =        14
------------------------------------------------------------------------------
             |              Corrected
        gini |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        gini |
         L1. |   .6003323    .113832     5.27   0.000     .3700853    .8305792
             |
   log_gdppc |   1.314471   1.118648     1.18   0.247    -.9482089    3.577151
             |
        eglo |
         L1. |  -.0062122   .0377006    -0.16   0.870    -.0824688    .0700445
```

```
             |
         rem |  -.0121562   .0491958    -0.25   0.806     -.111664    .0873517
      unempl |   .0892065   .0231693     3.85   0.000     .0423422    .1360709
         sav |  -.0273955   .0316672    -0.87   0.392    -.0914484    .0366575
         vat |   -.070692   .0513748    -1.38   0.177    -.1746074    .0332234
        gfcf |  -.0067327   .0280861    -0.24   0.812    -.0635422    .0500768
        infl |   .0001944   .0137529     0.01   0.989    -.0276234    .0280122
         trd |   .0002327   .0045807     0.05   0.960    -.0090326     .009498
        pols |  -.0199833   .0098487    -2.03   0.049     -.039904   -.0000625
         cor |  -.0502477    .022454    -2.24   0.031    -.0956653   -.0048301
         rol |   .0580603   .0181725     3.19   0.003      .021303    .0948177
         voa |   .0762029   .0318628     2.39   0.022     .0117543    .1406514
        regq |  -.0954585   .0342058    -2.79   0.008    -.1646462   -.0262708
        gove |  -.0041079   .0216409    -0.19   0.850    -.0478808     .039665
        popg |  -.0153373   .1956606    -0.08   0.938    -.4110982    .3804235
        myos |  -.2328613   .1752334    -1.33   0.192    -.5873042    .1215816
    pols_cov |   .0072472   .0075966     0.95   0.346    -.0081183    .0226127
     cor_cov |  -.0068748   .0067924    -1.01   0.318    -.0206137    .0068641
       _cons |   5.759612   9.892359     0.58   0.564    -14.24957     25.7688
------------------------------------------------------------------------------
Instruments for orthogonal deviations equation
  Standard
    FOD.(L.eglo rem unempl cons sav vat gfcf infl trd pols cor rol voa regq
    gove popg myos pols_cov cor_cov)
  GMM-type (missing=0, separate instruments for each period unless collapsed)
    L(2/4).log_gdppc collapsed
    L(1/2).L.gini collapsed
Instruments for levels equation
  Standard
    L.eglo rem unempl cons sav vat gfcf infl trd pols cor rol voa regq gove
    popg myos pols_cov cor_cov
    _cons
  GMM-type (missing=0, separate instruments for each period unless collapsed)
    DL.log_gdppc collapsed
    D.L.gini collapsed
------------------------------------------------------------------------------
Arellano-Bond test for AR(1) in first differences: z =  -2.23  Pr > z =  0.026
Arellano-Bond test for AR(2) in first differences: z =   0.44  Pr > z =  0.663
------------------------------------------------------------------------------
Sargan test of overid. restrictions: chi2(5)    =   5.56  Prob > chi2 =  0.352
  (Not robust, but not weakened by many instruments.)
Hansen test of overid. restrictions: chi2(5)    =   4.08  Prob > chi2 =  0.538
  (Robust, but weakened by many instruments.)

Difference-in-Hansen tests of exogeneity of instrument subsets:
  GMM instruments for levels
    Hansen test excluding group:     chi2(3)    =   0.95  Prob > chi2 =  0.814
    Difference (null H = exogenous): chi2(2)    =   3.13  Prob > chi2 =  0.209
  gmm(L.gini, collapse lag(1 2))
    Hansen test excluding group:     chi2(2)    =   0.96  Prob > chi2 =  0.618
    Difference (null H = exogenous): chi2(3)    =   3.12  Prob > chi2 =  0.374
  gmm(log_gdppc, collapse lag(2 4))
    Hansen test excluding group:     chi2(1)    =   2.02  Prob > chi2 =  0.156
    Difference (null H = exogenous): chi2(4)    =   2.06  Prob > chi2 =  0.724
```

GMM Dynamic panel model (lag limits 2 4) with dev dummy

```
Dynamic panel-data estimation, one-step system GMM
------------------------------------------------------------------------------
Group variable: c                               Number of obs      =       560
Time variable : y                               Number of groups   =        40
Number of instruments = 26                      Obs per group: min =        14
Wald chi2(20) = 520196.42                                      avg =     14.00
Prob > chi2   =     0.000                                      max =        14
------------------------------------------------------------------------------
        gini |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        gini |
         L1. |   .6515991   .0858821     7.59   0.000     .4832734    .8199249
             |
   log_gdppc |   1.409485   .6508944     2.17   0.030     .1337555    2.685215
             |
        eglo |
         L1. |    .001843   .0157368     0.12   0.907    -.0290005    .0326865
             |
         rem |   .0031939     .02647     0.12   0.904    -.0486863    .0550741
      unempl |   .1020128   .0247559     4.12   0.000     .0534922    .1505334
        cons |   .0328747   .0170314     1.93   0.054    -.0005063    .0662556
         vat |  -.0413521   .0272242    -1.52   0.129    -.0947106    .0120063
        gfcf |   .0103777   .0162746     0.64   0.524    -.0215199    .0422754
        infl |  -.0010348   .0133851    -0.08   0.938    -.0272691    .0251996
         trd |  -.0000564   .0018299    -0.03   0.975     -.003643    .0035301
        pols |  -.0250556   .0123665    -2.03   0.043    -.0492934   -.0008178
         cor |   -.050916   .0155398    -3.28   0.001    -.0813735   -.0204585
         rol |   .0395216   .0122456     3.23   0.001     .0155206    .0635226
         voa |   .0602366   .0168122     3.58   0.000     .0272853    .0931879
        regq |   -.074691   .0191281    -3.90   0.000    -.1121814   -.0372007
        gove |  -.0099644   .0108837    -0.92   0.360    -.0312961    .0113673
        popg |   .0454524   .1109954     0.41   0.682    -.1720947    .2629994
        myos |  -.1895648   .0642567    -2.95   0.003    -.3155057   -.0636239
    pols_dev |   .0078203   .0106782     0.73   0.464    -.0131086    .0287493
     cor_dev |    .006879   .0110028     0.63   0.532    -.0146861    .0284441
       _cons |  -1.017192   7.617308    -0.13   0.894    -15.94684    13.91246
------------------------------------------------------------------------------
Instruments for first differences equation
  Standard
    D.(L.eglo rem unempl cons sav vat gfcf infl trd pols cor rol voa regq gove
    popg myos pols_dev cor_dev)
  GMM-type (missing=0, separate instruments for each period unless collapsed)
    L(2/4).log_gdppc collapsed
    L(1/2).L.gini collapsed
Instruments for levels equation
  Standard
    L.eglo rem unempl cons sav vat gfcf infl trd pols cor rol voa regq gove
    popg myos pols_dev cor_dev
    _cons
  GMM-type (missing=0, separate instruments for each period unless collapsed)
    DL.log_gdppc collapsed
    D.L.gini collapsed
------------------------------------------------------------------------------
Arellano-Bond test for AR(1) in first differences: z =  -6.84  Pr > z =  0.000
Arellano-Bond test for AR(2) in first differences: z =   0.34  Pr > z =  0.730
------------------------------------------------------------------------------
```

```
Sargan test of overid. restrictions: chi2(5)    =   3.12  Prob > chi2 =  0.682
  (Not robust, but not weakened by many instruments.)

Difference-in-Sargan tests of exogeneity of instrument subsets:
  GMM instruments for levels
    Sargan test excluding group:     chi2(3)    =   1.52  Prob > chi2 =  0.677
    Difference (null H = exogenous): chi2(2)    =   1.59  Prob > chi2 =  0.451
  gmm(L.gini, collapse lag(1 2))
    Sargan test excluding group:     chi2(2)    =   1.57  Prob > chi2 =  0.457
    Difference (null H = exogenous): chi2(3)    =   1.55  Prob > chi2 =  0.671
  gmm(log_gdppc, collapse lag(2 4))
    Sargan test excluding group:     chi2(1)    =   0.58  Prob > chi2 =  0.446
    Difference (null H = exogenous): chi2(4)    =   2.54  Prob > chi2 =  0.638
```

GMM Dynamic panel model (lag limits 2 4) with gfc dummy

```
Dynamic panel-data estimation, one-step system GMM
------------------------------------------------------------------------------
Group variable: c                               Number of obs      =       560
Time variable : y                               Number of groups   =        40
Number of instruments = 26                      Obs per group: min =        14
Wald chi2(20) = 529990.11                                      avg =     14.00
Prob > chi2   =     0.000                                      max =        14
------------------------------------------------------------------------------
        gini |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        gini |
         L1. |   .6351185   .0849967     7.47   0.000     .4685281    .8017089
             |
   log_gdppc |   1.195656   .6947791     1.72   0.085    -.1660863    2.557398
             |
        eglo |
         L1. |    .001712   .0157903     0.11   0.914    -.0292364    .0326605
             |
         rem |  -.0169092   .0225242    -0.75   0.453    -.0610558    .0272375
      unempl |   .0957813   .0215036     4.45   0.000      .053635    .1379275
         sav |  -.0295821   .0178864    -1.65   0.098    -.0646388    .0054746
         vat |  -.0566306   .0314318    -1.80   0.072    -.1182357    .0049746
        gfcf |   .0048066   .0175979     0.27   0.785    -.0296846    .0392978
        infl |  -.0020481   .0137424    -0.15   0.882    -.0289826    .0248864
         trd |  -.0001246   .0018048    -0.07   0.945    -.0036618    .0034127
        pols |  -.0199614   .0065229    -3.06   0.002     -.032746   -.0071769
         cor |  -.0415753   .0126275    -3.29   0.001    -.0663248   -.0168257
         rol |   .0460083   .0133748     3.44   0.001     .0197942    .0722225
         voa |   .0578894   .0152597     3.79   0.000     .0279809     .087798
        regq |  -.0771589   .0183052    -4.22   0.000    -.1130364   -.0412814
        gove |  -.0050657   .0115115    -0.44   0.660    -.0276278    .0174964
        popg |   .0479988   .1101433     0.44   0.663    -.1678781    .2638757
        myos |  -.1838066    .060018    -3.06   0.002    -.3014397   -.0661735
    pols_gfc |   .0109553   .0113939     0.96   0.336    -.0113763     .033287
     cor_gfc |  -.0087732   .0107316    -0.82   0.414    -.0298068    .0122605
       _cons |   4.696886   7.278352     0.65   0.519    -9.568421    18.96219
------------------------------------------------------------------------------
Instruments for first differences equation
  Standard
```

```
    D.(L.eglo rem unempl cons sav vat gfcf infl trd pols cor rol voa regq gove
    popg myos pols_gfc cor_gfc)
  GMM-type (missing=0, separate instruments for each period unless collapsed)
    L(2/4).log_gdppc collapsed
    L(1/2).L.gini collapsed
Instruments for levels equation
  Standard
    L.eglo rem unempl cons sav vat gfcf infl trd pols cor rol voa regq gove
    popg myos pols_gfc cor_gfc
    _cons
  GMM-type (missing=0, separate instruments for each period unless collapsed)
    DL.log_gdppc collapsed
    D.L.gini collapsed
------------------------------------------------------------------------------
Arellano-Bond test for AR(1) in first differences: z =  -6.64  Pr > z =  0.000
Arellano-Bond test for AR(2) in first differences: z =   0.34  Pr > z =  0.734
------------------------------------------------------------------------------
Sargan test of overid. restrictions: chi2(5)    =   3.44  Prob > chi2 =  0.633
  (Not robust, but not weakened by many instruments.)

Difference-in-Sargan tests of exogeneity of instrument subsets:
  GMM instruments for levels
    Sargan test excluding group:     chi2(3)    =   1.49  Prob > chi2 =  0.684
    Difference (null H = exogenous): chi2(2)    =   1.95  Prob > chi2 =  0.378
  gmm(L.gini, collapse lag(1 2))
    Sargan test excluding group:     chi2(2)    =   1.65  Prob > chi2 =  0.438
    Difference (null H = exogenous): chi2(3)    =   1.79  Prob > chi2 =  0.618
  gmm(log_gdppc, collapse lag(2 4))
    Sargan test excluding group:     chi2(1)    =   0.14  Prob > chi2 =  0.710
    Difference (null H = exogenous): chi2(4)    =   3.30  Prob > chi2 =  0.509
```

GMM Dynamic panel model (lag limits 2 4) with eusdc dummy

```
Dynamic panel-data estimation, one-step system GMM
------------------------------------------------------------------------------
Group variable: c                               Number of obs      =       560
Time variable : y                               Number of groups   =        40
Number of instruments = 26                      Obs per group: min =        14
Wald chi2(20) = 521686.41                                      avg =     14.00
Prob > chi2   =     0.000                                      max =        14
------------------------------------------------------------------------------
        gini |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        gini |
         L1. |   .6553087     .08747     7.49   0.000     .4838708    .8267467
             |
   log_gdppc |    1.02279   .6475453     1.58   0.114    -.2463753    2.291956
             |
        eglo |
         L1. |  -.0004802   .0166194    -0.03   0.977    -.0330537    .0320932
             |
         rem |  -.0212009   .0224589    -0.94   0.345    -.0652195    .0228178
      unempl |   .0913467   .0223787     4.08   0.000     .0474852    .1352081
        cons |   .0276567   .0167791     1.65   0.099    -.0052298    .0605432
         vat |  -.0561579   .0327014    -1.72   0.086    -.1202514    .0079357
```

```
        gfcf |   .0058477   .0171953     0.34   0.734    -.0278544    .0395498
        infl |  -.0012092   .0131488    -0.09   0.927    -.0269805     .024562
         trd |  -.0000518   .0018014    -0.03   0.977    -.0035826    .0034789
        pols |  -.0161573   .0064904    -2.49   0.013    -.0288784   -.0034363
         cor |  -.0395264   .0122585    -3.22   0.001    -.0635527   -.0155001
         rol |   .0435764   .0135568     3.21   0.001     .0170057    .0701472
         voa |   .0550925   .0158263     3.48   0.000     .0240735    .0861116
        regq |  -.0711348   .0181835    -3.91   0.000    -.1067739   -.0354958
        gove |  -.0049227   .0115225    -0.43   0.669    -.0275064     .017661
        popg |   .0647794   .1078231     0.60   0.548      -.14655    .2761088
        myos |  -.1723006   .0621219    -2.77   0.006    -.2940573    -.050544
  pols_eusdc |  -.0030907   .0071878    -0.43   0.667    -.0171784    .0109971
   cor_eusdc |   .0021238   .0066281     0.32   0.749    -.0108671    .0151146
       _cons |   2.581923   8.336573     0.31   0.757    -13.75746    18.92131
------------------------------------------------------------------------------
Instruments for first differences equation
  Standard
    D.(L.eglo rem unempl cons sav vat gfcf infl trd pols cor rol voa regq gove
    popg myos pols_eusdc cor_eusdc)
  GMM-type (missing=0, separate instruments for each period unless collapsed)
    L(2/4).log_gdppc collapsed
    L(1/2).L.gini collapsed
Instruments for levels equation
  Standard
    L.eglo rem unempl cons sav vat gfcf infl trd pols cor rol voa regq gove
    popg myos pols_eusdc cor_eusdc
    _cons
  GMM-type (missing=0, separate instruments for each period unless collapsed)
    DL.log_gdppc collapsed
    D.L.gini collapsed
------------------------------------------------------------------------------
Arellano-Bond test for AR(1) in first differences: z =  -7.03  Pr > z =  0.000
Arellano-Bond test for AR(2) in first differences: z =   0.41  Pr > z =  0.682
------------------------------------------------------------------------------
Sargan test of overid. restrictions: chi2(5)    =   3.18  Prob > chi2 =  0.672
  (Not robust, but not weakened by many instruments.)

Difference-in-Sargan tests of exogeneity of instrument subsets:
  GMM instruments for levels
    Sargan test excluding group:     chi2(3)    =   1.41  Prob > chi2 =  0.702
    Difference (null H = exogenous): chi2(2)    =   1.77  Prob > chi2 =  0.413
  gmm(L.gini, collapse lag(1 2))
    Sargan test excluding group:     chi2(2)    =   1.44  Prob > chi2 =  0.487
    Difference (null H = exogenous): chi2(3)    =   1.74  Prob > chi2 =  0.627
  gmm(log_gdppc, collapse lag(2 4))
    Sargan test excluding group:     chi2(1)    =   0.53  Prob > chi2 =  0.468
    Difference (null H = exogenous): chi2(4)    =   2.66  Prob > chi2 =  0.617
```

Appendix G – Diagnostic tests for panel

*fit the model without heteroskedasticity

```
note: sav omitted because of collinearity
Iteration 1: tolerance = 0


Cross-sectional time-series FGLS regression

Coefficients:  generalized least squares
Panels:        homoskedastic
Correlation:   no autocorrelation

Estimated covariances      =         1          Number of obs      =       600
Estimated autocorrelations =         0          Number of groups   =        40
Estimated coefficients     =        18          Time periods       =        15
                                                Wald chi2(17)      =    444.86
Log likelihood             = -1574.607          Prob > chi2        =    0.0000

------------------------------------------------------------------------------
        gini |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
   log_gdppc |   1.618767    .510987     3.17   0.002     .6172511    2.620283
        eglo |  -.0355598   .0390273    -0.91   0.362    -.1120518    .0409322
         rem |   .0139987   .0586796     0.24   0.811    -.1010112    .1290087
      unempl |   .1999424   .0345476     5.79   0.000     .1322304    .2676544
        cons |   .0462148   .0299728     1.54   0.123    -.0125308    .1049604
         sav |          0  (omitted)
         vat |  -.2065111   .0447453    -4.62   0.000    -.2942102    -.118812
        gfcf |  -.0338556   .0383997    -0.88   0.378    -.1091176    .0414064
        infl |   .0152219   .0355966     0.43   0.669    -.0545462    .0849899
         trd |   .0002118   .0047002     0.05   0.964    -.0090005    .0094241
        pols |  -.0482784   .0128367    -3.76   0.000    -.0734378    -.023119
         cor |  -.0924515   .0212478    -4.35   0.000    -.1340965   -.0508064
         rol |   .1222765   .0234364     5.22   0.000      .076342     .168211
         voa |    .163882    .028388     5.77   0.000     .1082426    .2195214
        regq |  -.2132375   .0245341    -8.69   0.000    -.2613235   -.1651516
        gove |   .0313864   .0255785     1.23   0.220    -.0187465    .0815194
        popg |  -.3208099   .2506595    -1.28   0.201    -.8120935    .1704737
        myos |  -.5529481   .1374939    -4.02   0.000    -.8224313   -.2834649
       _cons |    24.6573   6.442084     3.83   0.000     12.03105    37.28355
------------------------------------------------------------------------------
```

*fit the model with panel-level heteroskedasticity and save the likelihood

```
note: sav omitted because of collinearity
Iteration 1: tolerance = .31105311
Iteration 2: tolerance = .38413635
Iteration 3: tolerance = .3238729
Iteration 4: tolerance = .18231495
Iteration 5: tolerance = .12056818
Iteration 6: tolerance = .08638534
Iteration 7: tolerance = .06464642
Iteration 8: tolerance = .05071956
Iteration 9: tolerance = .04209301
Iteration 10: tolerance = .03629369
Iteration 11: tolerance = .03168565
Iteration 12: tolerance = .02734879
```

```
Iteration 13: tolerance = .02228343
Iteration 14: tolerance = .01543668
Iteration 15: tolerance = .01203292
Iteration 16: tolerance = .00837712
Iteration 17: tolerance = .0059884
Iteration 18: tolerance = .00847882
Iteration 19: tolerance = .00963908
Iteration 20: tolerance = .01033993
Iteration 21: tolerance = .01086814
Iteration 22: tolerance = .01121489
Iteration 23: tolerance = .01128141
Iteration 24: tolerance = .01139963
Iteration 25: tolerance = .01147749
Iteration 26: tolerance = .01119072
Iteration 27: tolerance = .01062906
Iteration 28: tolerance = .00990073
Iteration 29: tolerance = .00910938
Iteration 30: tolerance = .00833602
Iteration 31: tolerance = .00763255
Iteration 32: tolerance = .00702496
Iteration 33: tolerance = .00652073
Iteration 34: tolerance = .00611649
Iteration 35: tolerance = .00580352
Iteration 36: tolerance = .00557124
Iteration 37: tolerance = .00555314
Iteration 38: tolerance = .00564237
Iteration 39: tolerance = .00575555
Iteration 40: tolerance = .00588627
Iteration 41: tolerance = .00602208
Iteration 42: tolerance = .00614335
Iteration 43: tolerance = .00622273
Iteration 44: tolerance = .00622682
Iteration 45: tolerance = .00612144
Iteration 46: tolerance = .00588117
Iteration 47: tolerance = .00550064
Iteration 48: tolerance = .00500145
Iteration 49: tolerance = .00442824
Iteration 50: tolerance = .00383452
Iteration 51: tolerance = .00338167
Iteration 52: tolerance = .00301893
Iteration 53: tolerance = .00265956
Iteration 54: tolerance = .002318
Iteration 55: tolerance = .00200321
Iteration 56: tolerance = .00171983
Iteration 57: tolerance = .00146928
Iteration 58: tolerance = .00125075
Iteration 59: tolerance = .00106208
Iteration 60: tolerance = .00090041
Iteration 61: tolerance = .0007626
Iteration 62: tolerance = .00064556
Iteration 63: tolerance = .0005464
Iteration 64: tolerance = .00046252
Iteration 65: tolerance = .00039162
Iteration 66: tolerance = .00033173
Iteration 67: tolerance = .00028112
Iteration 68: tolerance = .00023836
Iteration 69: tolerance = .00020221
Iteration 70: tolerance = .00017163
```

```
Iteration 71: tolerance = .00014575
Iteration 72: tolerance = .00012384
Iteration 73: tolerance = .00010527
Iteration 74: tolerance = .00008953
Iteration 75: tolerance = .00007618
Iteration 76: tolerance = .00006484
Iteration 77: tolerance = .00005521
Iteration 78: tolerance = .00004702
Iteration 79: tolerance = .00004007
Iteration 80: tolerance = .00003415
Iteration 81: tolerance = .00002911
Iteration 82: tolerance = .00002482
Iteration 83: tolerance = .00002117
Iteration 84: tolerance = .00001806
Iteration 85: tolerance = .00001541
Iteration 86: tolerance = .00001315
Iteration 87: tolerance = .00001122
Iteration 88: tolerance = 9.581e-06
Iteration 89: tolerance = 8.179e-06
Iteration 90: tolerance = 6.983e-06
Iteration 91: tolerance = 5.963e-06
Iteration 92: tolerance = 5.092e-06
Iteration 93: tolerance = 4.349e-06
Iteration 94: tolerance = 3.714e-06
Iteration 95: tolerance = 3.173e-06
Iteration 96: tolerance = 2.710e-06
Iteration 97: tolerance = 2.315e-06
Iteration 98: tolerance = 1.978e-06
Iteration 99: tolerance = 1.690e-06
Iteration 100: tolerance = 1.444e-06
Iteration 101: tolerance = 1.234e-06
Iteration 102: tolerance = 1.054e-06
Iteration 103: tolerance = 9.007e-07
Iteration 104: tolerance = 7.696e-07
Iteration 105: tolerance = 6.576e-07
Iteration 106: tolerance = 5.619e-07
Iteration 107: tolerance = 4.802e-07
Iteration 108: tolerance = 4.104e-07
Iteration 109: tolerance = 3.507e-07
Iteration 110: tolerance = 2.997e-07
Iteration 111: tolerance = 2.562e-07
Iteration 112: tolerance = 2.189e-07
Iteration 113: tolerance = 1.871e-07
Iteration 114: tolerance = 1.599e-07
Iteration 115: tolerance = 1.366e-07
Iteration 116: tolerance = 1.168e-07
Iteration 117: tolerance = 9.981e-08


Cross-sectional time-series FGLS regression

Coefficients:  generalized least squares
Panels:        heteroskedastic
Correlation:   no autocorrelation

Estimated covariances      =        40          Number of obs      =       600
Estimated autocorrelations =         0          Number of groups   =        40
Estimated coefficients     =        18          Time periods       =        15
```

```
                                                  Wald chi2(17)      =   5256.21
Log likelihood            = -1327.164             Prob > chi2        =    0.0000
```

gini	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
log_gdppc	-1.837838	.2182171	-8.42	0.000	-2.265536	-1.410141
eglo	-.0681929	.0172936	-3.94	0.000	-.1020877	-.0342982
rem	-.4872446	.0345947	-14.08	0.000	-.5550489	-.4194403
unempl	.0319039	.0139033	2.29	0.022	.0046539	.0591539
cons	-.0899201	.0129032	-6.97	0.000	-.11521	-.0646302
sav	0	(omitted)				
vat	-.1025706	.0157477	-6.51	0.000	-.1334356	-.0717056
gfcf	-.0288833	.0185031	-1.56	0.119	-.0651488	.0073822
infl	-.0332282	.029537	-1.12	0.261	-.0911195	.0246632
trd	-.0132583	.0017178	-7.72	0.000	-.0166251	-.0098914
pols	-.009001	.0052601	-1.71	0.087	-.0193107	.0013086
cor	-.0908994	.0113113	-8.04	0.000	-.1130691	-.0687298
rol	.0672225	.0114454	5.87	0.000	.0447898	.0896551
voa	-.0421896	.012931	-3.26	0.001	-.067534	-.0168453
regq	.0136027	.0139885	0.97	0.331	-.0138143	.0410196
gove	.0082295	.0100621	0.82	0.413	-.0114918	.0279508
popg	-.3174011	.0692666	-4.58	0.000	-.4531611	-.1816412
myos	-.9065881	.0553337	-16.38	0.000	-1.01504	-.7981359
_cons	80.63817	2.49904	32.27	0.000	75.74014	85.5362

*Wooldridge test for autocorrelation in panel data

```
Wooldridge test for autocorrelation in panel data
H0: no first-order autocorrelation
    F(  1,      39) =    111.202
           Prob > F =      0.0000
```

Appendix H – Kuznets curve quadratic regression

```
Median regression
R-squared = .09672567
Number of obs = 600
Objective function = 1.7170297
```

Heteroskedasticity robust standard errors

gini	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
log_gdppc	28.59046	7.606074	3.76	0.000	13.65255	43.52838
log_gdppc2	-1.525438	.3852327	-3.96	0.000	-2.282014	-.7688617
_cons	-100.3633	37.24539	-2.69	0.007	-173.5112	-27.21538

```
Machado-Santos Silva test for heteroskedasticity
         Ho: Constant variance
         Variables: Fitted values of gini and its squares

         chi2(2)      =  75.471
         Prob > chi2  =   0.000
```