TESTING THE VALIDITY OF KUZNETS' CURVE HYPOTHESIS: A HETEROGENEOUS PANEL ESTIMATION FOR THE WESTERN BALKANS

MASTER'S THESIS

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This is to certify that I have read this final work and that, in my opinion, it is fully adequate, in scope and quality, as a Master Thesis for the degree of Master of Science in Economics.

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TESTING THE VALIDITY OF KUZNETS' CURVE HYPOTHESIS: A HETEROGENEOUS PANEL ESTIMATION FOR THE WESTERN BALKANS

ABSTRACT

This research aims to test the Kuznets Curve hypothesis about the relationship between economic development and income inequality for the Western Balkan countries by employing a heterogeneous panel data technique. The main objective of this study is to answer the research question as to whether a significant inverse U-shaped relationship is observed between economic development and income inequality in these transition economies. The analysis employs advanced panel estimate methods like Mean Group, Augmented Mean Group and Common Correlated Effects Mean Group, which were calculated using the STATA program. For the regression analysis, the period from 2008 to 2023 is selected and focuses on five countries in the region: Albania, Bosnia & Herzegovina, Montenegro, North Macedonia, and Serbia. The econometric model includes seven independent variables: GDP per capita, trade openness, employment in agriculture, employment in industry, employment in the services, inflation, and domestic credit to the private sector. The findings support the Kuznets Curve hypothesis by demonstrating that GDP per capita exhibits an inverted U-shaped correlation with income inequality. Additionally, while employment in industry, services, and the availability of domestic credit are associated with reduced inequality, work in agriculture and inflation show a positive correlation with inequality. It is interesting to note that trade openness did not consistently lead to the results predicted by theory, and the outputs varied in character depending on the estimator used.

Given the employment of robust, heterogeneity-sensitive estimation techniques in a transitional regional context with a minimum quantity of empirical research conducted, these results can be a little more informative to the literature and increase the important influence of the policy for the purpose of inclusive economic growth in the Western Balkans.

Keywords: Kuznets Curve, Income Inequality, Economic Growth, Western Balkans, Panel Estimation.

TESTIMI I VLEFSHMËRISË SË HIPOTEZËS SË KURBËS SË KUZNETSIT: NJË VLERËSIM HETEROGJEN PANELI PËR BALLKANIN PERËNDIMOR

ABSTRAKT

Qëllimi i këtij kërkimi është të testojë hipotezën e Kurbes së Kuznets-it mbi marrëdhënien midis zhvillimit ekonomik dhe pabarazisë në të ardhura për vendet e Ballkanit Perëndimor, duke përdorur teknika të dhënash panel heterogjene. Qëllimi kryesor i këtij studimi është të japë përgjigje për pyetjen kërkimore nëse ekziston një marrëdhënie domethënëse në formën e një kurbe të përmbysur U midis zhvillimit ekonomik dhe pabarazisë në të ardhura në këto ekonomi në tranzicion. Analiza përdor metoda të avancuara të vlerësimit të panelit si Grupi Mesatar, Grupi Mesatar i Shtuar, dhe Efektet e Zakonshme të Korreluara Grupi Mesatar, te cilat jane llogaritur duke perdorur programin STATA. Për analizën e regresionit, eshte zgjedhur periudha nga viti 2008 deri në 2023 dhe fokusohet në pesë vende të rajonit: Shqipëria, Bosnje dhe Hercegovina, Mali i Zi, Maqedonia e Veriut dhe Serbia. Modeli ekonometrik përfshin shtatë variabla të pavarura: PBB për frymë, hapja tregtare, punësimi në bujqësi, punësimi në industri, punësimi në sektorin e shërbimeve, inflacioni dhe kredia për sektorin privat. Gjetjet mbështesin hipotezën e Kurbes së Kuznets-it duke treguar se PBB-ja për frymë ka një lidhje në formë U të përmbysur me pabarazinë në të ardhura. Gjithashtu, ndërkohë që punësimi në industri dhe sektorin e shërbimeve, si dhe disponueshmëria e kredisë për sektorin privat lidhen me uljen e pabarazisë, punësimi në bujqësi dhe inflacioni tregojnë një lidhje pozitive me pabarazinë. Është interesante të vihet re se hapja tregtare nuk solli gjithmonë rezultatet e parashikuara nga teoria, dhe rezultatet ndryshonin në varësi të vlerësuesit të përdorur.

Duke aplikuar teknika vlerësimi të fuqishme dhe të ndjeshme ndaj heterogjenitetit në një kontekst rajonal në tranzicion, ku ka mungesë kërkimesh empirike, këto rezultate mund të jenë më informative për literaturën dhe të rrisin ndikimin e politikave për një rritje ekonomike gjithëpërfshirëse në Ballkanin Perëndimor.

Fjalë kyçe: Kurba e Kuznets-it, Pabarazia në të Ardhura, Zhvillimi Ekonomik, Ballkani Perëndimor, Të Dhëna Panel.

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DECLATARION

I hereby declare that this Master's Thesis, titled "Testing the validity of Kuznets' Curve hypothesis: A heterogeneous panel estimation for the Western Balkans" is based on my original work except quotations and citations which have been duly acknowledged. I also declare that this thesis has not been previously or concurrently submitted for the award of any degree at Epoka University, any other university, or institution.

Marinela Çopa

June 2025

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LIST OF ABBREVIATIONS

ADF	Augmented Dickey-Fuller
ARDL	Autoregressive Distributed Lag
AMG	Augmented Mean Group
BRICS	Brazil, Russia, India, China and South Africa
CCEMG	Common Correlated Effects Mean Group
CD	Cross-Sectional Dependence
DFE	Dynamic Fixed Effects
DOM	Domestic Credit to Private Sector
EMPA	Employment in Agriculture
EMPI	Employment in Industry
EMPS	Employment in Services
EU	European Union
FDI	Foreign Direct Investment
FE	Fixed Effect
GDP	Gross Domestic Product
GMM	Generalized Method of Moments
HAC	Heteroscedasticity and Autocorrelation Consistent
IMF	International Monetary Fund
INEQ	Inequality
INF	Inflation
IPS	Im, Pesaran, Shin

LLC	Levin, Lin and Chu test
MG	Mean Group
NICs	Newly Industrialized Countries
OECD	Organisation for Economic Cooperation and Development
PMG	Pooled Mean Group
PP	Phillips-Perron
R&D	Research and Development
SDGs	Sustainable Development Goals
STATA	Statistics/Data Analysis Software
TRADE	Trade Openness
UN	United Nations
WB	Western Balkan
WDI	World Development Indicators
WID	World Inequality Database
WTO	World Trade Organization

CHAPTER 1

INTRODUCTION

During the last decade, income inequality, as one of the factors directly affecting the population's standards of living and prospects, has become a crucial concern for scholars and policymakers, especially in economies undergoing transition and structural reforms. Albania, Bosnia and Herzegovina, Montenegro, North Macedonia, and Serbia have demonstrated significant social and economic transformations, which are linked to unequal income distribution. To comprehend the interlink between economic and distributive aspects in these countries and the economic growth is very important to know how the policies can stimulate inclusive growth. This study uses the Kuznets curve theory as a framework to analyze the growth of income inequality in the Western Balkan region. This study aimed to provide a far more empirical and thorough understanding of the main causes of growing inequality by utilizing the panel-data approach.

1.1 Objectives of the Study

The nexus between income inequality and economic development is the main objective of this study, which will be examined in the context of the Kuznets curve hypothesis for 5 Western Balkan countries. The study, particularly, is set to establish whether economic growth and income inequality in these economies are inversely related in their function as an inverted-U relationship. This study also examines how trade openness, employment structures (agriculture, industry, and services), inflation, and domestic credit to the private sector have changed trends of income inequality in Albania, Bosnia and Herzegovina, Montenegro, North Macedonia, and Serbia over the period 2008-2023.

1.2 Research Questions

The research questions that came up in this study include the following:

1. Is the Kuznets' curve hypothesis valid for the Western Balkan states?
2. To what extent is income disparity influenced by the level of economic growth in these countries?
3. How would income inequality be affected by trade openness, sectoral employment distribution, macroeconomic volatility, and the stage of financial development?
4. Are there notable differences among countries in the explanatory factors of income inequality?

1.3 Research Hypotheses

Considering the Kuznets curve framework and existing literature, the following hypotheses are proposed:

- **H1**: There is an inverted U-shaped correlation between GDP per capita and income disparity in the Western Balkan countries, consistent with the Kuznets curve.
- **H2**: Economic growth significantly affects income inequality.
- **H3**: Higher trade openness, a greater share of employment in industry and services, greater access to domestic credit to the private sector, and lower inflation are all associated with reduced income inequality, whereas a higher share of employment in agriculture is associated with increased income inequality.
- **H4**: There are cross-country differences in the effects of explanatory variables on income inequality across the Western Balkan countries.

1.4 Motivation of the Study

This study was motivated by the developing socio-economic prominence of income distribution concerns in the Western Balkans, a region identified by political transformations, emerging economies, and aspirations to become part of the European Union. For the Kuznets curve, there has been considerable investigation and research in a

more global and larger context. Still, studies that are more specific to the countries in the Western Balkan region remain limited. This is very important for determining the differing paths of development among countries and for informing appropriate policy measures for more equitable economic development.

1.5 Novel Contribution of the Study

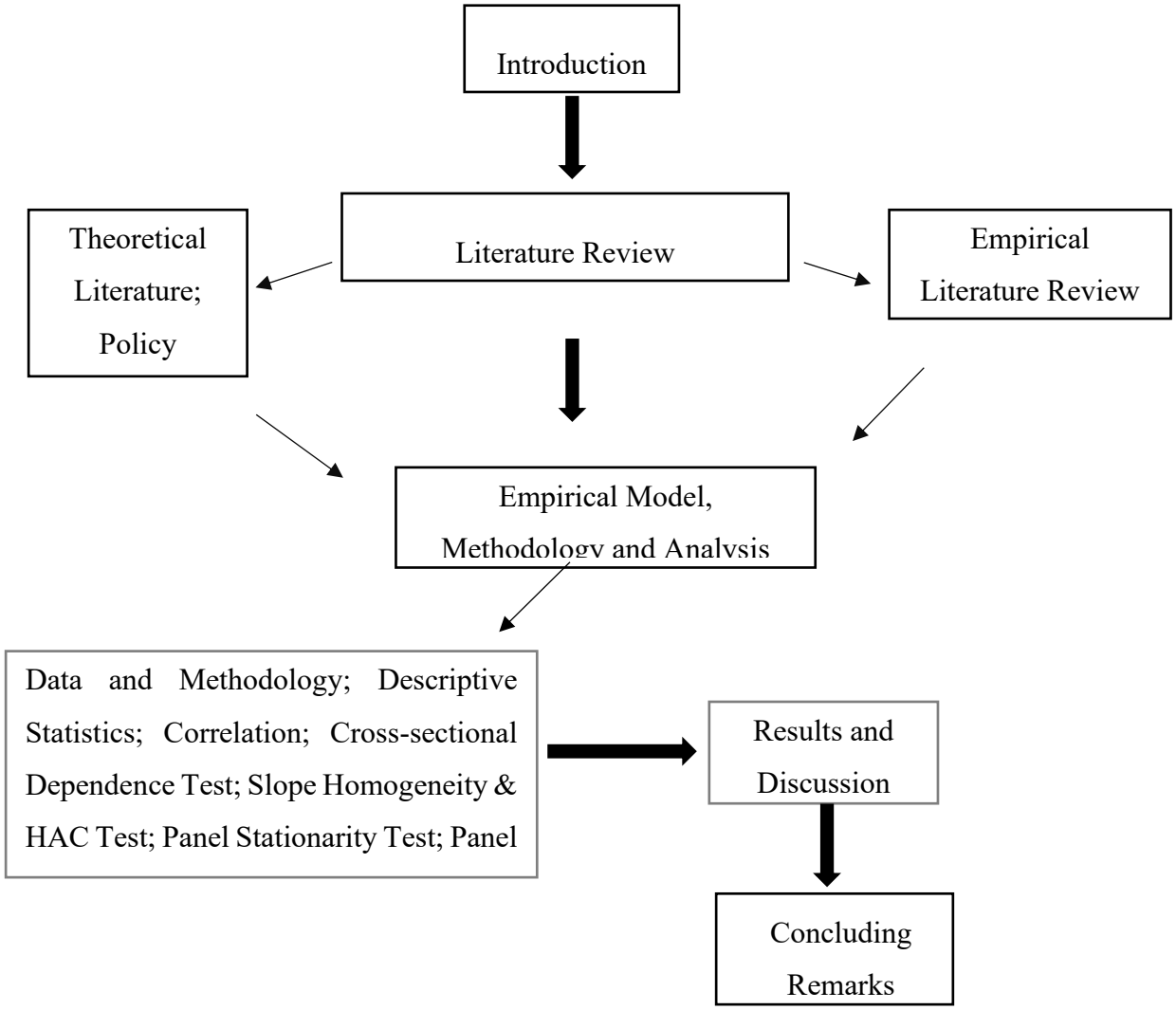
This study will contribute by offering an in-depth and up-to-date panel data analysis of the factors affecting income inequality in the Western Balkans, a field often skipped by empirical research. The research is intended to solve the hard-to-understand pattern of unequal distribution of income by using a wider set of independent variables (which include and extend beyond the already known economic indicators) with a special spotlight on the patterns of sectoral employment. It also links the study of the Kuznets curve in an extensive, special way, providing a great deal of new, insightful knowledge on the topics of inequality and development for the current academic and policy discussions.

1.6 Scope of the Study

The analysis refers to the available data covering a range of years, from 2008 to 2023, for the five countries of the Western Balkan region: Albania, Bosnia and Herzegovina, Montenegro, North Macedonia, and Serbia. The income inequality, which is the dependent variable, has a strong correlation with various independent variables such as GDP per capita, trade openness, employment in agriculture, industry, and services, inflation, and domestic credits to the private sector. This has been examined through panel data econometric techniques. The method is expected to capture broad trends across nations and specific country-level factors influencing patterns of income distribution.

1.7 Analytical Framework

Figure 1.1 serves as a diagrammatic representation of the paper's analytical framework. Firstly, the introduction part provides objectives, research questions and hypothesis, motivation, contribution, and scope of the study.



Source: Author compilation.

Figure 1.1 Analytical Framework

Afterwards, the literature review, which is divided into: empirical literature review and theoretical literature, and policy implementation. Basic theories and conclusions of previous authors are provided in these sections to make our research more evident and in coherence with theory and earlier research carried out by different authors and institutions in different regions. The empirical model, methodology, and analysis were developed utilizing the knowledge gained from the literature and constructed the analytical framework for putting the hypotheses to the test. The data and methodology section describes the variables, econometric approaches, and data collection methods, then supports the model. The data analysis findings will also be analysed in the context of the literature in the results and

discussion sections as mentioned above, and finally, the conclusions will summarize the main findings and implications of the study.

1.8 Structure of the Thesis

The research paper comprises chapters that are put in a logical stream, each chapter containing topic-related content.

The second chapter covers the most important theories that have been analyzed in the literature through the effect of the Kuznets curve theory. In addition, it provides a brief review regarding the framework that links the other study variables to inequality. This section broadly presents a review of the economy and financial state of WBs through presenting data and graphs of some critical indicators and their implementation in WBs.
The third section then proceeds with a critical examination of the empirical literature. Contemporary papers are chosen among the several studies for the study variables aimed at explaining the relationships among the variables in different countries. A table is included, summarizing all relevant information from all research scholars who dealt with the topic factors after completing the literature evaluation.

The fourth chapter of the thesis includes the methodology, empirical analysis, and findings all appear. This chapter has also enhanced understanding of the meanings of the variables, the source of the data collection, and the duration of time in conducting the analysis to meet the objectives of the thesis.

The final chapter serves as a summary of the thesis overall and presents conclusions and recommendations. This section is separated for clarity so it can be more easily distinguished from the recommended changes indicated in the findings, plus limitations of the research, which should be a guide in future directions for researchers.

CHAPTER 2

THEORETICAL BACKGROUND AND POLICY IMPLEMENTATION IN WESTERN BALKANS

The connection between economic development and income inequality has long been a central theme in economic theory, policymaking, and empirical research. To implement society's social and economic policies, it is crucial to understand how and why inequality occurs and how it interacts with the various stages of development. These dynamics propose a strong case for the research of factors that concern the Western Balkan countries of Albania, Bosnia & Herzegovina, Montenegro, North Macedonia, and Serbia. Since the Yugoslav uprising in 1991 and its economy having transitioned from a centralized to a market-oriented system, these nations have gone through quite a bit politically and economically. Nevertheless, they still suffer within the seams of income inequality, inefficiencies in the labor market, and institutional weaknesses.

Moreover, the presence of theories about income inequality makes the hypothesis of the Kuznets curve a very instructive framework to grasp the patterns of inequality witnessed during structural transformation and economic booms. The reasons why sectoral movements, globalization, investment patterns, and governmental policy all contribute significantly to income disparity are explained by both classical and modern economic theories. Additionally, researchers can learn about the advantages and disadvantages of the different strategies used to promote equitable growth by looking at actual policy interventions implemented in Western Balkan nations, some of which were influenced by international issuing organizations like the World Bank, European Commission, and International Monetary Fund.

Following a thorough explanation of the Kuznets curve hypothesis and a summary of the various policy initiatives implemented in the Western Balkans to combat inequality, this section will examine significant academic research and institutional reports on the theoretical underpinnings of economic development and inequality.

2.1 Theoretical Background

Various theoretical frameworks have been used to study the relationship between economic growth and income inequality. The central justice who directed the course of the debate, Karl Marx pointed out essentially the core inequities of the capitalist systems, whereas classical economists like Adam Smith and David Ricardo were concerned mostly with how market forces and capital accumulation will shape income distribution (Smith, 1776; Ricardo, 1817; Marx, 1867). In his criticism, Das Kapital, Marx (1867) argued that unequal social classes are the product of a capitalist economy. He argued that workers face stagnant pay, known as the immiseration of the proletariat, while capital accumulation leads to capital owners concentrating more and more wealth. Unlike other scholars, he focused on the deeper inequalities rooted within capitalism and forecasted that without social or political change, the divide would only continue to widen.

In the book Smith (1776), The Wealth of Nations, the case was introduced that income distribution would inevitably be influenced by market forces. Though he admits that inequalities could arise based on capital concentration, resulting in higher wages. Differential land rent and capital accumulation were concepts introduced by David Ricardo (1817) in 'Principles of Political Economy and Taxation'. He suggested that the expansion of the economy will result in widening income inequalities among capitalists, laborers, and landowners. He strongly believed that income disparity is a vital symptom of development, mostly when the increased profits from capital and land outpace the growth in wages.

Neoclassical theories later appropriated the concept of factor returns, going on to postulate that inequality is caused by divergences in the returns on labor and capital (Mankiw, 2007). According to the structuralist ideas emerging in the post-World War II era, such changes create peculiar inequities in the transition from agriculture to industry during the phases of economic development (Lewis, 1954). This was the basis on which Simon Kuznets

propounded his novel theory on inequality and progress. It suggested a systematic, non-linear relationship between inequality and development.

2.1.1 The Kuznets Curve Hypothesis

Kuznets, in 1955, based his theory that over time, income disparity initially increases as an economy comes into existence and thereafter gradually diminishes. Kuznets suggests that a concentration of wealth in the hands of those capable of taking advantage of new opportunities in growth is a characteristic of the earlier phases. Those deserving attention are largely in the industrial sector; Kuznets analyzes, among developed nations, the historical data available for the various growth phases. But the problem of economic disparity goes down as technology grows, with more capital, good jobs for people, and, of course, education. The Kuznets curve has been drawn visually inverted as a U-shape, which has GDP per capita on the horizontal axis and income inequality on the vertical axis.

The Kuznets hypothesis has been under investigation for several regions and at different periods. However, in their cross-country analysis, Deininger and Squire (1998), for example, found contradictory evidence on the inverted U-relationship. Recent literature states that globalization, technical innovation, and institutional factors may have played a role in bending or even reversing the usual Kuznets curve (Kanbur, 2000). The Kuznets curve hypothesis posits that as development evolves, inequality first rises and later falls. Industrialization in the first stage inhibits the concentration of capital, while wage inequality and rural-to-urban mobility against the income level mean all push the income differences far higher. It is expected that programs for social welfare, democracy, and greater access to education will eventually provide a more level playing field and thus reduce inequality (Kuznets, 1955). The Great U-Turn, a reversal of the decline in income inequality during this period, is the main subject of their research, wherein they test the Kuznets Curve hypothesis across US counties, 1970 - 1990 (Nielsen and Alderson 1997). Other than their analysis, income inequality in the US began to rise again after a decline in the first half, thus contradicting Kuznets' theory by not showing a classic Kuznets Curve.

However, certain empirical findings appeared instead to demonstrate contradictions. Fields (2001) specified that due to differences in the institutional frameworks and the levels of globalization, some countries follow the inverted U-shaped pattern, while others greatly

diverge from it. Additionally, it means that as developmental processes may proceed, inequalities can nonetheless persist or become aggravated since the new literature does not pay much attention to those structural inequalities (Piketty, 2014). Such subtle determinations are very important in the Western Balkans moving into an area greater and increasingly integrated into the global economy and, at the same time, changing from centrally planned to market-oriented economies, often coupled with sociopolitical turmoil.

2.1.2 Premature Deindustrialization Process in the Kuznets Curve Framework

The Kuznets' hypothesis is still one of the basic ideas in the study of development and economic inequality; however, it has been met with strong theoretical opposition. The fundamental idea of it, that the growth process is linear and equal in all cases, has given rise to one notable criticism. It is argued by critics that this model is too far from being a reality of development that the development of some nations, being in the middle of the developmental process, and the structural change itself, are quite difficult to comprehend. Kuznets curve is hence reducing the problem space a lot, even though it is quite complex because it does not take the class dynamics, institutional frameworks, and power dynamics into account from a political economy perspective.

Moreover, the Kuznets curve holds a theoretical disadvantage in being heavily dependent on the notion of industrialization, resulting in parity at one point. The hypothesis of this supposition, however, gets a reality check when one considers the kinds of socio-economic transformations, such as financialization, early deindustrialization, and technological polarization, which can prevent the move from unequal to equable, said the authors.

Tregenna (2016) puts forward the view of a thorough theoretical analysis of the cause and effect of deindustrialization, particularly in emerging nations. She draws the distinction between negative or premature deindustrialization, when manufacturing declines at lower levels of affluence and industrial development; and positive deindustrialization, which is said to occur naturally in advanced countries through productivity gains and sectoral shifts. Tregenna (2016) emphasizes that the beginning of the deindustrialization stage could be the decline of the industries that have been relied upon for employment and productivity throughout the history of the nation, which may hinder structural change and economic growth. She argues that such a trend could really be the result of the changes in the economy

that are not good for growth, and thus, must not be considered only as a statistical error. To minimize the negative effects of early deindustrialization and drive the growth of the local industry, leading to sustainable economic development in developing countries, the article underscores the importance of the implementation of industrial policy.

From the structural transformation view, Rahman and Schmillen (2020) conclude that there is a link with the Kuznets curve hypothesis. Specifically, the Kuznets curve indicates that when economies transition from agriculture to industry in their early stages of growth, income inequality tends to rise. Income disparity starts to decrease as more people get access to better-wage occupations, and the incomes have been fairly distributed in the latter stages. The initial phase of Kuznets is believed to follow Malaysia's transformation from farm to factory and enterprise, or structural transformation, wherein inequality could increase due to unequal productivity and pay growth across sectors. The emphasis on the need to reduce regional and sectoral disparities, however, corresponds to the second stage of the Kuznets Curve, where specific policies can act to flatten or reverse the inequality trends with further growth.

According to the paper of Rapacki (2016), while structural reforms have somewhat taken place in a handful of Western Balkans, the most prominent examples being Albania and North Macedonia, overall progress remains uneven and far behind that of their Central European counterparts. Competition continues to be negatively affected by pervasive institutional weaknesses and other macroeconomic issues such as a slow rate of growth and widening income disparities. The report emphasizes the need for comprehensive and sequential structural reforms for further macroeconomic improvement and global competitiveness in the region.

In the paper of Cengiz and Manga (2024), which study the effect of economic globalization on deindustrialization for five Western Balkan countries, using AMG estimation for the period 2000-2019, it is concluded that economic globalization has promoted industrialization in most countries, contrary to concerns that it might damage industrial regions. Specifically, industrial employment and its participation are positively influenced by economic globalization, along with other factors such as economic development and capital investments. So, rather than causing deindustrialization in the region being studied,

specifically for Albania, Bosnia and Herzegovina, Montenegro, North Macedonia, and Serbia, economic globalization encourages industrialization.

The paper by Ravindran and Suresh Babu (2021) studies the linkage between income inequality and premature deindustrialization for middle-income countries, using fixed effects models. This study indicates that in the event of early deindustrialization along with people's shift to low-productivity informal service sectors, for instance, in the field of trade, transportation, hospitality, and accommodation, there will be an increase in inequality among the population. In the situation of early deindustrialization, services can reduce income inequality if it is mostly filled with high-productivity, non-market services.

Araujo et al (2021) investigate the main drivers of deindustrialization for the period 1970-2017 in both emerging and advanced markets. The study has identified one of the most essential driving forces of deindustrialization, which is a nation's stage of economic development. When a country's economy is open to trade, the negative trend of the local currency is an indicator of the increase in the manufacturing value added in emerging economies. However, industrial production of developed countries has been observed to diminish which results from productuion outsourcing and financialization, even though trade still helps the industrial sector.

Kandžija et al. (2017) research the issue of the deindustrialization in the European Union. These authors assert that the EU is facing relative deindustrialization, which is marked by the growth of the service sector and a decrease in the GDP and employment share of industry and agriculture. It is important to point out that the reasons for the decline in industrial employment are the rising foreign direct investments and globalization instead of a decrease in industrial output.

The study carried out by Stevanović et al (2013) focuses on long-term deindustrialization of Serbia, which illustrates the catastrophic decline in industrial output and employment that was experienced after the country transformed from a socialist to a market economy in the 1990s. Unlike other countries in Eastern Europe, Serbia was not able to appease its industrial base, and by 2009, the share of this sector in GDP had decreased from almost 44% in the 1980s to only 15.9%.

In an analysis about Montenegro's deindustrialization, employed by Tomljanović et al (2018), these is concluded that in the country, a consistent decrease in the sector of industry sector and GDP share is seen since 2001. The author's suggestions about reindustrialization are linked with higher productivity, R&D investment, and alignment with EU integration goals, attributing this to both structural and economic transition obstacles.

The article by Lazarov (2024) analyses the impact of the manufacturing industry on the economic growth of North Macedonia for the years 2002-2022. It indicates that the contribution of the manufacturing industry to GDP almost doubled from 8.4% to 13.1% during the post-deindustrialization phase, alongside enhanced productivity during the period. Productivity increases are registered due to foreign direct investment and the shift from low-value subindustries to higher-value-added equipment and automobile manufacturing. The study concludes that the growth in GDP has been significantly propelled by increased activity within the manufacturing sector. It further suggests that to sustain growth, additional deindustrialization, investment in modern technologies, and further advancement of economic structural changes should be adopted.

2.2 Policy Implementation in the Western Balkans

To mitigate economic disparities and promote inclusive growth, the countries of the Western Balkans have adopted innumerable policies, especially concerning their aspirations for membership in the European Union. The European Commission (2023) states that within the area of economic development, structural changes were prioritized in education, flexibility of the labor market, and social protection systems aimed at poverty reduction and regional differences. But it does have its challenges. As noted by the World Bank (2021), ongoing inequality in the region is, to a large extent, directly related to unemployment levels, informality, and restricted access to quality health and education. National governments, for their part, have taken steps to promote the growth of the private sector, put in place targeted social assistance programs, and effect reforms in the labor market (European Commission, 2022).

Regional economic integration, as professed by the Western Balkan Six (WB6) program that is supported by the European Commission and the Regional Cooperation Council, is embraced by developing states for inclusive growth at the regional level (Regional

Cooperation Council, 2021). Concerning this issue, world institutions have considered advocating among nations, fostering human capital, strengthening fiscal frameworks, and improving governance to mitigate rising inequality. Examples of the influence of such organizations are found in policy documents such as the International Monetary Fund (IMF, 2022).

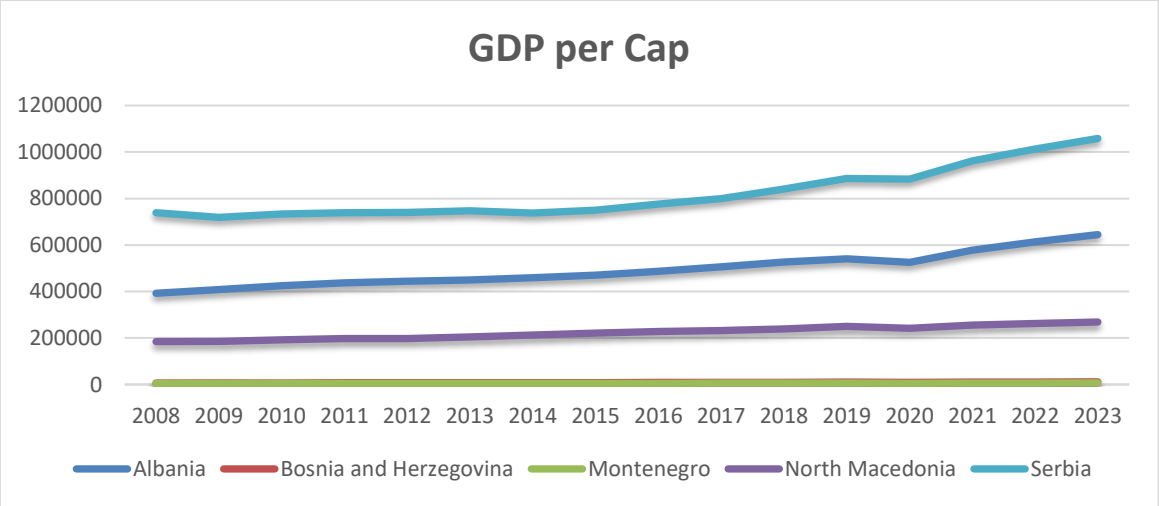
Notwithstanding the remarkable effort placed in doing so, there was no complete realization of policy objectives owing to implementation gaps, political instability, and institutional weaknesses (World Bank, 2021). The Western Balkan countries thus have to address inequalities as well as sustainable development in a transparent way and with effective governance, permanently adhering to the standards of the EU.

The report by Jovanović and Vujanović (2023), found that the Western Balkans are rediscovering industrial policy as an instrument for economic development, having been neglected for many years. The sectors under consideration given by the authors are IT, energy, tourist, agri-food, textile, and automotive. They argue for sector-specific strategies, like promoting high-end products in agri-food, superior end products in textiles, and advanced technologies in automotive. Furthermore, they stress the need for clever specialization strategies coupled with EU and Austrian support to finance such strategies and provide technical assistance and best practice exchange, including Austria's dual education system and social partnership model. The report proposes partnerships with countries such as Japan to attract private investments while stressing the EU’s need to establish regional governance support offices for better access to EU funds. To improve the Western Balkans' competitiveness, foster innovation, and ensure sustainable economic development, the authors argue that a strong and well-supported industrial policy is vital.

Economic growth in the long run is identified as a "transition process." According to Chenery (1960), the lower the share of manufacturing in a country, the more this reflects the productivity (and price) differences between produced goods and services. Thus, manufacturing was regarded as the most active sector in creating technologies and jobs and producing tradable goods, which are supposed to nurture the building of larger and stronger interlinked networks, whereas agriculture and services were rather static.

The initial spotlight on the importance of industrial connections in development processes was cast by Albert O. Hirschman (Hirschman, 1958). In general terms, both the so-called "advanced" and "backward" economies have viewed industrialization as one of the key determinants of economic development.

Figure 2.1 shows the development of GDP per capita for five Western Balkan countries during the period between 2008-2023. The data for constructing the graph was taken from the World Bank. Serbia, Albania, and North Macedonia consistently share the first places in the rankings of countries with the highest GDP per capita, with Montenegro and Bosnia & Herzegovina then standing at the bottom. Almost all the nations have displayed a steady increase in GDP per capita, indicating slow economic growth. There was a huge jump in the GDP per capita figures for both Serbia and Albania, which, however, stems from either the delight in growth-friendly policies or mainly due to foreign investment entering the market after 2017. This information is to empirically test by the later suggestions of Kuznets that a rise in GDP per capita in these countries must correlate with lower income inequality, or is the case that inequality has remained in place or worsened, implying departures from the expected pattern in transitional economies like those of the Western Balkans.

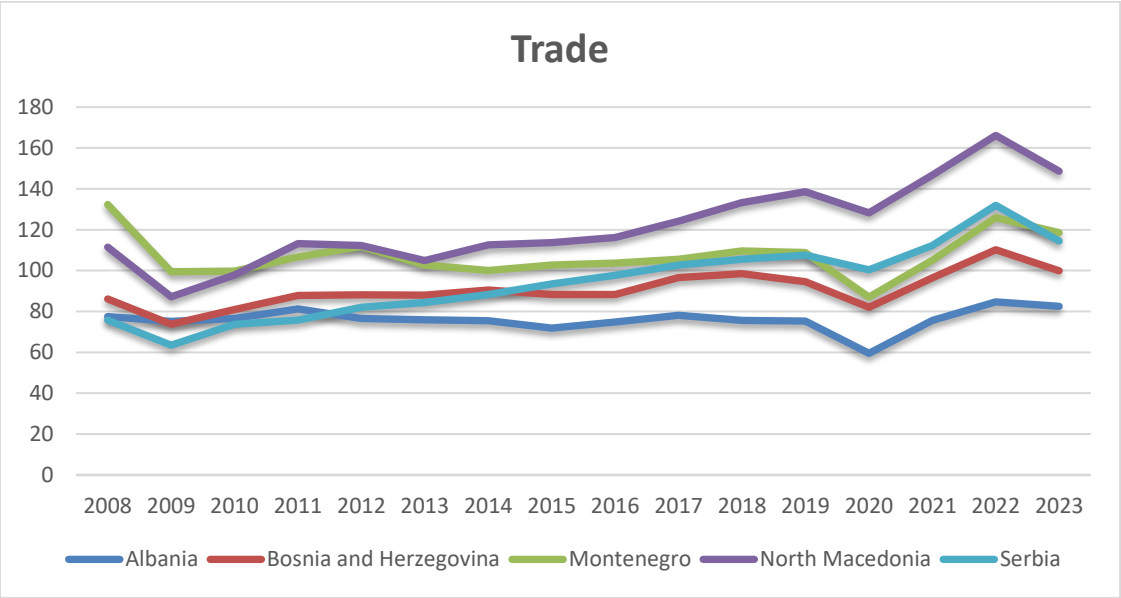


Source: Author compilation.

*Figure 2.*1 GDP per capita in the WBs.

Figure 2.2 depicts the development of trade openness during the period 2008-2023 using data from World Bank, which is usually calculated as the total of imports and exports over GDP. Montenegro and North Macedonia, however, always have higher levels of trade

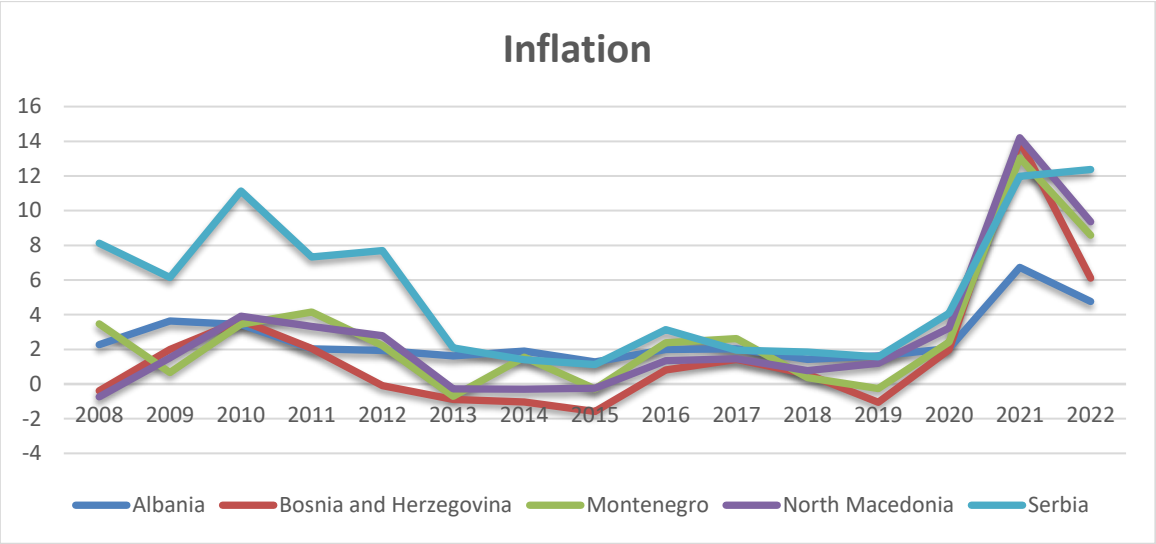
openness. This is what tells one that such economies are still more oriented towards international links. On the contrary, Bosnia and Herzegovina and Albania have lower trade proportions, which can suggest economies less integrated or even more locally focused. Serbia's commercial involvement is growing steadily but modestly. After 2020, there was a major increase in trade openness for North Macedonia, which could indicate an increase in foreign trade relations or a shift in certain policies.



Source: Author compilation.

Figure 2.2. Trade in the WBs.

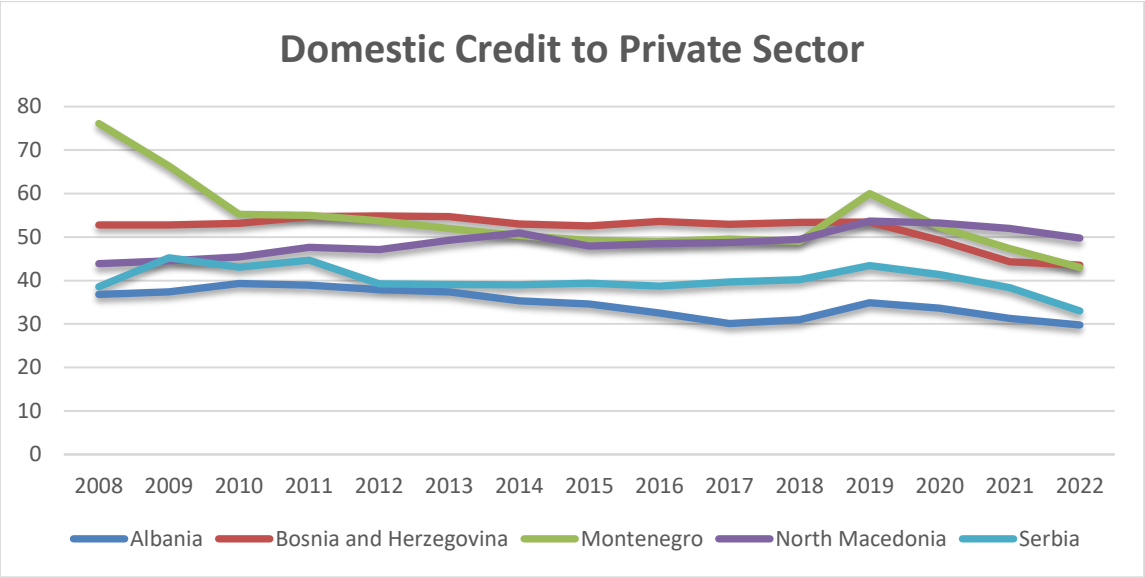
Figure 2.3 shows inflation data taken from the World Bank. The low inflation with little fluctuation was handled by all the nations for years. But substantial hikes in inflation were recorded in all five countries in 2021, by way of reflecting international economic issues. Serbia had the most remarkable increase in the years 2010 and 2021-2022. Inflation rates reached their highest in 2021 and then slightly fell in 2022 while remaining elevated relative to pre-2020 levels. This pattern suggests a localized response to global inflationary pressures occurring in the early 2020s.



Source: Author compilation.

Figure 2.3 Trade in the WBs

Figure 2.4 shows data from World Bank for Balkan nations between 2008 and 2022 about the share of GDP allocated to the private sector in the form of loans. Montenegro was credited with a high value of more than 75% of GDP in 2008, and after that, its credit level has been steadily decreasing, leaving it with an amount just over 50%, which has gone down a bit more until 2019. Bosnia and Herzegovina has remained at its credit level of approximately 55% for the majority of the time, decreasing slightly post-2019. Up until around 2019, North Macedonia and Serbia both reflected upward trend movements. They rather both show a downtrend until the year 2022. During the period, Albania has recorded the lowest credit levels, fluctuating very minimally but remaining at less than 40% of GDP. After 2019, the private sector lending usually recorded slow growth or stagnation across the regions and could be due to tighter financial conditions or unstable economic circumstances.

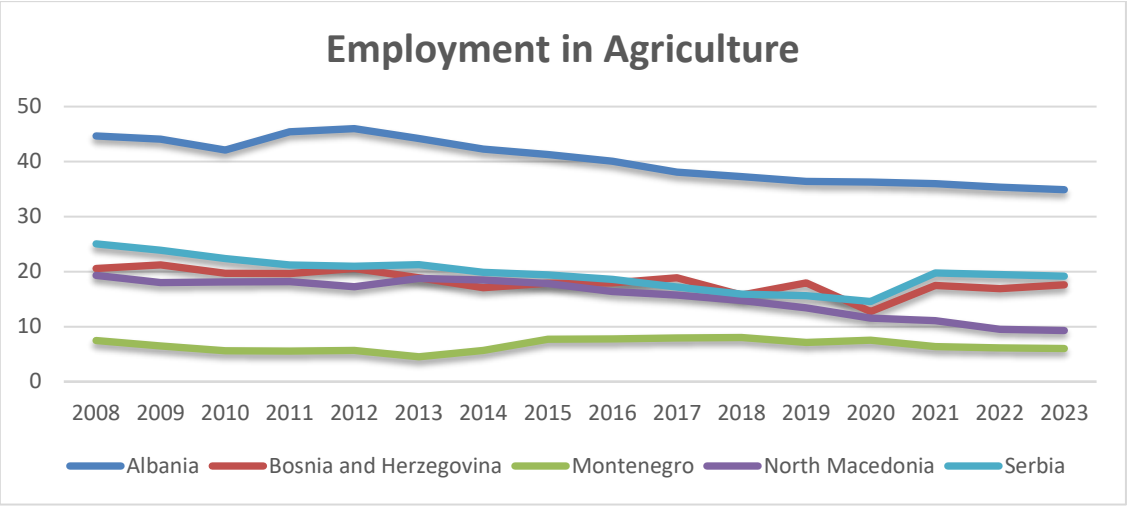


Source: Author compilation.

Figure 2.4 Financial Development in the WBs

Figure 2.5 illustrates shifts in agricultural employment across five Western Balkan countries, Albania, Bosnia and Herzegovina, Montenegro, North Macedonia, and Serbia, over the period from 2008 to 2023. Observation of the trends from the graph indicates that due to slower structural change, Albania consistently maintained the highest agrarian employment share, which commenced above 40% in 2008 and fell to roughly 35% by 2023.

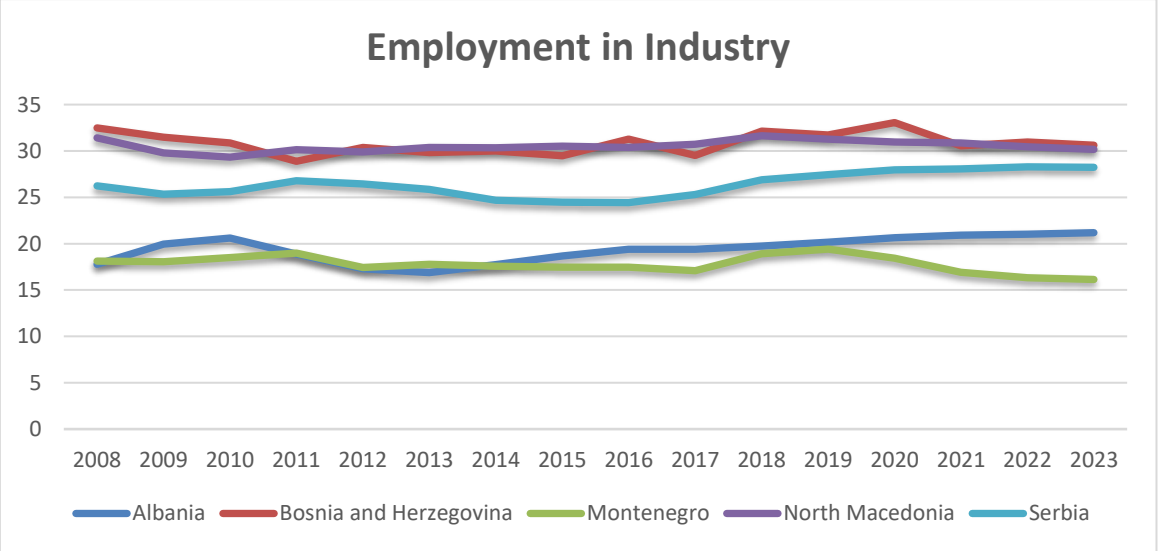
In contrast, levels did not fluctuate as wildly in Montenegro and Serbia and stayed substantially below 15%. North Macedonia saw a slight decrease, whilst Bosnia and Herzegovina had a more uneven pattern. These patterns indicate the shift of some countries from an agriculturally dominated economy to an industrial and post-industrial society; however, the source of employment is still located in the agricultural sector, at least in the case of Albania. This is associated with a significant proportion of agricultural employment being associated with economic stagnation and less productive activities, aggravating income inequality, especially in rural regions. This pertains to the issue of income inequality and employment in the agricultural sector.



Source: Author compilation.

Figure 2.5 Employment in Agriculture

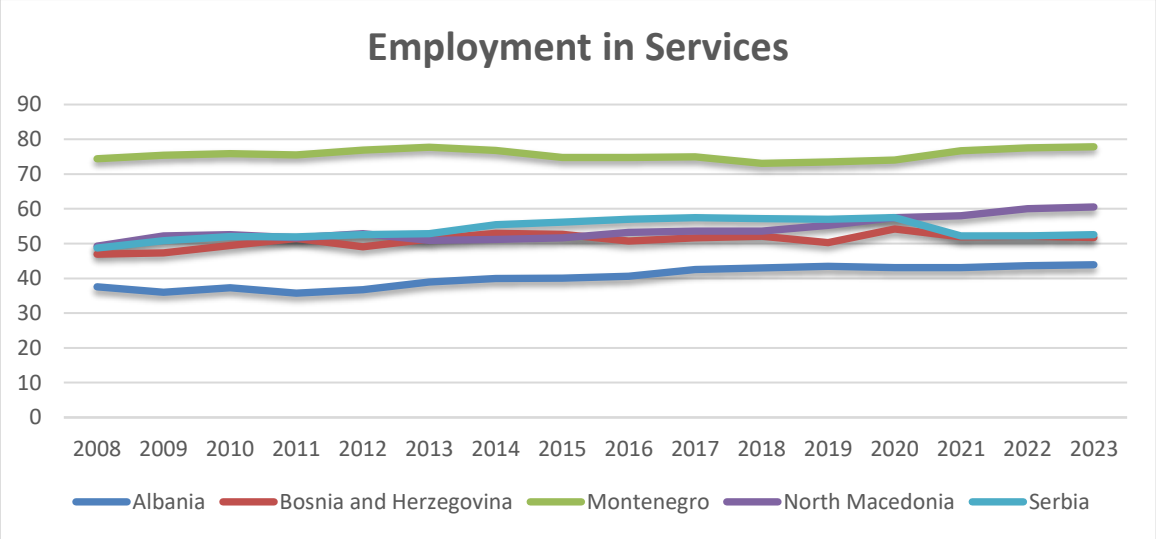
Figure 2.6 presents the share of employment in industry for five Balkan countries from 2008-2023. In every annual cycle, Bosnia and Herzegovina, along with North Macedonia, were superior in the industrial sector employment rate, having remained in the range of 30-33%. Serbia emerged from a constant pattern to reach 29% in 2023. Albania and Montenegro are on quite the opposite side, with values less than 22%. The whole figure represents the data at a medium shift in structure, which means that there are still sectors highly contributing to employment in the industry.



Source: Author compilation.

Figure 2.6 Employment in Industry

Figure 2.7 demonstrates the trend of employment in the service sector of five Balkan countries from 2008-2023. Montenegro is clearly shown to be the leader in the service sector, with the figure constantly staying above 70%, thus revealing an extensive reliance upon tourism and associated activities. North Macedonia, Serbia and Bosnia and Herzegovina are also on the rise, with the proportion of the service sector being close to 55-60%. Meanwhile, the graph of Albania reflects moderate growth from 36% to almost 45%. It seems that those numbers point out that the area has moved from being a heavily industry-led economy to a service-oriented one.



Source: Author compilation.

Figure 2.7 Employment in Services

CHAPTER 3

EMPIRICAL LITERATURE REVIEW

Today, a thorough understanding of what causes income inequality in transition countries, particularly in the Western Balkans, is critical. With the continuing post-socialist evolution and further integration into the EU, the forces of income distribution have been intricately molded by economic growth, sectoral shifts in the employment workforce, access to credit, and price stability. Many of these relationships have been studied empirically from various perspectives, which in turn have produced uncertain but highly interesting results. The findings are more relevant and generalizable across sectors and the country groups considered. The ability of various setups regarding the economic arrangements and policies of the EU, OECD, and BRICS countries has been researched to consider the issues about the dynamics of income distributions. This section examines the existing empirical research about the study variables framed within the Western Balkan context.

3.1 Income Inequality–Economic Growth Relationship

Regarding the study of development economics, the relationship between per capita income and income distribution is very important, concerning the Kuznets Curve theory. According to this theory, during the initial stages of economic growth, inequality increases but begins to diminish at some income level (Kuznets, 1955). Advancing and transitioning economies provide ample research evidence for such nonlinearity (Barro, 2000; Deininger and Squire, 1998). A panel data analysis from 100 countries was conducted by Barro (2000), in which he found that an increase in economic growth leads to an increase in the initial stages of income inequality but has a tendency to go down after reaching the threshold of development.

Bucevska (2019), in a panel data analysis of the main factors affecting income inequality for three EU candidate countries (Turkey, North Macedonia, and Serbia), concludes that there is a positive correlation between income inequality and GDP, so when income increases, there will also be an increase in inequality. This result is consistent with the Kuznets curve hypothesis. However, in the study, including countries like the USA, UK, France, and Germany, Sayed and Peng (2020) analyzed the relationship between income distribution and economic growth. The results of the study show that in a long-term period, the curve is like an "N-shape", which does not support the Kuznets curve theory. Mongi and Kais (2018), analyzing income inequality for the period 1990-2015, including 11 developing countries, find that there is a bidirectional causality between growth and income distribution. A study by Velkovska et al. (2021) examines the relationship between income inequality and economic growth in Balkan countries, including EU members such as Greece, Bulgaria, Croatia, and Slovenia, as well as EU candidate countries like Bosnia and Herzegovina, North Macedonia, Albania, and Serbia, during the period from 2001 to 2012. The research tests the applicability of the Kuznets curve and concludes that a U-shaped relationship exists, consistent with Kuznets' theory, indicating a positive correlation between income inequality and growth in the initial stages, which diminishes as countries attain certain income levels. The findings indicate that income disparity is lower in EU member states than in EU candidate nations. Member states may have more robust institutional structures and social policies that support equity, which could be the reason for this.

In the BRICS countries, as stated in the work of Acheampong et al. (2023), income inequality creates economic growth for China, South Africa, and Russia, but negatively affects the poorer regions of Brazil and India. In addition, the growth of the middle and upper classes of India is more developed. The authors Dorasamy and Kikasu (2024) in their study claim that the persistent internal disparities in wealth and human development impede the capacity of the BRICS group to lead the economy. Internal disparities may preclude inclusive growth and may also limit the collective negotiating ability of the group on the international stage. The BRICS group must therefore resolve these issues because it is only in addressing these disparities that they will be able to be strong enough to lead the global economy.

An extension of this analysis was conducted by Rajaguru et al. (2023) for 24 OECD countries, in which it was mentioned that there was a reduction in long-term income inequality for countries in this region with further growth, which was in line with Kuznets'

hypothesis. On the contrary, in a study of Li and Zou (1998) on BRICS countries, it was suggested that because these countries experience structural imbalances and limited mechanisms of social redistribution which are limited, growth can make inequality worse. In more advanced economies, inequality falls but goes up in low-income countries, thus further emphasizing the regional divisions, as concluded in the study of Cornia and Court (2001). Furthermore, the study carried out by Voitchovsky (2005) on OECD panels empirically shows that growth without the intervention of progressive taxes generally favors the upper classes. Bourguignon and Morrison (2002) analyze income inequality and economic growth on a global scale, considering how regional factors are major determinants of the pattern of inequality's growth. Herzer and Vollmer's (2011) use of a panel of 114 nations supports the inverted U-shape theory. However, it emphasizes the impact of the institutional framework on the reduction of inequality during periods of economic growth. These findings underscore the importance of taking spatial variance into account when studying the connection between GDP and inequality. Income inequality affects economic growth not in a positive way, both the long and short run, as mentioned in the paper of Tsitouras and Papapanagos (2025). This means that in the case when wealth is shared equally or more evenly, it would create opportunities for people to have access to education and resources, and encourage more investment in human capital. The study of Alves et al (2022) investigates the relationship between income inequality and economic growth for the period 1990-2019 within the OECD countries. The authors find that there is a U-shaped relationship between growth and inequality, suggesting that increases in GDP lead to a reduction in the distribution of income among people. Yet another rise in these economic metrics after a certain point corresponds with worsening income inequality. This observation contradicts the classic Kuznets hypothesis, as it assumes an inverted U-shaped relationship between economic growth and income inequality. Grigoli et al. (2016) found that in the case of the Western Balkans, after a large increase in GDP per capita from the early 2000s, the benefits of this growth have not been appropriated fairly. Estrin et al (2009) suggested that political disturbances and structural transformation during the post-transition period had characterized a growth trajectory that was to create a widening exclusion of the disadvantaged and perpetuate high inequalities. Even though GDP per capita goes up, without further broad institutional reforms and redistributive laws, there will not be much decline regarding inequality in the Western Balkan countries that are more toward a Kuznets approach.

3.2 Income Inequality–Trade Openness Relationship

According to the traditional concept of trade openness, efficiency improvements and economic modernization are facilitated, but there are trade-offs in terms of inequality depending on the structure of the economy. Research evidence finds that trade openness may have different effects based on the economic structures and policy regimes. In a panel study conducted by Dollar and Kraay (2004), which includes both developing and developed countries, it is suggested that economic growth is influenced by trade openness. On the other hand, income gaps could worsen with trade openness if those benefits are not distributed. Trade openness stimulates economic growth only if there is good institutional quality that, in turn, harbors some degree of flexibility in the labor market (Bergh and Nilsson, 2010). Similarly, the research conducted by Basu and Guariglia (2007) shows that trade openness leads to a disproportionate increase in capital ownership benefits, which results in growing inequality among developed countries in the BRICS group of countries.

De Wettinck and Van Mourik (2024), in their study of income inequality and growth in the EU for the period 2002-2020, reveal that an increase in trade would reduce the inequality in EU member states. This suggests that economic integration is an important factor in the result of income distribution across nations. The paper by Dorn et al (2021) investigates the relationship between trade openness and income inequality for 139 countries during the period 1970-2014. The results show that in less developed countries, there exists a positive effect of trade, which reduces poverty in that area, while for more advanced nations, trade openness increases income inequality. The research by Carlos et al (2023) analyzes the impact of globalization on the income distribution for OECD countries. Results suggest a direct and positive impact of globalization on income distribution. Supporting institutions that in the past may have helped in reducing inequality may be indirectly affected by globalization. Vuković and Damijan (2025) in their study about drivers of income inequality in the OECD countries conclude that trade openness, financial globalization and technology make inequality worse, leading to wide income disparities in the region being analyzed. According to the study of Dorasamy and Kikasu (2024), domestic disparities prevent the BRICS nations from promoting fair trade policies and restructuring international financial institutions. Contrary to empirical evidence in transition economies, Stolper and Samuelson (1941) assume that trade liberalization should reduce wage inequality in labor-abundant countries. Trade openness in developing countries causes demand for skilled labor to

increase, as concluded by Wood (1997), causing gaps in wages and also inequality. More evidence on trade openness is encountered in the study of Jaumotte et al (2013), including 51 countries, in which it was concluded that if trade openness is combined with technological advancement tends to rise wage inequality. Milanovic (2007) highlights that globalization increases the economic growth of a country, but it will worsen inequality in a country's economic disparity if not handled by some form of redistributive policy. Goldberg and Pavcnik's (2007) analysis of Latin America highlights that, in the absence of proper social protection, economic trade liberalization can worsen inequalities of income distribution.

As stated by Estrin and Uvalic (2014), the increased openness in the Western Balkans resulted in increased GDP growth as well as greater returns to skills, which created a widening gap in income between skilled and unskilled workers. Globalization has not always worked in favor of many rural areas or low-skilled industries (World Bank, 2021). Yet, there has been an increasing wave of productivity rises in sectors that need highly advanced education and technology in international trade, especially in Serbia and North Macedonia, with an unequal income distribution in both regions and among people (Bartlett & Prica, 2012). There are strict laws concerning employment, which worsen the bad situation regarding trade inequalities across the area, and yet there is no consideration for welfare systems.

3.3 Income Inequality– Structural Transformation in Employment Relationship

Agriculture is still an important contributor to the economy of the Western Balkan countries, because it generates jobs for a large part of the population, especially in Albania and Bosnia and Herzegovina, where working in the countryside is the most common means of making ends meet (World Bank, 2020). Like many other dimensions of agriculture, farming can be associated with lower productivity as well as insufficient jobs and income. Bojnec and Ferto (2012) defend that nations that employ a greater share of their workforce in agriculture tend to have slower rates of income equalization, which deepens the inequality gap. Moreover, studies show that agricultural employment is often associated with informal work and limited access to social protection benefits, which increases vulnerability (Bartlett, 2007).

Christiaensen et al. (2011) study parts of sub-Saharan Africa and Southeast Asia, noting regions where agricultural growth correlates with poverty reduction. They emphasize that

without structural changes in the industry, productivity improvements, and economic transition, inequality will persist. About EU member states, Ciaian and Kancs (2012) reference that Common Agricultural Policy (CAP) subsidization of the agriculture sector reduces rural poverty about the rest of the economy, but does very little to alleviate income inequality on a regional basis. Kiss (2020) analyzes the agricultural inequality for the EU during the period 2010-2019. It demonstrates that while the EU's agricultural value added increased by over 23%, agricultural jobs fell by over 19%, suggesting that productivity rose. Nevertheless, disparities remain, for various reasons like geographic, climatic, natural resources, and economic systems. Grzelak (2017) studied the impact of income inequality on food security in OECD countries, however, the evidence made it clear that food security and income inequality have a much more complicated and paradoxical relationship to each other across countries than any other. The study found a stronger association for food affordability than for any other possible explanation, and that increasing income inequality alone may relate negatively to food security through the diminishing accessibility of affordable food. The research by De Frahan et al (2017) examines farm household income in OECD member countries over the last 30 years of government assistance. In their study, the researchers determined that poverty and income inequality are worse in farm households than in non-farm households. This means that even though total income levels may be comparable, farm households have a more unequal income distribution. Ligon and Sadoulet's (2018) research highlighted the BRICS category of countries where rural development reduces poverty, even though in the more concentrated society, the inequality was still limited in connection with restricted access to land and markets. An article by Garidzirai (2020) analyzes the possibility of agricultural industries helping to achieve certain SDGs of the BRICS nations. The research study, employing panel data analysis from 1995-2018, finds that agricultural production in these nations is the way to go if we are to achieve the goals of reducing income inequality and, on the other hand, uplifting the level of economic performance.

The study by Timmer (2009) indicates that only when a society has fair access to resources and credit does agriculture-driven productivity development result in a decrease in inequality. The inclusive policies targeted toward agriculture are said to greatly diminish the inequality gap within rural communities, as supported by de Janvry and Sadoulet's research (2010). Eastwood and Lipton (2004) in their study have also pointed out that having

sufficient funds for agricultural development and lands that are fairly distributed amongst farmers is vital towards bridging the gap of inequality.

Industrial employment is often thought of as the driving locomotive for better wages, improved productivity, and diverse economic activities, which at certain times could serve to alleviate inequality (Rodrik, 2013). Such transitions in the Western Balkans were marked by considerable deindustrialization, especially of the old large-scale industries that persisted from the socialist period. Estrin and Mickiewicz (2010) point out that privatization often entailed massive layoffs and wage discrepancies, as the new industries hardly compensated for the losses incurred. With regards to the geographical division by placing the industries are placed in a few urban centers in Serbia and Montenegro (Uvalić & Bartlett, 2021). The automotive parts sector in Serbia is just one of many contemporary industries, however, the highly skilled workers have derived most benefits, while low-to-semi-skilled workers have experienced precarious employment since then (European Commission 2022). In this respect, many economies in the Western Balkans have a weak industrial base and are thus limited in their potential for equitable growth in terms of manufacturing engines.

Mehic's (2018) research looks at the relationship between industrial jobs and income inequality in 27 high- and middle-income countries between 1991 and 2014. The results showed a significant negative correlation between industrial jobs and income inequality, indicating that as manufacturing jobs are lost, there are greater income disparities. In the study of Castellano et al (2016), an analysis of the role played by the structural changes of the labor market, namely, the changes in the intensity of employment by skill level, in shaping the evolution of wage inequality in France, Germany, and Italy. The paper indicates that France and Germany invested efficiently in workers' skills in the wage equating process, whilst Italy's labor market configuration translates workers' skills into greater inequality. In their study, Guschanski and Onaran (2017) examined the determinants of the wage share at a sectoral level in 14 OECD countries from 1970 to 2014. Their results support the conjecture that globalization, and particularly offshoring to emerging markets, is a major factor behind the decline in the wage share. The influence of technological change on income distribution is not consistent across skill grades, but the evidence against the hypothesis that skill-biased technological change has been the principal influence behind the decline is weak. In the study of Chen et al (2013) for OECD nations, it is concluded that technology advancements are a major factor driving the increase in earnings inequality through wage dispersion across

workers. Specifically, the effect is largest in industries where skill-biased technological change increases the demand for high-skilled workers, while also leaving those unskilled workers far behind.

Acemoglu (2002) researched OECD countries, in which concluded that during the initial phases of industrial expansion, there is a rough increase in inequality because of the increased acceptance of uneven wage payments for different skill levels. Similar observations are made for the EU by Piketty and Saez (2014) when they notice that industry growth is skewed in favor of higher-skilled labor. However, Ghose (2004) analyzes the BRICS countries and states that industrial development may be fairer with active government funding of employment rights and fair remuneration. Further evidence from Autor et al (2013) highlights that there is usually greater industrial innovation and, at the same time, a greater wage disparity, which increases inequality in the absence of social policy intervention to mitigate the trend. Findings by Jaumotte and Osorio-Buitron (2015) indicate that industrial technological advancements tend to increase wage disparity by deepening the divide in pay for unskilled versus skilled labor, unless there is a simultaneous effort to upskill the employees. This is especially pronounced in EU panel studies, where automation and other forms of technological advancement have led to both polarization of employment opportunities and increased income inequality.

Nonetheless, the expansion of the service sector has been an indicator of economic development in the Western Balkans, with consequences upon inequality being somewhat unpredictable. Most of the early service boom was in low-wage and low-productivity sectors like retail, tourism, and personal services (Bartlett & Prica, 2012). They argue that knowledge-intensive services are still developing at a low level and that much of the service industry is characterized by underemployment and informality. The urban service economy has flourished in both countries-such as Bosnia and Herzegovina and North Macedonia-producing relative inefficiencies in comparison to smaller settlements (World Bank, 2021). In the study of Theyson and Heller (2015), which includes data from 147 countries from the years 1992-2007, it is concluded that as far as economies transition into a more service-oriented sector, the distribution of income and employment will see progress.

The role of service sectors in driving wage inequality in European Union countries between 2004 and 2013 is studied by Cyrek (2016). The paper reveals that service sectors, such as

information and communication, as well as financial and insurance activities, are correlated to lower levels of wage inequality within the EU. Hwang (2013) noted that depending on which services go higher, growth in the services sector may have ambiguous implications for income inequality in the OECD region. High-skilled service sectors are likely to help raise income inequality since they provide higher wage premia. Low-skilled service sectors may reduce the level of income inequality by providing jobs that employ low-income groups. In their paper, Sergeeva et al (2024) delve into how platform employment evolves in BRICS nations and how this development affects the income inequality scenario. It has been found that platform-based jobs are very fast-growing in BRICS economies, mostly in the service sector. However, with this growth comes worsening income inequality, and several reasons include insecure income in the gig economy, ever-changing income, and insufficient social security for its workers.

Moreover, the low-paid jobs in the service industry are predominantly occupied by women shows that gender inequality is still shown (Petreski et al. 2014). Thus, even though they contribute greatly to the overall national increase in GDP, their uneven structure and low inclusivity have impeded Western Balkan countries in delivering improvements against economic inequality. According to panel data analysis conducted by Autor and Dorn (2013), job polarization, which means an increase in high and low-skilled jobs with a decrease in middle-skilled jobs, has increased income inequality within the OECD countries. This means that in this region, the labor market is split into high-paying jobs, including those employed in finance or technology, and low-paying jobs, which include those employed in the food industry or retail. The other category of the middle-skilled jobs, which deal mostly with administrative or manufacturing roles, is disappearing. Goos et al (2010) extends its studies to the EU framework showing that technological advancements in services disproportionally benefit highly skilled workers, gaining a “premium” skill for the marketplace, increasing disparities among low skilled workers since these improvements in technology do not only shift the wealth to those that are more advanced in technology but also leaves them behind and out of the labor force making them discouraged and not willing to be part of it.

3.4 Income Inequality–Macroeconomic Instability Relationship

The negative effect of macroeconomic instability on income distribution is a familiar phenomenon, especially in the presence of weak social safety nets and a poorly developed

financial market (Easterly & Fischer, 2001). The hyperinflationary experiences of the Western Balkans in the 1990s inflicted severe damage on income distribution by wiping out savings and disproportionately affecting the poorer segments of the population (Uvalić, 2010). It is evident that during the macroeconomic stabilization of the early 2000s, low-income households continued to face the hardest inflationary shocks, particularly relating to food and energy prices (World Bank, 2020). On the contrary, Serbia experienced inflation in 2022-2023 after the hike in global prices of commodities, suppressing the real wages of the poorest quintiles (European Commission, 2023).

As depicted in the report of Eurofound (2024), lower-income households tend to be affected more seriously by inflation in the EU, thus, they make the income inequality even more severe. As the poor spend a larger part of their income on things such as food and energy, when the prices of these goods increase, the lower economic strata of society will suffer even more. The situation is becoming more complicated with global disruptions such as the COVID-19 recovery and the Ukraine conflict. As stated in the study of Chen et al (2013) for OECD countries, regulatory changes issued for the purpose of promoting growth and productivity have different implications. They typically narrow the gap between those employed and those not employed by increasing job availability, but they also contribute to greater wage inequality. These factors can create macroeconomic instability that could lead to greater income inequality and changes in aggregate demand. According to Berisha et al (2019), income inequality is significantly affected by inflation in BRICS economies. The results suggest that inflation inequitably affects the poor and increases income inequality. The study of Younsi and Bechtini (2018) for BRICS countries gives evidence that lowering income inequality and increasing sustainable growth is reliant on macroeconomic stability, with low and stable inflation rates as part of that stability. The paper stated that increases in inflation could worsen inequality, be more severe for low-income households, and also harm economic stability, for these are also the factors that will decrease growth that is equitable. Therefore, inflation control has been proposed as an important part of targeting economic inequality for the BRICS nations.

Albanesi (2007) researched OECD countries, indicating that inflation has a greater impact on lower-income families, deepening inequality. In the same way, in the study of Easterly and Fischer (2001) conclude that high inflation reduces the purchasing power and savings of the lower classes in EU countries. For BRICS economies, Bulir (2001) shows that inflation

volatility is more harmful to poorer households since this category often lacks savings, widening the income gap without social protective barriers in place. Without any welfare programme or subsidies, the gap that exists between poor and rich tends to go up, since poorer households have difficulties in keeping up with rising costs. Thus, inflation represents one of the most serious risk factors for accelerating income inequality, especially under circumstances where targeted subsidy schemes and mechanisms for pay indexation are underdeveloped.

3.5 Income Inequality–Financial Development Relationship

One of the key components that raises economic opportunity and increases income is financial development. However, loan markets in most Western Balkan countries are underdeveloped and biased in favor of larger, urban-based businesses (World Bank, 2020). The authors Petreski et al. (2014) affirm that limited access to reasonably priced finance has very much impeded the entrepreneurship and small business development of marginalized populations. In Bosnia and Herzegovina and North Macedonia, financial exclusion is a common practice, especially among women as well as rural residents.

Weychert (2020) studied financial development in the EU and described a paradox of financial development reducing income inequality. The results reveal that while financial development gives more access to credit, inspires development, growth, and investment, it also increases income inequality, assuming the business class and wealthy capture the majority of the financial benefits. Mbona (2022) studies financial development and income inequality for 120 countries in the years 2004-2019. The findings mentioned that increased access to financial income may lead to reduced income inequality due to broadened access to credit and investment opportunities for low-income groups.

In the study of Manta et al (2023) for CEE countries, taking into consideration the period 2004-2019, it is concluded that an increase in income inequality is present due to the development of finance. This did not happen only when there is an increase in financial markets but also because of having easier access to credit. The reason is that bigger firms and better-off people capture the financial sector expansion more than low- or moderate-income households, and low-income households are likely to face barriers to financial access. De La Cuesta-González et al. (2020) study the correlation between financial development and inequality for OECD nations. Aspects of the study indicate that economic progress does not always make income differences smaller. Also, according to the study, the

structure and access of financial institutions are key determinants in how it matters. They revealed that economic growth may increase inequality if the richer group of society obtains a larger proportion of the gain, and confirmed that inclusive financial policies would generate an equitable effect throughout income distribution. The investigation by Chiu and Lee (2019) studies the interdependence among country risk, income inequality, and financial development in various countries. The findings suggest that financial development tends to alleviate income inequality in low-risk countries, while aggravating it in high-risk ones. Younsi and Bechtini (2018) investigate the causal links between economic growth, financial development, and income inequality in BRICS countries using panel Granger causality tests. They find evidence for two-way causation between financial development and income inequality, indicating that the development of financial markets impacts income distribution and income distribution impacts the development of financial markets.

Financial development lowers inequality because it tends to create less inequality in inclusive growth in the OECD countries, as Beck et al (2007) concluded. About BRICS (Brazil, Russia, India, China, and South Africa), Greenwood and Jovanovic (1990) argue that a U-shaped relationship exists, with credit creation increasing inequality during the early growth stages and eventually decreasing inequality once financial markets have developed and are open to "more" individuals. The relationship between income inequality and financial development in newly industrialized countries (NICs) is examined by Öndes and Kızılgöl (2024). A U-shaped link is revealed by the results, highlighting how important it is to achieve a particular level of financial growth before achieving an equitable income distribution.

The microfinance initiatives have shown some degree of progress, however, their scale is too small to significantly affect inequality (European Commission, 2022). Therefore, it was necessary to enhance credit accessibility for the disadvantaged population to reduce income disparity as well as promote inclusive economic growth in the region.

Table 3.1

The Summary of the Empirical Literature Review

Author/s	Title of the Paper	Country/Region/ Group of Countries	Data Period	Empirical Methodology	Variables	Main Results
Kuznets (1955)	Economic Growth and Income Inequality	Cross-country (theoretical)	1870–1949 (historical)	Descriptive/Historical analysis	GDP per capita, income inequality	Proposes an inverted U-shaped relationship between development and inequality.
Barro (2000)	Inequality and Growth in a Panel of Countries	Global sample	1960–1995	Panel regression	GDP per capita, Gini coefficient	Supports inverted U-shape for middle-income countries; results vary by region.
Deininger & Squire (1998)	New Ways of Looking at Old Issues	Global sample	1960s–1990s	Cross-country panel analysis	Income inequality, GDP	Finds mixed evidence on Kuznets' hypothesis; highlights data quality issues.
Grigoli et al. (2016)	Inequality and Growth: A Heterogeneous Approach	Transition countries include. Balkans	1990–2014	Panel regressions with fixed effects	GDP growth, Gini index	Growth does not always reduce inequality in governance, or in low-education-level countries.
Estrin & Uvalic (2014)	FDI into Transition Economies:	Western Balkans	1990–2010	Comparative case analysis	FDI inflows, income levels	FDI benefits skilled labor; income inequality increases without institutional safeguards.

	Are the Balkans Different?					
Bucevska (2019)	Determinants of Income Inequality in EU Candidate Countries: A Panel Analysis	EU countries and candidate countries	2005-2017	Panel data analysis with fixed effects	unemployment, GDP per capita, and the share of gross fixed capital formation	The primary causes of rising income disparity in the countries under study are unemployment, economic progress, and investment rates.
Sayed and Peng (2020)	The income inequality curve in the last 100 years: What happened to the inverted-U?	Developed countries (USA, UK, France, and Germany)	1915-2014	Panel data technique	Income share and GDP per capita	Long-term “N shape” which does not hold for the Kuznets Curve theory
Mongi and Kais (2018)	Education, poverty, inequality, and	11 developing countries	1990-2015	Panel data method (GMM estimation)	Inequality, GDP growth, Education, Unemploym	The empirical findings demonstrate that education significantly boosts economic growth, reduces poverty, and lessens inequality.

	economic growth relationship: Fresh evidence from developing countries using a simultaneous equation model				ent, Population growth, Stability	
Velkovska (2021)	Is there a link between income inequality and economic growth in the Balkans? Testing the Kuznets Hypothesis	Balkan Countries	2001-2012	Panel data regression analysis	Gini index, GDP per cap	The findings indicate a Kuznets curve that starts flat and then shows decreasing income disparity as the economy grows.

Dorasamy and Kikasu (2024)	Global Inequality: Will The Inequality Among the Brics Nations Hinder Maneuverin g the Global Economy	BRICS countries	Not specified	Descriptive analysis	Economic inequality, economic growth,	Key conclusions suggest that economic, income, and growth disparities in BRICS may hinder their collective influence on the global economy.
Acheampo ng et al (2023)	Income inequality and economic growth in BRICS: insights from non-parametric techniques	BRICS nations	1990-2020	Non-parametric techniques (Quantile Regression and Kernel-based estimations)	Economic growth, income inequality, investment, education and trade openness	The Kuznets theory is supported by the fact that income disparity has varying effects on economic growth across the various income distributions in the BRICS.
Dollar and Kraay (2004)	Trade, Growth, and Poverty	Global sample	1977-1997	Cross-country regression analysis	Trade openness, economic	Although it is unclear how trade openness directly affects income disparity, it is linked to increased economic growth, which helps to reduce poverty.

					growth, poverty, and income inequality	
Bergh and Nilsson (2010)	Do Liberalization and Globalization Increase Income Inequality?	OECD and developing countries	1970-2005	Panel data analysis	Economic liberalization, globalization, and income inequality	Income disparity is observed to rise as a result of globalization and liberalization, especially in developing nations; in OECD countries, the effect is less noticeable.
De Wettinck and Van Mourik (2024)	The Impact of Economic Integration on Income Inequality in the EU: A Panel Data Analysis of the EU Members from 2002-2020	EU member states	2002-2020	Panel data regression analysis (Fixed Effects, Random Effects, GMM)	Income inequality (Gini index), trade openness, FDI, labor mobility, GDP per capita, and institutional quality	Economic integration reduces income inequality in EU countries.

Gorjón et al. (2023)	The rise of income inequality in OECD countries	OECD countries	1995-2018	Panel regression (FE, RE, dynamic)	Gini, KOF index, trade, FDI, education, labor	Globalization increases inequality, especially without strong redistribution policies.
Vuković and Damijan (2025)	Drivers of Income Inequality in OECD Countries	OECD countries	1995-2020	Panel regression (FE, dynamic GMM)	Top 1% income, GDP, education, labor market, taxes	Supports Milanovic's TOP hypothesis; top income shares are the main inequality drivers.
Kiss (2020)	Agricultural Income Inequality in the EU	EU countries	2007-2017	Gini, Theil indices, decomposition	Agricultural income, CAP payments	High inequality in agricultural incomes; CAP contributes to disparities.
Ligon and Sadoulet (2018)	Agricultural Growth and Expenditure Distribution	Developing countries	Cross-country (various years)	Regression models	Agricultural GDP, expenditure distribution	Agricultural growth is more pro-poor than other sectors; it reduces inequality.
Rodrik (2013)	Unconditional Convergence in Manufacturing	Global sample	1960-2010	Cross-country regression	Manufacturing productivity, GDP	Manufacturing shows convergence; potential to reduce global inequality.

Castellao et al. (2016)	Labor Market Structure and Wage Inequality	EU countries	1995-2012	Multivariate analysis, cluster analysis	Wages, employment	Labor market segmentation explains wage inequality across EU countries.
Guschanski and Onaran (2017)	Political Economy of Income Distribution	14 OECD countries	1970-2010	Industry-level panel analysis	Wages, productivity, unionization, capital share	Declining labor share tied to capital accumulation and weakened labor institutions.
Cyrek (2016)	Service Branches and Wage Inequality in the EU	EU countries	2008-2013	Comparative statistical analysis	Service sector, wages, and employment structure	Service sector growth is linked to decreasing intra-country wage inequality.
Hwang (2013)	Service Sector Growth on Income Inequality	Global/Developing countries	1980-2010	Panel regression	Gini, service employment, GDP, education	Service sector growth reduces inequality only with high-skilled labor and inclusive policies.
Sergeeva et al. (2024)	Challenges of Platform Employment Developmen	BRICS countries	Current trends (qualitative study)	Comparative analysis	Platform employment, labor rights, digitalization	In the BRICS, platform work presents issues with inequality and regulations; low protection and irregular labor make pay disparities worse.

	t in BRICS Countries					
Younsi and Bechtini (2018)	Economic Growth, Financial Development, and Income Inequality in BRICS	BRICS	1990-2015	Panel data, GMM estimation	GDP growth, financial development, and Gini	Confirms Kuznets curve: inequality rises then falls with growth; financial development has mixed effects.
Albanesi (2007)	Inflation and Inequality	Cross-country	1960–1999	Panel regressions	Inflation, income shares	Higher inflation increases income inequality; policy credibility and financial inclusion can offset this.
Weychert (2020)	Financial Development and Income Inequality	Emerging Europe	1995-2015	Dynamic panel (GMM)	Financial access, inequality	Financial development can reduce inequality, but only when access improves for low-income groups.
Mbona (2022)	Impacts of Overall Financial Development, Access and Depth on Income Inequality	Developing Countries	1990-2017	Panel regression (FE, RE)	Financial access, Gini, income share	Financial development reduces inequality when it includes depth and access, especially in low-income countries.

Grzelak (2017)	Income Inequality and Food Security in the Light of the Experience of the OECD Countries	OECD	2000-2015	Descriptive analysis, correlation methods	Gini index, food security indicators, income, and social spending	Greater wealth disparity harms food security, while redistribution improves access and reduces vulnerability for low-income groups.

Source: Author compilation.

CHAPTER 4

EMPIRICAL ANALYSIS AND THE RESULTS

The appropriate empirical procedures must be employed throughout the research process to adequately examine the research topics. Income inequality is empirically analyzed in this chapter about some important economic indicators such as economic growth, trade openness, employment in agriculture, industry and services, macroeconomic instability, and financial development. The ultimate objective is to develop a comprehensive understanding of these relationships and draw some pertinent conclusions. Three estimation techniques for empirical analysis are included in this research: The MG, the CCEMG, and the AMG estimator. The dataset's characteristics of slope heterogeneity and cross-sectional dependence were the reasons why these estimation techniques were adopted.

4.1 Model and Methodology for Empirical Analysis

The investigation's time frame covers, due to the availability of time series, a group of five Western Balkan countries: Albania, Bosnia and Herzegovina, Montenegro, North Macedonia, and Serbia, from 2008 to 2023, with a total of 80 observations. The information related to the variables was obtained from reliable secondary sources and trustworthy statistical databases, such as the World Bank database's WDI. Only the income inequality variable has been acquired from the World Inequality Database (WID). To examine the empirical relationship between the variables of the selected countries, it was used the software tool such as STATA. Techniques like MG, CCEMG, and AMG have been used in empirical analysis under the Panel Mean Group/Autoregression Disturbance Lag (PMG/ARDL) procedure.

To perform such analysis initially, we test for the cross-sectional dependency test, slope heterogeneity test, panel stationarity tests, and panel cointegration tests. Regarding the variables that will be included in the model's equation, short definitions will be provided in the following table.

4.1.1 Data Collection

The variables used in the model of this thesis are based on the existing literature presented in the third chapter, and the data is retrieved from the World Bank Database during the years 2008-2023. The dependent variable is income inequality, and the independent variables are GDP per capita, trade openness, employment in agriculture, industry, services, macroeconomic instability, and financial development.

Table 4.1

Variables Description with their Logarithmic Forms, Units, and Data Sources

Variable	Definition	Units of measurement	Source
INEQ	Income inequality refers to disparities in the distribution of income among individuals or households within a society.	Top 10% share	WID
GDP	GDP per capita is the gross domestic product.	Per capita constant	WDI
TRADE	Trade is the total value of goods and services imported and exported, expressed as a percentage of GDP.	% of GDP	WDI
EMPA	Individuals of working age who were engaged in any kind of activity to produce goods or services for compensation or profit are employed, whether or not they are actually working because of a work arrangement or employee leave.	% of total employment	WDI
EMPI	A person is considered employed if during the reference period he/she has engaged in activities for the production of goods or services for any kind of pay or profit or else that person was legally employed but he/she did not perform any work activities because of a working-	% of total employment	WDI

	time arrangement he/she had accepted or a temporary leave from employment.		
EMPS	People of working age who were active in any way producing goods or providing services for pay or profit are classified as employed, even if he/she was not working during the reference period due to a working time arrangement, or left his/her job temporarily.	% of total employment	WDI
INF	Consumer Price Index (CPI).	Annual %	WDI
DOM	Financial resources given to the private sector by financial institutions, such as loans, the purchase of securities, and other accounts receivable that create an entitlement for payment.	% of GDP	WDI

Source: Author compilation.

4.1.2 Model Specification

To test the relationship between the dependent variable, income inequality (INEQ), and the explanatory variables economic growth (GDP), trade openness (TRADE), employment in agriculture (EMPA), employment in industry (EMPSI), employment in services (EMPS), financial development (DOM) and macroeconomic instability (INF), **the following model is specified:**

$$INEQ_t = f\,(GDP_t, TRADE_t, EMPA_t, EMPI_t, EMPS_t, DOM_t, INF_t) \quad (1)$$

where *INEQ* is income inequality; *TRADE*- trade openness; *GDP*-economic growth*; EMPA*-employment in agriculture; *EMPI*- employment in industry; *EMPS*- employment in services; *DOM*- domestic credit to the private sector and *INF*- inflation, *t-time*.

Assuming that there is a nonlinear relationship among variables, the model can be expressed as follows:

$$INEQ_t = \varepsilon_0 + \varepsilon_1 GDP_t + \varepsilon_2 \mathrm{TRADE}_t + \varepsilon_3 EMPA_t + \varepsilon_4 EMPI_t + \varepsilon_5 EMPS_t + \varepsilon_6 DOM_t + \varepsilon_7 INF_t + v_t \quad (2)$$

where ε *is* the long-term and v is the error term.

To make it more linearized, the model is followed by a log-linear form expressed as follows:

$$INEQ_t = \alpha_0 + \beta_1 LGDP_t + \beta_2 LTRADE_t + \beta_3 LEMPA_t ++ \beta_4 LEMPI_t + \beta_5 LEMPS_t + \beta_6 LDOM_t + \beta_7 INF_t + \varepsilon_t \quad (3)$$

where *Ln is* the logarithmic form; α_0 is the constant intercept; ε is the white noise error term; and β_i (where i = 1, 2, 3) is the long-run elasticity. All the variables are used in logarithmic form except for the INEQ and INF since they have negative values in their log forms.

Referring to the work of Pesaran and Shin (1996), to study the long-term effects of financial development on exports, economic growth, transport, and tourism, we consider the empirical estimation approaches of MG, PMG, and FDE based on the model, which is specified by the following equation:

$$Y_{it} = \sum_{j=1}^{p} \varphi_{i,j} Y_{i,t-j} + \sum_{j=0}^{q} \delta_{i,j} X_{i,t-j} + \vartheta_i + \epsilon_{jt} \quad (4)$$

where i = 1,2..., N is the number of countries; t= 1...T is the time; j is the number of lags; $X_{i,t}$ is the vector of the explanatory variables; and ϑ_i is the specific fixed
effect of the nation. Considering the adjustment coefficient and long-term dynamics, equation (4)is modified as follows:

$$\Delta \mathbf{Y_{it}} = \emptyset_i\left(\mathbf{Y_{i,t-1}} - \boldsymbol{\theta}_i \mathbf{X_{i,t}}\right) + \sum_{\mathbf{j=1}}^{\mathbf{p-1}} \boldsymbol{\varphi}'_{\mathbf{i,j}} \Delta \mathbf{Y_{i,t-j}} + \sum_{\mathbf{j=0}}^{\mathbf{q-1}} \boldsymbol{\delta}'_{\mathbf{i,j}} \Delta \mathbf{X_{i,t-j}} + \boldsymbol{\vartheta}_\mathbf{i} + \boldsymbol{\epsilon}_\mathbf{jt} \quad (5)$$

where $\emptyset_i$ It is the adjustment coefficient of the long-term dynamics. θ_i indicates the long-run equilibrium relationship among $Y_{i,t,}$ and $X_{i,t}$ $\varphi'_{i,j}$and $\delta'_{i,j}$ represent the short-run coefficients connecting financial development with its past values and the factors of interest $X_{i,t}$.

A long-term relationship exists between income inequality and economic growth, trade, employment in agriculture, industry and services, macroeconomic instability, and financial development, if $\emptyset_i$ is significant; then, a cointegration relation occurs between $Y_{i,t}$ and $X_{i,t}$

4.1.3 Cross-Sectional Dependency and Slope Homogeneity Tests

In recent years, new approaches have been developed to address the issue of cross-sectional dependency, which the conventional estimation techniques were unable to resolve. These

methods are applied to estimate methodologies, stability testing, and cointegration tests. Such methods include the AMG estimator presented in Eberhardt and Teal (2010) and Bond and Eberhardt (2009), the Pesaran and Smith (1995) MG estimator, and the Pesaran (2006) CCEMG estimator. Choosing the right estimators and testing for cross-sectional dependence are essential when examining panel datasets.

This paper utilizes two tests for cross-sectional dependence: the Breusch–Pagan (1980) Lagrangian multiplier (LM) test, the Pesaran LM test, and the Pesaran cross-sectional dependence (CD) test. When T > N, we can apply the Breusch-Pagan Lagrange Multiplier (LM) Test. In cases where the cross-sections of the panel consist of a larger number of entities (N) but are recorded over fewer time periods (T), it is obvious that verifying the presence of cross-sectional dependence is crucial. This is a frequent problem in the analysis of panel data (De Hoyos and Sarafidis, 2006). For situations in which the number of entities (N) is fixed while the number of periods (T) approaches infinity, one can use Breusch and Pagan's (1980) LM test for cross-sectional dependence in panel data. The null hypothesis states that the test statistic is asymptotically chi-square distributed with n(n-1)/2 degrees of freedom, where n is the number of entities. However, this test becomes inappropriate in situations where n approaches infinity. To overcome this limitation, Pesaran (2004) proposed a CDlm test that scales the LM test. Unlike its predecessor, CDlm is tailored to be correctly distributed as a standard normal distribution N(0,1) when T approaches infinity first, then N. Nevertheless, Pesaran (2004) acknowledges that the CDlm test incorrectly centers around zero for finite T and tends to have large non-central bias as N increases. In an attempt to resolve the problem, Pesaran (2004) developed a diagnostic test of the sample average of the sample correlations, which is called the CD test. This CD test is valid for large N and provides a solution for correct centering at zero, ensuring accurate size control when dealing with finite T (Baltagi et al. 2012).

The problem that may interfere with the consistency of the estimators while analyzing the panel data is slope heterogeneity. The slope heterogeneity is concerned with identifying whether the association between a dependent variable and an independent variable changes among the various cross-sectional units. In this master's thesis, we decided to apply the Pesaran and Yamagata (2008) slope heterogeneity test. This test is based on Swamy's (1970) dispersion statistic, but it was modified to investigate the cross-section "dispersion" of individual slopes, weighted by their relative precision. These authors are better than others

because it is the only test that performs well when the cross-section dimension (N) or the time series dimension (T) is large, or when N > T. The reasoning for this test concerns the distance between the estimators from a pooled FE regression and from a cross-sectional unit-specific regression. The estimation procedure takes into account the unit-specific standard errors and hence permits heteroscedasticity (Bersvendsen & Ditzen, 2021). Results indicate that for dynamic panels, this test performs well across all combinations of N and T, though it is critical that the dominant root of the dynamic model is under the null hypothesis and not near one.

The slope heterogeneity test by Pesaran and Yamagata (2008) cannot address cases where there exists heteroskedastic and cross-sectional dependence. In this recovery, it was decided to preserve the slope homogeneity test and utilize Blomquist and Westerlund's (2013) Heteroskedasticity and Autocorrelation Consistency (HAC) robust version. This test possesses the same characteristics as Pesaran and Yamagata (2008), but the authors of the new model substituted the contemporaneous covariance estimator with HAC. According to the simulations performed in the initial paper, Blomquist and Westerlund's model is well within bounds except for low values of N and T.

4.1.4 Panel Unit Root Tests

According to Maddala and Wu (1999), four different panel unit root tests were utilized to assess the unit root of the variables of the study. These are the LLC test (Levin et al. 2002), IPS statistics (Im et al. 2003), and the ADF–Fisher and PP-Fisher tests, which both perform N independent unit root tests and aggregate their p-values. All tests were performed under a deterministic temporal trend. The decision for these tests came from their different characteristics. That is, the fact that one of them might have certain advantages over the other, thus not suffering from its limitations (Batchelor, 2018). Westerlund (2008) states that the LLC test requires that the panel unit root is the same for all the units, with uniform autocorrelation coefficients. However, the ADF-Fisher test assumes an individual unit root process with coefficients varying across different units of cross-section. Otherwise, both the LLC and ADF-Fisher tests can effectively adjust for cross-sectional dependence problems by removing the cross-sectional means (Choi, 2001). In the IPS test, each time series should not contain any gaps, but balanced data are not required.

After taking a closer look at the unit root tests, Maddala and Wu (1999) found that both the LLC and IPS frameworks have their limitations. Considering this, they came up with a new testing method. They recommend using a non-parametric Fisher-type test, which cleverly combines the p-values from the test statistics for a unit root across each cross-sectional unit. This test operates under a chi-square distribution with 2n degrees of freedom. The authors point out that this type of analysis offers three key advantages. First, it does not require a balanced panel. Second, the test can utilize different lag lengths in individual ADF regression. Lastly, it can be applied to any derived unit root test.

In the research, Maddala and Wu (1999) method is used to conduct a panel unit root test as two of the given variables do not contain CD, and Pesaran's (2007) method is applied as it is a second-generation test, which is used for the other variables that have CD (cross-sectional dependence). This technique was decided on the basis that Maddala and Wu's (1999) model assumes that all the time series in the panel data are individual across sections. This is wrong as the error terms' pairwise cross-section covariances differ among the different series, though.

The Pesaran (2007) model is implemented by taking the first differences and the average of the lagged levels of the individual series into the basic DF regressions. The panel unit root tests utilizing such a scheme rely solely on the simple averages of the renewed ADF statistics for each cross-section. It is proved by this dissertation that the tests keep good size and power even with very small values of N and T. The authors' conclusion comes after they had conducted Monte Carlo simulations for the cross-sectionally augmented panel unit root tests.

4.1.5 Panel Cointegration Tests

By utilizing panel unit tests, the stationarity of the sequence is checked. We go further to examine the relationship between the variables if they are found to be stationary. By modeling cross-sectional independence and a combination of stationary and nonstationary factors in the panel unit root test, we then check if there is a cointegrating relationship among the variables. The selection of Kao (1999) and Pedroni (1999, 2004) tests, along with the panel cointegration tests, is used in our research. There is a correspondence between both methods in questionless cointegration. Upon performing the Kao and Pedroni cross-sections, the panel cointegration tests show that the variables are cointegrated across all panels.

The Westerlund (2008) cointegration test is utilized because the variables in this master's thesis dataset exhibit cross-sectional dependence. Unlike other tests, the four-panel tests in Westerlund's (2008) approach do not impose any common factor constraints. This is because the null hypothesis of no cointegration relies on structural dynamics instead of residual dynamics. These tests are quite innovative as they assess whether the error correction term in a conditional error correction model equals zero, effectively testing the null hypothesis.
If we find that the null hypothesis, which suggests there is no error correction term, is rejected in this test, it also means we have to reject the null hypothesis of no cointegration. One of the great things about this cointegration technique is that it allows us to include non-strictly exogenous regressors, error terms that are serially correlated, as well as individual intercepts, trend terms, and unique slope parameters in the model. It is important to remember that for the variables to work effectively in the model, they need to be exogenous and weak.

4.1.6 Panel ARDL Estimation Methods

The body of work on dynamic panel estimation should be established by choosing the appropriate estimation method as outlined by Bond et al. (2010), Bond and Eberhardt (2009), Coakley et al. (2006), Eberhardt et al. (2011), Eberhardt et al. (2010), Kapetanios et al. (2011), Pesaran et al. (2006), Pesaran et al. (1999), Pesaran et al. (2010), and Roodman (2009). The core assumption of homogeneity that underpins pooled models encourages the use of heterogeneous estimates over conventional homogeneous ones. By adjusting the level of country-specific parameter heterogeneity, researchers can opt for these heterogeneous estimators instead of the traditional pooled homogeneous parameter estimators (Baltagi et al., 2000).

One way to estimate is the Difference in Fixed Effects (DFE) method that combines panel data from different groups by allowing only the intercepts to differ across groups. So, in the case when the slope coefficients are significantly different across groups, the DFE method could be biased, and hence incorrect estimates would arise. On the other hand, the Mean Group (MG) estimator, proposed by Pesaran and Smith in 1995, estimates a separate model for each group and calculates the average of the coefficients. This model allows the user to introduce the level of the intercepts, the size of the coefficients, and the variance of the errors

being different for each group. More recently, Pesaran, Shin, and Smith (1997, 1999) created the Pooled Mean Group (PMG) estimator, which stands between pooling and averaging strategies. This mixture of strategies allows for some changes in the intercepts, the short-run coefficients, and the errors' variances across groups, such as those required by the MG method, while it also forces the long-run coefficients to be the same across groups, just as the Fixed Effects (FE) estimator does.

In 1999, Pesaran, Shin, and Smith introduced a maximum likelihood approach to tackle the nonlinear factors involved in these calculations. Their research on the MG and PMG estimators is crucial for estimating nonstationary dynamic panels that exhibit diverse characteristics across various groups. To give a more thorough estimation, the PMG method blends pooling and averaging techniques, while the MG method simply averages the coefficients from individual time-series regressions. Blackburne and Frank (2007) pointed out that the DFE estimator, like the PMG, imposes equality requirements on the cointegrating vector's coefficients across all panels. As a result of recent developments, new techniques have been created to address the shortcomings and errors of conventional estimations when slope heterogeneity and cross-sectional dependency are present. In this thesis, we use heterogeneous panel estimation approaches to estimate processes and stability, and cointegration testing.

Pesaran and Smith's MG estimator (1995), Pesaran's CCEMG estimator (2006), and Eberhardt and Teal's (2010) and Bond and Eberhardt's (2009) AMG estimator are notable instances of these methods. To choose the best estimator for panel research, it is crucial to evaluate slope heterogeneity and cross-sectional dependence.

Our analysis starts with the Pesaran (2005) CD test, which helps us check for cross-sectional dependence and see how the countries in our panel are correlated with each other. We also include the robust version of the slope heterogeneity test by Bloomquist and Westerlund (2013), which considers both autocorrelation and heteroskedasticity.

There are alternatives like the CS-ARDL estimator and Driscoll-Kraay errors, which could also address cross-sectional dependence or dynamic relationships. However, given the structure of my dataset and the comparative strength of methods like AMG and CCEMG in handling slope heterogeneity and cross-sectional dependence simultaneously, I opted for the

more robust heterogeneous estimators. That said, future research could explore these alternatives for robustness.

4.2 Results of Empirical Analysis

The results of the previously specified tests, which must be met to do the empirical analysis of our model, will be thoroughly examined in this part.

4.2.1 Descriptive Statistics and Correlation Between Variables

Table 4.2 gives an overview of significant parameters such as the mean, minimum, maximum, and standard deviation for each variable. It is important to note that income inequality (INEQ) has seen marked changes, and it points out that there are major differences between countries and over time. Correspondingly, GDP per capita and trade openness have had a vast array, hence indicating that the area has had different economic systems and openness levels. The employment numbers in the agriculture, industry, and services sectors are subject to significant variations; hence, different countries are at different stages of structural change.

Table 4.2

Summary of statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
INEQ	80	0.34818	0.0308976	0.2928	0.4598
LGDP	80	11.34316	2.100641	8.501034	13.87209
LTRADE	80	4.565164	0.2057308	4.086324	5.112875
LEMPA	80	2.827558	0.6071901	1.506989	3.828546
LEMPI	80	3.191194	0.2367236	2.781111	3.498262
LEMPS	80	3.985304	0.2090981	3.576476	4.354755
INF	80	3.420147	3.839628	-1.584008	14.20472
LDOM	80	3.812012	0.2028691	3.393712	4.459548

Source: Author's calculations, STATA.

Table 4.3 shows the correlation between variables. From the results, it is concluded that most of the variables have a moderate and strong correlation with each other. For instance, there is a slightly positive relation between trade openness and GDP per capita, which means that the better-off countries are usually more open to the world. Income inequality and GDP have a negative relationship with agricultural employment. In addition, there are weak but favorable relationships between GDP and industry and service sector employment.

Table 4.3

Correlations between variables

	INEQ	LGDP	LTRADE	LEMPA	LEMPI	LEMPS	INF	LDOM
INEQ	1.0000							
LGDP	0.1671	1.0000						
LTRADE	-0.3386	-0.1731	1.0000					
LEMPA	0.0374	0.6500	-0.6427	1.0000				
LEMPI	-0.1765	0.1283	0.2446	0.1304	1.0000			
LEMPS	0.1320	-0.5894	0.5766	-0.9751	-0.2083	1.0000		
INF	0.0946	0.1958	0.2261	-0.0382	0.0223	0.0522	1.0000	
LDOM	-0.2838	-0.7452	0.4559	-0.7194	0.1539	0.6359	-0.1640	1.0000

Source: Author's calculations, STATA.

4.2.2 Cross-Sectional Dependency (CD) and Slope Homogeneity & HAC Tests

According to the results of Table 4.4, which shows the CD test for variables used in this paper, we can see that variables of inequality, economic growth, trade openness, employment in agriculture, industry, sector and macroeconomic instability have a p-value lower than the significance level of 0.05 showing that these values suffer from CD and rejecting the null hypothesis. Only the variable of financial development has a p-value higher than 0.05, meaning that this variable does not have any problem with cross-sectional dependency.

Table 4.4
Results of the CD test for variables

Variable	CD -test	p-value	average joint T	mean	mean abs
INEQ	3.526	0.000	16.00	0.28	0.49
LGDP	12.008	0.000	16.00	0.95	0.95
LTRADE	6.808	0.000	16.00	0.54	0.54
LEMPA	3.521	0.000	16.00	0.28	0.55
LEMPI	2.814	0.005	16.00	0.22	0.28
LEMPS	3.75	0.000	16.00	0.30	0.41
INF	10.987	0.000	16.00	0.87	0.87
LDOM	1.56	0.119	16.00	0.12	0.43

Source: Author's calculations, STATA.

H0: Cross-section independence (correlation) in variables

Ha: Cross-section dependence (correlation) in variables

In panel data, a common claim is that the slope coefficients are equal for the entire period under consideration. Nonetheless, testing, for example, the Pesaran and Yamagata (2008) slope heterogeneity, is only required when the panel is large in the time-dimension (i.e., big T) and small in the cross-sectional dimension (N). Table 4.5 shows the result, after conducting the test, of the p-value 0.013, which is lower than the significance level of 0.05 meaning that the null hypothesis should be rejected and concluding that the slope is heterogeneous. In order to tackle the effect of heteroscedasticity and autocorrelation, the HAC test by Blomquist and Westerlund (2013) will be conducted.

Table 4.5
Slope heterogeneity test

	Delta	p-value
	1.646	0.100
Adj.	2.488	0.013

Source: Author's calculations, STATA.

Based on the HAC test in Table 4.6, with a result of p-value equal to 0.036, it can be concluded that the null hypothesis of the absence of any heteroskedasticity and autocorrelation within the error terms can be rejected at the 5% level. The p- p-value of 0.036 indicates that we need to reject the null hypothesis.

Table 4.6

HAC test

	Delta	p-value
	-1.390	0.164
Adj.	-2.102	0.036

Source: Author's calculations, STATA.

H0: Slope coefficients are homogenous

Ha: Slope coefficients are heterogeneous

4.2.3 Results of Panel Unit Root Tests

After conducting the cross-section dependency test, the results indicated that seven variables suffer from CD, while only one of them did not. Based on these results, it was decided to use Maddala and Wu's (1999) first–generation panel unit root test for the variable that did not have CD and Pesaran (2007) for the remaining variables for analyzing the stationarity of the series in determining the cointegration.

4.2.3.1 Results of First and Second-Generation Panel Unit Root Tests

Due to the fact that we found we have variables that suffer from cross-sectional dependency, we will also employ both first and second-generation panel unit root tests in the study. Maddala and Wu's (1999) and Pesaran's (2007) unit root test results are shown in Table 4.7. The test is made for the linear case or when the model has a deterministic trend.

Based on the results of Maddala and Wu (1999), with p-values greater than 0.10, the INEQ variable is found to be non-stationary in level under both the lag structures and the specifications (intercept and trend), such that the unit root null hypothesis cannot be rejected. As all the test statistics are not significant in any of the specifications, it follows that therefore, the LGDP variable is non-stationary in levels. Conversely, LTRADE appears to be stationary at a level in the trend and intercept-only specification. In particular, with lag 1, the p-values are below 0.05, which shows stationarity. In both specifications, as the p-values are high, the LEMPA variable is found to be non-stationary in level. For the variable LEMPI, there are mixed results. Due to cross-sectional dependence (CD), this variable should be reexamined in the CIPS test, as in the MW test is shown to be non-stationary (p-values >

0.05). In a similar way, LEMPS does not show significant stationarity at a level in either specification. When using the intercept-only model, the INF variable is indicated to be weakly stationary at lag 0 (p = 0.101) without sufficient evidence to accept it. In addition, according to the traditional significance levels, none of LDOM's p-values are acceptable, which means it is non-stationary at the level.

According to MW (1999)'s research, LTRADE has kept its level stable over a certain period. Unless all other variables are martingales, INF may be shown to be locally stationary but with long memory. It is still necessary to use auxiliary tests (CIPS test or the check on cross-sectional independence) to make sure whether it is really a weak stationarity of INF.

Extensive robustness to cross-sectional dependence is going to be there if the CIPS test by Pesaran (2007) is used. With p-values lower than 0.01, it is evident that LTRADE and INF are stationary at a high level under both intercept-only and trend requirements. Here, INEQ is only marginally stationary in both specifications at the 5% level under intercept + trend (p = 0.042) and at the 10% level under intercept (p = 0.088), showing it is non-stationary. It means that INEQ is not subject to any mean reversion process, and hence its dynamics are not improving. The LGDP can be considered as tentatively stationary at the 10% level, even though it was non-stationary in the MW test. It basically shows just below the border of stationarity under the trend definition (p = 0.094). P-values for LEMPA, LEMPI, and LEMPS are repeatedly over 0.10 in both specifications, which means that their levels are usually not stationary. On top of that, LDOM is non-stationary, as its p-values are consistently higher than 0.05.

On the whole, the CIPS test results support that LTRADE and INF are stationary variables. When all other variables are non-stationary and must be differenced before any econometric research, LGDP can probably be treated as non-stationary at the 10% level.

Table 4.7
Results of first and second-generation panel unit root tests
(A) Maddala and Wu (1999) Panel Unit Root test (MW)

Specification without trend

Variable	lags	chi_sq	p-value
INEQ	0	9.722	0.465
INEQ	1	9.264	0.507
LGDP	0	0.303	1.000
LGDP	1	0.299	1.000
LTRADE	0	22.668	0.012
LTRADE	1	25.833	0.004
LEMPA	0	9.675	0.469
LEMPA	1	5.788	0.893
LEMPI	0	13.961	0.175
LEMPI	1	11.112	0.349
LEMPS	0	10.309	0.414
LEMPS	1	12.509	0.252
INF	0	15.969	0.101
INF	1	8.313	0.598
LDOM	0	11.325	0.233
LDOM	1	10.777	0.375

Specification with trend

Variable	lags	chi_sq	p-value
INEQ	0	4.867	0.900
INEQ	1	6.148	0.893
LGDP	0	18.627	0.045
LGDP	1	6.937	0.726
LTRADE	0	58.054	0.000
LTRADE	1	48.973	0.000
LEMPA	0	15.517	0.114
LEMPA	1	3.902	0.952
LEMPI	0	12.863	0.231
LEMPI	1	41.075	0.000
LEMPS	0	8.177	0.612
LEMPS	1	5.087	0.885
INF	0	10.595	0.390
INF	1	1.440	0.979
LDOM	0	6.247	0.794
LDOM	1	11.282	0.336

(B) Pesaran (2007) Panel Unit Root test (CIPS)

Specification without trend

Variable	**lags**	**Zt-bar**	**p-value**
INEQ	0	-1.251	0.088
INEQ	1	-1.018	0.155
LGDP	0	-1.221	0.097
LGDP	1	-1.176	0.098
LTRADE	0	-2.174	0.000
LTRADE	1	-2.754	0.000
LEMPA	0	-1.352	0.090
LEMPA	1	-1.162	0.141
LEMPI	0	-1.496	0.067
LEMPI	1	-1.396	0.093
LEMPS	0	-0.026	0.489
LEMPS	1	-0.105	0.446
INF	0	-2.457	0.000
INF	1	-2.585	0.005
LDOM	0	-1.001	0.158
LDOM	1	-1.269	0.085

Specification with trend

Variable	lags	Zt-bar	p-value
INEQ	0	-1.731	0.042
INEQ	1	-1.321	0.090
LGDP	0	-2.416	0.002
LGDP	1	-1.646	0.094
LTRADE	0	-1.799	0.032
LTRADE	1	-2.064	0.054
LEMPA	0	-1.644	0.096
LEMPA	1	-1.666	0.092
LEMPI	0	-2.586	0.005
LEMPI	1	-1.972	0.080
LEMPS	0	-0.971	0.188
LEMPS	1	-0.872	0.196
INF	0	-1.981	0.008
INF	1	-2.034	0.002
LDOM	0	-1.126	0.274
LDOM	1	-0.916	0.237

Source: Author's calculations, STATA.

4.2.3.2 Results of the Pesaran Panel Unit Root Test with Cross-Sectional and First Difference

To ensure that all variables are set for the upcoming testing process, it is essential to perform the Pesaran (2007) panel unit root test, considering both cross-sectional and first differences. The results reveal that most of the variables become stationary according to standard levels of significance when they are first differenced. Specifically, the statistical significance of the variables dINF, dLTADE, dLEMPI, and dLEMPS at the 1% level confirms the stationary feature of these variables, as verified by the Pesaran panel unit root test with CD and first differences. As for the variable dLDOM, it is also valid at the level of 10%, which means this variable is still non-stationary of the first order. Nevertheless, the variable dLGDP is stationary at the level as seen in Table 4.8, whereas dLEMPA is stationary at the first difference, considering the test statistic at the 5% critical level.

Table 4.8

Results of the Pesaran panel unit root test with cross-sectional and first difference

Variable	**CIPS Statistic**
dINEQ	-4.205***
dINF	-5.453***
dLGDP	-1.855
dLTRADE	-4.192***
dLEMPA	-2.800***
dLEMPI	-4.435***
dLEMPS	-3.955***
dLDOM	-2.534*

Stars indicate level of statistical significance (***1%, **5%, *10%).

Source: Author's calculations, STATA.

4.2.4 Results of Panel Cointegration Tests

After unit root tests and getting the non-stationarity assumption, the model is proper for testing cointegration tests of Kao (1999) and Pedroni (1999, 2004), and due to the presence of CD, we should add the Westerlund (2008) test.

According to the results of the Pedroni, Kao, and Westerlund cointegration tests, which are displayed in Table 4.9, the existence of a long-run equilibrium relation between the selected

macroeconomic indicators (GDP per capita, trade openness, sectoral employment, inflation, and domestic credit to the private sector) with income inequality across the Western Balkans countries is strongly supported in theory. All the test statistics (Modified Phillips-Perron t, Dickey-Fuller t, Augmented Dickey-Fuller t) under both Pedroni and Kao frameworks are significant at the 1% level; hence, the null hypothesis of no cointegration is rejected.

A significant statistic (2.6983, p = 0.0035) is also found when using the Westerlund variance ratio test, which confirms the existence of cointegration even amidst cross-sectional dependence. These results support the model's hypothesis that there is a long-term relationship between the explanatory factors and income inequality. The confirmation of cointegration in the thesis-tested Kuznets Curve philosophical context entails that the economic developmental trajectory and associated macroeconomic indices in the Western Balkans can meaningfully explain the course of income inequality and therefore provide an empirical basis for arguing for policy interventions in favor of equitable growth.

H0: No cointegration of panels
Ha: All panels are cointegrated

Table 4.9
Results of Kao, Pedroni, and Westerlund Cointegration Tests

Test	Statistic	p-value
Pedroni test for Cointegration		
Modified Phillips-Perron t	3.7620	0.0001
Phillips-Perron t	-12.7206	0.0000
Augmented Dickey-Fuller t	-8.0131	0.0000
Kao test for Cointegration		
Modified Dickey-Fuller t	-5.7594	0.0000
Dickey-Fuller t	-8.0663	0.0000
Augmented Dickey-Fuller t	-5.5047	0.0000
Unadjusted modified Dickey-Fuller t	-7.8182	0.0000
Unadjusted Dickey-Fuller t	-8.4019	0.0000
Westerlund test for Cointegration		
Variance ratio	2.6983	0.0035

Source: Author's calculations, STATA.

4.2.5 Results of Panel PMG/ARDL Estimations

The research aims to provide practical estimations of the interconnection between income inequality and such factors as economic growth, trade, employment in sectors of agriculture, industry, and services, macroeconomic uncertainty, and financial development in WB countries which are Albania, Bosnia and Herzegovina, Montenegro, North Macedonia and Serbia, over the period 2008-2023.

Three various models have been employed to estimate the PMG/ARDL dynamic mean-reverting coefficient. We employed the MG estimation methods in group one and the CCEMG and AMG estimation methods in group two. Due to slope heterogeneity and having CDs, we can ignore these tests, but to make sure we have done so, we see that the variables are not significant in these tests.

4.2.5.1 Results of MG Estimation

The main objective of this study is to provide the validity of the Kuznets Curve hypothesis for Western Balkan countries, emphasizing the proposed inverse relationship between income inequality and economic growth.

The MG conclusions shown in Table 4.10 provide evidence on the relationship that exists between economic growth and income inequality in the Western Balkans.

After looking closely at the Western Balkans, the data collected empirically presented immense backing for the Kuznets Curve hypothesis. The coefficient for LGDP is **-0.1492** and statistically significant at the 1% level (p-value = 0.0060). This indicates that, holding other variables constant, a 1% increase in GDP corresponds to a 0.1492 unit reduction in income inequality, which is consistent with the Kuznets Curve. More specifically, the GDP per capita coefficient is negative and strongly statistically significant, which would imply that income inequality decreases during the initial stages of economic development. These results may be as an indicator of implementation of minimum wage reforms or EU- aligned reforms which intend to increase the levels of wages in the upcoming years as indicated from Eurostat (2025) database.

Financial development (DOM) has a coefficient of -0.0291 that is only significant at the 10% level of significance (p-value = 0.0680). It implies that a 1% rise in private credit in the local market through the banking system can lead to a 0.0291 unit reduction in the share of income. This may be due to the financialization of wealthier classes of society rather than urban populations, which may have limited financial benefits. Moreover, the relationship between macroeconomic instability and income inequality is significant at a 5 % significance level (p-value = 0.0420) but negative, indicating that for a 1 percentage point increase in macroeconomic instability measured by inflation, there would be a 0.0005 unit decrease of income inequality.

Considering trade openness, a 1% increase means that income inequality would experience a 0.0376 unit growth, but statistically it is not significant (p-value = 0.1490). The evidence suggests that the liberalization of trade increases income inequality, so a fall in global market integration may lead to less equitable growth. This effect might indicate that the benefits of trade are not evenly distributed, indicating a concentration of capital in more urban areas, leaving the low-skilled behind.

Besides, changes in employment by sectors also indicate similar effects. For the 1% increase in agricultural employment, there would be a 0.0179 unit decrease in income inequality, though this result is not statistically significant (p-value = 0.7950). Employment in agriculture has a disproportionately negative impact on income inequality, most likely because it reflects low productivity and the informal nature of employment. Similarly, an increase of 1% in industrial and services employment is associated with a 0.2665 and 0.0751 unit reduction, respectively, in the income inequality rate. Both variables are statistically insignificant (p-value = 0.3510, p-value = 0.3650). Employment in industry and services is conducive to a sharp decrease in income inequality, thus evidencing that structural transformation is inclusive. This region suffered from early deindustrialization as mentioned in the paper of Cengiz and Manga (2024), as a consequence of the state-owned factories being shut down or privatized during the 1990s. Though some industrial employment was created, the remaining work opportunities achieved were insufficient to reduce inequality. In services, most employment growth has been concentrated in retail and tourism, low-productive informal and seasonal sectors that simply do not offer steady or well-paying jobs, which stifles their capacity to reduce income inequalities. The results not only confirm the

five research hypotheses but also provide very clear guidelines for those policies that will help move balanced regional development forward.

In the same table are provided the group of countries, which are Albania, Bosnia and Herzegovina, Montenegro, North Macedonia, and Serbia. In each group, there is a separate analysis of each of the variables, including the p-values to see the significance.

The first group, which corresponds to Albania, proved to be positive and strongly significant only for the employment in agriculture, services, and industry variables, with p-values less than 0.05, while the other variables have a p-value higher than that. So, for a 1% increase in agriculture, industry, and service sector employment, there would be a 1.6182, 0.6917, and 1.442 unit increase, respectively, of income inequality. This is indicative of the premature industrialization process occurring in Albania or the incomplete structural transformation that leads to an increase of income inequality. All other variables in the case of Albania are statistically insignificant. The relationship between deindustrialization and income inequality is a debated topic in the theoretical framework. If the share of EMPI in employment becomes the largest group, and when EMPI rises, industry can contribute to lower income disparities.

The second group is related to Bosnia and Herzegovina, whose variables are all statistically insignificant with p-values less than 0.05, indicating no evidence for Kuznets in this case. Explanation of all those factors may have an insignificant effect in Bosnia and Herzegovina due to the intricate structure of the country's institutions and politics, which results in disconnected economic policy formation and inefficient coordination on the national level. Informal employment, especially in agriculture and services may be another indicator.

Montenegro, in the third group, shows significant variables at different significance levels. For instance, a 1% increase in GDP reduces inequality by 0.1456 units (p-value = 0.0010). This indicates a highly significant and negative effect of GDP on inequality, which supports the Kuznets Curve hypothesis. There is a possibility that successful tourism-driven growth, advancements in education, and adaptation to EU standards, which in turn have facilitated broad-based social development, are the causes of this phenomenon. If trade increased by 1%, there would be a 0.0758 unit increase in inequality distribution. The likely reason for the notable but almost entirely positive impact of trade on inequality in Montenegro may

stem from the country's small size, dependency on imports, and the trade benefits that tend to accrue to a limited number of firms or industries, as opposed to being widely dispersed. For a 1 % increase in EMPA, EMPI, and EMPS, there would be a 0.2037, 0.6900, and 2.8109 units decrease, respectively, in income inequality. The significant negative effects of agricultural, industrial, and service employment suggest that the country's modern, export-oriented sectors, especially in services like finance, IT, and tourism, have helped create more equitable income opportunities. Also, for a 1% rise in DOM, the income distribution will be reduced by 0.0497 units. This highly significant variable may have these results due to the fact that Montenegro has incorporated a very well-structured digital banking system for its size, which may be able to lessen the exclusion of the less educated community from the formal financial system. On the other hand, macroeconomic instability for 1 % point increase would have a 0.0012 unit reduction in income inequality. This variable is significant at the 10% level. Montenegro strongly supports the Kuznets hypothesis.

In the fourth group, we have North Macedonia, where GDP 1% increase, would lower inequality by 0.1860 units. Employment in industry also indicates statistically significant results, which for a 1% increase would reduce inequality by 0.4083 units. Industrial employment and GDP have a significantly negative impact on inequality in the context of North Macedonia, suggesting that economic growth and structural change are succeeding in closing the gaps. The variable of trade, for a 1% increase, has a 0.0639 % positive effect on income inequality. The export-oriented strategy that benefits the capitalists or the city residents at the expense of rural people is perhaps the reason for the positive outcome of trade openness. However, despite these positive changes, the services sector is insignificant, most likely due to the division between informal, low-paid retail and hospitality jobs and high-end services. The EMPA, DOM, and INF are statistically insignificant and do not have to be interpreted.

For Serbia in the fifth group, no variables are statistically significant. The direction of GDP is negative, which is consistent with the Kuznets hypothesis. However, high p-values across all variables imply no clear or significant influence from these macroeconomic factors on income inequality during the study period. These results may be due to the large informal economy in the country or political transitions over the years.

Table 4.10
Results of the MG estimator

		Coefficient	p-value
	Mean Group Estimators		
LR	LGDP	-0.1492	0.0060
	LTRADE	0.0376	0.1490
	LEMPA	-0.0179	0.7950
	LEMPI	-0.2665	0.3510
	LEMPS	-0.0751	0.3650
	LDOM	-0.0291	0.0680
	INF	-0.0005	0.0420
Country 1	LGDP	-0.0576	0.7520
	LTRADE	0.0186	0.7080
	LEMPA	1.6182	0.0000
	LEMPI	0.6917	0.0010
	LEMPS	1.4420	0.0010
	LDOM	-0.0294	0.5090
	INF	6.55e-0.6	0.9960
Country 2	LGDP	-0.0513	0.2490
	LTRADE	0.0440	0.1570
	LEMPA	-0.0008	0.9930
	LEMPI	-0.0208	0.9150
	LEMPS	0.0054	0.9860
	LDOM	-0.0016	0.9600
	INF	-0.0006	0.2590
Country 3	LGDP	-0.1456	0.0010
	LTRADE	0.0758	0.0230
	LEMPA	-0.2037	0.0220
	LEMPI	-0.6900	0.0080
	LEMPS	-2.8109	0.0080
	LDOM	-0.0497	0.0000
	INF	-0.0012	0.0880
Country 4	LGDP	-0.1860	0.0040
	LTRADE	0.0639	0.0050
	LEMPA	0.0023	0.9600
	LEMPI	-0.4083	0.0000
	LEMPS	-0.2197	0.2090
	LDOM	-0.0432	0.1300
	INF	-0.0004	0.4390
Country 5	LGDP	-0.3241	0.2110
	LTRADE	-0.0573	0.3570
	LEMPA	0.0566	0.9030
	LEMPI	-0.5428	0.5040
	LEMPS	-0.0131	0.9930
	LDOM	0.0925	0.3090
	INF	0.0032	0.1900

Source: Author's calculations, STATA.

4.2.5.2 Results of CCEMG and AMG Estimation

Table 4.11 presents the results of the CCEMG and AMG estimators for the analyzed countries of the WBs for the period 2008 – 2023.

The estimated results for five economies in the Western Balkan region over the period 2008-2023, conducted with CCEMG and AMG models, are presented in Table 13. After all the p-values are quite higher than the usual significance thresholds, it can be interpreted from the results of the CCEMG estimator that none of the explanatory factors i.e. GDP per capita, sectoral employment (agriculture industry, and services), trade openness, macroeconomic instability and financial development, have had a statistically meaningful impact on income inequality. This leads to the conclusion that the dynamics and differences among countries in this dataset were not completely considered by the CCEMG model. However, for a very important variable, the AMG estimator gives statistically significant results because it is more robust to cross-sectional dependency and heterogeneity.

Firstly, for a 1% increase in TRADE, there would be a 0.0676 unit increase in income inequality. To be more specific, the relationship between trade openness ($p = 0.002$) and income inequality is positive, which means that the increase in the number of trade types might have been a factor in the region's widening inequalities. Furthermore, for a 1% increase in EMPA, EMPI, and EMPS, there would be a 0.1435, 0.3756, and 0.5768 unit decrease in income disparity. The decrease in inequality is positively correlated with the employment in services ($p=0.024$), industry ($p=0.000$), and agriculture ($p=0.011$), whose largest equalizing effect is due to industrial employment as shown in the results. These results suggest a strong correlation of these variables with the Kuznets hypothesis.

For the AMG model, there is no statistically significant correlation between GDP, DOM, and INF with income inequality. They all show insignificance at all levels, which means there is no need to interpret these variables.

The AMG model is a more reliable means for studying these relationships, and the research indicates that changes in employment and trade openness are the key factors that, together, drive the inequality in the Western Balkans. This is arguably the most important information.

Table 4.11
Results of CCEMG, AMG Estimator

		Coefficient	p-value
	Common Correlated Effects Mean Group Estimation		
LR	LGDP	-0.0470	0.8320
	LTRADE	-0.0068	0.9610
	LEMPA	0.0394	0.9700
	LEMPI	-0.9991	0.3580
	LEMPS	-2.0043	0.3650
	LDOM	0.0603	0.5160
	INF	0.0001	0.8860
	Augmented Mean Group Estimation		
LR	LGDP	-0.0983	0.1070
	LTRADE	0.0676	0.0020
	LEMPA	-0.1435	0.0110
	LEMPI	-0.3756	0.0000
	LEMPS	-0.5768	0.0240
	LDOM	-0.0049	0.8650
	INF	0.0010	0.1370

Source: Author's calculations, STATA.

CHAPTER 5

CONCLUSIONS AND RECCOMENDATIONS

This chapter gives an account of the main findings of the examination of the Kuznets curve hypothesis for the Western Balkan countries. The same chapter put a summary of the study and, in a non-implicit way, pointed out the research's limitations that could be a useful path for future explorations. The paper further goes on to give advice to the government based on the gathering of the empirical data.

5.1 Conclusions

Within this master's thesis research study, the nexus between economic growth and income-based inequality was sought to be investigated in the countries of Albania, Bosnia and Herzegovina, Montenegro, North Macedonia, and Serbia, all being Western Balkan nations, having the Kuznets curve as the theoretical framework for reference. The research estimated the influence of a variety of economic factors such as economic growth, trade openness, employment in agriculture, industry and services, macroeconomic instability and lastly financial development on income inequality in the area using panel data for the years 2008-2023 and three advanced estimate approaches, the MG, AMG and CCMG estimators.

The empirical findings show that an increase in economic development tends to mitigate the problem of inequality, with an invariable strong negative correlation existing between income inequality and growth, especially in the fertile lands of Montenegro and North Macedonia. The results align with observations from other OECD nations, show that as income levels rise in advanced economies, income inequality decreases according to Rajaguru et al. (2023). In their 2022 study, Alves et al. propose that OECD countries experience a U-shaped pattern connecting inequality and growth.

This insinuates that growth can foster greater fairness past a certain income threshold trend that has already begun in some Western Balkan countries. The research results validated the Kuznets hypothesis for the Western Balkans since the data ruled out a direct U-shaped association between GDP per capita and income inequality. The upshot is that inequality rises with income in the initial stages of economic growth, after which it generally declines beyond a certain income level.

The research found that income inequality was also very much affected by some aspects apart from GDP. The data showed that trade openness caused a double result, the reason for it being that with countries having no adequate labor market flexibility or weak redistributive systems, trade openness increased inequality and vice versa. North Macedonia and Montenegro experienced increased inequality because these nations received unequal shares of global trade advantages, especially in skill-dependent sectors. Research by Gorjón et al. (2023) and Bergh and Nilsson (2010) demonstrates that trade liberalization and globalization consistently resulted in higher inequality within BRICS and OECD countries, especially in areas lacking robust social safety measures.

The situation of a high level of inequality came from employment in agriculture. This was mainly seen in Albania, which was characterized by a lot of the agriculture being informally done, yet still very common. While industrial and service jobs decreased inequality in Montenegro substantially, probably due to relatively high productivity and wage stability in those sectors, high concentrations of workers in the agricultural and service sectors, characterized by low productivity, increased inequality in Albania. These research findings support Rodrik's (2013) and Mehic's (2018) theories about how industrial employment creates equal opportunities across developed and developing nations. Early deindustrialization, however, appears to have constrained this mechanism in some of the Western Balkan countries, with Tregenna (2016) and Ravindran & Suresh Babu (2021) raising similar alarms for other middle-income countries. However, to a greater or lesser extent, employment in industry and services had a mitigating effect on inequality in most countries.

Low-income families are particularly hit hard by high prices on a disproportionate basis. At times, inflation is even used as a proxy for macroeconomic instability, so its growth has a likely destructive effect on the wealth distribution. However, the relationship between

financial development, as evaluated by the private sector's loans in a country, and inequality is double-edged. The increase in credit availability may be a factor lowering inequality, but in most cases, it is mostly people from the richer class or the urban who are the beneficiaries, amidst the absence of a financial system that is inclusive, thus leading to the widening of inequality. With small coefficients as well as unclear directional impacts, inflation was not very useful at all and did not disseminate uniformly among countries. This suggests that the impact of macroeconomic instability compared to inequality in the Western Balkans is likely moderated by some other factors, such as wage rigidity or income indexation that is not fully flexible. According to OECD and BRICS studies (Albanesi, 2007; Berisha et al., 2019), inflation increases inequality when low-income groups experience substantial price rises without adequate support.

In Montenegro, the impact of financial development on inequality was notable, supporting the idea that comprehensive credit provision can facilitate equitable growth. This was further supported by Beck et al. (2007) and Mbona (2022), evidencing that expanding credit access in both OECD and developing countries reduces inequality, provided it is accessible to the disadvantaged. Petreski et al. (2014) analyze the underdeveloped or unbalanced financial markets and attempt to explain the lackluster performance of other Western Balkan countries.

The research study presents statistical evidence illustrating how economic growth levels alongside employment structure, macroeconomic conditions, trade dynamics, and financial inclusivity serve as main factors determining income inequality throughout the Western Balkans. The detailed insights present a comprehensive understanding of the indicators of inequality present in the region.

5.2 Policy Recommendations

The research indicates that implementing some policy recommendations is effective in the Western Balkans in achieving a more equitable income distribution.

1. Stimulating inclusive growth strategies: By financing programs for social safety nets, equitable taxation, and the provision of these public services to the vulnerable groups, which are usually less accessible, policymakers can keep growth on track after the turning point of the Kuznets curve.

2. Change agricultural employment: By improving efficiency, organizing the workforce in agriculture, and helping workers to switch to well-paid sectors are significant factors for those nations with a large portion of the working population in such a sector, and especially Albania, for them to be open for and positively deal with the process of further urbanization coming from the countryside.
3. Encouragement of manufacturing and service sector growth: Adding investment to both the manufacturing and high-value service activities that provide quality, skilled jobs will fight inequality, to which inclusive universal education systems must be added and human capital needed to provide widespread access to the opportunities created by the former.
4. Access to credibility: Providing the people of lower income and marginalized communities the opportunity to borrow money can help to deal with the issue. It should also be made an effort to eradicate financial marginalization through appropriate banking, fintech, and microfinance.
5. Inflation control and maintenance of macroeconomic stability: The implementation of both fiscal and monetary policies is the price stability determinant that is the most necessary tool to secure the consumption level of the working population and protect it from the redistributive impacts of inflation.
6. Trade regulations and social protection should be in balance: To address trade-related inequality, social safety nets, labor protection, and labor market policies should be trade liberalization-friendly and applied jointly with the latter.

Since the MG results for Albania concluded that employment in agriculture, industry, and services was positive and statistically significant, there should be some policy recommendations. Albania should focus on the most important priority of promoting labor strength and efficiency through training, technology, and rural investment. As for leveling wage inequalities and social disparities, the authorities must, first of all, pay great attention to job creation through proper employment formalization, therefore, upskilling, and the implementation of the minimum wage in the industrial and service sectors.

Talking about Bosnia and Herzegovina, not even one of the variables was substantial. Bosnia and Herzegovina should assertively focus on institutional reforms and national economic coordination as the primary means to enable the successful implementation of redistributive policies. The effect of inequality on other macroeconomic tools would be more efficient

through data transparency, formalization of the informal sector, and setup of fair financial systems.

Trade openness, by contrast, has a negative influence, whereas the growth of the Montenegrin economy, the creation of jobs in both the service and industrial sectors, the achievements in the financial sector, and the progress in agriculture have been the main reasons for the decrease in inequality. Talking from another perspective, the nation must strive to make available resources for attracting foreign investments into sectors showing the highest productivity and in doing so, be sure to cover rural areas and the underprivileged strata of society with the fair credit facilities, as well as managing trade integration, thereby redistributing the wealth of the society more equitably through the mechanism of social targeted transfers and the progressive taxation system, which are also the means of maintaining and propagating the inclusive but economic development.

It can be said that trade liberalization is the primary reason for the widening inequality in North Macedonia, but on the other hand, the large-scale industrial growth and the increase of working positions in this area have mostly countered it. Along with the process of rising manufacturing employment, predominantly in export-driven zones, the Republic of North Macedonia has to ensure the primary focus on broadening the education of vocational training, as well as promoting ethical labor standards. Similarly, the setting up of equitable industrial policies and the powerful backup of social safety nets are also the best ways to protect people with low income from globalization-associated disparities.

The main focus in the case of Serbia is to put the foundations for equitable growth by making social support, financial services, and education more accessible in the marginal areas. No variables were found to have statistical significance. Another necessary action is to settle differences on a regional level and also promote the transformation of informal activity into formal one to make sure that macroeconomic progress is directly linked to reduced inequality.

5.3 Limitations of the Study

This study has several limitations, even though it offers pertinent insights into the dynamics of income disparity in the Western Balkans. The missing data for Kosovo is the main

limitation of our study, since the lack of data makes it difficult for this country to be taken into consideration in the study as a country included in the Western Balkans. Given that the data is available, the sample size (N) of the study is small, and the period (T) is also not extensive. Pesaran's PMG estimator, which is suitable for both small N and non-stationary panels, is provided as a solution to this limitation. It is important to say that a stronger analysis could have also been done if a more extensive dataset were used.

Future studies can take these findings as the basis for more research with the help of broader institutional factors, analyzing more recent data when it will soon becomes available, and by conducting country-based case studies to more adequately capture the local dynamics and policy effects.

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APPENDICES

Appendix A: Econometric Analysis Results

Table A.1

Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
INEQ	80	.34818	.0308976	.2928	.4598
log_GDP	80	11.34316	2.100641	8.501034	13.87209
log_TRADE	80	4.565164	.2057308	4.086324	5.112875
log_EMPA	80	2.827558	.6071901	1.506989	3.828546
log_EMPI	80	3.191194	.2367236	2.781111	3.498262
log_EMPS	80	3.985304	.2090981	3.576476	4.354755
INF	80	3.420147	3.839628	-1.584008	14.20472
log_DOM	80	3.812012	.2028691	3.393712	4.459548

Table A.2

Correlations

	INEQ	log_GDP	log_TR~E	log_EMPA	log_EMPI	log_EMPS	INF	log_DOM
INEQ	1.0000							
log_GDP	0.1671	1.0000						
log_TRADE	-0.3386	-0.1731	1.0000					
log_EMPA	0.0374	0.6500	-0.6427	1.0000				
log_EMPI	-0.1765	0.1283	0.2446	0.1304	1.0000			
log_EMPS	0.1320	-0.5894	0.5766	-0.9751	-0.2083	1.0000		
INF	0.0946	0.1958	0.2261	-0.0382	0.0223	0.0522	1.0000	
log_DOM	-0.2838	-0.7452	0.4559	-0.7194	0.1539	0.6359	-0.1640	1.0000

Table A.3

CD Test

Variable	CD-test	p-value	average joint T	mean ρ	mean abs(ρ)
INEQ	3.526	0.000	16.00	0.28	0.49
log_GDP	12.008	0.000	16.00	0.95	0.95
log_TRADE	6.808	0.000	16.00	0.54	0.54
log_EMPA	3.521	0.000	16.00	0.28	0.55
log_EMPI	2.814	0.005	16.00	0.22	0.28
log_EMPS	3.75	0.000	16.00	0.30	0.41
INF	10.987	0.000	16.00	0.87	0.87
log_DOM	1.56	0.119	16.00	0.12	0.43

Notes: Under the null hypothesis of cross-section independence, CD ~ N(0,1)
P-values close to zero indicate data are correlated across panel groups.

Table A.4

Slope heterogeneity tests

Testing for slope heterogeneity
(Pesaran, Yamagata. 2008. Journal of Econometrics)
H0: slope coefficients are homogenous

	Delta	p-value
	1.646	0.100
adj.	2.488	0.013

Variables partialled out: constant

Table A.5

HAC test

Testing for slope heterogeneity
(Blomquist, Westerlund. 2013. Economic Letters)
H0: slope coefficients are homogenous

	Delta	p-value
	-1.390	0.164
adj.	-2.102	0.036

HAC Kernel: bartlett
with average bandwith 2
Variables partialled out: constant

Table A.6
First and second-generation panel unit root tests

(A) Maddala and Wu (1999) Panel Unit Root test (MW)

	Specification without trend		
Variable	lags	chi_sq	p-value
INEQ	0	9.722	0.465
INEQ	1	9.264	0.507
log_GDP	0	0.303	1.000
log_GDP	1	0.299	1.000
log_TRADE	0	22.668	0.012
log_TRADE	1	25.833	0.004
log_EMPA	0	9.675	0.469
log_EMPA	1	5.788	0.833
log_EMPI	0	13.961	0.175
log_EMPI	1	11.112	0.349
log_EMPS	0	10.309	0.414
log_EMPS	1	12.509	0.252
INF	0	15.969	0.101
INF	1	8.313	0.598
log_DOM	0	11.325	0.333
log_DOM	1	10.777	0.375

	Specification with trend		
Variable	lags	chi_sq	p-value
INEQ	0	4.867	0.900
INEQ	1	6.148	0.803
log_GDP	0	18.627	0.045
log_GDP	1	6.997	0.726
log_TRADE	0	58.054	0.000
log_TRADE	1	48.973	0.000
log_EMPA	0	15.517	0.114
log_EMPA	1	3.902	0.952
log_EMPI	0	12.863	0.231
log_EMPI	1	41.075	0.000
log_EMPS	0	8.177	0.612
log_EMPS	1	5.087	0.885
INF	0	10.595	0.390
INF	1	1.440	0.999
log_DOM	0	6.247	0.794
log_DOM	1	11.282	0.336

(B) Pesaran (2007) Panel Unit Root test (CIPS)

	Specification without trend			
Variable	lags	Zt-bar	p-value	t-bar
INEQ	0	-1.351	0.088	.
INEQ	1	-1.015	0.155	.
log_GDP	0	1.921	0.973	.
log_GDP	1	2.646	0.996	.
log_TRADE	0	1.173	0.880	.
log_TRADE	1	2.714	0.997	.
log_EMPA	0	1.554	0.940	.
log_EMPA	1	1.562	0.941	.
log_EMPI	0	-1.293	0.098	.
log_EMPI	1	-1.496	0.067	.
log_EMPS	0	-0.026	0.489	.
log_EMPS	1	0.617	0.732	.
INF	0	-3.457	0.000	.
INF	1	-2.585	0.005	.
log_DOM	0	-1.001	0.158	.
log_DOM	1	-1.369	0.085	.

	Specification with trend			
Variable	lags	Zt-bar	p-value	t-bar
INEQ	0	-1.731	0.042	.
INEQ	1	-1.321	0.093	.
log_GDP	0	2.416	0.992	.
log_GDP	1	2.542	0.994	.
log_TRADE	0	-1.799	0.036	.
log_TRADE	1	1.754	0.960	.
log_EMPA	0	1.509	0.934	.
log_EMPA	1	1.668	0.952	.
log_EMPI	0	-1.134	0.128	.
log_EMPI	1	-2.586	0.005	.
log_EMPS	0	-0.971	0.166	.
log_EMPS	1	0.872	0.808	.
INF	0	-4.498	0.000	.
INF	1	-0.898	0.185	.
log_DOM	0	0.128	0.551	.
log_DOM	1	-0.716	0.237	.

Null for MW and CIPS tests: series is I(1).
MW test assumes cross-section independence.
CIPS test assumes cross-section dependence is in
form of a single unobserved common factor.

-multipurt- uses Scott Merryman's -xtfisher- and
Piotr Lewandowski's -pescadf-.

Table A.7
Pesaran panel unit root test with cross-sectional and first difference

Pesaran Panel Unit Root Test with cross-sectional and first difference mean included for dINF
Deterministics chosen: constant

Dynamics: lags criterion decision General to Particular based on F joint test

Individual ti were truncated during the aggregation process

H0 (homogeneous non-stationary): bi = 0 for all i

CIPS* = -5.453 N,T = (5,15)

	10%	5%	1%
Critical values at	-2.22	-2.37	-2.66

Pesaran Panel Unit Root Test with cross-sectional and first difference mean included for dlog_GDP
Deterministics chosen: constant

Dynamics: lags criterion decision General to Particular based on F joint test

H0 (homogeneous non-stationary): bi = 0 for all i

CIPS = -1.855 N,T = (5,15)

	10%	5%	1%
Critical values at	-2.22	-2.37	-2.66

Pesaran Panel Unit Root Test with cross-sectional and first difference mean included for dlog_TRADE
Deterministics chosen: constant

Dynamics: lags criterion decision General to Particular based on F joint test

Individual ti were truncated during the aggregation process

H0 (homogeneous non-stationary): bi = 0 for all i

CIPS* = -4.192 N,T = (5,15)

	10%	5%	1%
Critical values at	-2.22	-2.37	-2.66

Pesaran Panel Unit Root Test with cross-sectional and first difference mean included for dlog_EMPA
Deterministics chosen: constant

Dynamics: lags criterion decision General to Particular based on F joint test

H0 (homogeneous non-stationary): bi = 0 for all i

CIPS = -2.800 N,T = (5,15)

	10%	5%	1%
Critical values at	-2.22	-2.37	-2.66

Pesaran Panel Unit Root Test with cross-sectional and first difference mean included for dlog_EMPI
Deterministics chosen: constant

Dynamics: lags criterion decision General to Particular based on F joint test

H0 (homogeneous non-stationary): bi = 0 for all i

CIPS = -4.435 N,T = (5,15)

	10%	5%	1%
Critical values at	-2.22	-2.37	-2.66

Pesaran Panel Unit Root Test with cross-sectional and first difference mean included for dlog_EMPS
Deterministics chosen: constant

Dynamics: lags criterion decision General to Particular based on F joint test

H0 (homogeneous non-stationary): bi = 0 for all i

CIPS = -3.955 N,T = (5,15)

	10%	5%	1%
Critical values at	-2.22	-2.37	-2.66

Pesaran Panel Unit Root Test with cross-sectional and first difference mean included for dINF
Deterministics chosen: constant

Dynamics: lags criterion decision General to Particular based on F joint test

Individual ti were truncated during the aggregation process

H0 (homogeneous non-stationary): bi = 0 for all i

CIPS* = -5.453 N,T = (5,15)

	10%	5%	1%
Critical values at	-2.22	-2.37	-2.66

Pesaran Panel Unit Root Test with cross-sectional and first difference mean included for dlog_DOM
Deterministics chosen: constant

Dynamics: lags criterion decision General to Particular based on F joint test

H0 (homogeneous non-stationary): bi = 0 for all i

CIPS = -2.534 N,T = (5,15)

	10%	5%	1%
Critical values at	-2.22	-2.37	-2.66

Table A.8

Kao, Pedroni, and Westerlund Cointegration Tests

Kao test for cointegration

Ho: No cointegration — Number of panels = 5
Ha: All panels are cointegrated — Number of periods = 13

Cointegrating vector: Same
Panel means: Included — Kernel: Bartlett
Time trend: Not included — Lags: 1.20 (Newey-West)
AR parameter: Same — Augmented lags: 1

Cross-sectional means removed

	Statistic	p-value
Modified Dickey-Fuller t	-3.7366	0.0001
Dickey-Fuller t	-3.7211	0.0001
Augmented Dickey-Fuller t	-2.6206	0.0044
Unadjusted modified Dickey-Fuller t	-4.7864	0.0000
Unadjusted Dickey-Fuller t	-3.9822	0.0000

Pedroni test for cointegration

Ho: No cointegration — Number of panels = 5
Ha: All panels are cointegrated — Number of periods = 14

Cointegrating vector: Panel specific
Panel means: Included — Kernel: Bartlett
Time trend: Included — Lags: 2.00 (Newey-West)
AR parameter: Panel specific — Augmented lags: 1

Cross-sectional means removed

	Statistic	p-value
Modified Phillips-Perron t	3.8639	0.0001
Phillips-Perron t	-3.5400	0.0002
Augmented Dickey-Fuller t	-2.1247	0.0168

```
. xtcointtest westerlund L.INEQ log_GDP log_TRADE log_EMPA log_EMPI log_EMPS log_DOM INF, trend demean
```

Westerlund test for cointegration

Ho: No cointegration — Number of panels = 5
Ha: Some panels are cointegrated — Number of periods = 15

Cointegrating vector: Panel specific
Panel means: Included
Time trend: Included
AR parameter: Panel specific

Cross-sectional means removed

	Statistic	p-value
Variance ratio	1.9323	0.0267

Table A.9
MG Results

Pesaran & Smith (1995) Mean Group estimator

All coefficients present represent averages across groups (CODE)
Coefficient averages computed as outlier-robust means (using rreg)

Mean Group type estimation — Number of obs = 80
Group variable: CODE — Number of groups = 5

Obs per group:
min = 16
avg = 16.0
max = 16

Wald chi2(7) = 18.90
Prob > chi2 = 0.0085

INEQ	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
log_GDP	-.1492652	.054258	-2.75	0.006	-.2556088	-.0429216
log_TRADE	.0376041	.0260833	1.44	0.149	-.0135183	.0887264
log_EMPA	-.0179776	.0691281	-0.26	0.795	-.1534663	.117511
log_EMPI	-.2665741	.2856022	-0.93	0.351	-.8263441	.293196
log_EMPS	-.0750992	.0829002	-0.91	0.365	-.2375806	.0873822
log_DOM	-.0291618	.0159608	-1.83	0.068	-.0604444	.0021207
INF	-.0005956	.0002923	-2.04	0.042	-.0011684	-.0000228
__000007_t	.0049163	.0022349	2.20	0.028	.0005361	.0092966
_cons	4.185675	6.128144	0.68	0.495	-7.825266	16.19662

Root Mean Squared Error (sigma): 0.0047
(RMSE uses residuals from group-specific regressions: unaffected by 'robust').
Variable __000007_t refers to a group-specific linear trend.
Share of group-specific trends significant at 5% level: 0.200 (= 1 trends)

Group-specific coefficients

	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
Group 1						
log_GDP	-.0576156	.1824363	-0.32	0.752	-.4151841	.2999529
log_TRADE	.0186867	.0498079	0.38	0.708	-.0789351	.1163084
log_EMPA	1.618249	.4536462	3.57	0.000	.7291192	2.50738
log_EMPI	.6917189	.1996675	3.46	0.001	.3003777	1.08306
log_EMPS	1.442069	.4213825	3.42	0.001	.6161749	2.267964
log_DOM	-.0294013	.0445106	-0.66	0.509	-.1166405	.0578379
INF	6.55e-06	.0014309	0.00	0.996	-.0027979	.002811
__000007_t	.0063044	.0056418	1.12	0.264	-.0047534	.0173621
_cons	-12.27977	5.294065	-2.32	0.020	-22.65595	-1.903595
Group 2						
log_GDP	-.0513352	.0445292	-1.15	0.249	-.1386108	.0359404
log_TRADE	.0440887	.0311902	1.41	0.157	-.0170429	.1052203
log_EMPA	-.0008789	.1047253	-0.01	0.993	-.2061367	.2043789
log_EMPI	-.0208848	.1953831	-0.11	0.915	-.4038286	.3620589
log_EMPS	.0054469	.316144	0.02	0.986	-.614184	.6250779
log_DOM	-.0016382	.0326589	-0.05	0.960	-.0656486	.0623721
INF	-.0006748	.0005977	-1.13	0.259	-.0018464	.0004967
__000007_t	.0013563	.0016479	0.82	0.410	-.0018735	.004586
_cons	.6596263	2.205007	0.30	0.765	-3.662107	4.98136
Group 3						
log_GDP	-.1456517	.0434314	-3.35	0.001	-.2307757	-.0605276
log_TRADE	.0758362	.0332444	2.28	0.023	.0106784	.1409941
log_EMPA	-.2037357	.0888212	-2.29	0.022	-.3778221	-.0296493
log_EMPI	-.6900727	.2591647	-2.66	0.008	-1.198026	-.1821192
log_EMPS	-2.810904	1.054981	-2.66	0.008	-4.878628	-.7431792
log_DOM	-.049771	.0126148	-3.95	0.000	-.0744956	-.0250465
INF	-.0012598	.0007384	-1.71	0.088	-.002707	.0001875
__000007_t	.003694	.0010323	3.58	0.000	.0016707	.0057174
_cons	15.95793	5.463514	2.92	0.003	5.24964	26.66622
Group 4						
log_GDP	-.1860927	.0639815	-2.91	0.004	-.3114941	-.0606912
log_TRADE	.0639331	.0225811	2.83	0.005	.0196748	.1081913
log_EMPA	.0023284	.0462164	0.05	0.960	-.088254	.0929108
log_EMPI	-.4083475	.1098508	-3.72	0.000	-.6236511	-.1930439
log_EMPS	-.2197365	.1749476	-1.26	0.209	-.5626275	.1231545
log_DOM	-.0432934	.0286228	-1.51	0.130	-.0993931	.0128062
INF	-.0004677	.0006044	-0.77	0.439	-.0016523	.000717
__000007_t	.0036816	.001856	1.98	0.047	.0000438	.0073194
_cons	4.70481	1.566954	3.00	0.003	1.633637	7.775983
Group 5						
log_GDP	-.3241098	.2588369	-1.25	0.211	-.8314208	.1832012
log_TRADE	-.0573274	.0622636	-0.92	0.357	-.1793618	.064707
log_EMPA	.0566036	.4636713	0.12	0.903	-.8521754	.9653826
log_EMPI	-.5428101	.8126185	-0.67	0.504	-2.135513	1.049893
log_EMPS	-.0131909	1.432902	-0.01	0.993	-2.821627	2.795246
log_DOM	.0925618	.0910347	1.02	0.309	-.085863	.2709866
INF	.0032942	.0025145	1.31	0.190	-.0016342	.0082226
__000007_t	.0140162	.00831	1.69	0.092	-.0022711	.0303035
_cons	6.258612	11.42604	0.55	0.584	-16.13602	28.65324

Table A.10
Results of CCEMG, AMG Estimator

Pesaran (2006) Common Correlated Effects Mean Group estimator

All coefficients present represent averages across groups (CODE)
Coefficient averages computed as unweighted means

Mean Group type estimation		Number of obs	= 80
Group variable: CODE		Number of groups	= 5
		Obs per group:	
		min	= 16
		avg	= 16.0
		max	= 16
		Wald chi2(4)	= 6.45
		Prob > chi2	= 0.1683

INEQ	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
log_GDP	-.0470261	.2210374	-0.21	0.832	-.4802515	.3861993
log_TRADE	-.006805	.1402141	-0.05	0.961	-.2816196	.2680096
log_EMPA	.0394492	1.065673	0.04	0.970	-2.049232	2.128131
log_EMPI	-.9991491	1.086964	-0.92	0.358	-3.12956	1.131262
log_EMPS	-2.004388	2.212539	-0.91	0.365	-6.340885	2.332109
log_DOM	.0603558	.0929913	0.65	0.516	-.1219038	.2426153
INF	.0001698	.0011853	0.14	0.886	-.0021534	.0024931

Augmented Mean Group estimator (Bond & Eberhardt, 2009; Eberhardt & Teal, 2010)

Common dynamic process imposed with unit coefficient
Dependent variable adjusted INEQ
All coefficients present represent averages across groups (CODE)
Coefficient averages computed as unweighted means

Mean Group type estimation		Number of obs	= 80
Group variable: CODE		Number of groups	= 5
		Obs per group:	
		min	= 16
		avg	= 16.0
		max	= 16
		Wald chi2(4)	= 118.58
		Prob > chi2	= 0.0000

	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
log_GDP	-.098387	.0610728	-1.61	0.107	-.2180874	.0213134
log_TRADE	.0676987	.0216483	3.13	0.002	.0252689	.1101286
log_EMPA	-.1435109	.0565835	-2.54	0.011	-.2544125	-.0326092
log_EMPI	-.3756418	.063852	-5.88	0.000	-.5007893	-.2504942
log_EMPS	-.5768533	.2552404	-2.26	0.024	-1.077115	-.0765913
INF	.0010414	.0007007	1.49	0.137	-.000332	.0024148
log_DOM	-.0049039	.0288061	-0.17	0.865	-.0613628	.051555
__000007_t	.0025691	.0021898	1.17	0.241	-.0017228	.0068609
_cons	5.352985	.7414706	7.22	0.000	3.899729	6.806241

Root Mean Squared Error (sigma): 0.0043
Variable __000007_t refers to a group-specific linear trend.
Share of group-specific trends significant at 5% level: 0.200 (= 1 trends)

CURRICULUM VITAE

Marinela Çopa was born in Greece on February 19, 2002, and she is an enthusiast working on her academic and professional pursuits in Economics. She earned a bachelor's degree in Economics in 2023 and is set to complete her master's program in the same field by 2025 at Epoka University. Throughout her educational journey, Marinela has consistently been engaged in learning and gaining knowledge in economic theories and practicalities to gain excellence in her field.

She possesses a broad set of skills, including excellent time management, attention to detail, and strong analytical abilities. She can easily hold her composure under intense pressure, which indicates that she can multitask and work efficiently. Within economics, Marinela gained some knowledge in macroeconomics, microeconomics, econometrics, and monetary policy.

In addition to her academic achievements, Marinela has worked as a sales manager for a construction company in real estate, an experience that greatly enriched her practical knowledge as well as her professional development. Moreover, for the last two years, she has been working as an internal economist at the same company, gaining valuable experience as well as valuable insight into economic and financial operations.