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The Impacts of Economic Globalization on Poverty and Income Inequality: Evidence from CEECs

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Abstract

This paper aims to explore the relationship between economic globalization and poverty and income inequality in Central and Eastern Europe Countries (CEECs). Despite the considerable research on the effects of globalization on poverty and income inequality, there is a lack of consistent conclusions and a specific emphasis on CEECs. To address these research gaps, we employ two-way fixed-effects regression model, country fixed-effects regression model, and random effects-regression model to examine the impacts of the KOF economic globalization index as well as its sub-indices on World Bank absolute poverty estimates and World Bank Gini index estimates using panel data of nine high-income CEECs from 2004 to 2020. Overall, the study suggest that economic globalization reduces both poverty and income inequality in CEECs, which contradicts the expectation that globalization may exacerbate income inequality. By disaggregating the impacts of economic globalization, the results show that trade and financial globalization can significantly reduce poverty yet only financial globalization can substantially decrease income inequality. Additionally, positive effects of restrictions are more robust than those of actual flows. These findings support policies that promote economic openness in CEECs to mitigate poverty and income inequality.

Keywords

Economic Globalization; Poverty; Income Inequality; Central and Eastern Europe

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Declaration of Authorship

1. The author hereby declares that he compiled this thesis independently, using only the listed resources and literature.

2. The author hereby declares that all the sources and literature used have been properly cited.

3. The author hereby declares that the thesis has not been used to obtain a different or the same degree.

Prague … 01/08/2023 **Yi Hu**

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Contents

Introduction

Over the past few decades, globalization has had a profound influence on economic development and human life in its economic, social, and political aspects, with the ongoing economic globalization facilitating the expansion of international trade, investment, and capital flows and improving the welfare of an open economy (Gozgor and Ranjan, 2017; Gozgor et al, 2020). Following the collapse of Soviet communism in the 1990s, Central and Eastern European Countries (CEECs) have experienced a dramatic globalization process during transition from centrally planned economies to market-oriented systems, which was accelerated when these countries started to join the European Union (EU) since 2004, boosting the integration of these countries into the global economy (Bandelj, 2010). Meanwhile, with the rapid development of globalization, poverty and income inequality have remained persistent global concerns. The challenge to alleviate poverty and mitigate income inequality has been highlighted by the United Nation's Millennium Development Goals (MDGs) and the subsequent Sustainable Development Goals (SDGs). The MDGs, which were established in 2000, stated a global commitment to combat extreme poverty and have achieved a significant progress by halving the extreme poverty rate by 2015. Launched in 2015, the SDGs aim to eliminate world poverty and with reducing within- and among- country income inequality by 2030. The study on the impacts of economic globalization on poverty and income inequality in Central and Eastern Europe (CEE) can help with the SDG's objectives of permanently eliminating poverty and reducing income inequality by offering recommendations for policymakers in the region.

Given the rapid expansion of globalization and the necessity of addressing poverty and income disparity, a great number of research have investigated the impacts of globalization on these two socio-economic factors, respectively. Despite much academic discussion in recent decades, there is still no consensus on how economic globalization affects poverty and income inequality. The neoliberal argument, which claims that since the 1980s, global poverty and income inequality have been on the decline as a result of expanding cross-border economic integration, is one of the key

theoretical frameworks for the study of this subject. Meanwhile, the impact of trade globalization on poverty and income inequality is theoretically supported by the Stolper-Samuelson theorem and the Heckscher-Ohlin (HO) theory of international trade, which assert that trade integration help reduce poverty and lessen income inequality for countries with abundant less-skilled labour force while exacerbate income inequality for the ones with abundant professional labour force. A large body of research have confirmed that economic globalization, including trade openness and financial integration, could reduce poverty primarily through boosting economic growth (Bergh and Nilsson, 2014; Bhagwati and Srinivasan, 2002; Dollar and Kraay, 2004; Dollar, 2005; Nissanke and Thorbecke, 2006; Nissanke and Thorbecke, 2010). Nonetheless, other studies argued that globalization may have both positive and negative impacts on the poor (Aisbett et al., 2007; Harrison, 2006; Harrison and McMillan, 2007; Kang-Kook, 2014). Besides, a growing body of studies have revealed the complex relationship between economic globalization and income inequality by investigating the impact of trade integration and financial globalization on income inequality separately, as well as the differential income inequality impact of trade and financial globalization across various levels of economic development, with many of them claiming that globalization has led to increased income inequality in developed countries (Aisbett et al., 2007; Baek and Shi, 2016; Bergh and Nilsson, 2010; Dorn et al., 2018; Harrison, 2006; Heimberger, 2020; Huang et al., 2020; Hui and Bhaumik, 2023; Jaumotte et al., 2013; Kang-Kook, 2014; Zakaria and Fida, 2016).

With inconsistent conclusions on how economic globalization affects poverty and income inequality, there is a significant research gap on this topic. Furthermore, while numerous studies have explored the impact of economic globalization on countries throughout the world, most of them overlooked the unique case of the CEE region and the rapid globalization of recent decade, focusing mainly on the early transition period of the 1990s. To address these research gaps, this paper aims to provide empirical evidence on the role of economic globalization on poverty and income inequality in CEECs, starting from their accession to EU in 2004 to the present. The research develops two hypotheses grounded in theoretical foundations that intend

to explore the link between economic globalization and poverty and income inequality respectively. Our first hypothesis posits that economic globalization could greatly reduce poverty in CEE, whereas our second hypothesis contends that it would significantly widen income inequality in the region. This paper adopts two-way fixed-effects (FE) model, entity fixed-effects model, and random-effects (RE) model, to examine the impact of economic globalization on poverty and income inequality. Our sample consists of annual panel data for nine high-income countries in the CEE region, including the Czech Republic, Hungary, Poland, Slovakia, Estonia, Latvia, Lithuania, Slovenia, and Romania, covering the period 2004-2020. Using the KOF Globalization Index, this paper provides a thorough analysis of the impact of economic globalization on poverty and income inequality by measuring economic globalization broadly across five dimensions, including the overall economic globalization, trade globalization, financial globalization, actual flows (de facto), and restrictions (de jure). Moreover, this article uses World Bank estimates for absolute poverty and the Gini index to access poverty levels and income inequality in CEECs.

The following study consists of four main chapters including literature reviews, hypotheses and methodology, results and discussions, and conclusions. Firstly, the literature reviews chapter provides basic definitions and key measures of globalization, poverty, and income inequality as well as background information regarding these factors in the CEE region, conducts theoretical debates on the impact of economic globalization on poverty and income inequality, and highlights the contribution of the research by emphasizing the research gap on such topic. In the second chapter, we introduce the hypotheses and the methodology of our research. The hypotheses section outlines the objectives and theoretical foundations of the study, and accordingly presents two main research hypotheses, wherein the first hypothesis concerns the causal link between economic globalization and poverty and the second one concerns the relationship between economic globalization and income inequality. The methodology section consists of three parts including sample and data, variable construction, and model specification. Furthermore, the third chapter consists of three sections, which are descriptive analysis, regression analysis, and discussions. Descriptive analysis presents

overall and country-specific summary statistics as well as time series graph across countries over the observation period for key variables. Regression analysis provides a detailed explanation on the tests employed during the regression analysis, including the tests for multicollinearity, stationarity, model selection, cross-sectional dependence, heteroscedasticity, and autocorrelation, as well as the regression outcomes and robust estimations followed by a summary of the key findings. The last section provides a comprehensive discussion of the key findings by incorporating them into relevant theories and literature. Lastly, the paper reviews the research objectives, contributions, and key findings in the conclusion section and provides recommendations for future research and policymakers, whilst acknowledging the limitations of this study.

1. Literature Reviews

To examine the effects of economic globalization on poverty and income inequality in the CEE region, this chapter concentrates on the key findings and debates in the existing research by providing the concept and history of globalization, poverty, and inequality as well as the theoretical background on the causality from economic globalization to poverty and income inequality, respectively. The first part illustrates the basic definitions and key measurements of globalization, poverty, and income inequality regarding current literatures. In the second part, this paper presents an overview of globalization, poverty, and income inequality in the CEE region. Furthermore, the third part offers a theoretical discussion by gathering various point of views on the impacts of globalization to evaluate how it affects poverty and income inequality based on the existing studies. The last part summarises the findings and highlights the contributions that this article brings to the field by outlining the research gaps in the body of prior work on the subject of how economic globalization impacts poverty and income disparity.

1.1 Basic Concepts and Definitions

This section describes the key definitions and measurements of economic globalization, poverty, and income inequality, respectively. By reviewing different perspectives and approaches, we aim to gain a comprehensive understanding of the basic concepts of these factors and to select the definition and measurement that aligns best with our research objectives, in order to establish a solid foundation for further analysis.

1.1.1 Definition and Measurement of Economic Globalization

The idea of globalization exists with many interpretations. According to Keohane and Nye (2000), globalization is a multidimensional phenomenon that

comprises economic globalization, social and cultural globalization, military globalization, and environmental globalization, wherein economic globalization is characterized as movements of products, services, and capital across long distances as well as the information and perceptions that accompany market exchanges. A comprehensive definition of globalization introduced by Al-Rodhan and Stoudmann (2006) stated that globalization is the process of integrating both human and non-human operations across national and cultural boundaries including its origins, development, and effects, involving economic integration, cross-border policy transfer, knowledge transmission, cultural stability, and the perpetuation of power relations and ideologies. Moreover, Thompson (2000) demonstrated that globalization is a radical transformation process that not only entails a fundamental change in the foundation of national and global economic interactions, but also in political and cultural ones. Samimi et al. (2011) explained that globalization has an impact on the economic, social, political, and environmental spheres of our life, contributing to a larger amount of oversea trade flows of goods and services, higher international capital flows, lower trade barriers, and the dissemination of technology and information. Bach (2008) pointed out the benefits of globalization, including the rapid expansion of the global economy, the creation of job opportunities, the broadening of career-advancing possibilities, the encouragement of shared ownership of technology and commodities, the enhancement of information retrieval and health services, and the facilitation of labour mobility across occupations and countries. Therefore, globalization can be further divided into a few aspects, such as economic globalization, social globalization, and political globalization, as it frequently refers to the phenomenon of growing economic, social, and political interconnectedness for nations around the world.

With regard to the economic dimension of globalization, previous studies have suggested that economic globalization has garnered the most attention out of several facets of globalization. Al-Rodhan and Stoudmann (2006) held that the economic foundations of the concept of globalization are frequently emphasized, which are commonly illustrated either through market expansion or the sale of products and services. Given the significance of economic dimension, our study is aimed at

discussing the effects of economic globalization on poverty and inequality rather than those of the whole globalization process. Trade openness and financial integration are frequently seen as the most crucial elements of economic globalization. According to Brady et al. (2005), economic globalization is defined as the process of expanding economic activity that includes trade, investment, and production, on an international scale. Thompson (2000) stressed that overseas trade and foreign direct investments (FDI) are seen as the most significant elements in speaks of economic globalization as they are the key to the capacity of international economic system.

Since globalization is a complicated process that lack of universal agreed definition, researchers have intended to evaluate the concept of globalization based on their own perceptions. Some researchers preferred to use a single index such as the ratio of trade calculated by trade volume as share of the gross domestic product (GDP) or simply FDI as indicator for the level of economic globalization, while others have recently attempted to capture all dimensions of globalization in one composite index. The KOF Index of Globalization (KOF) first introduced by Dreher (2006), commonly regarded as the most comprehensive measurements of globalization, establishes the economic, social, and political dimensions of globalization. The KOF Index of Economic Globalization mainly covers trade globalization and financial globalization, which is further categorized into the actual flows (de facto) as well as the constraint (de jure) of trade and capital. Samimi et al. (2011) divided the measurements of economic globalization into single index and synthetic index. Single index approach consists of de facto globalization index as well as de jure globalization index and further emphasized the significance of trade and financial effects of economic globalization, where de facto index measures trade and financial openness by the level of export, import, and capital flows while de jure captures trade and financial globalization by the degree of restrictions imposed on the movement of goods, services, and capital. However, the study criticized that de jure metrics of single index are incomprehensive and fail to reflect the real level of trade and financial openness of an economy while de facto measurements of single index quantify them indirectly. Additionally, they suggested that the KOF is the best index for assessing globalization as it calculates for

a large number of countries over a longer period of time, measures the level of trade and all types of foreign capital flows as well as restrictions on them, and evaluates the social and political aspects of globalization more thoroughly than other indices.

1.1.2 Definition and Measurement of Poverty

According to World Bank (2000), poverty is defined as "pronounced deprivation in well-being", which comprises many aspects such as low incomes and the inability to obtain the necessities for survival with dignity. Hagenaars and De Vos (1988) divided the definition of poverty into three categories: absolute poverty, relative poverty, and the one in between, where absolute poverty is "having less than an objectively defined or absolute minimum" and relative poverty is "having less than others in society". The absolute poverty represents the minimum living standard as to cover the basic needs, while the relative poverty is related to income inequality as it is defined by a certain percentage of the mean income of population (Bourguignon, 2004). On the other hand, following Barder (2009), poverty reduction refers to foster economic growth that would permanently bring as many people as possible above the poverty line, which is commonly measured as an increase in GDP per capita or a reduction in the number of people living in poverty.

In fact, poverty can be measured in a variety of ways using information from household surveys. It is necessary to carefully select the measurement of poverty as a reliable one can be a powerful instrument for drawing the attention of policymakers on the living conditions of the poor (Ravallion, 1998). Number of people living below a certain poverty line is the most straightforward measure of poverty, such as national poverty line and international poverty line. The national poverty line is country-specific, reflecting local perception on what constitutes being not poor. Ravallion (2002) argued that the World Bank estimation appears to be the best estimation for analysing absolute poverty. To measure absolute poverty on a consistent basis across countries, the World Bank employed a common international poverty line to measure poverty instead of using national poverty lines in constructing the world poverty data,

using Purchasing Power Parity (PPP) to convert currencies into a comparable unit across different countries, in which the number of people in households with consumption per capita below the national equivalent of the international poverty line constitutes the poverty headcount of each country (Deaton, 2006). The debate on the benefits and drawbacks of globalization has triggered contrasting claims regarding its impact on global poverty, with proponents highlighting the potential for poverty reduction through growth, while critics argued that globalization primarily benefits wealthy nations and deepens poverty, making the World Bank's international poverty line a crucial measure in addressing this issue (Deaton, 2006).

Instead, relative poverty is typically characterized as the share of population below a certain percentage of the national median disposable income by the International Labour Organization (ILO), having close association with income inequality yet it could conceal the dynamic and indirect consequences of social welfare programs (Kenworthy, 1999; Fritzell et al., 2015). Förster et al. (2002) held the belief that the majority of cross-national studies on poverty employ the relative measurement. However, Kenworthy (1999) mentioned that there are two limitations of relative poverty. One is that it may cover up the indirect and dynamic impacts of social welfare programs, reducing the growth and thus potentially harming the poor in the long run, and the other is that it treats poverty as merely a subset of income inequality (Kenworthy, 1999). In addition to absolute and relative poverty, Coudouel et al. (2002) revealed that poverty measurement can be categorized into monetary measurement that encompasses income and consumption, and non-monetary measurement that includes indicators such as health and education, where consumption could be a better indicator than income in assessing poverty.

In contrast to the conventional headcount method, several composite indicators have been utilized to encompass multiple dimensions associated with poverty in the measurement process. Human Development Index (HDI) introduced in the United Nations Development Program (UNDP)'s *Human Development Report 1990* is one of the most influential indicators for measuring multidimensional welfare and poverty, focusing on three dimensions of development including life expectancy, education, and

living standards. As an alternative measure, Human Poverty Index (HPI) proposed in the UNDP's *Human Development Report 1997* captures deprivations in basic dimensions of life such as shorten life expectancy, lack of basic education, and limited access to public and private resources (Anand and Sen, 1997). Yet Duclos and Tiberti (2016) criticized that the HDI and HPI fail to identify whether the poor suffer more from multiple deprivations in certain societies than the others. To address the shortcomings of these two composite indices, Multidimensional Poverty Index (MPI) was developed by the UNDP and the Oxford Poverty and Human Development Initiative (OPHI) in 2010, which combines various aspects of deprivation such as health, education, and living standards. However, Duclos and Tiberti (2016) argued that the MPI deviates from the expected characteristics of continuity, monotonicity, and sensitivity to multiple deprivations that should be observed in multidimensional poverty indices used for measuring and comparing poverty across different countries and over time.

1.1.3 Definition and Measurement of Income Inequality

Income inequality is the presence of any deviation from equality, wherein an unequal distribution of income occurs if any individual receives less than the proportionate share of the aggregate income (Schutz, 1951). Economists have employed a variety of indicators to gauge income inequality, such as the Lorenz curve, the Gini coefficient, decile ratios, the Palma ratio, the Theil index, the mean logarithmic deviation of income (MLD), and the Atkinson measure, as it is widely acknowledged that the Gini coefficient is the most popular measurement of income inequality (De Maio, 2007; Trapeznikova, 2019; U.S. Census Bureau). The Gini coefficient is derived from the Lorenz curve framework, which displays the proportion of total income earned by cumulative percentage of population (De Maio, 2007). According to the definition of the World Bank, the Gini index measures the deviation from a perfectly equal distribution of income or consumption expenditure across households or individuals, ranking the population from the poorest to the richest, as perfect equality is represented

by a Gini index of 0 while a perfect inequality is implied by a value of 100. In accordance with the assessment of the Gini index, several new datasets of income inequality have been established.

Based on the measure of Gini index, Deininger and Squire (1996) presented a cross-country dataset on income inequality for the World Bank, following which the World Income Inequality Database (WIID) developed by the World Institute for Development Economics Research of the U.N. University (UNU-WIDER) offers a more comprehensive set of income inequality while it is limited by the trade-off between comparability and coverage. Starting from the Version 2.0c of the WIID database, the Standardized World Income Inequality Database (SWIID) conducted by Solt (2009) standardized observations of income inequality using as much data from comparable years within the same nation, which is a better fit to extensive cross-national studies on income inequality by maximizing comparability for the largest sample of nations and years. On the other hand, calculating decile ratios is a fast but efficient method to examine income inequality, which can be done by denoting the income of the richest 10% of households divided by the one of the poorest 10% of households as income inequality, allowing researchers to identify the most significant category of income as a determinant of other factors (De Maio, 2007).

1.2 Background Information on CEE

This section provides the background information on the CEE region in terms of economic globalization, poverty, and income inequality. It offers an overview of the historical patterns and trends observed in the CEE area based on the previous studies. By examining the specific characteristics and development of economic globalization, poverty, and income inequality in CEE, this section sets the stage for a deeper analysis of how economic globalization impacts poverty and income inequality in the CEE countries.

1.2.1 An Overview of Economic Globalization in CEE

For the past decades, post-communist countries in CEE region have gone through dramatic globalization process since the transition from centrally planned economies to market-oriented systems in the early 1990s, contributing to their economic integration into the global economy. The fall of communism and the subsequent economic integration of Europe have profoundly shaped global development in the twenty-first century, notably enhancing the stabilization and the development of the CEE economies by the post-communist institutional reforms encompassing government decentralization, greater private ownership, reconstruction of banking system, markets expansion, international assistance, and foreign investment flows (Kornecki, 2008). The accession to European Union (EU) acts as a favourable condition for promoting global economic integration in the CEE region as it lowers the perceived risk of post-communist countries, provides opportunities for cost reduction in production, and creates new potential markets for foreign investors, especially those from the former EU member states (Bandelj, 2010).

While studies generally agreed that economic globalization has contributed to the growth in CEE economies, recent evidence presented that the impact of globalization has varied across different period and brought out various changes in the region. According to Joshi et al. (2014), most CEE countries suffered from serious recessions at the start of the transition as the linkage between free price and old economies were broke down, but soon experienced a strong growth with large capital inflows that were benefit from their integration with Western Europe or EU in the early and mid-2000s, which consequently caused significant damage in global and euro zone financial crisis of 2008. They noted that the CEE region, with the earliest and most radical market reform, suffered most from the sudden stopped capital flows as well as collapsed global trade, and thus was hit hardest among the emerging market during the global financial crisis 2008, resulting in continued high unemployment rate and largest output declines than other emerging market regions, where Poland was the only country in Central Europe luckily escaped from the great recession. It is shown that the Baltic

countries has experienced the most serious economic contractions during the financial crisis while the non-EU region in Southern and Eastern Europe (SEE) only experienced the smallest loss.

In addition, Carp (2014) pointed out that during periods of macroeconomic imbalances, financial globalization has not proven to be beneficial and has instead sparked erratic capital flows, which have hurt the economic development of CEE countries. Furthermore, Capello and Perucca (2015) emphasised that the economic performance of the CEE countries exhibits a sharp increase during the 2004-2007 EU accession period, yet the impact of financial crisis characterized by the economic standstill in Europe leads to a negative association between globalization and GDP growth. Additionally, the Covid-19 pandemic in 2020 has presented a significant challenge to globalization as poverty and inequality have been severely exacerbated under the pandemic (Iwuoha and Jude-Iwuoha, 2020; Asare and Barfi, 2021). Generally, the CEE countries have undergone a significant process of globalization over the last few decades, with substantial contributions from EU integration and the impact of financial crisis as well as the pandemic that have played crucial roles during this transformative period. To comprehensively investigate the impact of economic globalization on poverty and income inequality in the CEE region, this study aims to focus on the period from the EU accession in 2004 to the present, which encompasses significant milestones that allows for a detailed examination of the effects under these key time points.

1.2.2 An Overview of Poverty and Income Inequality in CEE

Early research has suggested that the CEE region encountered a challenging economic period during the early stages of transition, leading to a significant exacerbation of poverty and income inequality, particularly in areas where the transition to market-oriented systems was incomplete. The transition from communism to capitalism in CEECs has been costly and has led to an unprecedented increase in poverty, inequality and all forms of deprivation, rejecting the assumption that the

CEECs would quickly and smoothly join the prosperous economies of the Western world following a painful economic transition (Cerami, 2003; Izyumov, 2010). Since the beginning of the transition period in 1989, the CEE region has undergone a notable decline in social welfare, characterized by a quick increase in open unemployment, the expansion of poverty, and a heightened severity of homelessness, especially for the region of South-Eastern Europe and the Commonwealth of Independent States (CIS), where unemployment and poverty rates continue to rise, while public service infrastructure has further weakened (Götting, 1998). Conversely, the situation in the more advanced transition countries of Central Europe appears comparatively more favourable, as there has been a recent cessation in the decline of employment and incomes (Götting, 1998).

In addition, Milanovic (1998) in his article demonstrated that, poverty headcount ratio has witnessed varying increases across all transition economies during the transition period, as the rise of poverty in Central Europe (excluding Poland) was relatively minor due to their high-income levels both before and after the transition, yet poorer countries such as Poland have experienced a substantial increase in poverty, with a significant number of individuals falling below the poverty line. Furthermore, his findings suggested that income inequality increased sharply and more dispersed across all countries, as the increase in Central Europe was moderate, while the Baltics and the Balkans observed a substantial rise. However, there have been positive changes in CEE over 2010-2016 regarding the "no poverty" indicators of SDG, with the Czech Republic and Slovenia in the leading position while Romania and Bulgaria recorded the worst, whereas Bulgaria, Estonia, Romania, Slovenia, and Slovakia have shown unfavourable transformation regarding two risk-related poverty factors (Raszkowski and Bartniczak, 2019).

Despite the negative impacts of economic transition in the region, it is noteworthy that marketization has also brought numerous trade and investment opportunities to the CEE region. The accession to the EU has also contributed to the reduction of poverty and income inequality in the CEE region through cross-border economic activities. There has been a decline in employment across all countries, even

in those with higher GDP than in 1989, resulting in increased unemployment, poverty rates, and economic inequality, with the former Soviet Union serving as a glaring example of the devastating consequences of the transformation, while the eight countries that joined the European Union in 2004 and the five nations with equitable growth have fared comparatively better (Heyns, 2005). Moreover, following the collapse of the Soviet Union, the breakdown of state ownership ushered in a new age of self-employment and small enterprises in need of finance services throughout the area, improving poverty alleviation by servicing modest loans to more borrowers (Sheremenko et al., 2017).

1.3 Theoretical Debates

There have been extensive debates among academics on the relationship between economic globalization, poverty, and income inequality. While some claimed that globalization could worsen poverty and income inequality, others contended that it may serves to combat these issues. The purpose of this section is to provide a comprehensive overview of the theoretical underpinnings of how economic globalization affects poverty and income inequality respectively by analysing the body of available research.

1.3.1 Theoretical Views on Economic Globalization and Poverty

Globalization is often seen to be an effective method to eliminate poverty. According to neoliberal economic theory, rapid economic liberalization leads to faster economic growth, greater wealth, and lower poverty. The theory claims that the positive developments of poverty and income inequality are mostly attributable to the rising economic integration, which has increased the efficiency of global resources allocation as countries and regions have been specialized in accordance with their comparative advantages (Wade, 2004). Consistent with neoliberalism, Dollar (2005) highlighted the strongest trends towards growth and poverty reduction since 1981 in developing

countries that are mostly integrated with the global economy, supporting that economic integration has been a positive driven force for improving lives of people in developing economies. On the contrary, Wade (2004) gave an illustration on neoliberal argument that world poverty and income inequality showed a sign of decline due to the increasing intensity of cross-border economic integration since 1980s yet criticized the empirical basis of the neoliberal argument by raising the possibility that World Bank has underestimated international poverty line and population living in extreme poverty owing to a large margin of error of its survey data. Kiely (2005) also challenged the assertions of neoliberalism that globalization will lower the rate of poverty by contesting the evidence that poverty has decreased throughout the globalization period. He noted that the positive impact on poverty reduction might not have been solely attributed to globalization even while there has been a reduction in poverty.

On the other hand, trade-related theories serve as the fundamental basis for exploring the causal link between globalization and poverty, with trade openness being the central aspect of economic globalization. The Stolper-Samuelson theorem derived by Stolper and Samuelson (1941) is one of the most popular argumentations of international trade, following which Bhagwati and Srinivasan (2002) alleged that free trade should contribute to alleviation of poverty in developing countries with their comparative advantage in exporting labour-intensive goods. According to the theorem, an increase in relative price of an output will lead to a higher return for the factor that is most frequently used to produce the output, and thus, asserting that globalization can benefit with countries with abundant factors while hurting the one with scarce factors. Additionally, Heckscher-Ohlin theory of international trade, developed by Heckscher and Ohlin (1991) based on the Stolper-Samuelson theorem, is the theoretical framework for most studies asserting that trade globalization may boost the salary for unskilled workers and benefit the poor in developing countries thanks to their abundant labour resources. Based on the HO theory, countries tend to export products that make extensive use of their own abundant and cheap factors while import products that use their limited resources. Considering low-income countries are specialized in abundant unskilled labour force while rich countries have an advantage in skilled labour,

globalization may benefit poor countries by offering comparative advantages to less skilled workers in those countries.

However, the HO theory has been recently challenged. A series of studies have established that the HO trade theory is misleading since globalization may affect the poor in both good and bad ways (Aisbett et al., 2007; Harrison, 2006; Harrison and McMillan, 2007). Harrison (2006) held that trade and foreign investment reforms have a positive impact on the poor in exporting industries and sectors attracting foreign investments but have negatively affected the poor in import-competing sectors, measuring globalization by trades and international capital flows, and contended that the poor may bear the brunt of financial crisis while gaining from globalization with the help of complementary policies. Nevertheless, the findings were established based on the evidence collected from relevant papers, yet the author's original analysis is missing in this work. Following Harrison (2006), Aisbett et al. (2007) employed OLS regression model to estimate the aggregate relation between different measurement of globalization and absolute poverty, using trade and financial integration to represent globalization, where trade integration is denoted by trade flows (as measured by imports and exports as share of GDP) and tariff (as measured by import revenues as share of total imports) while financial integration is denoted by international capital flows, yet these measures appear somewhat partial to represent economic globalization. Their results suggested that trade integration is negatively associated with poverty except for the regions with inflexible labour law, where an increase in poverty is present with higher trade openness, while financial integration is significantly associated with poverty reduction along with good institution and governance as well as macroeconomic stability, emphasizing that the relationship between globalization and poverty complicated and context specific. Harrison and McMillan (2007) further confirmed that some poor individuals may suffer from trade or financial integration despite the poverty-reduction effects of export activities and FDI, indicating that the link between globalization and poverty is more complex than previously assumed.

Some researchers have explained the poverty-reduction effects of globalization through other factors, such as economic growth. Dollar and Kraay (2004) revealed that

growing globalization is a force for poverty reduction with the evidence on the growth benefits of greater trade openness. The results displayed a strong positive correlation between trade volume and growth as well as between growth and income of the bottom quintile poor in a dataset covering 100 countries, indicating that trade enhances growth and that growth reduces poverty, yet their conclusions lack the support of empirical evidence from the trade volume and poverty regression. Notwithstanding, their conclusion are not thorough enough since they exclude the effects of increasing capital flows produced by financial globalization. Moreover, Nissanke and Thorbecke (2006, 2010) proposed that at the economic level, globalization not only alleviates poverty directly through trade and capital openness, and global disinflation, but also indirectly via economic growth and income distribution. They explored the channels through which the process of globalization affects poverty by providing a critical review of existing literatures regarding the globalization-poverty nexus as well as by conducting case studies of countries in Latin America. Nonetheless, Bergh and Nilsson (2014) questioned the view of globalization-growth-poverty nexus and assumed that globalization has influences on prices, incomes and information flows, which may or may not result in economic growth and poverty elimination. They adopted fixed-effect, first-difference and pooled ordinary least squares (OLS) regressions to estimate the relations between different types of the KOF lagged one period and the percentage of the population in a country living on less than one dollar per day by using five-year average data from 114 countries over the period 1983-2007. The findings suggested that globalization is negatively associated with the absolute poverty. It is shown that less trade restrictions are robustly associated with lower poverty level regarding the effects of such barriers towards import prices, while the poverty-decreasing effect of restrictions remained relatively large after controlling for growth, suggesting that the assumption of globalization-growth-poverty causality might underestimate the poverty-reduction effect of globalization. However, the poverty-decreasing effects of trade flows no longer exist after controlling for income or growth. Their findings serve as a useful theoretical reference for the Hypothesis One of this study, by using a composite KOF index to offer a comprehensive overview of the influence of various components

of globalization on poverty. However, their conclusions on the indirect effects of growth might not be solid enough given that they failed to examine the relationship between growth and globalization. By contrast, Kang-Kook (2014) in his paper found that trade globalization may reduce poverty in a long run, as its interaction terms with economic growth and education are positively associated with poverty, indicating that countries with less human capital and growth tend to have greater reduction in poverty along with more international trade, whereas financial globalization generally increases poverty with no conditional effects.

To sum up, most current theories and studies have regarded globalization to be an effective means of poverty reduction, with a few arguing that globalization may exacerbate poverty. However, the mechanism through which globalization reduces poverty and the scope of its application have remained controversial. Theoretical arguments on the negative association between economic globalization and poverty have primarily concentrated on the neoliberal argument and the HO trade theory. Some research has opposed neoliberalism by questioning the declined trend of poverty in recent decades, whereas some others challenged the Heckscher-Ohlin model by raising opinion that globalization possibly generates both winners and losers among the poor. While it is generally accepted that economic globalization could reduce poverty, several recent studies have challenged the leading theories and argued that it may worsen the level of poverty in poor countries that lack of flexible labour legislation. Additionally, in studies revealing the effects of globalization to be anti-poor, some scholars have claimed that it may indirectly eliminate poverty through economic growth, or directly through trade and capital openness, such as lower barriers on imports. The ongoing theoretical debate on globalization's impact on poverty presents potential research value for our thesis.

1.3.2 Theoretical Views on Economic Globalization and Income Inequality

The impact of economic globalization on income inequality is still an ongoing topic of discussion. Some scholars believed that trade and financial integration have helped to eliminate income inequality in many countries, whereas some declared that economic globalization is the main cause for the rise of income disparity within nations. As the theoretical foundation of the relationship between globalization and income inequality, the Stolper-Samuelson theorem as mentioned predicts that the demand for unskilled labour will rise as global trade expands in developing countries, raising average salaries, and lowering income inequality. The income-inequality effects of trade can also be explained using the Heckscher-Ohlin framework, which assumes that trade openness may narrows the income gap between unskilled and skilled labours in emerging countries while raising income disparity in developed countries. However, Topalova (2007) questioned the HO theory that inequality is unaffected by local intensity of trade liberalization in the case of Indian districts by using tariff to represent regional exposure to international trade, yet this conclusion might not be applicable to nations other than India due to the limitations of the sample. Moreover, neoliberal argument holds a belief that economic integration has caused global income inequality to decline for the first time in more than a century and a half (Wade, 2004). Consistently, Wei and Wu (2001) proved that globalization, as measured by trade openness, has helped to reduce income inequality in both urban and rural areas by using data across Chinese regions.

While these theories contend that there is a downward trend in income inequality and that is driven by economic globalization, a large number of current research suggested that economic globalization should be blamed for the rise in income disparity. Using the unbalanced panel data from 10 CEE countries for the 2000-2006 period, Piotrowska (2008) conducted random-effects and fixed-effect regression analysis to assess the effects of economic integration on income inequality in the CEE region. He demonstrated that economic integration through globalization, measured by

FDI intensity and trade integration, has significantly increased income inequality among CEE nations and has a greater impact on within-country income inequality than regional integration. The results also suggested that the impacts of globalization on income inequality might differ across different countries or regions due to a range of factors, including variations in economic structures, labour markets, and policy decisions. For instance, countries with skilled labour force or favourable business environment could be better off in attracting FDI that benefits capital and labour while others may experience a loss in union power and workforce financial security. However, his findings might be biased due to insufficient sample size.

Although many researchers have argued that globalization may worsen income inequality, there are still varying perspectives on how globalization has changed income disparity in different classifications of countries. Whilst some researchers believed that economic globalization worsens income disparity in underdeveloped nations, others thought this mainly happened in wealthy nations. According to cross-country studies in Harrison (2006), globalization has been accompanied by growing income inequality within developing countries, indicating that rising inequality induced by globalization may offset some of the poverty reductions brought by trade-induced growth. On the other hand, Bergh and Nilsson (2010) examined whether globalization and liberalization (measured by the KOF Index of Globalization and the Economic Freedom Index, simply the KOF and the EFI) were associated with income inequality (measured by Gini index and Kuznets ratio) within individual countries using the SWIID. They adopted a fixed-effect model by employing panel data covering around 80 countries from 1970 to 2005, suggesting that international trade liberalization, including trade taxes, tariffs, trade barriers, and capital controls, appears to exacerbate income inequality primarily in rich countries while social globalization is more significant in less developed ones, whereas political globalization and legal reforms have no effects on income inequality. However, the lack of in-depth discussion of the findings is a major shortcoming of their study. Focusing on the financial component, Kebede and Tawiah (2023) conversely found that de jure financial globalization could reduce income inequality in high-income countries while de facto financial globalization

exacerbates income inequality across all countries, employing panel quantile regression analysis for 73 countries over 2000–2016. Furthermore, Huang et al. (2020) further proved that de facto financial globalization, as implied by FDI, is positively associated with income inequality for the low-income countries while negatively associated with income inequality for the high-income countries, by using 543 empirical studies over 1995-2019.

Indeed, the impact of globalization on income inequality is a complex issue on which there are still no clear conclusions. There is a growing body of literature that has revealed the complicated relationship between economic globalization and income inequality by examining the impact of financial and trade globalization on income inequality separately. Referring to the study of Kang-Kook (2014), trade globalization could result in complicated and conditional influences on income distribution and poverty that more international trade might reduce income inequality with conditional effects related to education levels, however, may potentially worsen income disparity by supporting professionals in wealthy nations while hurting unskilled workers in developing nations. He employed a cross-country OLS model to estimate the long-term effects of globalization on income inequality using data from 1976 to 2004, where inequality is measured by Gini coefficients and globalization is measured by trade openness as imports and exports to GDP as well as by financial integration as the sum of foreign assets and liabilities to GDP. The findings indicated that financial globalization worsens income disparity overall in a long run while there exists a conditional association between trade openness and income inequality, and further suggest that institutional efforts and improvements to education might reduce the negative consequences of globalization while maximizing its benefits. Asteriou et al. (2014) examined the impact of globalization on income inequality for several categories of the EU-27 member countries, such as the EU core and new member states, over the period 1995-2009 by estimating panel regression models, where income inequality measured by the log of Gini coefficients is explained as a function of trade and financial globalization variables. They suggested that financial globalization factors, including FDI, capital account openness, and stock market capitalization, have been the primary

contributors to income inequality, among which FDI appears to be the key driving force to boost up inequality for all EU-27 countries over the entire observed period, whereas trade openness is beneficial for equalizing income distribution. On the contrary, Zakaria and Fida (2016) claimed that increasing trade openness results in increasing income inequality, while financial openness may reduce income inequality, in the case of China and the SAARC Region for 1973-2012.

The differing effects of trade and financial globalization on income inequality have also been used in certain research to explain the various effects of globalization on income disparity in advanced and developing nations. Based on the Hechscher-Ohlin theory and the Stopler-Samuelson theorem, Baek and Shi (2016) investigated the relationship between economic globalization and income inequality by disaggregating economic globalization into trade and financial integration and by distinguishing the sample into developing and developed countries. Using panel data from 79 countries over the period 1990–2010, they confirmed that trade integration may widen income gap within developed countries but decreases income inequality in developing countries, as implied by the theories, whereas financial integration reduces income inequality in developed countries but increases disparity in emerging countries. Conversely, using data of 140 countries over the period 1970-2014 and the instrumental variable (IV) approach, Dorn et al. (2018) found that the relationship between economic globalization and income inequality varies depending on the measurement of economic globalization, implying that economic globalization as measured by trade integration has little influence on income inequality while the measurement of financial globalization is positively linked with inequality in both full sample and advanced countries but has no significant effects in developing ones. Through applying meta-analysis to 123 qualified econometric studies with a total of 1,254 estimates, Heimberger (2020) suggested that economic globalization, including trade openness and financial globalization, has generally contributed to rising income inequality in both developing and developed countries, whereas the impacts may differ among these countries. He pointed out that trade openness helps minimize income inequality within emerging economies by boosting the demand for unskilled labour and encouraging the

expansion of labour-intensive industries, yet it may exacerbate inequality in advanced nations by improving actual returns to skilled employees and reducing actual returns to untrained workers. He also asserted that financial globalization could increase income inequality in developed countries by raising mobility of capital and labour force that reduces wage pressure for unskilled workers and increases bargaining power of capital owner, while having mixed effects on inequality in developing countries, such as greater investment opportunities, higher risk of financial crisis, and greater disparity in wealth distribution.

In addition, some researchers believed that the contribution of economic globalization to income inequality is relatively small due to the opposite implications of FDI and trade on income distribution. Jaumotte et al. (2013) held that the growing globalization has only generated a minor impact on income inequality owing to the offsetting effects of trade and financial globalization. Using a newly complied panel of 20 developed and 31 developing countries over 1981-2003 period, they revealed that trade globalization, measured by the ratio of imports and exports to GDP, tends to lessen income inequality by increased salary and productivity for workers who have been granted greater opportunities to specialize in the field where they have competitive advantage. Moreover, they also suggests that financial globalization, measured by the ratio of FDI, portfolio debt and equity flows, and bank assets to GDP, appears to widen the gap of income distribution by raising the demand of technological industries for skilled workers and lowering the bargaining power of labour, reducing the salary level or labour demand under the volatility of capital flows and currency rates, as well as increasing the likelihood of financial crisis that might negatively affect low-income households. On the contrary, Hui and Bhaumik (2023) pointed out an opposing view on the distinct impacts of trade and FDI on income inequality, argued that trade worsens income disparity while FDI offers advantages to all countries and helps minimize income inequality. Based on the meta-analysis and meta-regression approaches, they affirmed that FDI contributes more to industrialized countries with sufficient human capital and technological resources but has negligible effects in low-income economies, which compensates the small harms of trade on inequality and allows economic

globalization overall help mitigate income inequality in advanced countries, indicating that economic globalization helped reduce income inequality in developed countries but having completely contrast impacts in low-income ones. It is shown that economic globalization exacerbates the income gap in low-income nations though it is beneficial to all other economies as income inequality is only minimally impacted by FDI in low-income countries. However, their research lacked a thorough justification of the contrasting effects of trade and FDI on inequality and failed to clarify how these conflict implications relate to the modest impacts of economic globalization on inequality.

Different political and social systems in various nations may also be used to explain the complicated link between income disparity and globalization. According to Mazier (2008), the effects of globalization on income inequality vary based on the political and social framework of the nation. Through observing indicators of income inequality including wage inequality and disposal income across European countries, the author found that high salary disparity exists in Poland and the Baltic states, while the majority of Continental European countries as well as Hungary and the Czech Republic have moderate levels of wage inequality. However, despite the author's thorough description of the level of data on income disparity in each European nation, an in-depth analysis and discussion of these phenomena is lacking.

Furthermore, some studies have argued that there is no significant relationship between economic globalization and income inequality, challenging the claim that globalization has widened the income gap among individuals in all nations. Pan-Long (1995) examined the relationship between FDI and income inequality (measured by Gini coefficients) by comparing regressions with and without geographical dummy variables. The results suggested that the statistically significant association between FDI and income inequality may reflect the geographic variation in inequality rather than the harmful effects of FDI, as only developing economies in Eastern and South-eastern Asia among all less-developed countries have been damaged by FDI inflows during the 1970s. Additionally, Dollar and Kraay (2004) challenged the view that globalization leads to rising income inequality within countries. They estimated a regression to explore whether increasing trade systematically causes larger within-

country income inequality by using data of Gini index from 137 countries starting from the 1960s to 2004. It is found that there is no significant relationship between changes in income inequality and changes in trade volumes when controlling for changes in average income, implying that there is no evidence to support the notion that income inequality is generally growing with countries with greater trade volume. However, it is notable that the findings did not suggest that globalization has no impact on income inequality, and further study is required to properly identify the precise consequences of globalization on income disparity that may differ among circumstances and countries.

In summary, the impact of economic globalization on income inequality continues to be a complicated and challenging topic. On the one hand, some relevant theories and studies have contended that economic globalization could lessen income inequality, while on the other hand, some academics have argued that it substantially increased income disparity. The complicated relationship between globalization and income disparity has been frequently explained by scholars in terms of the different effects of trade globalization and financial globalization on income inequality. However, there is still no conclusive evidence regarding these issues. Moreover, the impact of economic globalization on income disparity in advanced and developing nations is still up for debate. Some researchers have even argued that the significant connection between globalization and income inequality might not exist in certain countries. Given the multiple perspectives on how income inequality is affected by economic globalization, there is a large research gap on this subject.

1.4 Research Gaps and the Contribution of the Research

This section briefly introduces the research gap revolves around the effects of economic globalization and poverty and income inequality, and the contribution of this study regarding such research gap. The current body of literature highlights several notable research gaps on the topic of the impact of economic globalization on poverty and income inequality in CEE. Firstly, despite extensive discussions in recent decades,

there is no definitive consensus on the relationship between economic globalization and these socio-economic factors. There are conflicting views, with some scholars suggesting that economic globalization can alleviate poverty and income inequality, while others argue that it may exacerbate them. This paper aims to provide a comprehensive understanding and address this complex question, thus bridging the research gap in this field. Secondly, while numerous studies have examined the impact of economic globalization on various countries worldwide, limited attention has been given to the specific context of the CEE region. Most of the existing studies have concentrated on a global range of countries, especially middle and low-income nations, leaving a gap in regional studies that specifically use CEE as a sample. To fill this research gap, this paper conducts an analysis of how economic globalization influences poverty and income inequality in CEE countries, most of which are classified into the group of high-income countries by the World Bank, thereby gathering relevant research and data to contribute to the understanding of this region. Furthermore, despite the significance of events such as EU accession and the financial crisis during the process of globalization in CEE, there is a lack of research that investigates the period from 2004 to the present. Most studies tend to concentrate on the transition period, from the early 1990s to the early 2000s instead. This research gap presents an opportunity to conduct an in-depth examination of the specific effects of economic globalization on poverty and income inequality in the CEE region, particularly during the period from 2004 onwards. Thus, this report can address such research limitation of existing studies by covering data from 2004 to the present in the CEE area, aiming to cover the period during which CEE nations underwent a substantial process of economic globalization, starting from the EU accession in 2004, which includes the 2007-2008 financial crisis as well as the 2020 pandemic.

2. Hypotheses and Methodology

This chapter consists of two sections: hypotheses and methodology. Firstly, in the hypotheses section, we briefly introduce the objectives and the theoretical foundation of the study and accordingly construct two main research hypotheses. The first hypothesis concerns with the causality link between economic globalization and poverty, and the second hypothesis is related to the relationship between economic globalization and income inequality. This is followed by the methodology section that includes sample and data, variable construction, and model specification.

2.1 Hypotheses

This section constructs the research hypotheses based on the theoretical foundation of how economic globalization affects poverty and income inequality. As mentioned, the neoliberal argument suggested that economic globalization can effectively reduce world poverty and income inequality by enhancing resource efficiency across national borders. On the other hand, the Stopler-Samuelson theorem and the Hechscher-Ohlin theory emphasized the effects of trade globalization on poverty and inequality, predicting that these positive effects are primarily observed in developing countries with abundant unskilled labour, while the level of income inequality is expected to rise in developed countries with ample skilled labour. The main literature on the relationship between globalization and poverty, as well as globalization and income inequality, including and Bergh (2010, 2014), have confirmed the theory that economic globalization, through reducing trade restriction, can effectively alleviate poverty while exacerbating income inequality in high-income countries. Drawing on the theories as well as the findings and methodology of Bergh (2010, 2014), this paper presents hypotheses concerning the impacts of economic globalization on poverty and income inequality in Central and Eastern Europe, to conduct a thorough investigation of the effects of economic globalization on these socio-economic factors in the region.

Our first hypothesis is related to the globalization-poverty causality link, which holds that there is a significant and negative association between economic globalization and poverty in CEE. As the level of economic globalization increases in this region, it is expected that the poverty rates would subsequently decrease. Table 1-1 exhibits the summary of Hypothesis One. This hypothesis is based on the mainstream theories that economic globalization is beneficial to eradicate poverty. Furthermore, our second hypothesis concerns the complex relationship between economic globalization and income inequality. Following the theory that economic globalization increases income inequality in high-income countries, this hypothesis posits that there is a significant and positive association between economic globalization and income inequality in CEE. In other words, income inequality is projected to worsen as the CEE region becomes more economically globalized. The summary of Hypothesis Two is shown as Table 1-2 below.

Table 1-1: Summary of Hypothesis 1

Alternative Hypothesis (H_1)	**Null Hypothesis (H_0)**
There is a significant and negative association between economic globalization and poverty in CEE.	There is no significant association between economic globalization and poverty in CEE.

Table 1-2: Summary of Hypothesis 2

Alternative Hypothesis (H_1)	**Null Hypothesis (H_0)**
There is a significant and positive association between economic globalization and income inequality in CEE.	There is no significant association between economic globalization and income inequality in CEE.

2.2 Methodology

This paper adopts quantitative method, building upon econometric models, and employs Stata 17.0 for analysis. The methodology of this research consists of three parts: sample and data, variables construction, model specification. The first part is about the description of sample and dataset, providing reasonable explanation on the selection of country list and period of time. Moreover, the study introduces the construction and detailed description of each variable, including the dependent variables, independent variables, and control variables. Finally, the paper describes the baseline model used in the empirical analysis. These parts form the basis of the research methodology and contribute to a comprehensive examination of our two research hypotheses.

2.2.1 Sample and Data

Our sample consists of annual panel data across nine high-income countries in the CEE region, including the Czech Republic, Hungary, Poland, Slovakia (known as the Visegrad Group[1]), Estonia, Latvia, Lithuania (known as the Baltic states), Slovenia, and Romania, over the period 2004-2020. The data were obtained from the KOF Swiss Economic Institute, World Bank, and SWIID. The sample and data used in this research focus on countries from both Central Europe (including the Visegrad Group, Slovenia, and Romania) and the Baltics, as they have witnessed the most profound process of globalization in recent decades within CEE, which were selected to represent the sample for studying the effects of economic globalization in the CEE region. Furthermore, choosing high-income CEECs as a sample fills the theoretical gap in the relationship between globalization and poverty and income inequality, given that the theories mostly focusing on poor or underdeveloped nations. The chosen period of analysis covers from 2004 to 2020, as most of the selected countries joined the EU in 2004 (except for Romania, who joined the EU later in 2007), marking a significant milestone and serving as a starting point for examining the impact of globalization.

Additionally, the selected countries were significantly affected by the 2008 financial crisis, which particularly impacted economies with higher levels of globalization and more radical market reforms promoting international free trade. Moreover, a growing body of studies pointed to the Covid-19 pandemic in 2020 as a challenge to globalization, seriously exacerbating poverty and inequality. Therefore, the period from 2004 to 2020 is chosen for this study, deviating from the earlier focus on the period from the early 1990s to the early 2000s in previous research.

2.2.2 Construction of Variables

We use poverty and income inequality as the dependent variables in our study to examine the effects of economic globalization on these two factors. In terms of poverty, this paper adopts absolute poverty to denote the level of poverty in each country. According to World Bank, the national poverty level, the international extreme poverty line ($2.15 in 2017 PPP dollars), the lower-middle-income ($3.65 in 2017 PPP dollars), and the upper-middle-income ($6.85 in 2017 PPP dollars) poverty lines have all been used in calculating the absolute poverty rate, as the international poverty line is derived from the national poverty lines of corresponding income level countries. Taking into account the relatively higher income levels in CEECs, we prefer the upper-middle-income poverty line, i.e., $6.85 in 2017 PPP dollars, to estimate the absolute poverty in the region. The absolute poverty is denoted by *Poverty*. All poverty data were collected from World Bank's World Development Indicators (WDI). As for income inequality, our preferred measurement is the Gini index, which is the most common indicator for income disparity (De Maio, 2007; Trapeznikova, 2019). The Gini Index, based on the deviation between the observed income distribution (Lorenz curve) and a perfectly equal distribution, is an extensive measure of income inequality that summarises the income distribution's dispersion (World Bank; U.S. Census Bureau). The dependent variable of income inequality is represented by *Gini* for regression analysis. The data of Gini index were collected from SWIID and WDI. Table 2-1 presents the detailed description of dependent variables.

Table 2-1: Description of Dependent Variables

Variables	Description	Sources
Poverty	Poverty headcount ratio at $6.85 a day (2017 PPP) (% of population), i.e., the percentage of the population living on less than $6.85 a day at 2017 purchasing power adjusted prices. World Bank absolute poverty estimation.	World Bank WDI
Gini	Gini index, ranges from 0-1, i.e., 0%-100%. A Gini index of 0% represents perfect income equality, while a Gini index of 100% represents perfect income inequality.	SWIID; World Bank WDI

Economic globalization is the independent variable examined in this study. To quantify economic globalization, this paper uses the KOF Globalization Index, which captures multiple dimensions of globalization, to analyse the effects of the overall economic globalization as well as of its subcomponents such as trade and financial globalization on poverty and income inequality, respectively. The overall KOF index is a comprehensive measure that encompasses economic, social, and political dimensions of globalization, consisting of three sub-indices: KOF economic globalization, KOF social globalization, and KOF political globalization, as KOF economic globalization can be further divided into KOF trade globalization and KOF financial globalization. Following the definition of Keohane and Nye (2000), Dreher (2006) constructed two indices to measure economic globalization, including the de facto and de jure indices. The de facto KOF economic globalization measures the actual flows such as trade, foreign direct investments, portfolio investment, international debt and reserves, while de jure KOF economic globalization measures trade and capital restrictions by using indicators such as trade regulations, income taxes on international trade, mean tariff rates, and investment restrictions, as higher trade tax revenues indicate lower levels of globalization for a country at a specific trade level. The variables of actual flows and restrictions are aggregated into trade and financial

globalization index. The advantage of using the KOF-index is that it enables a separate analysis of trade and financial globalization, as well as economic flows and restriction policies. Principal components analysis is used in the estimation of the KOF to assign the weights that change over time for the individual variables. The statistical robustness of using the nominal trade openness index to calculate the KOF economic globalization index has been highlighted by Gozgor (2018), thereby further affirming the advantages of the KOF index. The dataset of the current version of the KOF index revised by Gygli et al. (2019) were obtained from the KOF Swiss Economic Institute. The KOF economic globalization index is constructed through the dimension of trade and financial globalization. Appendix 2 (see Appendices) presents the structure of KOF economic globalization index. Based on different dimensions of the KOF index, this paper categorizes the independent variables into three groups, including overall economic globalization (*KOF1*), trade globalization (*KOF2*) and financial globalization (*KOF3*), and the actual flow (*KOF4*) and restrictions of economic globalization (*KOF5*). Table 2-2 below illustrates the description of each independent variable.

Table 2-2: Description of Independent Variables

Variables	Description	Sources
Group 1: Overall Economic Globalization		
KOF1	Economic globalization, represented by the KOF economic globalization index, ranging from 1-100.	KOF Swiss Economic Institute
Group 2: Trade Globalization and Financial Globalization		
KOF2	Trade globalization, represented by the KOF trade globalization index, ranging from 1-100.	KOF Swiss Economic Institute
KOF3	Financial globalization, represented by the KOF financial globalization index, ranging from 1-100.	KOF Swiss Economic Institute
Group 3: Economic Globalization (de facto) and Economic Globalization (de jure)		

KOF4	Economic globalization (actual flows), represented by the KOF de facto economic globalization index, ranging from 1-100.	KOF Swiss Economic Institute
KOF5	Economic globalization (restrictions), represented by the KOF de jure economic globalization index, ranging from 1-100.	KOF Swiss Economic Institute

To ensure the validity of the relationship between globalization, poverty, and income inequality, it is crucial to identify other key determinants of poverty and income inequality. First of all, GDP per capita growth is regarded as a powerful tool to alleviate poverty, through which the macroeconomic policies supporting openness to global economy could contribute to the reduction in poverty (Roemer and Gugerty, 1997; Nissanke and Thorbecke, 2006; Nissanke and Thorbecke, 2010; Bergh and Nilsson, 2014). The inverted-U shape relationship between economic growth and income inequality has been reported by Kuznets (1955), making growth an important factor in income inequality. Additionally, Choi (2006) proved that the increasing real GDP per capita growth could lead to a reduction of income inequality within a country. On the other hand, education is also considered to be an essential tool for reducing poverty and income inequality, as it is negatively associated with poverty rate as well as inequality in wages and incomes (Tilak, 2002; Heyns, 2005; Awan et al., 2010). Meanwhile, inflation may affect poverty and income inequality through its effects on real wages (Cardoso, 1992; Powers, 1995; Rodríguez-Pose and Tselios, 2009; Thalassinos et al., 2012; Monnin, 2014). Hence, this paper uses economic growth (*growth*), education attainment (*edu*), and inflation (*inflation*) as control variables for the regression analysis. The data of control variables were all obtained from World Bank's WDI. Table 2-3 below exhibits the description and sources of control variables.

Table 2-3: Description of Control Variables

Variables	Description	Sources
growth	Annual percentage growth rate of GDP per capita based on constant local currency.	World Bank WDI
edu	Educational attainment. The percentage of population ages 25 and over that attained or completed at least upper secondary education.	World Bank WDI
inflation	Annual inflation rate measured by the consumer prices index.	World Bank WDI

2.2.3 Model Specification

This paper aims to investigate the impact of economic globalization on poverty and income inequality by incorporating economic growth in Central and Eastern European Countries. There are a large body of existing literature that adopted OLS regression to analyse the relationship between globalization, poverty, and income inequality. In this study, we employ the two-way fixed-effect model as our baseline model to discuss the role of economic globalization on poverty and inequality, respectively. Following the previous studies of Bergh and Nilsson (2014), the lagged economic globalization is taken into consideration for the poverty model, as its effects on poverty might not be instantaneous. Therefore, we constructed two baseline models to examine the effects of economic globalization poverty and income inequality, respectively, which are shown as follows:

Poverty Model:

$$poverty_{i,t} = \lambda_i + \gamma_t + \beta_1 * glob_{i,t-1} + \beta_2 * X_{i,t} + \varepsilon_{i,t}$$

Income Inequality Model:

$$gini_{i,t} = \lambda_i + \gamma_t + \beta_1 * glob_{i,t} + \beta_2 * X_{i,t} + \varepsilon_{i,t}$$

For t =1,…,T; i =1,…N where T refers to the number of time periods and N refers to the number of countries; $poverty_{i,t}$ represents the dependent variable of poverty; $gini_{i,t}$ represents the dependent variable of income inequality; $glob_{i,t}$ and

$glob_{i,t-1}$ denote the extent of economic globalization at t and $t-1$, respectively, while the indices of economic globalization are included separately to avoid the issues of multicollinearity; the parameter β_1 represents the correlation between economic globalization and poverty or income inequality; $X_{i,t}$ measures the control variable at t; the parameter β_2 represents the correlation between each control variable and poverty or income inequality; λ_i represents the country fixed effects that captures the stable variation in poverty and income to each country; γ_t refers to the time fixed effects that capture the time-specific events that affects poverty and income inequality across all countries; $\varepsilon_{i,t}$ is the error term.

3. Results and Discussions

This chapter consists of three sections, which are descriptive analysis, regression analysis, and discussions. First, the descriptive analysis offers a comprehensive overview of poverty, income inequality, economic globalization, and other key control variables, presenting summary statistics for each variable and country and examining patterns across countries during the observed period. Moreover, the regression analysis focuses on the interpretation of results of our econometric models, providing insights into the relationships between the variables of interest. Finally, the discussion section provides an in-depth analysis that relates the findings to existing theories and literature.

3.1 Descriptive Analysis

The descriptive statistic as displayed in Table 3-1 reveals insights about the variables in the study. To start with, the mean value of absolute poverty was 6.49%, with a wide range from 0% to 42.2%, indicating substantial differences in poverty levels among the selected countries or over the observed period. By contrast, the Gini index, which measures income inequality, showed a mean value of 31.03% with a standard deviation of 4.52, suggesting a relatively similar level of inequality across the observed countries over time. In terms of economic globalization, the overall index with an average value of 76.97 ranged from 55.12 to 86.35, indicating considerable variation in this variable. The trade index exhibited a higher mean value of 79.66 compared to the financial globalization index at 74.28, indicating a greater degree of trade globalization relative to financial globalization in the CEE region. Moreover, the restriction index exceeded the actual flows index, with average values of 81.74 and 72.19, respectively. This suggests that economic globalization in the CEE region has been predominantly influenced by policies focused on promoting trade and financial openness, with greater emphasis on reducing trade and capital restrictions. Regarding the control variables, the economic growth rate ranged from -14.46% to a maximum positive value of 13%, with

an average growth rate of 3.19%, indicating overall economic development and growth in the CEE region during the observed period. Education attainment rate showed significant variation, with a high standard deviation of 7.38, ranging from 62.98% to 90.93%. The mean value of 81.13% indicated a relatively high average level of education in the CEE region. Lastly, the inflation rate varied from -1.54% to 15.4%, reflecting fluctuations between inflation and deflation throughout the 2004-2020 period in CEE.

Table 3-1: Descriptive Statistics

Variables	Mean	Std. dev.	Min	Max
Poverty	6.490	8.230	0	42.20
Gini	31.03	4.520	23.20	39.60
KOF1	76.97	6.230	55.12	86.35
KOF2	79.66	6.500	52.68	89.03
KOF3	74.28	7.510	57.57	86.96
KOF4	72.19	8.920	48.11	84.63
KOF5	81.74	5.070	62.13	89.58
growth	3.190	4.580	-14.46	13
edu	81.13	7.380	62.98	90.93
inflation	2.920	2.670	-1.540	15.40

Source: Calculated by the author using Stata 17.0.

Furthermore, we conducted a country-specific descriptive analysis of the variables of interest. Starting with absolute poverty, Slovenia exhibited the lowest mean of 0.241% among the nine observed countries, following by the Czech Republic with a mean of 0.676%. On the other hand, Romania had the highest absolute poverty rate, indicating that a significant portion of the population experienced extreme poverty, with a mean of 26.27%, which was much higher than in other countries. The findings are consistent with the study of Raszkowski and Bartniczak (2019). Additionally, Romania's high standard deviation of 9.759 suggested a substantial fluctuation in

absolute poverty over time. The remaining countries displayed moderate levels of absolute poverty, with average values below 10%. The characteristics of specific categories in CEE were also taken into account. It is shown that the Baltics suffered from comparably high poverty rates with the exception of Estonia, whereas the Visegrad Group had relatively lower level of poverty, with the Czech Republic having a substantially lower poverty rate than the rest of the countries. Table 3-2 below displays the descriptive statistics of absolute poverty for each country.

Table 3-2: Country-specific Descriptive Statistics –Absolute Poverty

Country	**Mean**	**Std. dev.**	**Freq.**
The Visegrad Group			
Czech Republic	0.676	0.268	17
Poland	5.138	4.131	16
Slovak Republic	4.031	1.398	16
Hungary	4.653	1.707	17
Other CE			
Slovenia	0.241	0.150	17
Romania	26.27	9.759	15
The Baltics			
Latvia	8.382	4.879	17
Lithuania	7.265	4.974	17
Estonia	3.829	2.546	17
Total	**6.487**	**8.233**	**149**

Source: Calculated by the author using Stata 17.0.

As for the Gini index, Romania exhibited the highest level of income inequality with a Gini index value of 36.09% in the region, while Slovenia had the lowest level at 24.79%. The Slovak Republic followed with a mean of 26.08%, closely followed by the Czech Republic with an average of 26.11%. Additionally, Lithuania and Latvia also experienced relatively high levels of income inequality, with mean values of 35.81%

and 35.75%, respectively (Table 3-3). It is shown that the Baltics and Romania had the greater average degree of income inequality than other countries, whilst Slovenia had the lower levels, similar to the Visegrad countries except for Poland. The variation in the average Gini index among countries was not significant, indicating that the differences in income inequality levels were relatively small within the region. The standard deviations for each country were also relatively small, with most of them falling below 2, except for Poland, which had a slightly higher standard deviation of 2.283. These findings suggest that the region generally have maintained a relatively stable level of income inequality, with Poland exhibiting the most significant change in income inequality among the nine countries.

Table 3-3: Country-specific Summary Statistics – Income Inequality (Gini Index)

Country	**Mean**	**Std. dev.**	**Freq.**
The Visegrad Group			
Czech Republic	26.11	0.680	17
Poland	32.90	2.283	16
Slovak Republic	26.08	1.615	16
Hungary	29.86	1.766	17
Other CE			
Slovenia	24.79	0.640	17
Romania	36.09	1.274	15
The Baltics			
Latvia	35.75	1.227	17
Lithuania	35.81	1.553	17
Estonia	32.26	1.467	17
Total	**31.03**	**4.519**	**149**

Source: Calculated by the author using Stata 17.0.

In terms of the KOF index, Estonia with highest average of 85.56 has experienced the greatest degree of economic globalization, while Romania has had the least globalized economy, with an average value of only 66.98. The level of economic

globalization in Hungary was second only after Estonia, with the KOF index averaging 82.62 over the observation period, while Poland has had the second lowest degree of economic globalization, with an average of 69.14. As for the remaining countries, the average values of the globalization index ranged from 70 to 80. From these data, we can observe that Romania has had the lowest level of economic globalization and the highest levels of both absolute and relative poverty among the nine countries, which to some extent reflects a negative relationship between economic globalization and poverty.

Table 3-4:

Country-specific Summary Statistics - KOF Economic Globalization Index

Country	Mean	Std. dev.	Freq.
The Visegrad Group			
Czech Republic	79.58	2.373	17
Poland	69.14	3.457	17
Slovak Republic	78.99	1.989	17
Hungary	82.62	1.274	17
Other CE			
Slovenia	74.43	2.864	17
Romania	66.98	4.341	17
The Baltics			
Latvia	78.92	2.191	17
Lithuania	76.46	2.766	17
Estonia	85.56	0.533	17
Total	**76.97**	**6.235**	**153**

Source: Calculated by the author using Stata 17.0.

Figure 1-1 presents the trends of absolute poverty across nine CEECs from 2004 to 2020. Overall, the graph shows a downward pattern in absolute poverty rates over time. Poverty levels were initially high but experienced a rapid decline since 2004. However, during the financial crisis in 2008, there was a significant increase in poverty rates. From 2012 onwards, there was a steady recovery and subsequent decline in absolute poverty rates. Among all the observed countries, the Czech Republic and Slovenia have maintained the lowest levels of absolute poverty over time, with poverty rates remaining close to 0%. On the other hand, Romania has had the highest absolute poverty rate among all the countries, significantly exceeding the others. However, Romania has shown the most significant reduction in absolute poverty rates, with its poverty level declining from over 40% in 2004 to below 10% by 2020, approaching the levels observed in other CEECs.

In addition, the Gini index for these CEE nations has remained at a relatively stable level, ranging from approximately 25 to 40, with no significant fluctuations over the period 2004-2020. The Baltic states as well as Romania have had comparably highest level of income inequality among the region, while Slovenia, Czech Republic, and Slovenia have maintained the lowest degree of income inequality over time. The time series graph of Gini index from 2004 to 2020 is displayed as Figure 1-2. By analysing statistics and trends in absolute poverty and Gini index, it is shown that countries with high levels of poverty tended to have greater levels of income inequality, whereas those with low poverty rates tended to have lower levels of income inequality.

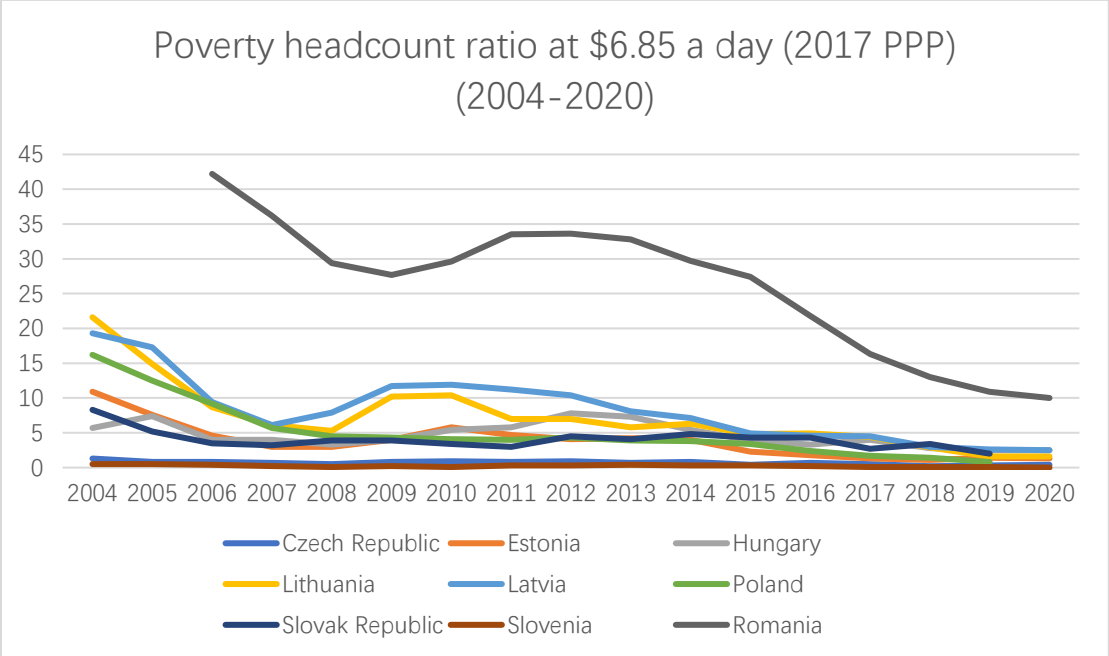
For the independent variables, the time series graph as exhibited in Figure 1-3 shows a slow upward trend of the degree of economic globalization in CEE region over the period 2004-2020. It is shown that Estonia has had the greatest level of economic globalization in almost all observed years, whereas Hungary has maintained the second highest degree of economic globalization, with KOF Economic Globalization Index in range of 80-90 over time. Meanwhile, Romania and Poland have had the lowest degree of economic globalization, yet these two countries have experienced more dramatic change than others, especially for Romania, which has gone from approximately 50 to over 70 since the beginning of the century.

Furthermore, we examined the trends in economic growth in the CEE region from 2004 to 2020. It is shown that there have been notable fluctuations in economic growth rate across the region during the observed years, especially during the financial crisis,

when all sample countries have experienced a sharp decline and serious recession in 2007-2008, particularly for the Baltics, before quickly rebounding to positive growth in 2009. However, economic growth turned negative again in 2020, as a result of the Covid pandemic. Figure 1-4 below presents the time series graph of economic growth over 2004-2020.

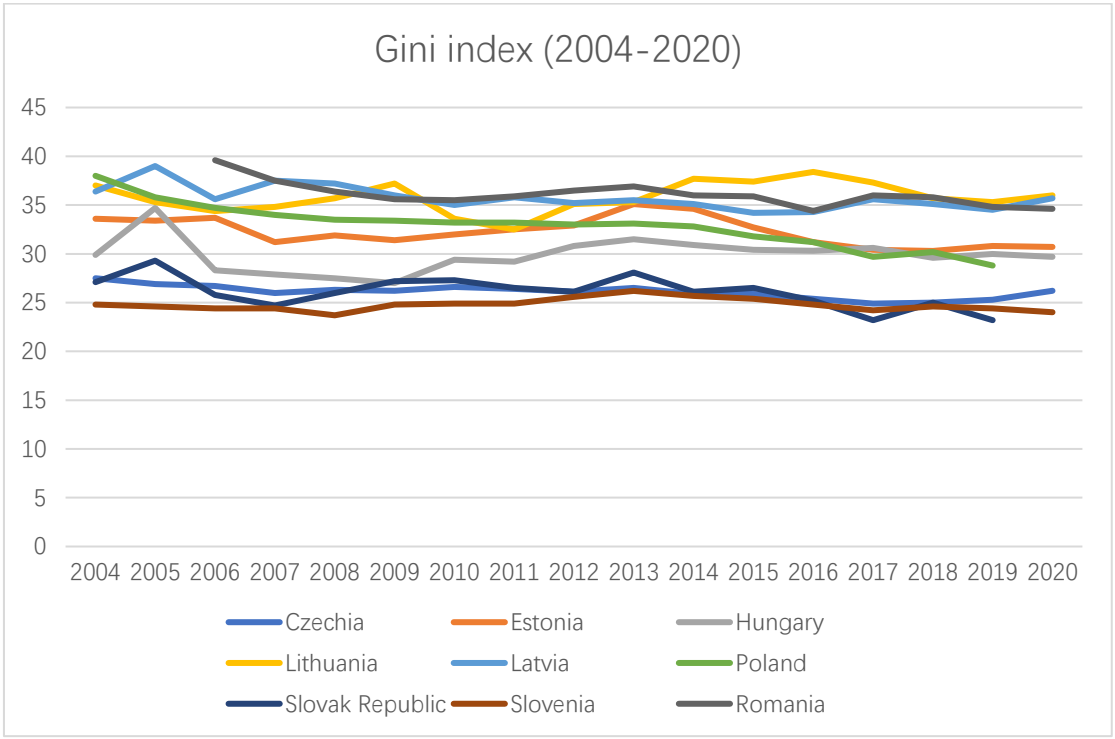
Figure 1-1:

Time Series Graph of World Bank Absolute Poverty Estimation (2004-2020)



Source: World Bank WDI. Constructed by the author using Excel.

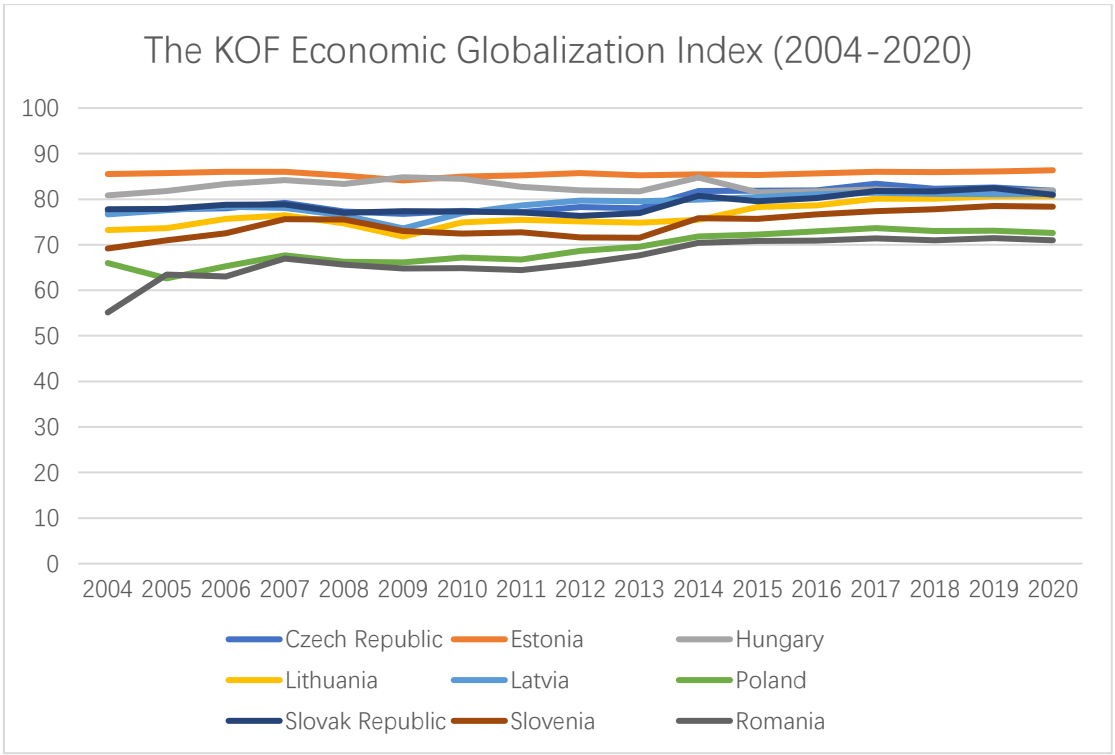
Figure 1-2: Time Series Graph of Gini Index (2004-2020)



Source: World Bank WDI. Constructed by the author using Excel.

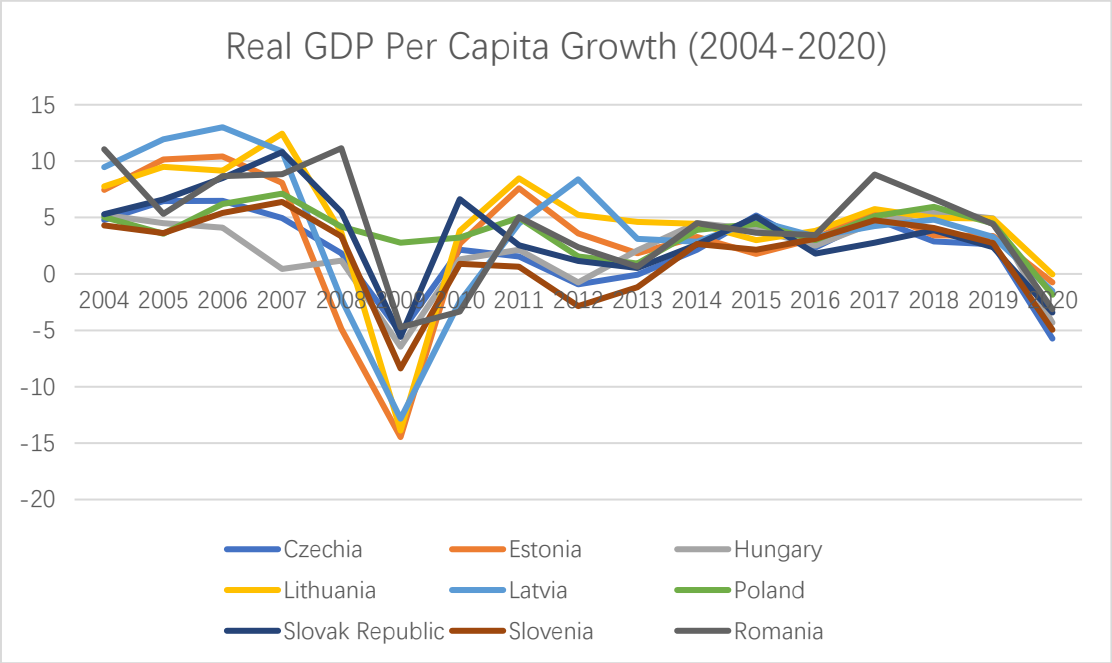
Figure 1-3:

Time Series Graph of KOF Economic Globalization Index (2004-2020)



Source: World Bank WDI. Constructed by the author using Excel.

Figure 1-4: Time Series Graph of Economic Growth (2004-2020)



Source: World Bank WDI. Constructed by the author using Excel.

Overall, these findings present preliminary evidence for our first hypothesis of negative correlation between economic globalization and poverty by showing that the number of populations living below $6.85 poverty line have substantially decreased in CEE while there was a slight upward trend in the level of economic globalization across CEECs over time. For instance, the absolute poverty rate in Romania was much higher than other high-income CEECs while the level of economic globalization was comparably the lowest over 2004-2020. On the other hand, the Baltics have maintained the highest income inequality as well as the degree of economic globalization over time, whereas Poland have also suffered from the great income inequality but has had the second lowest degree of economic globalization among all observed countries, indicating that our second hypothesis on the relationship between economic globalization and income inequality needs to be further investigated. The descriptive statistics and graphs provide the foundation for the empirical analysis in the following parts by displaying the general characteristics of key variables in this study as well as variations and trend in each variable across all observed countries.

3.2 Regression Analysis

To examine the validity of our research hypotheses, we performed regression analysis of economic globalization and poverty and income inequality, based on panel data regressions. This section gives a thorough explanation on the tests involved in the regression analysis, such as the tests of multicollinearity, stationarity, model selection, cross-sectional dependence, heteroscedasticity, and autocorrelation, as well as a detailed interpretation of regression outcomes, followed by a summary of the key findings.

3.2.1 Multicollinearity Test

To ensure the validity of estimation results, we examined variable correlations and detect the presence of multicollinearity, which might cause unstable regression models and misinterpretations of variable relationships and coefficient estimates. Table 4-1 displays the correlation between each independent variable in our study, indicating a low level of correlation among the independent variables in the model.

Table 4-1: Correlation Matrix

	KOF1	***KOF2***	***KOF3***	***KOF4***	***KOF5***	***growth***	***edu***	***inflation***
KOF1	1							
KOF2	0.8722*	1						
KOF3	0.9059*	0.5830*	1					
KOF4	0.9410*	0.9000*	0.7838*	1				
KOF5	0.8034*	0.5612*	0.8486*	0.5545*	1			
growth	-0.0732	-0.0770	-0.0549	-0.1115	0.0161	1		
edu	0.6113*	0.5305*	0.5483*	0.6070*	0.4125*	-0.0955	1	
inflation	-0.1807*	-0.3107*	-0.0311	-0.1907*	-0.1087	0.1712*	-0.2125*	1

Note: * Statistically significant at 5% level.

Source: Calculated by the author using Stata 17.0.

To confirm the absence of multicollinearity among the independent variables, the study employed the Variance Inflation Factor (VIF) test as an additional verification method. The VIF of all independent variables were less than 2, suggesting that the issue of multicollinearity does not exist. Table 4-2 below displays the VIF test results.

Table 4-2: Results of VIF Test

Variable	**VIF**	**1/VIF**
KOF1	1.640	0.609
growth	1.030	0.975
edu	1.700	0.590
inflation	1.060	0.943
Mean	**1.360**	

Variable	**VIF**	**1/VIF**
KOF2	1.460	0.683
growth	1.030	0.969
edu	1.430	0.697
inflation	1.100	0.912
Mean	**1.260**	

Variable	**VIF**	**1/VIF**
KOF3	1.480	0.674
growth	1.020	0.980
edu	1.560	0.640
inflation	1.080	0.928
Mean	**1.290**	

Variable	**VIF**	**1/VIF**
KOF4	1.630	0.615
growth	1.020	0.981
edu	1.670	0.600
inflation	1.060	0.942
Mean	**1.340**	

Variable	**VIF**	**1/VIF**
KOF5	1.240	0.808
growth	1.040	0.961

edu	1.290	0.777
inflation	1.060	0.942
Mean	**1.160**	

Note: Dependent variable is *poverty*.

Source: Calculated by the author using Stata 17.0.

3.2.2 Panel Unit Root Test

Performing a unit root test is essential for econometric models as it verifies the presence of stationarity in the data, preventing spurious regression and ensuring the validity of estimation results. The Im-Pesaran-Shin (IPS) unit-root test is one of the most popular tests for stationarity. The null hypothesis of the IPS test is that all panels contain unit roots, while the alternative hypothesis represents the presence of stationarity. Therefore, we conducted a IPS unit-root test to check for the validity of stationarity for our panel data regression models.

Table 5: Results of the IPS Unit Root Test

Variables	Z-t-tilde-bar Statistics	p-value
Poverty	-2.0391	0.0207
Gini	-4.1338	0.0000
KOF1	-3.0051	0.0013
KOF2	-3.1905	0.0007
KOF3	-1.9420	0.0261
KOF4	-2.2503	0.0122
KOF5	-2.9925	0.0014
growth	-1.9820	0.0237
edu	-3.5996	0.0002
inflation	-4.1297	0.0000

Source: Calculated by the author using Stata 17.0.

As Table 5 shown, the results of the IPS tests suggest that all variables were stationary at 5% significance level, and most of them were stationary at 1% significance level, indicating that all variables satisfied the requirement of stationarity. This finding provides confidence in the reliability of the data, allowing for more robust analysis and interpretation.

3.2.3 Pre-estimation Check

To choose estimation models, pre-estimation check has been conducted before the regression analysis. Hausman test is commonly used to choose between random-effects and fix-effects model. Moreover, the Joint-F test for entity fixed-effects and time fixed-effects helps decide whether country fixed-effects and time fixed-effects exist, while the Breusch and Pagan Lagrangian multiplier test can be used to determine whether random-effects are significant against the pooled model. Table 6-1 and Table 6-2 below display the results of pre-estimation tests for poverty and income inequality models, respectively. To begin with, the results of Hausman tests suggest that the null hypothesis of random-effects was rejected against fixed-effects at 10% significance level on all sets of poverty regression variables, while the null hypothesis of random-effects was rejected at 1% level on all sets of income inequality regressions, supporting our choice of baseline models. In addition, as for poverty regression, the results of Joint-F test and Breusch and Pagan Lagrangian multiplier test suggest that pooled OLS model was rejected against time FE model and RE model at 1% significance level, whereas the Joint-F tests and Breusch and Pagan Lagrangian multiplier test of regressions on income inequality show that pooled model was rejected against both entity and time FE model as well as RE model at 1% level, indicating that the pooled model was strongly rejected against fixed-effects and random-effects model for our empirical analysis. As a result, the pooled model will not be taken into account in the discussion of the regression analysis in this study. However, according to the results of the joint-F test of poverty models, we failed to reject the null hypothesis that the coefficients for the years are jointly equal to zero, implying that time FE were insignificant for poverty regression analysis. Therefore, in examining the impact of economic globalization on poverty, this study tends to focus on the results of the country FE models rather than the two-way FE models.

Table 6-1: Results of Pre-estimation Tests for Poverty Models

Tests	Statistics	Poverty Models				
		(1) *KOF1*	(2) *KOF2*	(3) *KOF3*	(4) *KOF4*	(5) *KOF5*
Joint-F Entity FE	chi2	394.57	374.43	337.53	281.22	429.56
	p>chi2	0.0000	0.0000	0.0000	0.0000	0.0000
Joint-F Time FE	chi2	14.97	16.40	14.57	18.32	15.20
	p>chi2	0.4534	0.3560	0.4828	0.2462	0.4372
Hausman	chi2	11.30	11.57	18.49	8.69	26.20
	p>chi2	0.0234	0.0208	0.0010	0.0694	0.0000
B-P Multiplier	chi2	323.64	287.74	304.01	275.58	295.81
	p>chi2	0.0000	0.0000	0.0000	0.0000	0.0000

Note: (1), (2), (3), (4), and (5) indicate the regression of lagged overall economic globalization, lagged trade globalization, lagged financial globalization, lagged financial globalization, lagged actual flow of economic globalization, and lagged restriction of economic globalization on absolute poverty, after controlling for economic growth, education attainment, and inflation, respectively.

Source: Calculated by the author using Stata 17.0.

Table 6-2: Results of Pre-estimation Tests for Income Inequality Models

Tests	Statistics	Income Inequality Models				
		(1) *KOF1*	(2) *KOF2*	(3) *KOF3*	(4) *KOF4*	(5) *KOF5*
Joint-F Entity FE	chi2	1202.32	1131.87	1254.27	1171.91	1162.75
	p>chi2	0.0000	0.0000	0.0000	0.0000	0.0000
Joint-F Time FE	chi2	25.74	25.07	26.30	25.68	25.29
	p>chi2	0.0577	0.0686	0.0499	0.0587	0.0649
Hausman	chi2	17.71	18.03	17.47	18.02	17.43
	p>chi2	0.0014	0.0012	0.0016	0.0012	0.0016
B-P Multiplier	chi2	536.89	527.06	545.00	532.98	530.77
	p>chi2	0.0000	0.0000	0.0000	0.0000	0.0000

Note: (1), (2), (3), (4), and (5) indicate the regression of overall economic globalization, trade globalization, financial globalization, financial globalization, actual flow of economic globalization, and restriction of economic globalization on income inequality, after controlling for economic growth, education attainment, and inflation, respectively.

Source: Calculated by the author using Stata 17.0.

3.2.4 Interpretation of the Results

The regressions on economic globalization and absolute poverty have been conducted to evaluate the validity of Hypothesis One. Table 7-1, Table 7-2, and Table 7-3 summarize the results from the poverty regressions of two-way fixed-effects model, country fixed-effects model, and random-effects model, respectively. To start with, in the two-way FE model, the coefficient of the overall KOF economic globalization index at time t-1, represented by $KOF1_{t-1}$, was statistically and negatively significant at 5% significance level, after controlling for the impacts of economic growth, education, and inflation. The association between the overall economic globalization and absolute poverty appeared to be even stronger in the entity FE model and RE model, wherein the coefficient of the lagged overall KOF economic globalization index was negative at 1% level, indicating that economic globalization had significant and negative lagged effects on absolute poverty, which supports our first hypothesis that there is a significant and negative relationship between economic globalization and poverty and is consistent with the findings of Bergh and Nilsson (2014).

To investigate in what way economic globalization has had a negative effect on poverty, the dimensions of trade and financial globalization have been further examined. It is shown that the lagged trade globalization, denoted by $KOF2_{t-1}$, had significantly negative impacts on absolute poverty at 1% level in all models, suggesting that trade globalization had a significant and negative lagged effect on absolute poverty in the CEE region. Nonetheless, different models have produced varied outcomes on the correlation between financial globalization and poverty. The results of the two-way fixed-effects model suggested that the lagged financial globalization ($KOF3_{t-1}$) had no significant effect on absolute poverty at any level, yet the results of country fixed-effects model and random effects model indicated that there was a statistically significant and negative relationship between financial globalization and poverty at 1% level and 5% level, respectively. Here, we tended to use the findings of the country FE model that there was a significantly negative impact of financial globalization on poverty at 1% level, regarding the results of the joint-F test that time fixed-effects are rejected in this regression serial.

As for the actual flow (de facto, denoted by $KOF4_{t-1}$) and restriction (de jure, denoted by $KOF5_{t-1}$) dimensions of economic globalization, all results suggested that the actual flows of economic globalization have no significant effects on absolute poverty at any significance level, whereas the correlation between restrictions of economic globalization and absolute poverty was found to be statistically significant and negative at 1% significance level. Furthermore, as for the control variables, it is shown that the coefficients of GDP per capita growth and inflation rate were not statistically significant in all models, whereas education attainment presented a significantly negative effects on absolute poverty in the country FE model as well as RE model.

Table 7-1: Results of Two-way Fixed-effects Poverty Model

Two-way Fixed-effects Model. Dependent Variable: Absolute Poverty.					
	(1)	(2)	(3)	(4)	(5)
$KOF1_{t-1}$	-0.4924**				
	(0.2088)				
$KOF2_{t-1}$		-0.6640***			
		(0.1849)			
$KOF3_{t-1}$			-0.1133		
			(0.1600)		
$KOF4_{t-1}$				0.0365	
				(0.1597)	
$KOF5_{t-1}$					-0.6578***
					(0.1541)
$growth_t$	0.0239	0.0462	-0.0109	-0.0234	0.0327
	(0.1052)	(0.1011)	(0.1075)	(0.1082)	(0.0975)
edu_t	0.1051	0.1322	0.0368	-0.0050	-0.1136
	(0.1922)	(0.1837)	(0.1966)	(0.2144)	(0.1785)
$inflation_t$	0.0936	0.0883	0.0750	0.0673	0.1615
	(0.1834)	(.1758)	(0.1891)	(0.1893)	(0.1723)
constant	33.0283	47.0853**	8.6423	1.1112	67.3230***
	(20.7960)	(19.9196)	(19.0402)	(17.2072)	(21.4593)

Note: ***, **, * Statistically significant at 1%, 5%, 10% level, respectively. Numbers in parenthesis are standard errors of coefficients.

Source: Calculated by the author using Stata 17.0.

Table 7-2: Results of Country Fixed-effects Poverty Model

Country Fixed-effects Model. Dependent Variable: Absolute Poverty.					
	(1)	(2)	(3)	(4)	(5)
$KOF1_{t-1}$	-0.7871***				
	(0.1538)				
$KOF2_{t-1}$		-0.7074***			
		(0.1264)			
$KOF3_{t-1}$			-0.3710***		
			(0.1350)		
$KOF4_{t-1}$				-0.1950	
				(0.1316)	
$KOF5_{t-1}$					-0.5434***
					(0.1005)
$growth_t$	0.0071	0.0479	-0.0512	-0.0396	-0.0157
	(0.0574)	(0.0579)	(0.0609)	(0.0636)	(0.0558)
edu_t	-0.1619	-0.1127	-0.3888***	-0.3184*	-0.5571***
	(0.1188)	(0.1189)	(0.1147)	(0.1679)	(0.0970)
$inflation_t$	0.0140	-0.1559	0.0829	-0.0096	-0.0036
	(0.1046)	(0.1050)	(0.1196)	(0.1168)	(0.1031)
constant	80.2318***	72.4168***	65.604***	46.7143***	96.1832***
	(10.2388)	(9.0315)	(10.8605)	(9.0632)	(11.9547)

Note: ***, **, * Statistically significant at 1%, 5%, 10% level, respectively. Numbers in parenthesis are standard errors of coefficients.

Source: Calculated by the author using Stata 17.0.

Table 7-3: Results of Random-effects Poverty Model

Random-effects Model. Dependent Variable: Absolute Poverty.					
	(1)	(2)	(3)	(4)	(5)
$KOF1_{t-1}$	-0.6668***				
	(0.1424)				
$KOF2_{t-1}$		-0.6194***			
		(0.1199)			

$KOF3_{t-1}$			-0.2702**		
			(0.1153)		
$KOF4_{t-1}$				-0.1774	
				(0.1126)	
$KOF5_{t-1}$					-0.4557***
					(0.1031)
$growth_t$	-0.0050	0.0315	-0.0526	-0.0436	-0.0171
	(0.0591)	(0.0594)	(0.0656)	(0.0644)	(0.0630)
edu_t	-0.2716**	-.2399**	-0.5120***	-0.4209***	-0.6056***
	(0.1123)	(0.1110)	(0.1063)	(0.1424)	(0.0896)
$inflation_t$	-0.0038	-.1605	0.0383	-0.0337	-0.0060
	(0.1073)	(0.1077)	(0.1254)	(0.1176)	(0.1144)
constant	79.7442***	75.4124***	68.1841***	53.6918***	92.8709**
	(9.6617)	(8.8022)	(9.2912)	(8.3890)	(10.8626)

Note: ***, **, * Statistically significant at 1%, 5%, 10% level, respectively. Numbers in parenthesis are standard errors of coefficients.

Source: Calculated by the author using Stata 17.0.

On the other hand, the study regressed KOF economic globalization index and Gini coefficients to test Hypothesis Two. The regression outcomes for the two-way fixed-effects model, country fixed-effects model, and random-effects model are exhibited in Table 7-4, Table 7-5, and Table 7-6, respectively. Firstly, the results from all three models demonstrated that overall economic globalization had a negative and significant impact on income inequality at the 5% level of significance, after controlling for the effects of economic growth, education, and inflation. Based on the findings of the two-way fixed-effects model, Gini index would reduce by 0.1907% as the overall KOF economic globalization index increased by 1 unit. In other words, we had 95% confidence to conclude that there is statistically significant and negative relationship between economic globalization and income inequality, disproving our second hypothesis and arguing against the conclusions of several existing research, such as Bergh and Nilsson (2010).

Similarly, in order to explore the impact of different aspects of economic globalization on income inequality, we decomposed economic globalization into trade globalization and financial globalization based on its definition. The findings indicated that there was no significant association between trade globalization and income

inequality at any significance level, whilst the coefficient of financial globalization turned out to be statistically significant and negative at 5%, 1%, and 1% level, in two-way FE model, entity FE model, and RE model, respectively, after controlling for the growth, education attainment, and inflation, suggesting that financial globalization can significantly reduce income inequality in the CEE region.

Additionally, we performed separate regression analysis on actual flows (de facto) and restrictions (de jure) of economic globalization in accordance with its nature. The results implied that the actual flow of economic globalization had a significant and negative impact on Gini index at 10%, 5%, and 10% significance level, in two-way FE model, country FE model, and RE model, respectively. In terms of restrictions of economic globalization, the results of all models displayed that there was a significant and negative correlation between restrictions and Gini index at 10% significance level. Furthermore, the results of our baseline model suggested that inflation rate was significantly and positively associated with income inequality while the coefficient of economic growth and education attainment was not significant at any level.

Table 7-4: Results of Two-way Fixed-effects Income Inequality Model

Two-way Fixed-effects Model. Dependent Variable: Gini Index.					
	(1)	(2)	(3)	(4)	(5)
$KOF1_t$	-0.1907**				
	(0.0903)				
$KOF2_t$		-0.0727			
		(0.0965)			
$KOF3_t$			-0.1634**		
			(0.0644)		
$KOF4_t$				-0.1129*	
				(0.0655)	
$KOF5_t$					-0.1549*
					(0.0888)
$growth_t$	-0.0009	-0.0159	-0.0007	-0.0070	-0.0088
	(0.0458)	(0.0465)	(0.0449)	(0.0459)	(0.0457)
edu_t	0.1271	0.1111	0.1072	-0.1435	0.0774
	(0.0829)	(0.0873)	(0.0804)	(0.0873)	(0.0821)

$inflation_t$	0.1574**	0.1604*	0.1684**	0.1528*	0.1723**
	(0.0792)	(0.0817)	(0.0781)	(0.0803)	(0.0797)
constant	35.1920***	28.0677***	34.0610***	27.1401***	37.8834***
	(8.1353)	(8.3015)	(7.2746)	(6.4877)	(10.1041)

Note: ***, **, * Statistically significant at 1%, 5%, 10% level, respectively. Numbers in parenthesis are standard errors of coefficients.

Source: Calculated by the author using Stata 17.0.

Table 7-5: Results of Country Fixed-effects Income Inequality Model

Country Fixed-effects Model. Dependent Variable: Gini Index.					
	(1)	(2)	(3)	(4)	(5)
$KOF1_t$	-0.1904**				
	(0.0750)				
$KOF2_t$		-0.0524			
		(0.0702)			
$KOF3_t$			-0.1845***		
			(0.0560)		
$KOF4_t$				-0.1215**	
				(0.0597)	
$KOF5_t$					-0.0952*
					(0.0547)
$growth_t$	-0.0368	0.0122	0.0338	0.0270	0.0173
	(0.0297)	(0.0304)	(0.0276)	(0.0294)	(0.0282)
edu_t	0.0004	-0.0513	-0.0241	0.0309	-0.0864*
	(0.0549)	(0.0595)	(0.0474)	(0.0708)	(0.0463)
$inflation_t$	0.0102	-0.0012	0.0274	0.0024	0.0010
	(0.0506)	(0.0562)	(0.0485)	(0.0505)	(0.0511)
constant	45.8166***	39.4838***	46.6411***	37.4234***	45.8798***
	(4.9734)	(4.6801)	(4.5971)	(3.7882)	(6.1359)

Note: ***, **, * Statistically significant at 1%, 5%, 10% level, respectively. Numbers in parenthesis are standard errors of coefficients.

Source: Calculated by the author using Stata 17.0.

Table 7-6: Results of Random-effects Income Inequality Model

Random-effects Model. Dependent Variable: Gini Index.					
	(1)	(2)	(3)	(4)	(5)
$KOF1_t$	-0.1765**				
	(0.0742)				
$KOF2_t$		-0.0446			
		(0.0699)			
$KOF3_t$			-0.1736***		
			(0.0554)		
$KOF4_t$				-0.1028*	
				(0.0572)	
$KOF5_t$					-0.0991*
					(0.0565)
$growth_t$	0.0354	0.0120	0.0332	0.0239	0.0197
	(0.0314)	(0.0321)	(0.0293)	(0.0309)	(0.0302)
edu_t	-0.0186	-0.0708	-0.0348	-0.0032	-0.0962**
	(0.0554)	(0.0588)	(0.0485)	(0.0681)	(0.0464)
$inflation_t$	-0.0064	0.0022	0.0304	0.0045	0.0035
	(0.0537)	(0.0595)	(0.0517)	(0.0539)	(0.0541)
constant	46.0527***	40.2920***	46.5889***	38.6691***	46.8417
	(5.0217)	(4.8299)	(4.6111)	(3.9279)	(6.1670)

Note: ***, **, * Statistically significant at 1%, 5%, 10% level, respectively. Numbers in parenthesis are standard errors of coefficients.

Source: Calculated by the author using Stata 17.0.

3.2.5 Post-estimation Modification

To ensure the reliability of the regression results, this research further examined the presence of cross-sectional dependence (CSD), heteroskedasticity, and autocorrelation that may lead to biased results. Based on the results of pre-estimation tests, we preferred to adopt the results of country FE model for poverty regressions, while for the income inequality regressions we referred more to the results of the two-way FE model. Therefore, this part checks for the chosen models and makes modifications for any CSD, heteroskedasticity, and autocorrelation issues. Pesaran's test for CSD presented

a weak CSD in regression (1), (2), (3), and (5) of country FE model for absolute poverty, while a strong CSD might exist in regression (4) of country FE model for poverty as well as in all two-way FE models for income inequality. Here, Driscoll-Kraay standard errors were adopted to remedy for the problem of CSD. In addition, the results of Modified Wald test revealed that groupwise heteroscedasticity might present in all observed FE regression models. Moreover, Wooldridge test detected the presence of autocorrelation in panel data for the regression of poverty and income inequality at 1% and 10% significance level, respectively. Thus, we applied robust standard errors to correct the issues of heteroscedasticity and autocorrelation.

Table 8-1 and Table 8-2 below present the results of modified estimations for the model of poverty and income inequality, respectively. As for the poverty models, the results of robust estimations remained unchanged from the original results of country FE model except for the level of significance, suggesting that the overall economic globalization as well as the dimensions of trade and financial globalization, and the restrictions of economic globalization had robust negative impacts on absolute poverty at 10% level, whereas the actual flow of economic globalization has little impact on poverty before and after the modifications. For the income inequality models, after the modification for heteroscedasticity and autocorrelation, the robust estimation of overall economic globalization coefficient remained the same as its original results, suggesting that economic globalization has robust negative impact on income inequality at 5% significance level. While the coefficient of trade globalization stayed insignificant, financial globalization presented a more robust association with Gini index after modification, implying that financial globalization had a robust negative impact on income inequality at 1% significance level. Nonetheless, the coefficient of actual flow of economic globalization was no longer significant under the robust estimation, whereas the link between restriction of economic globalization and Gini index appeared to be stronger after modification, supporting that the restriction dimension of economic globalization had statistically significant and negative effects on income inequality at 5% significance level. However, it is noticeable that some results from modification for CDS with Driscoll-Kraay standard errors were not consistent with the those obtained using robust standard errors. Given the statistical significance of addressing heteroskedasticity in this context, the interpretation of results with robust standard errors was preferred for further discussions.

Table 8-1: Modified Results for Poverty Models

Key Variables	Original Results	Modification for CSD	Modification for Heteroscedasticity & Autocorrelation
$KOF1_{t-1}$	-0.7871***	/	-0.7871*
	(0.1538)		(0.4083)
$KOF2_{t-1}$	-0.7074***	/	-0.7074*
	(0.1264)		(0.3347)
$KOF3_{t-1}$	-0.3710***	/	-0.3710*
	(0.1350)		(0.1812)
$KOF4_{t-1}$	-0.1950	-0.1950*	-0.1950
	(0.1316)	(0.1086)	(0.1107)
$KOF5_{t-1}$	-0.5434***	/	-0.5434*
	(0.1005)		(0.2816)

Note: ***, **, * Statistically significant at 1%, 5%, 10% level, respectively. The column of original results are the results of country FE models for absolute poverty. Numbers in parenthesis for the column of modification for CSD are Driscoll-Kraay standard errors. Numbers in parenthesis for the column of modification for heteroscedasticity and autocorrelation are robust standard errors of coefficients.

Source: Calculated by the author using Stata 17.0.

Table 8-2: Modified Results for Income Inequality Models

Key Variables	Original Results	Modification for CSD	Modification for Heteroscedasticity & Autocorrelation
$KOF1_t$	-0.1907**	-0.1907	-0.1907**
	(0.0903)	(0.1456)	(0.0741)
$KOF2_t$	-0.0727	-0.0727	-0.0727
	(0.0965)	(0.1346)	(0.1304)
$KOF3_t$	-0.1634**	-0.1634	-0.1634***
	(0.0644)	(0.0939)	(0.0464)
$KOF4_t$	-0.1129*	-0.1129	-0.1129
	(0.0655)	(0.1191)	(0.0635)

$KOF5_t$	-0.1549*	-0.1549*	-0.1549**
	(0.0888)	(0.0801)	(0.0560)

Note: ***, **, * Statistically significant at 1%, 5%, 10% level, respectively. The column of original results are the results of two-way FE models for income inequality. Numbers in parenthesis for the column of modification for CSD are Driscoll-Kraay standard errors. Numbers in parenthesis for the column of modification for heteroscedasticity and modified autocorrelation are robust standard errors of coefficients.

Source: Calculated by the author using Stata 17.0.

3.2.6 Summary of Key Findings

In general, these results suggest that economic globalization, with a lag, has a significantly negative impact on absolute poverty in CEE region, supporting the first hypothesis of our research that there is a significant and negative relationship between economic globalization and poverty in CEE. To investigate how economic globalization reduces absolute poverty, the paper also performed regression analysis on each of its dimension, including trade and financial globalization, as well as the actual flow and restriction of economic globalization. The results demonstrate that both lagged trade globalization and lagged financial globalization, which are the two most important components of economic globalization, can significantly reduce absolute poverty in CEE. Furthermore, the findings reveal that restriction of economic globalization has a significantly negative impact on absolute poverty, while there is no significant correlation between actual flows of economic globalization and absolute poverty, indicating that it is the restriction rather than actual flow that alleviates poverty in CEE area. The robustness estimations maintain the significance of these results, confirming the validity of our findings. Though the globalization-poverty nexus has been proved, our results suggest that there is no significant association between economic growth and absolute poverty, implying that the indirect effect of growth may not exist.

On the contrary, these findings reject the second hypothesis of the study that there is a significant and positive relationship between economic globalization and income inequality in CEE, illustrating that economic globalization can robustly lower the level of income inequality in the region. In the regression analysis of trade and financial dimensions of economic globalization, it is found that financial globalization has a robust negative effect on income inequality, whereas there is no significant relationship between

trade globalization and income inequality, suggesting that economic globalization minimises the level of income inequality mainly through its financial component instead of the trade dimension. The inequality impact of financial globalization, which was initially significant at the 5% level, became stronger under the correction of heteroscedasticity with robust standard errors, enhancing its significance to the 1% level. Additionally, the results of regression analysis show that the restriction of economic globalization has a robust and negative effect on income inequality, while the coefficient of actual flow of economic globalization is statistically and negatively significant at 10% level in the baseline model. However, no significant association is found between actual flow of economic globalization and income inequality in CEE under robust estimations. Therefore, we may conclude that economic globalization decreases income inequality through free trade and capital policies, while the actual flows such as imports, exports, and FDI have little considerable impact on income inequality in the region.

3.3 Discussions

In this section, an in-depth discussion of our key findings will be carried out regarding the effects of economic globalization on poverty and income inequality in CEE region, incorporating into existing theories and literatures.

To examine the effects of economic globalization on poverty, the first research hypotheses has been formulated based on the main literature and theoretical framework, assuming that economic globalization may reduce poverty in CEE. Our first finding on the impact of economic globalization on poverty strongly support the first research hypothesis. It is found that economic globalization can significantly reduce absolute poverty in the CEE region, which is consistent with the study of Bergh and Nilsson (2014). They proved that the lagged KOF economic globalization is significantly and negatively correlated with absolute poverty for a sample of 114 countries. Also, our first finding is in line with the predominant theories, including the neoliberal argument and the HO trade theory. Firstly, our finding supports the neoliberal argument that the increasing globalization has contributed to the reduction of poverty around the world through the increasing global efficiency of resource allocation as countries and regions specialize based on their comparative advantages. On the other hand, the Stopler-Samuelson theorem and the HO theory can be used to explain the poverty-reduction effects of economic globalization in the less developed countries in CEE region. Despite

the relatively high level of income, these countries still exhibit economic conditions closed to developing nations, suggesting that the interpretation of the Stopler-Samuelson theorem and the HO theory for underdeveloped countries could be applicable. Based on these trade theories, some relatively less developed CEECs with abundant unskilled labour force, such as Romania and Poland, may benefit from the process of economic globalization as globalization boosts demand for exports, raising the demand for unskilled workers in exporting sector as well as their wages, which ultimately contributes to poverty reduction.

By decomposing economic globalization, our findings reveal that both trade globalization and financial globalization have robust negative impacts on absolute poverty, further supports our first hypothesis. These findings are consistent with the studies of Dollar (2005) and Nissanke and Thorbecke (2006, 2010), which concluded that globalization could reduce poverty through trade integration and financial openness. A number of previous studies explained the relationship between trade and financial openness and poverty through economic growth. One possible explanation is that the integration of less developed economies to more advanced ones, as in the case of the CEE to the Western Europe through accession to the EU, has offered unprecedented opportunities for the poor to improve their living standards, contributing to significant growth and poverty reduction for such countries (Dollar, 2005). Another explanation is that, in the context of globalization, trade and financial openness have facilitated exports, imports, and capital flows, through which benefit export industries, enhance resource allocation efficiency and competition, and transfer technology and skills, respectively, thereby boosting economic growth and reducing the poverty rate (Nissanke and Thorbecke, 2006). However, it is surprising to find that there is no significant relationship between growth and poverty after considering it as a control variable. Bergh and Nilsson (2014) believed that the poverty-decreasing effects of globalization has been underestimated under the assumption of globalization-growth-poverty nexus, as the effect of globalization remained strong after controlling for the growth. Thus, our results suggest that there could be a more direct and robust relationship between globalization and poverty reduction, or the impact of economic growth on poverty could be lagged rather than immediate, which requires further examination.

In addition, our results suggest that the de jure KOF economic globalization is significantly and negatively correlated with absolute poverty, while there is no significant association between de facto KOF economic globalization and poverty, suggesting that

economic globalization in CEE region mainly decreases poverty through restrictions rather than actual trade and capital flows. This finding is consistent with the conclusion of Bergh and Nilsson (2014), where the poverty-reduction impacts of trade restriction are robust and relatively large after controlling for the effect of economic growth, while the poverty effects of flows are no longer significant after controlling for growth. Our findings demonstrate that increased trade and capital flows are not significantly related to poverty reduction, whereas more liberal trade and capital restrictions are robustly associated with lower poverty levels. This may imply that more liberal restrictions do not necessarily contribute to higher flows of trade, which is also in line with the finding of Bergh and Nilsson (2014). Following their conclusions, one possible explanation for the importance of restrictions is that these constraints matter for import prices. Less restrictions and lower barriers on trade frequently leads to lower import prices, which may stimulate domestic competitions, encourage industrial efficiency and productivity, and eventually lower poverty rates (Nissanke and Thorbecke, 2006). Additionally, cheaper imports may increase the purchasing power of the poor in CEE, enabling them to afford the essentials and improve living standards, which in turn contribute to the reduction in absolute poverty.

As for the relationship between economic globalization and within-country income inequality, our second hypothesis predicts that economic globalization may worsen income inequality within CEECs, which is based on the theory that globalization exacerbates income inequality in rich countries. By contrast, our second finding suggests that there is a robust and negative association between the overall economic globalization and income inequality in CEECs after controlling for economic growth, education attainment and inflation, refuting the second hypothesis of our research. This finding is consistent with the neoliberal argument that the increasing economic integration has enhanced resource allocation efficiency globally as countries specialize in accordance with their comparative advantages. However, the Stopler-Samuelson theorem and the HO theory contend that such progressive trend mainly happened in low-income countries. According to these theories, globalization, particularly trade integration, may lessen the income gap between unskilled workers and professionals within low-income countries as they specialize in less technology-intensive products, thereby enhancing job opportunities and income levels for unskilled workers and subsequently lessening the income gap between unskilled and skilled workers, whereas the income gap between unskilled and skilled labours increases within the high-income countries that specialize in technology-

or capital-intensive products. Considering that our findings are based on a sample of high-income CEECs, these results are seen to be inconsistent with the theoretical expectation that globalization may worsen income inequality in rich countries, implying that these trade theories may not hold. A likely explanation is that the Stopler-Samuelson theorem and the HO theory primarily interpret the influence of trade integration on income disparity, while disregarding the effects of financial globalization. Consequently, these theories may not fully explain the overall impact of economic globalization on income inequality. Nonetheless, our second finding is in accord with the study of Hui and Bhaumik (2023) that economic globalization reduced inequality in wealthy countries while having the opposite effect on low-income ones.

To analyse the inequality effects of trade and financial globalization separately, our findings suggest that there are differences in the impacts of trade and financial globalization on income inequality. It is shown that financial globalization can robustly reduce the level of income inequality in CEE, whilst there is no robust relationship between trade globalization and income inequality in the region. The findings match those observed in earlier studies. On the one hand, for the impact of financial globalization on income inequality, Zakaria and Fida (2016) found that financial openness as measured by FDI can significantly reduce income inequality. Following their discussions, financial globalization can lower income inequality by raising the earnings of low-skilled and female labour forces. Given that the majority of foreign investments take place in relatively low-skilled and less technology-intensive industries, raising both demand for and income of low-skilled labours and lowering income inequality, which is similar to the Stopler-Samuelson theorem and the HO trade theory. Besides, as foreign investments also frequently occur in less skilled and women-intensive industries such as textiles, thereby increasing the income of female workers and reducing income inequality (Zakaria and Fida, 2016). Additionally, Baek and Shi (2016) proved that as financial integration increased, income inequality decreased in developed countries but increased in poor countries over the 1990–2010 period thanks to the rising globalization. Furthermore, Huang et al. (2020) claimed that financial globalization worsens income inequality during an early stage of economic development of a country, but ultimately reduces income inequality as the country's level of development rises. Hui and Bhaumik (2023) found that financial globalization is beneficial for reducing income inequality in both advanced and low-income countries. On the other hand, our findings suggest that there is no significant relationship between trade globalization and income inequality, which match

the study of Dorn et al. (2018) that trade openness has merely little impact on income inequality in both highly advanced and transition countries.

Furthermore, by examining the de facto and de jure economic globalization separately, our findings demonstrate that restrictions of economic globalization have robust and negative impact on income inequality in high-income CEECs while actual flows of economic globalization hardly affect income inequality in these countries. As discussed, our findings suggest that the robust negative impact of economic globalization on income inequality in CEE is mainly achieved through financial globalization instead of trade globalization. Combining these findings, we may conclude that it is policies and restrictions surrounding international capital flows that lead to a substantial decrease in income inequality rather than the actual international financial flows. Regarding the robust association between restrictions and inequality, our result ties well with the studies of Kebede and Tawiah (2023) that de jure financial globalization alleviates income inequality in high-income nations but exacerbates inequality in low-income and middle-income countries. They discovered that in high-income countries, de jure financial globalization had a more favourable impact on income distribution at lower quantiles of inequality, contributing to a decrease in income inequality. However, there is a lack of literature investigating the impact of de jure financial globalization on income inequality. Gygli et al. (2019) offered one likely explanation for the impact of de jure financial globalization on economic growth. They argued that countries with effective policies that have lowered the institutional barriers to cross-border financial flows have experienced stronger economic growth, such growth effects may eventually contribute to the reduction in income inequality.

However, our study presents different results compared to the findings of Bergh and Nilsson (2010). They found that international trade liberalization, measured by the EFI as the combination of trade taxes, trade barriers, tariff rates, and capital market controls, has a robust and positive impact on within-country income inequality in relatively rich countries, while there is no significant relationship between the KOF economic globalization index and income inequality. The contrasting outcome could potentially be contributed by the different measurements. They employed the KOF index to assess economic globalization without further disaggregation while using the EFI to measure international trade liberalization, proving that such openness leads to increased income inequality, where income inequality is measured by the Kuznets ratio rather than the Gini index. Thus, the inconsistent findings could be due to the difference in the

selection of both dependent and independent variables in the empirical studies. Moreover, in examining the relationship between globalization and income inequality, they failed to control for the effect of inflation, which may have led to bias in their results. Additionally, our findings are inconsistent with the results of Kang-Kook (2014) that financial globalization overall increases long-term poverty and income inequality while trade globalization affects poverty and income inequality conditionally on a case-by-case basis. They found that trade globalization may reduce and income inequality in a long run, whereas less human capital and economic growth may contribute to more poverty reduction along with greater trade globalization. The contrasting results on financial globalization may reflect the difference between short-term and long-term impacts of financial globalization on poverty and income inequality.

Conclusion

To summarize, this paper aims to explore the relationship between economic globalization, poverty, and income inequality in Central and Eastern Europe. Though there have been extensive studies on the impacts of economic globalization on poverty and income inequality, current research has not reached consistent and clear conclusions on such topic and there is a lack of research on CEECs, especially in the context of accelerating globalization that has taken place in the region since its accession to the EU in 2004 and to date. To address these research gaps, this paper constructs two hypotheses to test the link between economic globalization and poverty and income inequality, assuming that economic globalization may reduce poverty in CEE while increasing income inequality in the region. We examine the impacts of economic globalization on World Bank absolute poverty estimates and World Bank Gini index estimates using two-way fixed-effects regression model, country fixed-effects regression model, and random effects-regression model based on the panel data of nine high-income CEECs including the Czech Republic, Hungary, Poland, Slovakia, Estonia, Latvia, Lithuania, Slovenia, and Romania from 2004 to 2020. Using the composite KOF Index of Globalization, the study measures economic globalization broadly across five dimensions, including the overall economic globalization, trade globalization, financial globalization, actual flows, and restrictions, in order to provide a comprehensive analysis of the effects of economic globalization on poverty and income inequality. Additionally, robust standard errors are employed in the study to eliminate the bias caused by heteroscedasticity and autocorrelation, thereby ensuring the validity of the findings.

The study suggest that economic globalization overall significantly reduces absolute poverty in the CEE region after controlling for the effects of economic growth, education attainment, and inflation, supporting our first hypothesis that there is a significant and negative association between economic globalization and poverty in CEE. We also conduct regression analysis for various aspects, such as trade and financial globalization, as well as the actual flows and restrictions of economic globalization, to investigate the factors from which economic globalization decreases absolute poverty. The results suggest that both trade globalization and financial globalization, as the most important components of economic globalization, can significantly decrease absolute poverty in CEE. Moreover, it is shown that de jure economic globalization has a significantly negative impact on absolute poverty, while there is no significant correlation

between de facto economic globalization and absolute poverty, indicating that it is the restriction rather than actual flow that alleviates poverty in CEE area. The robustness estimations maintain the significance of these results, confirming the validity of our findings. One possible explanation for the robust effects of restriction is that less restrictions leads to lower import prices, which boost local competitions and industrial efficiency, and eventually decrease poverty rates (Nissanke and Thorbecke, 2006). Though the globalization-poverty nexus has been proved, our results suggest that there is no significant association between economic growth and absolute poverty, implying that the indirect effect of growth may not exist and there could be a more direct link between globalization and poverty.

In addition, the study finds that economic globalization can overall significantly mitigate income inequality in CEECs, contradicting our second hypothesis that there is a significant and positive association between economic globalization and income inequality in CEE. Taking a closer look at the components of the KOF index, the results show that financial globalization has a statistically significant and negative impact on income inequality while there is no significant relationship between trade globalization and income inequality. This finding implies that in the CEE region, economic globalization reduces income inequality mainly through its financial component instead of its trade dimension. A likely explanation could be that foreign investments is mainly concentrated on unskilled and female labour-intensive sectors, consequently, financial integration could raise the income of these workforces and mitigate income inequality (Zakaria and Fida, 2016). Further analysis shows that both de facto and de jure economic globalization are significantly and negatively associated with income inequality. However, after correcting for heteroscedasticity using robust standard errors, the effect of de facto economic globalization on income inequality becomes insignificant. This finding suggests that economic globalization decreases income inequality through lowering trade and capital barriers in CEE, while the actual flows such as imports, exports, and FDI have little considerable impact on income inequality in the region. Additionally, the inequality effects of both financial globalization and de jure economic globalization appear to be stronger under robust estimations, suggesting that our findings are robust and provide strong evidence of a negative relationship between globalization and poverty.

Overall, this paper proves that for the specific sample of CEE, economic globalization has a favourable impact in this region that can help alleviate poverty and

mitigate income inequality. On the one hand, the findings on poverty-reduction effects of economic globalization agree with the prevailing theories in the current literature about the impact of economic globalization on poverty. By studying a sample of CEECs for the period 2004-2020 as our sample, we add to the application cases for these theories and strengthen the conclusions of existing research. On the other hand, while a significant portion of research posits that globalization may worsen income inequality, particularly in wealthy nations, the study proves that economic globalization has in fact strongly reduced income inequality in high-income CEECs by lowering barriers to foreign investments. This finding potentially fills a theoretical gap concerning the relationship between economic globalization and income inequality in a somewhat novel way. Furthermore, these conclusions offer recommendations for policymakers in the CEE region for policy formulation and implementation. Considering the positive benefits of economic globalization on absolute poverty and income inequality, policies should be designed to further promote economic openness, which include lowering trade and foreign investment barriers, facilitating exports and foreign capital flows, and promoting international cooperation. Meanwhile, the sudden influx of foreign capital could disrupt the domestic markets and economies, making it necessary to implement effective regulation to manage the risks associated with globalization. These policy recommendations are particularly applicable to the countries in the CEE region with relatively strong economic performance, assisting them in the goals of eliminating poverty as well as decreasing income disparity.

Nevertheless, there are a few limitations in this study. One concern is that we only use the high-income countries in CEE as our sample, which may cause biased results. Also, considering most sample countries have undergone transformation from developing to advanced countries during the observed period, the current income classification may not accurately reflect the income levels in CEECs. Cautious consideration is needed as to whether our results can be applied to other high-income countries. Moreover, the study does not capture long-term effects of economic globalization on poverty and income inequality in CEE. In addition, the study does not control for the lagged economic growth when examining causal link between lagged economic globalization and absolute poverty, which may lead to an underestimation of indirect effects of growth. Finally, our findings on the impact of economic globalization on income inequality are not robust to the modification for cross-sectional dependence, which may cause biased conclusions. Therefore, future research should be undertaken to explore the relationship between

economic globalization, poverty, and income inequality in CEE by disaggregating the region across income groups and time periods, controlling for lagged growth while employing new models to identify long-run effects, and dealing carefully with possible cross-sectional dependence.

Note:

1. The Visegrad Group (commonly known as the Visegrad Four, simply the “V4”, or the European Quartet), aiming to reinforce cooperation among members and with all countries, is the collaboration of four CEE countries including the Czech Republic, Hungary, Poland, and Slovakia on the economic, cultural, and political front that was formed in 1991. These four countries became members of the EU in 2004, representing the attempt of the Central Europe to cooperate in a range of areas of shared interest as part of the integration of all of Europe (Czajkowska and Stasiak-Betlejewska, 2014).

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List of appendices

Appendices

Appendix 1: Country List

Country Name
Czech Republic
Poland
Slovak Republic
Hungary
Slovenia
Romania
Latvia
Lithuania
Estonia

Appendix 2: Structure of KOF Economic Globalization Index

Economic Globalization (de facto)		**Economic Globalization (de jure)**	
Trade Globalization			
De facto		**De jure**	
Components	*Descriptions*	*Components*	*Descriptions*
Trade in goods	(Imports + Exports)/GDP	Trade taxes	Tax income/Revenue
Trade in services	(Imports + Exports)/GDP	Tariffs	Unweighted Mean of tariff rates
Trade partner diversity	Average of HHI for imports and exports of goods	Trade agreements	Number of bilateral and multilateral free trade agreements
		Trade regulations	Average of prevalence of non-tariff barriers to trade and compliance costs for imports and exports
Financial Globalization			
De facto		**De jure**	
Components	*Descriptions*	*Components*	*Descriptions*
Foreign direct investment	FDI, stocks/GDP	Capital account openness	Chinn-Ito index
Portfolio investment	International equity portfolio investments, stocks/GDP	International Investment Agreements	BITs and TIPs
International income payments	Capital and labour income and payments/GDP	Investment restrictions	Prevalence of foreign ownership and regulations to international capital flows
International reserves	Foreign exchange, SDR holdings, reserve in IMF/GDP		
International debts	International Portfolio Debt Securities and International Bank Loans and Deposits, inward and outward stocks/GDP		

Source: KOF Swiss Economic Institute