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MASTER THESIS

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MASTER THESIS

PUBLIC SPENDING AND INCOME DISTRIBUTION IN SOUTH EAST EUROPEAN COUNTRIES

Ljubljana, March 29th, 2018 **DŽENANA HADŽIOMEROVIĆ VAJNBERGER**

AUTHORSHIP STATEMENT

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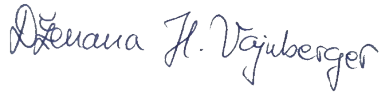

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INTRODUCTION

Government expenditures attract attention of researchers and general public since the state as has emerged as a superior organization (Dogic, 2014). Mostly, the both are concerned with the amount and/or efficiency of the government. Moreover, de Mello and Tiongson (2008, p. 3) believe that: "Poverty reduction is seen as one of the major goals of international development policy agenda. It is widely accepted that a government can play a key role in redistributing income through public policies. Government intervention in income redistribution is justified because sustained economic growth alone may fail to reduce income inequality." Also, Afonso, Schuknecht, & Tanzi (2008, p. 8) state that: "Effectiveness and efficiency of public policies in affecting income distribution should not be seen as God given. The functioning of the institutional framework and the effectiveness and competence of government in attaining the objectives of distributional policies can be improved by appropriate policy reforms."

Due to the frequent data limitations for some regions, the effects of public spending on income distribution is mostly investigated for developed countries. Regarding this field of research for developing countries, the literature seems somewhat scarce. We focus our research attention on public spending and income distribution in South East European (hereafter: SEE) countries, hence, we contribute to this literature by investigating the region and the group of countries, which was mainly outside of the existing literature. To the best of our knowledge, the research of public spending and income distribution covering the same sample of SEE countries and/or the same time period as ours has not been previously conducted.

The purpose of our master's thesis is to investigate the relationship between public spending and income distribution in SEE countries for the selected time period. Additionally, the thesis investigates the effects of redistributive public spending categories (social protection, healthcare and education) on income distribution in the selected sample of countries in the selected time period. Therefore, referring to the problem and purpose of our master's thesis, we state below main hypotheses of our research:

H_1: Higher total general government spending is negatively associated with income distribution in SEE countries.
H_2: Higher spending of the general government on redistributive categories is negatively associated with income distribution in SEE countries.

Through this research, we aim to achieve the following objectives:

- To collect data on public spending and income distribution for all SEE countries;
- To provide an overview of public spending and income distribution in SEE countries;
- To make comparison between SEE countries;
- To investigate whether total public spending is associated with income inequality in SEE countries;
- To determine whether redistributive public spending categories are associated with income inequality SEE countries.

The narrative part of our thesis is based on the existing theoretical and empirical literature. Our empirical analysis employs panel data for selected SEE countries covering years from 2006 to 2014. The core research methodology includes an empirical panel data analysis, mostly based on secondary annual data collected from multiple sources. Following the most relevant literature and economic rationale, we decided to use both country and time Fixed Effects (hereafter: FE). Moreover, we decide to use Instrumental Variable (hereafter: IV) approach to tackle a potential problem of endogeneity.

Our thesis is organized in the following way. In the "Introduction" we define the problem of our research, the main hypotheses, the purpose and goals of our research. Next, "Theoretical Framework – Public Spending and Income Distribution" provides definitions of public spending and income distribution based on dominant theoretical views. The following chapter "SEE Countries – An Overview" presents different aspects and preconditions that shaped the current economic situation in each of selected SEE countries and allows as to do different comparisons across the selected dataset. Next, "Review of Existing Literature in the Field of Public Spending and Income Distribution" presents the literature review regarding existing empirical research on the link public spending – income inequality and issues that researchers face in empirical modelling. The following section, "Research Data" introduces selected variables for our research and the rationale and arguments for their inclusion in our empirical model. The next chapter "Empirical Strategy Employed" explains the empirical strategy conducted to answer our main research questions and discusses different econometric methods. Finally, "Empirical Findings" discuses the empirical results obtained. "Conclusion" section presents the main findings of our analysis.

1 THEORETICAL FRAMEWORK – PUBLIC SPENDING AND INCOME DISTRIBUTION

It is generally believed that public policies choices made by the general government can have a major impact on income distribution in the country. According to de Mello and Tiongson (2008, p. 3), as sustainable economic growth itself could not efficiently lead to improvements in income distribution the interference of government takes place. Moreover, when country is experiencing stages of economic growth it usually leads to decrease in poverty, but not automatically to enhancements in income distribution, particularly not in countries that record high levels of income inequality. Nevertheless, the governments in more unequal societies often tend to redistribute less than those in more egalitarian parts of the world. In this case, unfortunately, the governments of countries that record high levels of inequality in income usually spend less on redistributive policies, which could potentially lead to improvements in income distribution. Afonso et al. (2008, p. 8) suggest that effectiveness and efficiency of government redistributive choices that impact income distribution should not be considered "God given". Adequate reforms of public policies implemented by government could lead to improvements in tackling the issues of equality among its citizens and would, therefore, lead to decrease inequality in income across country.

1.1 Defining Public Spending

The best way to represent total public expenditures is to introduce the concept known as general government spending. According to Organisation for Economic Co-operation and Development (hereafter: OECD) (OECD, 2015a, p. 62): "General government is consisted of central, state and local governments and the social security funds controlled by these units. Public spending has two key goals: to produce and/or pay for the goods and services delivered to citizens and businesses, and to decrease inequality of income." Moreover, International Bank for Reconstruction and Development (hereafter: IBRD) (IBRD, 2005) argues that public spending is one of the key ways for government to impact the economic dimensions of peoples' lives. Likewise, income redistribution is considered as one of the key tasks of public policies. IBRD (2005, p. xiii) also discusses that: "Fairness or equity of general government expenditures can be considered as a key concern, since the governments of developing and transition countries fail to provide services and to protect the poor, women, minorities, and other disadvantaged members of society. Instead, governments in less developed countries often serve the interests of an elite group of people citizens, with little concern for the wellbeing of citizens at large." Furthermore, Chan and Karim (2012, p. 8) argue that: "It is crucial for the government to spend the money collected from taxpayers efficiently, as it is accountable to its citizens."

In our research, we follow OECD (2015a, p. 52) explanation and the System of National Accounts terminology that defines total expenditure of the general government (i.e. public spending) as the total expenditure of a country's general government, which includes spending for: intermediate consumption, compensation of employees, subsidies, property income, social benefits, other current expenditures and capital expenditures.

1.1.1 Theories of Public Expenditure

As Paun and Brezeanu (2013, pp. 211-214) argue that: "In a market economy, the state is viewed as an economic entity that supplies public goods[1] aiming to provide efficient functioning of the economic system. State's interference is focused on public resources being transformed into public goods of undeniable and undividable access, free of charge to the beneficiary. Moreover, public spending is usually linked to public goods and public sector[2]. Public expenditures are generated when the state finances various fields, objectives and actions, which leads to creation or provision of public goods and public services, which satisfy public needs and serve general society interests. Besides, public spending is achieved through a complex group of public institutions or public entities that are authorised by the government to process the delivery of financial resources. This is done in order to let the functions and goals of public interest take place in the country. The traditional theories of public finances consider general government expenditures as the starting point of the whole economic life. The classical economic theory considers that public spending should be financed from income taxes and other taxes collected from taxpayers solely when these expenditures aim to serve the general interest of the society."

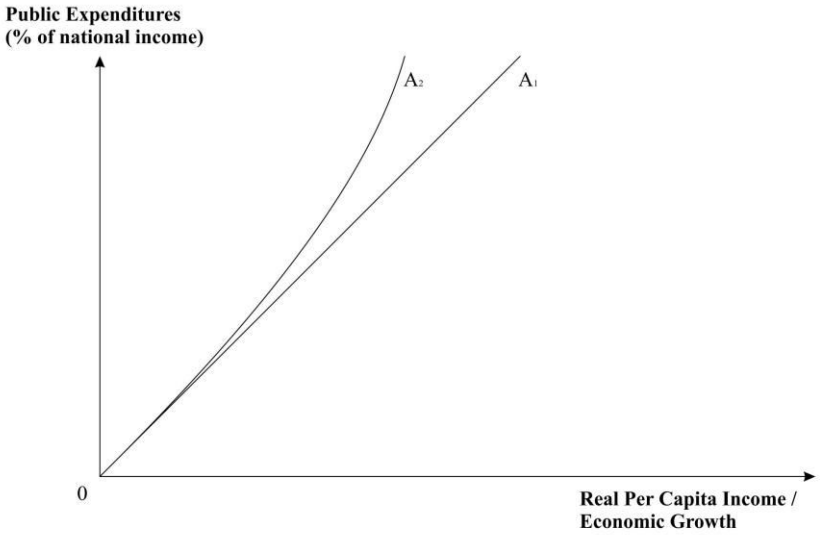
Wagner's Law, developed by German economist and politician named Adolph Wagner, is considered to be the very first developed model of public spending in entire history of public finances. Wagner (1893) identified that country's level of economic development is positively associated with the size of public sector and that there is a long-term tendency for the public sector to grow relative to national income. In other words, the Wagner's Law suggests the idea that as a country is experiencing sustainable economic growth, the share of government expenditures in national income shows the tendency of growth as well. Wagner's Law has become a stylized fact in public finance that is rarely questioned (Atkinson & Stiglitz, 1980). In fact, as argued by Edame and Akpan (2013, p. 38) Wagner's Law states that the general government expenditures grow faster compared to national income. As Lamartina and Zaghini (2011, p. 1) argue, often referred to it as "Law of Increasing State Activity", Wagner's Law states that public sector expands both in

[1] "Pure public goods are those goods and services for which there does not exist rivalry on the consumption market and for which exclusion is impossible" (Stiglitz, 2000, p. 128).

[2] The public sector is consisted of public institutions that provide public goods and services (Paun & Brezeanu, 2013, p. 213).

absolute and relative terms (including central and local government's entities) at the cost of the growth in the private sector. Wagner's idea of growth of public expenditure is presented in Figure 1 below.

Figure 1. Wagner 's Hypothesis



Source: Adapted from J. R. Gupta, *Public Economics in India: Theory and Practice*, 2007, p. 100, Figure 4.2.

As we can see in Figure 1, economic growth, or real per capita income is positively and directly related to the changes in public expenditure. Hence, growth in public spending leads to the growth of public sector, which results in increased economic growth. That is, as real income per capita grows caused by the country's economic development the proportion of general government expenditures relative to the national income remains constant. The line A_1 in Figure 1 represents constant proportion line between public spending (expressed as their share in national income) and economic growth or real per capita income over time, while A_2 curve shows that with the increase of real per capita income in a country, the proportion of public spending increases as well.

Dogan and Tang (2006, p. 49) explained that Wagner proposed three key causes that lead to greater involvement of the government. Primarily, industrialization and modernization could cause a substitution of public to private actions. This is the result of industrialization process, which makes country's administrative and protective functions more important. Also, governments' actions regarding maintenance of law and order and government interventions in economic regulation usually gain more attention of the general public during industrialization caused by higher urbanization rates and growing complexity of

economic life. Next, industrialization process also leads to higher public expenditures on culture and welfare services in a country, meaning higher spending of the general government on education and other redistributive policies. This means that as country is experiencing economic growth, public services provided by the government become more, and more needed in the ayes of the public, which in the end leads to higher public spending in Gross Domestic Product (hereafter: GDP). It is considered that education and culture are in general areas where "collective producers are more efficient than the private ones" (OECD, 2001, p. 29). Conclusively, economic development and technological change impose to governments to take over the management and finance natural monopolies[3] in order to ensure smooth market operations (Bird, 1971). This means that more and more firms operate due to the technological change, which leads to creation of natural monopolies, whose effects will be offset by the state.

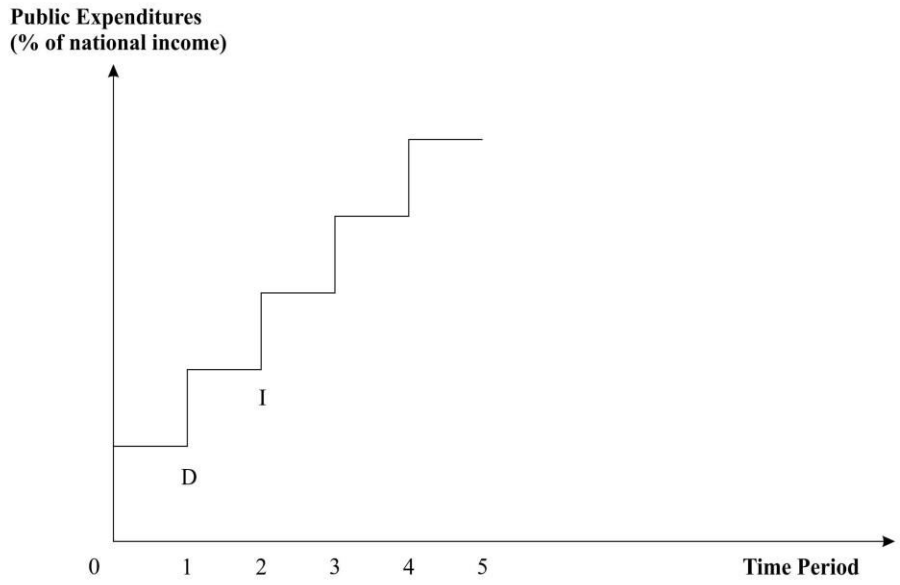
The second theory of public expenditure growth, the **Peacock and Wiseman Hypothesis** (1961) was based on Wagner's Law. This Hypothesis discusses the link economic growth – public spending. The authors argue that if country is experiencing economic growth, it will result in rise in public spending. While Wagner predicted linear relationship between public spending and economic growth, Peacock and Wiseman proposed a zigzag link. As Alm and Embaye (2011, p. 13) explain, Peacock and Wiseman Hypothesis state that: "External shocks can have permanent impact on public expenditures by displacing them to a new, sustained, and higher level." Figure 2 presented below depicts the Peacock and Wiseman Hypothesis.

The authors argue that social disturbances like war, natural catastrophes, and political instabilities may produce economic instability within the affected country. The first effect discussed by Peacock and Wiseman, the *Displacement Effect*, states that in cases of social disturbances, government usually relies on huge public expenditure in order to restructure the economy. For example, as Akriani (2011) explains: during the time of wars, the government raises the tax rates and expands the tax structure to create additional funds, so that higher defence spending could be provided. After the war, according to Alm and Embaye (2011. p. 6) this higher rate or structures could stay untouched, since taxpayers become tolerant to increase in taxes created through the period of shock. As a result, this new, higher level of public expenditures becomes permanent. Overall, this will lead to a certain change in country's public spending represented at a Point D in Figure 2. As explained by Irshad (2017), this change reflects the Displacement Effect that entails increase in general government expenditures. Due to increase in public spending, government makes adjustments of public revenues by increasing taxes. It happens due to social disturbances that force people and governments to observe social needs during the

[3] A natural monopoly happens when one company can produce the total output in the market at lower cost compared to several other companies (Perloff, 2012, p. 372).

period of crisis and to find out solutions to certain problems that were previously neglected. Therefore, both accept a need for greater social spending.

Figure 2. Peacock and Wiseman Hypothesis



Source: Adapted from J. R. Gupta, *Public Economics in India: Theory and Practice*, 2007, p. 102, Figure 4.3.

This leads to another equilibrium created at higher position. This situation is known as the *Inspection Effect*, and it is shown as Point I in Figure 2. Finally, Neog, Phukan, & Barthakur (2014) believe that local level governments will have fewer responsibilities, as this increase in public spending now creates need for central government to fulfil more extensive country's economic undertakings. In other words, when an economy is experiencing economic growth, there exist a tendency that economic activities of the central government will grow at a faster rate than those of regional or local public authorities. Therefore, *Concentration* or *Scale Effect* takes place. This occurs because each major disturbance leads to a situation in which the central government has to assume a larger proportion of the total national economic activity, and, therefore, the central government introduces a number of measures to sustain higher economic activity (Moheeth, n.d.). The situation will remain unchanged up till new displacement occurs. The process will continue as it is presented in Figure 2.

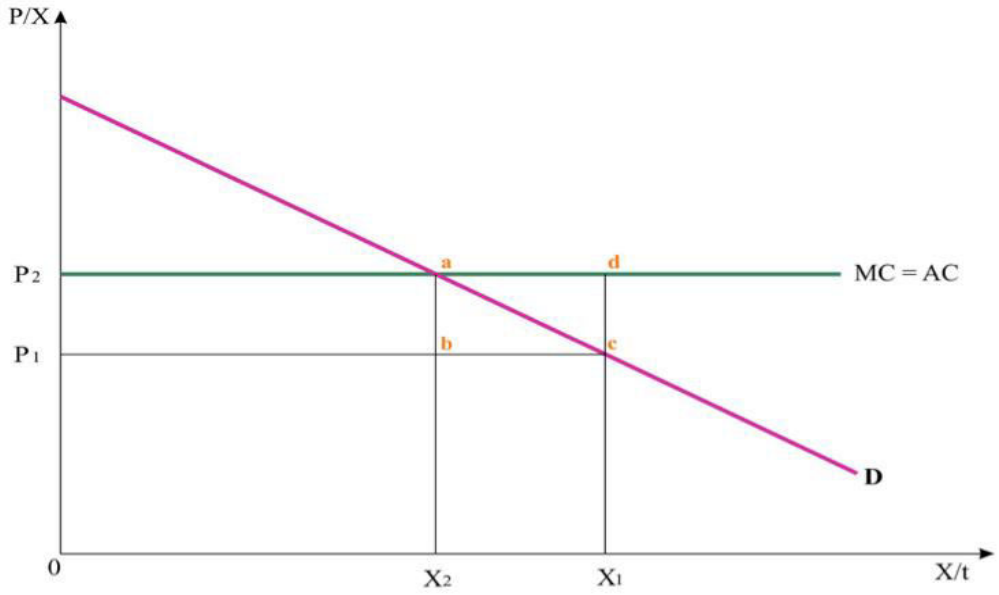
The third theory of growth of public expenditures, **Colin Clark's Hypothesis** or **Critical-Limit Hypothesis** explains the tolerant level of taxation. According to Clark (1945), the maximum taxable capacity is 25% of national production. However, if taxation exceeds this limit, devaluation of national currency and inflation occurs in the next few years. This

happens due to the following reasons. First, high taxes negatively affect employee's incentives to work, to save and to invest, which leads to decrease in production. Next, high taxes make public expenditure management to be more relaxed if used for entertainment, furnishing, travelling, etc. Finally, imposing high taxes causes political effects as well. The legislator begins to think that inflation is "the lesser evil" than the enormous taxation. Consequently, the legislator becomes tolerant to all sorts of measures. All of these measures lead in the direction of inflation. Overall, this Hypothesis states that if the taxes and other receipts of the general government exceed 25% of aggregate economic activities, inflation will undoubtedly arise, irrespectively of whether the budget is balanced or not. However, it is important to acknowledge that the limit of 25% cannot be a valid limit for all countries and under all circumstances (Gupta, 2007).

The next theory we consider is the **Theory of Fiscal Illusion**. This is a public choice theory of public spending formulated by Puviani (1903). It refers to systematic misperceptions of fiscal parameters. According to Sanandaji and Wallace (2011, p. 237), the idea is that the design of a tax system could cause underestimation of the costs of general government expenditures since all relevant details on this issue are not explained to the general public. According to Das and Omar (2014, p. 136): "Fiscal illusionist hypothesis is founded on the taxpayers' subjective insights of the cost of public expenditures. Moreover, fiscal illusion can be interpreted as an idea by which governments easily increase revenues since citizens do not posses adequate knowledge regarding the functioning of a tax system. The authors summarized this concept in the following manner: When general public, i.e. taxpayers, does not completely perceive public revenues, general government costs are perceived lower than they really are. Consequently, incentives for increased public spending are created by the general public, which creates an opportunity for politicians to enlarge the public spector (measured as PSPEND/GDP). The concept of fiscal illusionists boost rises in taxes (particularly when budget deficit occurs), since they make the public meet higher public expenditures without making them feel the cost." Figure 3 below depicts the theory of fiscal illusion in a form of a diagram created by Wagner (1976).

We can see in our Figure 3, as explained by Dollery and Worthington (1996, p. 4): "X_2 and P_2 show the tax-price and desired output of the public good in the case where there is no fiscal illusion. The area $0P_2aX_2$ represents the public budget (expenditure or revenue). If we include fiscal illusion, the perceived tax-price will reduce to P_1, desired output rises to X_1 and the perceived budget is now OP_1cX_1. Yet, the actual budget is $0P_2dX_1$, as the real tax-price remains P_2."

Figure 3. Fiscal Illusion



Source: Adapted from R. E. Wagner, *Revenue Structure, Fiscal Illusion, and Budgetary Choice*, 1976, p.54, Figure 1.

Finally, Baumol (1967) analysed the effects of differential productivity growth on the health of different sectors in an economy and on the whole economy as well. The service sector, such as high education or public healthcare, is categorized as non-progressive industry that is characterized as being labour intensive in contrast to progressive. Similarly, according to Nordhaus (2006, p. 2), Baumol's Hypothesis states that: "economic sectors that record growth rates in productivity below the economy's average (i.e. stagnant) will tend to record increases in costs that are above the economy's average." This phenomenon is called the **Baumol's Cost Disease** or the **Baumol's Effect**. Morover, Nordhaus (2006, p. 2) states that this Effect could: "Cause stagnant sectors to record growth in price above the economy's average, declining quality, and financial pressures. Additionally, reduction in the economy's overall rate of productivity and real output growth could follow caused by the drag from stagnant sectors." Lastly, according to Andersen and Kreiner (2015, p. 1), even though the Baumol's Effect referes to services in general (provided by the private sector and provided by the public sector), numerous researchers highlighted to the particular troubles it causes for provision of tax-financed services. The Baumol's Effect is also found in many areas such as healthcare, education, and social service. The share of expenditures in these sectors (measured as % of GDP) tends to have a rising trend, since they are labour intensive sectors, i.e. they rely heavily on human interactions or activities (Oh & Kim, 2012).

1.1.2 Redistributive Expenditure Types – Public Spending on Social Protection, Healthcare and Education

According to Encyclopedia Britannica (2015) ”Welfare state is an idea of government in which the state or a well-established network of social institutions plays a key role in the protection and promotion of the social and economic well being of its citizens. This concept is founded on the principles of equality of opportunity, equitable distribution of wealth, and public responsibility for those unable to avail themselves of the minimal provisions for a good life”. As Obst (2013, p. 3) states: “Generally, the welfare state exists to improve the welfare: (a) by providing social protection to weak and vulnerable groups of people; (b) by using redistributive transfers[4] to improve lives of poor people; (c) by organising cash benefits for people who are neither poor nor vulnerable, but need to be provided with education and healthcare, as well as with social insurance and over their life cycle.” According to Barr (2012, p. 8), there exist various ways through which government can redistribute income in a given welfare system and selection of public policy measures will determine the final impact on income inequality reduction in the country.

Barry (2004) explains that redistribution of income and wealth are respectively transfers of income and wealth from one group of individuals to another. These transfers are realized through following social instruments: taxation, charity, welfare and public services. Usually, this concept entails country-level redistribution, not the redistribution among different individuals. However, it generally implies redistribution from those having more to those who are less well-off. According to OECD (2008, p. 303), redistributive policies are usually remedial and they aim to reduce income inequality and poverty after they have been realized in the market. However, redistributive policies represent just one of the potential solutions in fighting poverty. Finally, using preventive public policies can be useful, since they reduce the possibility of development of poverty in the first place. Moreover, Goerl and Seiferling (2014, p. 9) argue that public expenditures generally lead to redistribution. However, specific government redistributive undertakings can cause more effective redistribution of income. Cash transfers seem to be mostly used mean of redistribution by governments worldwide. Yet, in-kind transfers also proved to substantially lower income inequality, but the majority of redistributive effects are achieved through public spending on healthcare and education. Similarly, Kohler (2015, p. 1) claims that: “Redistributive government policies represent a key component of strategies aiming to reduce income inequality and promote sustainable economic development. Redistribution policies are seen as a strong tool that leads to improvements in equality by reducing income inequality.” Furthermore, Prasad (2008, p. 1) believes that there exist

[4] Transfer payments are realized money transfers from one individual to another, but not in return for the provision of goods or services. However, in-kind benefits are public services received as a good or commodity, but not provided in cash (Stiglitz, 2000, p. 27).

several different motives for a government to implement policies of redistribution. These motives can be achievement of social justice or equity as ethnical imperatives. Accordingly, democracy and general public voice should be taken into consideration by governments who make decisions on selection of measures regarding redistribution, as redistribution policies are in fact political matter. Finally, redistribution can be achieved through: taxation, social transfers and public spending on healthcare, education and social protection. Bandyopadhyay and Esteban (2009, p. 3) claim that: "Governments that want to redistribute income through budgetary policies, usually do so on the spending side of the budget, rather than on its taxing side."

The Classification of Functions of Government data contained in the Government Finance Statistics Yearbook prepared by the International Monetary Fund (hereafter: IMF) offer the essential disaggregation of categories of general government expenditures. IMF (2014a, p. 143) classifies government expenditures in 10 categories, namely: General Public Services; Defence; Public Order and Safety; Economic Affairs; Environmental Protection; Housing and Community Amenities; Health; Recreation, Culture, and Religion; Education; and Social Protection. Social protection, healthcare, and education reflect redistributive types of public expenditures according to IMF (2014a). Table 1 presents the subcategories of these redistributive expenditure types in detail.

Table 1. Redistributive Expenditure Types

Social Protection	**Healthcare**	**Education**
Sickness and disability	Medical products, appliances, and equipment	Pre-primary and primary education
Old age	Outpatient services	Secondary education
Survivors	Hospital services	Postsecondary non-tertiary education
Family and children		Tertiary education
Unemployment	Public health services	Education not definable by level
Housing		Subsidiary services to education
Social exclusion not elsewhere classified	Research and Development Health	Research and Development Education
Research and Development Social protection		
Social protection not elsewhere classified	Health not elsewhere classified	Education not elsewhere classified

Source: International Monetary Fund, *Government Finance Statistics Manual 2014*, 2014a, p. 143, Table 6A.1.

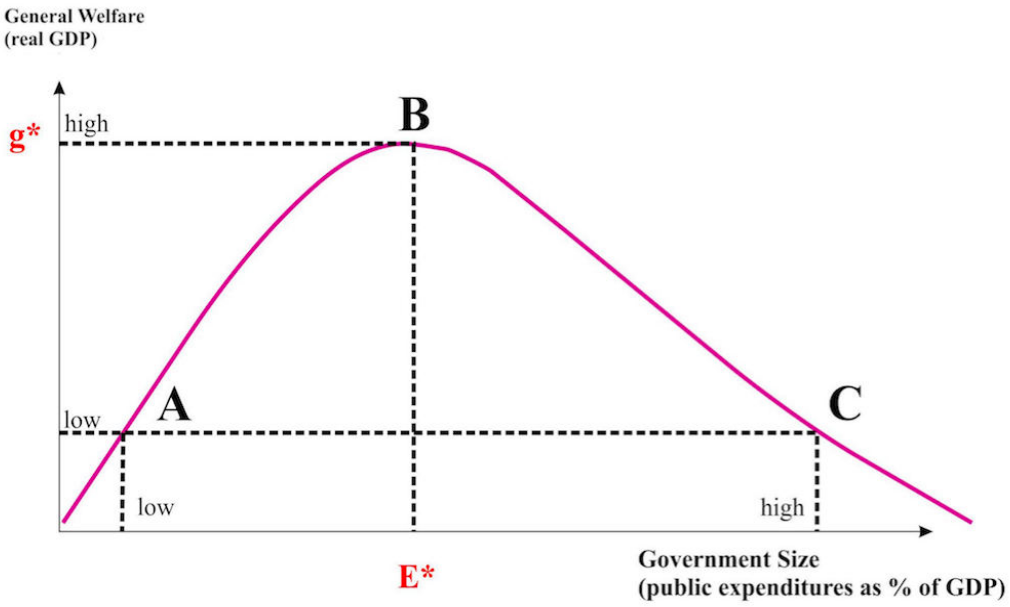
According to OECD (2017), social protection policies reflect government willingness to address their responsibility in supporting living standards of their citizens, in particular their following groups: disadvantaged or vulnerable, low-income households, elderly, disabled, sick, unemployed, or young persons. Social expenditures include: cash benefits, direct in-kind provision of goods and services, and tax breaks with social purposes. On the other hand, OECD (2016a, p. 120) states that: "healthcare spending measures the final consumption of health goods and services. They include expenditures on medical services and goods, public health and prevention programmes and administration." Finally, OECD (2016a, p. 96) states that education spending is calculated by summarizing total annual expenditures from primary to tertiary education plus expenditures made of research and development activities." An OECD (2008, p. 242) study finds that public spending on healthcare leads to decrease in income inequity in all OECD countries by 1.1 points on average. General government spending on education has slightly smaller effect. Yet, social expenditures prove to be significant in lowering income inequality across OECD countries, but their impact proves to be smaller than those associated with both: spending on healthcare and education. In conclusion, redistribution across individuals with different income levels always coexists with redistribution across life-course. This study finds that OECD countries, which in aggregate redistribute more across the lifecycle, tend to have higher public expenditures compared to countries that primarily focus on redistribution between rich and poor. Finally, the effects of government services provided to individual users and general government expenditures may not take their full effect in the moment in which they are provided. The effects can extend to the medium or long term, as education services enhance the future earnings of students, while health conditions have major impact on work abilities of individual during they lifecycle, which could finally impact individual's earnings. Lastly, Salverda, Nolan, & Smeeding (2009) find that the provision of public goods (especially healthcare and education) has key impact on human capital and, consequently, significantly affects income inequality as well. While vertical inequality is perceived as inequality between different individuals or households, the horizontal inequality represents inequality between different groups, usually culturally defined (Stewart et al., 2009, p. 3). Conclusively, Stewart, Brown, & Cobham (2009) state that fiscal policy is one important way in which governments can tackle the both types of inequality within society.

1.1.3 Optimal Size of Government

Turan (2014, p. 286) believes that: "the link between the economic growth and the size of the government (public or administrative sector) has been one of the crucial and prominent themes in economic research for a long time. It is a well-known fact that the size of the government and social welfare represent a very important issue for policymakers. While we cannot determine the precise relation between the government size and economic growth, we can acknowledge that a certain amount of government expenditure is required

in order for economic growth or general public order to take place. However, this does not mean that every raise of public spending should be considered positive." Many authors (e.g. Barro, 1990; Folster & Henrekson, 2001; Hansson & Henrekson, 1994) believe that once certain limit has been reached, growth of the public sector can negatively affects economic growth. According to Dogic (2014, p. 10), the size of the public sector can be measured by: (a) government expenditures as percentage of GDP; (b) government revenues as percentage of GDP; and (c) government employment as percentage of total employment. Typically, general government spending as percentage of GDP represent the best proxy for measurement of the size of the public sector (Dogic, 2014, p. 11). In order to decide if the public sector is too big or too small, we need to determine that optimal size of the public sector. An American politician Richard Armey (1995) introduced the concept of optimal size of government when he developed the so-called **Armey Curve**. The Armey Curve shows that the increase in public spending leads to improvements in economic growth of the country, but only until certain limit. Yet, growth of public spending beyond this point leads to decline in economic growth. The Armey Curve is presented below in Figure 4.

Figure 4. Armey Curve



Source: Adapted from G. D. Liddo, C. Magazzino, & F. Porcelli, *Decentralization, Growth and Optimal Government Size in the Italian Regional Framework*, 2014, p. 8, Figure 1.

According to Pevcin (2004, p. 4), the Armey Curve shows that: "non-existence of government would lead to the state of anarchy, absence of collective infrastructure and low levels of output per capita, due to non-existence of rule of law or property rights. Contrary,

when government makes all decisions regarding allocation of resources, output per capita becomes lower because of demotivation, increasing inefficiency and corruption. Still, when there exist a mix of private and public decisions, output will record higher rates. Thus, when government is smaller, the government actions that lead to growth in output should prevail. In this case, growth in government size will lead to growth in economic output. Nevertheless, at certain point, the government actions that lead to growth in output should be reduce, since additional growth of government will no longer generate output growth on national level. Therefore, as public expenditures increase, this eventually leads to situation in which "additional project financed by the government become increasingly less productive and the taxes and borrowing levied to finance government impose increasing fiscal burdens" (Pevcin, 2004, p. 4).

In Figure 4 we can see that at point E*, the marginal benefits resulting from growth in public expenditures are equal to zero. Point B in Figure 4 represents the optimal amount of public expenditures (Point E*), at which growth prospects are maximized (Point g*). The idea behind the Armey Curve's shape is that a too low level of public expenditures would not allow the government to guarantee the proper functioning of the market economy (Cardoso, 1979, p. 662), and therefore a positive GDP growth rate (Point A in Figure 4). On the other hand, as Liddo, Magazzino, & Porcelli (2014) state, a Point C in Figure 4 shows that very high rate of public expenditure (measure as % of GDP) would discourage citizens from investing and producing due to the high fiscal burden associated with such endeavours. Economic theory generally "suggests a concave shape relationship between the size of the public sector and the economic growth in the long run" (Mutascu & Milos, 2009, p. 447). Moreover, Khan (2011, p. 1) researched the link between economic growth and size of the administrative sector and he came up with a conclusion that the "optimal" or "growth-maximizing" size of public sector can vary between 15% and 30% of GDP. Another study (Chobanov & Mladenova, 2009, p. 5) shows that the optimal size of the public sector (i.e. "the share of total general government expenditures that maximizes economic growth") cannot be higher than 25% of GDP. Interestingly, all SEE countries have overall government spending of 28% of GDP or higher, indicating that SEE countries are placed anywhere between Point B and Point C in Figure 4.

1.2 Defining Income Distribution

Bertola, Foellmi, & Zweimuller (2006, p. 10) believe that questions regarding income distribution were very popular in economic research, as economic researchers wanted to investigate "how an economy's output can be divided or distributed between different classes in society". According to Cowell (2007, p. 2), there exist two major types of income distribution: the "functional distribution of income" (i.e. the distribution of income between different factors of production), and "personal or size distribution of income" (i.e. distribution of income between different individuals or income groups, such as

households). In our research, we focus on the second type solely, i.e. personal or size income distribution.

According to McKay (2002, p. 1), although the two are mutually related, there exists some difference among inequality and poverty. **Income inequality** depicts differences in living standards cross-country. **Poverty**, on the other hand, shows solely those individuals whose living standard is lower than certain threshold level, for example Poverty Line[5]. Income inequality, therefore, usually represents variations of income among different persons within a single society.

Sylwester (2002, p. 43) states that highly unequal distribution of income within a population is generally considered undesirable or harmful to other socio-economic policies. Therefore, "less skewed" income distribution is considered preferred. Afonso et al. (2008, p. 8) state that some of the most frequently raised questions by economists and political scientists regarding income distribution include: "What determines the distribution of income in a given country and at a given time?"; "Why is the income distribution more even in some countries than in others?"; and, "Can the distribution of income be changed through the intervention of the government?". In the numerous undemocratic regimes of the past, the highly unequal societies in terms of income were considered practically normal. On the contrary, in the modern, democratic societies, voters have low tolerance for high-income inequality. Therefore, policymakers tend to create policies that lead to more equal distribution of income within society. Despite all this, it appears that the world is becoming increasingly unequal. Beddoes (2012) believes that current worldwide upward trend in income inequality can be stopped by appropriate policy measures, yet prevention of its development is considered to be one of the biggest social, economic and political challenges of our time.

A recent study done by OECD (2015a) showed that the levels of income inequality significantly vary worldwide. Developing countries seem to record higher income inequality rates, compared to the developed, industrialized economies. While Scandinavian economies tend to record the lowest income inequality rates in the world (with GINI amounting approximately 0.2), on the other side of the world, the most unequal economies like South Africa record extremely high levels of income inequality (with GINI amounting approximately 0.6). This study also argues that governments have a range of tools for reducing income inequalities, which include social transfer policies, in-kind benefits through public services, and spending for education and health. The study concludes that regardless of issues that might cause inequality, we are not powerless in preventing its

[5] Poverty Line (poverty threshold or poverty limit) is the minimum level of income assumed necessary in a certain country (Ravallion, 1992, p. 25). In 2015, the World Bank stated that it amounts $1.90 USD a day at 2015 Purchasing Power Parity (World Bank, 2015).

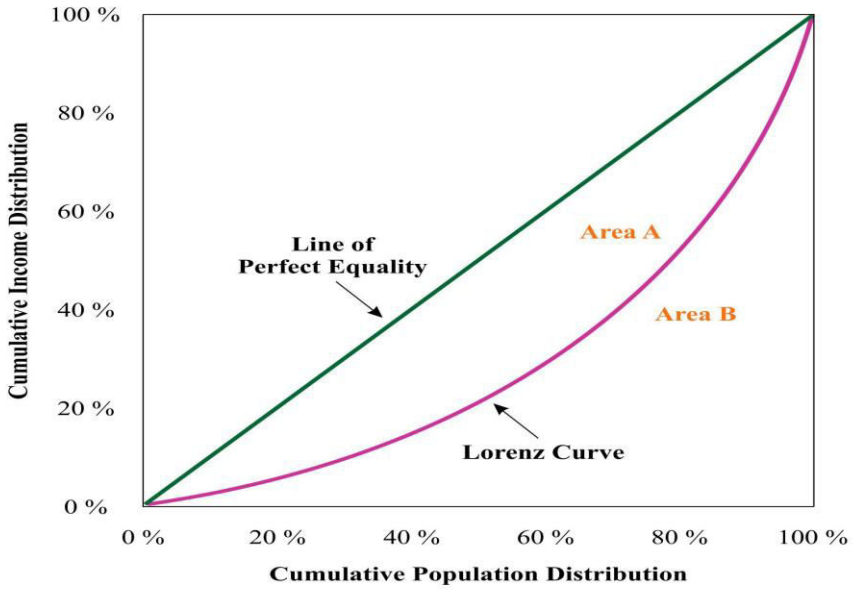
future development. We also believe that redistributive policy objectives can be successfully accomplished if public policies are carefully designed to fight this issue.

1.2.1 Size Distribution of Income and Wealth

The **Lorenz Curve** is generally used instrument, which represents and analyses the size distribution of income and wealth (Kakwani & Podder, 1976). This concept was introduced by an American economist Max Lorenz (1905), in order to represent the inequality of the wealth distribution. When constructing the Lorenz Curve, Bakare (2012, p. 49) states that: " horizontal and vertical axes must be equally long (showing cumulative percentages, up to 100%). Along the horizontal axis the numbers of income recipients are plotted, while the vertical axis represents the share of total income received by each percentage of population. The entire figure is bounded by a square. The Line of Perfect Equality (45 degrees diagonal line) is drawn from the lower left corner of the square to the upper right corner. At any given point along the Line of Perfect Equality, the percentage of income received is exactly equal to the percentage of income recipients (population)".

According to Bhouri, Aron, & Scemama (2016 p. 5) **Gini Concentration Ratio** (also known as **Gini Coefficient**, or **Normalized Gini Index**) is a "measure of statistical dispersion" which aims to represent the distribution of income among the population in specific country. Gini Coefficient was firstly formulated by an Italian statistician Corrado Gini (1912). Gini Coefficient can be obtained with the help of the Line of Perfect Equality and the Lorenz Curve. In Figure 5 below we can see this relationship in more detail.

Figure 5. Lorenz Curve and Gini Coefficient



Source: Adapted from B. A. Atkinson, *On the Measurement of Inequality*, 1970, p. 248, Figure 2.

We can calculate the Gini Coefficient in the following way: first we determine the proportion of the zone between Lorenz Curve and Line of Perfect Equality (Area A in Figure 5). After, we divide this number with the sum of Area A and Area B (see Figure 5). This is also shown in the equation (1) below:

$$Gini\ Coefficent = \frac{Area\ A}{Area\ A + Area\ B} \qquad (1)$$

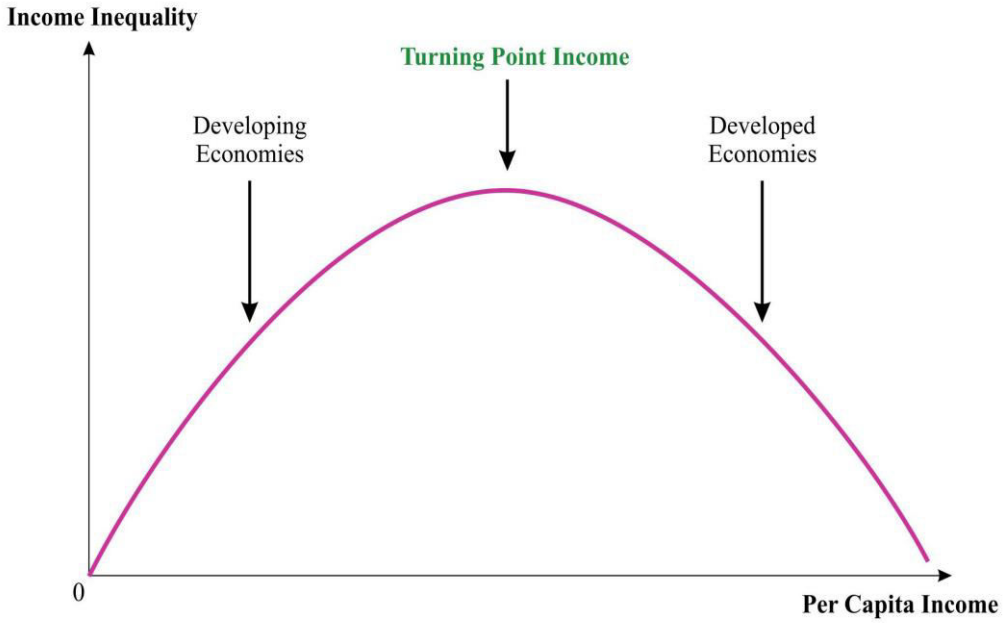
Afonso, Schuknecht, & Tanzi (2010, p. 372) state that Gini Coefficient "measures the relative income distribution" within the country. Theoretically, Gini Coefficient can vary anywhere from 0 (perfect equality when everybody has equal income) to 1.0 (perfect inequality when entire income goes to a single person). Sometimes, the Gini Coefficient is s multiplied by 100, when it ranges between 0 and 100. If the Gini Coefficient is closer to 1.0 (or 100) in certain country, than means that it's society has more unequal distribution of income among individuals. The Gini Coefficient is equal to 0 only in case of perfect equality. Then, the Lorenz Curve would be equal to the Line of Perfect Equality. With the increase in income inequality, the Area A increases as well. In a situation of perfect inequality, the Area B would totally vanish and the Gini Coefficient would, hence, be equal to 1.0. We can say that Gini Coefficient is generally preferred measure for calculating the level of income inequality[6] within a society, as it "summarizes the extent of inequality in a single figure" (Luebker, 2010, p. 1).

1.2.2 Economic Development and Income Distribution

Simon Kuznets (1955), an American economist, analysed the link: economic development and income inequality. The **Kuznets Curve** represents income inequality and income per capita along the path of economic development of a country. According to Ospina (2014, p. 6), when country is facing lower levels of economic development, her increasing economic development leads to more unequal distribution of income. This relationship changes at certain point beyond, however. Then, as economic growth continues it leads to more equal distribution of income. A "bell-shaped" or an "upside down U-shaped" curve known as the Kuznets Curve shown below in Figure 6 depicts this changing relationship.

[6] Other income inequality measures include: Atkinson Index, Decile Dispersion Ratio, Theil's T and Theil's L, and Pen's Parade (Haughton & Khandker, 2009). Moreover, these measures are mostly unavailable for our sample of SEE countries.

Figure 6. Kuznets Curve



Source: Adapted from B. Yandle, M. Vijayaraghavan, & M. Bhattarai, *The Environmental Kuznets Curve: A Primer*, 2002, p. 2, Figure 1.

A study by Cingano (2014, p. 17) estimates that when income inequality (measured by Gini Coefficient) is decreased for one point, it leads to increase in cumulative growth of 0.8 percentage points of GDP in the next five years (0.15 points per annum). This study also implies that reducing income inequality by increasing the income at the bottom of the income distribution has a larger positive effect on entire economic performance, rather than reducing the income of those at the top of the income scale. This is caused by the fact that the group of individuals belonging to the bottom of the income distribution tends to consume a larger share of their disposable income (they generally do not save or invest their incomes as they use it for everyday life and current expenses) OECD (2015b). Finally, majority of our SEE countries are developing economies (i.e. countries at low or medium levels of industrialization) and only few of them are developed OECD economies that "have passed the highest point of the Kuznet's Curve". One would, therefore, expect a positive link between economic development (measured by GDP pc) and income inequality (measured by Gini Coefficient) (Ospina, 2014, p. 6).

2 SEE COUNTRIES – AN OVERVIEW

Our research of public spending and income distribution is conducted for the following SEE countries: Republic of Albania (hereafter: Albania), Republic of Austria (hereafter: Austria), Bosnia and Herzegovina (hereafter: B&H), Republic of Bulgaria (hereafter: Bulgaria), Republic of Croatia (hereafter: Croatia), Hellenic Republic (hereafter: Greece), Republic of Hungary (hereafter: Hungary), Former Yugoslav Republic of Macedonia (hereafter: Macedonia), Republic of Moldova (hereafter: Moldova), Republic of Montenegro (hereafter: Montenegro), Romania, Republic of Serbia (hereafter: Serbia), Slovak Republic (hereafter: Slovakia) and Republic of Slovenia (hereafter: Slovenia). We have selected these countries in line with the definition of South East Europe Transnational Cooperation Programme (hereafter: SEE Programme) (2016). The geographical position of SEE countries is available in Appendix B – Figure 1. Countries that are being selected for our research are marked in dark blue, while positions marked in yellow show regions in Republic of Italy and in Ukraine that geographically belong to the SEE, but are excluded from our research. This Figure also shows the geographical position of Kosovo, excluded from our research. The South East Europe area is the most diverse, heterogeneous and complex area in Europe due to the emergence of new countries and with establishment of new borders. SEE area includes 16 countries (SEE Programme, 2016). For 14 countries that we include in our research and that are listed above, country's whole territory is located in SEE. The two remaining countries, Republic of Italy and Ukraine are only partly located in SEE, so we decided not to include them in this research. Besides, we decided not to include Republic of Kosovo (hereafter: Kosovo) due to the lack of necessary data and due to the lasting political disputes regarding its recognition status[7].

Wherever it is possible, the research examines period that includes years from 2006 to 2014. We decided that the 2006 would be the starting year for our research since it was the year in which Montenegro declared its independence from Serbia, leading the state union of Serbia and Montenegro to an end[8]. Consequently, data for Serbia and Montenegro presented separately before 2006 do not exist. We decided to conclude our research with

[7] Ethnic and regional conflicts in Kosovo existed prior to and after the breakup of SFRY. They culminated in 1999 with the Kosovo War. Its result was United Nations Security Council Resolution. Kosovo declared its independence from Serbia in 2008. Ever since, world continues to be divided on this issue (European Forum for Democracy and Solidarity, 2016).

[8] The first Montenegrin independence referendum was held in 1992, when Montenegro remained within SFRY. Following its results, the two remaining republics of SFRY, Serbia and Montenegro, established together a federation named the Federal Republic of Yugoslavia in the same year. In 2003 it was transformed into the State Union of Serbia and Montenegro, due to the first signs of political discordance between Serbian and Montenegrin leaders. In 2006 the second Montenegrin independence referendum was held. Following its results, Montenegro declared its independence in June 2006, leading a State Union of Serbia and Montenegro to an end (Deloy, 2006).

2014 due to the data availability. Moreover, it is possible that certain data for Serbia, especially data collected from country's National Bank or Ministry of Finance, include data for Kosovo even after 2008.

The main empirical results of Holzner (2011, p. 21) research on income inequality and economic growth were very much driven by the general conditions in the Central, East and SEE transition economies, especially if the countries were involved in the European enlargement process. Thus, the authors conclude that the large rise in income inequality in Eastern European states since the breakdown of socialism in the late 1980's or early 1990's adds to the presumption that state policy matters for the income distribution. Similarly, Doerrenberg and Peichl (2014, p. 2076) observe that: "Radical and liberal welfare states are characterized by more income inequality compared to social-democratic or conservative states." Therefore, in aim of better understanding the differences among selected countries, we will shortly present below different aspects and preconditions that shaped the current economic situation in selected SEE countries.

2.1 Different Political Preconditions in SEE Countries

According to IMF (2014b, p. 2): "In the mid-1980s, few would have imagined the dramatic changes that were about to overwhelm Europe." Later, the economic and political situation in the republics/countries of the socialist block has worsened, which led to the historic changes in the region, starting in 1989. To the West of the Iron Curtain[9] countries of Western or Capitalist Bloc were countries that allied with the North Atlantic Treaty Organization, i.e. NATO, against the Soviet Union (hereafter: SU) and its allies. On the other side of the Iron Curtain, the courtiers/republics belonging to the Eastern Bloc were governed by the Soviet-installed governments. Here, only exception was the SFRY, which retained its full independence, as it belonged to the Non-Aligned Movement[10]. However, in the late 80's, the economic and political conditions in every of these countries/states were somewhat different.

Union of Soviet Socialist Republics or the Soviet Union lasted until 1991 as a socialist country on European and Asian continents. It was a union of multiple (in the majority of years, of 15) sub national Soviet Socialist Republics. Moldavian Soviet Socialist Republic was one of the 15 republics of the SU and it is the only country in SEE region that was

[9] According to Self Study History (2016): "The Iron Curtain was imaginary boundary that divided Europe into two separate areas from the end of World War II in 1945 until the end of the Cold War in 1991. The term symbolized efforts by the SU to block itself and its satellite states from open contact with the West and non-Soviet-controlled areas."

[10] Non-Aligned Movement was a self-proclaimed neutral bloc founded in 1961. Its members were: SFRY, Egypt, India and Indonesia. Formally, it wasn't aligned with/against any major power bloc (Self Study History, 2016).

former member of SU. In 1991, Moldova seceded from the SU and became a sovereign, independent state. Soviet satellite states[11] in SEE included: Czechoslovak Socialist Republic, Hungarian People's Republic, People's Republic of Bulgaria, Socialist Republic of Romania and People's Socialist Republic of Albania[12]. By the end of 1980's, the weakened SU slowly stopped interfering in the internal matters of Eastern Bloc states, which led to several independence movements. In 1989 Autumn of Nations, a wave of Revolutions, swept across the Eastern Bloc (Szafarz, 1991). Besides, yet another socialist state SFRY was a federation of six socialist republics and two autonomous provinces[13]. All six former SFRY republics are today independent countries that belong to SEE region, namely: B&H, Croatia, Macedonia, Montenegro, Serbia and Slovenia. The Yugoslav Wars, involving ethnic conflicts from 1991 to 2001, accompanied and/or facilitated the breakup of the SFRY when its constituent republics declared independence. Today, out of former SFRY republics only Croatia and Slovenia are European Union (hereafter: EU) Member States, while remaining countries aspire to become full EU members.

2.2 Transition Process of Former Socialist / Communist SEE Countries

Emerged, new countries created on the ruins of the socialist block or former socialist/communist countries were now faced with a double challenge: they had to introduce economic reforms that lead to market economy and they had to create the basic economic institutions needed for management of an independent state economy (European Commission, 2016b). Transition is a process in which a transition economy is changing from a centrally planned economy[14] to a market economy[15]. Transition countries undertake a set of structural reforms in order to create market-based institutions (Feige, 1994). The task of building market economies has not been easy and fast (IMF, 2014b, p. v). We believe that historic facts played an important role in paving the road towards development of SEE countries. Different historical preconditions across SEE region are the key in understanding the varieties across SEE region in terms of their economic development.

[11] The term Satellite state refers to a state that is formally independent, but it is under substantial political, economic and military influence or control from another country. In our case, it refers to the states belonging to the Eastern Block under the supremacy of the SU (Lumen - Boundless World History, 2016).

[12] According to Self Study History (2016): "People's Socialist Republic of Albania re-aligned itself in the 1960s away from the SU and towards People's Republic of China."

[13] The autonomous provinces in SFRY were within the Socialist Republic of Serbia: Kosovo and Vojvodina.

[14] Centrally planned economy represents an economic system in which the society's leaders, usually members of the central government, make all economic decisions (Quizlet, 2016).

[15] Market economy is economic system in which all economic decisions are based on market determined supply and demand, rather than government intervention (Gregory & Stuart, 2004).

Following IMF (2014b), we can group the selected SEE countries from our research sample as follows (this is also available in Appendix C - Table 1):

- SEE non-transition countries/EU Member States (2): Austria, Greece;
- SEE new EU Member States (6): Croatia, Bulgaria, Hungary, Romania, Slovakia, Slovenia;
- SEE non-EU countries or EU candidate/potential candidate countries (5): Albania, B&H, Macedonia, Montenegro, Serbia;
- SEE CIS country (1): Moldova.

Until the former socialist/communist country becomes a full EU member, i.e. during its transition process, the country needs to implement numerous fundamental economic reforms[16]. Besides, all transition countries share something. Namely, from the beginning of their transition process, these countries set for themselves the strategic goal of joining the EU and its internal market as soon as possible. In time, this strategic goal became main and mutual outside anchor that made the process of economic reforms in transition countries unite (European Commission, 2016b).

2.3 European Integration of SEE Countries

In the Appendix B - Figure 2 shows the process of European Integration and a dramatic transformation in the entire European continent, including SEE region over the past 25 years. As we can see, the process of European integration started in 1989 with the fall of communism. Also, we marked in red European countries that were under communism in 1989 (Soviet Bloc), while countries marked in orange represent other economies that were socialist economies in 1989. Moreover, EU Member States are marked in blue, while the EU candidate or potential candidate countries are marked in light blue. Furthermore, the members of Commonwealth of Independent States[17] (hereafter: CIS) are marked in yellow. Finally, euro area is marked in dark blue in Appendix B - Figure 2.

Next, Appendix C - Table 1 shows EU memberships status among SEE countries. EU currently counts 28 Member States. Moreover, eight out of fourteen SEE countries are

[16] These reforms include: liberalization, macroeconomic stabilization, restoration of private property, setting the legal and institutional framework needed for a market economy, repayment or re-negotiation of the accumulated foreign debt, capitalization of the national economy, and the reform and development of public finances (Sikulova & Frank, 2013, p. 5).

[17] Commonwealth of Independent States is regional organization that was formed in 1991 during the breakup of the SU. Nine out of the 15 former Soviet republics are its members, and two are its associate members. This organization supports coordination among its members in the areas of trade, finance, law making, and security. Moreover, Moldova is the only SEE country that is its member (Commonwealth of Independent States, 2016).

currently EU Member States. Greece was first in joining the EU among SEE countries. It joined EU back in 1981 as a part of the Mediterranean or Second Enlargement. It is the only SEE country that was EU Member States prior to 1989. Next, Austria joined EU in 1995, marking EU's Fourth Enlargement. As a part of Eastern Enlargement, three SEE countries joined EU in 2004 (Hungary, Slovakia and Slovenia), while Bulgaria and Romania jointly entered the EU in 2007. Croatia was the last SEE country to join the EU in 2013, as a part of Western Balkans Enlargement. The following SEE countries: Albania, Macedonia, Montenegro and Serbia are all recognized as official EU candidate countries. These countries, former members of SFRY have all adopted EU integration as an aim of their foreign policies. B&H has the status of EU potential candidate country[18]. Nevertheless, Moldova, a former member of the SU, signed the Association Agreement with the EU in 2014, which deepened its trade and political links with the EU.

However, some Member States additionally integrated and have replacing their national currencies with the EU single currency: the euro (hereafter: EUR). These Member States now form the euro area, also known as the Eurozone (European Commission, 2016a). In Appendix C - Table 1, we can see that only four out of eight EU Member States from SEE region belong to Eurozone. These countries are Austria, Greece, Slovakia and Slovenia. Non-euro area Member States in SEE region are: Bulgaria, Croatia, Hungary and Romania. These countries entered the EU after EUR was launched in 1999. At the time of accession of these countries in the EU, they did not meet the required conditions for entrance to the Eurozone, also known as the euro convergence criteria[19]. However, these countries committed to join Eurozone once they meet relevant criteria. As Montenegro has no currency of its own, the Montenegrin government chose a dollarization[20] model with the euro as the *de facto* currency in all private and banking transactions. Remaining SEE countries currently use their national currencies.

If we look at the demographic data in SEE region in Appendix C - Table 1, we can see that 88.2 million people live in SEE. From this number, 68.1 million lives within the EU area,

[18] The Stabilization and Association Agreement between B&H and EU was ratified end entered into force in 2015. In beginning of 2016, B&H submitted the application aiming to access the EU and in mid 2016 EU Member States accepted B&H's application. Now, a long process has begun in which EU Member States need to decide on B&H's candidacy.

[19] The euro convergence criteria, also known as Maastricht criteria, represents the economic and legal preconditions that EU Member States are required to meet in order to successfully participate the EMU and to ultimately replace their national currencies with the single currency: the euro (European Central Bank, 2016).

[20] Official dollarization/euroization means that a country's government decides to adopt a foreign currency USD/EUR as a legal tender. The Montenegrin euroization took place during specific political circumstances. Initially, this was tolerated by the EU authorities. However, in time the attitude of EU authorities towards Montenegrin euroization changed. When time comes for potential Montenegrin accession in the EU, it is quite uncertain how this issue will be handled (Jacome & Lonnberg, 2010).

and 26.9 million lives in the euro area. Romania is the most populated SEE country with 19.9 million of inhabitants. It is followed by Greece (10.9 million), Hungary (9.9 million) and Austria (8.5 million). On the other hand, Montenegro, one of the smallest countries in Europe, is the smallest country in SEE as well, with only 0.6 million of inhabitants in 2014.

2.4 Gross Domestic Product of SEE Countries

Finally, Appendix D – Figure 3 shows GDP levels across SEE countries (in current prices, in million EUR) as primary indicator used to measure the health of an economy. If we look at the GDP of high-income countries, we can see that Austria has the highest GDP compared to other SEE countries. Austria's GDP stood at €329,296 million in 2014. It was followed by Greece, whose GDP amounted €177,559 million in 2014. Moldova and Montenegro had the lowest GDP in SEE region in 2014 €6,558 million and €3,458 million, respectively. Furthermore, we can see that as the result of the global financial crisis[21], all SEE countries experienced significant decline measured by GDP. It seems that Greece was one of the EU countries that were affected most negatively by the global financial crisis[22], resulting in the Greek government-debt crisis[23]. We can see better how recent crisis affected SEE economies in the Appendix D – Figure 4 that shows GDP growth rates for SEE countries. Hence, when growth rates of GDP collapsed in the first quarter of 2009, the financial crisis hit SEE countries full-force. Additionally, Appendix D – Figure 5 will present GDP per capita for SEE countries. If we look at the GDP per capita in selected SEE countries, we can see that Austria has the highest GDP per capita among selected SEE countries, with GDP per capita reaching €42,107 in 2014. It is followed by Slovenia and Greece with GDP per capita amounting €19,767 and €17,851 in 2014, respectively. Contrary, Moldova, Albania and B&H had lowest level of GDP per capita in 2014 amounting €1,844, €3,759 and €3,945, respectively. Conclusively, GDP growth rates of SEE countries are still not back to their pre-crisis levels. European recovery is widely expected to be slow (Storm & Naastepad, 2015). Additionally, IMF (2014b, p. 47) claims

[21] The global financial crisis, started in mid 2007 in developed countries, spread to many developing countries (including those in the SEE region) with a few months lag. However, in September 2008 the region was at the epicenter of the emerging market crisis (IMF, 2014b).

[22] Eurozone crisis or European debt crisis took place in EU starting in the last months of 2009. Several eurozone countries (Greece, Portugal, Ireland, Spain and Cyprus) that previously experienced the damaging effects of the global financial crisis led to it due to their inability to repay/refinance their government debt, nor to bail out over-indebted banks without the help of the third parties (European Central Bank, International Monetary Fund).

[23] Greek government-debt crisis started in late 2009. The global financial crisis structurally weakened the Greek economy. It was only later reviled that the Greek government undercounted previous data on government debt levels and deficits. As a result, Greece has become a symbol of government indebtedness (McDonald, 2017).

that the impacts of crisis "still resonate manifested in continued below-potential growth, high unemployment, and fragile financial markets."

2.5 Income Levels in SEE Countries

From Appendix C - Table 1 we can see that five out of 14 SEE countries belong to high-income group, namely: Austria, Croatia, Greece, Hungary, Slovakia and Slovenia. These high-income group countries from SEE all have Gross National Income (hereafter: GNI) per capita of $12,736 or more. Other seven SEE countries belong to upper-middle-income group, having GNI per capita in the range from $4,126 to $12,735. Regarding income level groups, the only exception in our sample is Moldova, one of the poorest countries in Europe. Moldova is only country in SEE region marked as lower-middle-income country, as its GNI per capita ($2,560 in 2014) is in the range from $1,046 to $4,125 (World Bank, 2016b).

Most OECD[24] Member States are high-income, developed, market economies that promote democracy. Out of 35 OECD Member States, only five come from SEE: Austria, Greece, Hungary, Slovakia and Slovenia. All of them belong to the high-income countries. However, SEE upper-middle income countries Bulgaria and Romania are EU Member States, but not OECD Member States. Interestingly, Croatia is the only SEE country that belongs to the high-income group and is EU Member State, but not an OECD Member State. This is shown in Appendix C - Table 1.

3 REVIEW OF EXISTING LITERATURE IN THE FIELD OF PUBLIC SPENDING AND INCOME DISTRIBUTION

In this chapter, we will first present the literature review regarding existing empirical research on the link public spending – income inequality. Next, we will present issues that researchers face in empirical modelling guided.

3.1 Review of Existing Empirical Research

Majority of researchers who investigated potential reasons of rise in levels of income inequality focused on government expenditures. For example, Afonso et al. (2010, p. 368) claim that: "It is self-evident that public spending can directly affect income distribution by transferring income to the less well-off individuals." Similarly, Mukaramah, Zakariah, &

[24] OECD is an intergovernmental, economic organization created in order to induce economic progress and world trade (OECD, 2016c).

Azali (n.d., p. 1) argue that: "It is widely accepted that the government can play a key role in redistributing income through public spending policies."

The first research that we present is the paper by **De Gregorio and Lee (2003)**. It provides analysis regarding impact of education on income distribution in a panel dataset including numerous countries worldwide in years from 1960 to 1990. For the dependent variable in their research (Gini Coefficient), the authors use the existing database, which was previously constructed using multiple sources. This paper utilizes unbalanced panel dataset for numerous selected world countries calculated at five-year intervals. The authors research both cross-country and inter-temporal links among education and income distribution. Their panel comprises six equations (for selected five-year sub periods). For estimation, authors use Seemingly-Unrelated-Regression. The regression applies to a total of 274 observations. Also, the authors analyse the impact of public spending on social protection on income distribution. Moreover, to tackle the issue of endogeneity in their research, the authors use the lagged values of their dependent variable. Their results show that certain elements of education (higher educational attainment and more equal distribution of education) have an impact on levels of income inequality. Besides, the findings of this paper present the Kuznets inverted U link regarding levels of income and income distribution. Finally, the authors report a positive relationship between public spending on social protection and income distribution.

Similarly, a research by **Sylwester (2002)** analyses if increasing public spending on education has a positive impact on income inequality on a country-level. Author selects data for numerous countries in a time span from 1970 to 1990 and he uses Gini Coefficient as a measure for income inequality and his dependent variable. The author divides the sample into OECD countries and least developed countries subsamples. Later, he regress variations in GINI by employing Linear Least Squares Regression on a matrix of control variables, and on the average of public spending on education (measure by their share in GDP). Later, the author uses lagged public spending aiming to reduce the possibility of reverse causality and since he believes that it is possible that impacts of levels and policies of public spending in prior periods are reflected in current levels of income inequality. Moreover, in order to control for robustness of his results, the author chooses the actual rates of government spending instead of their share in country's GDP. The sample in this research consists of 50 observations. The author points out that the absence of a larger sample size is a result of nonexistence of appropriate data regarding income distribution for many countries. The study findings lead to assumption that public spending on education has a stronger impact on reducing inequality in income in developed, OECD countries, compared to developing countries. Moreover, to check the robustness of his findings, the author includes several control variables in his research. The results prove to be robust and the impact seems to be stronger in developed, OECD countries. Yet, the research shows some indication that public spending on education can gradually reduce

income inequality in developing countries too, but this evidence is not as strong. Moreover, the results show that increasing expenditures on public education could lead to reduction in income inequality on a country-level. However, the author leaves certain issues open in his research (Sylwester, 2002, p. 49): "What type of education expenditures are most beneficial at reducing income inequality: primary; secondary; or higher education?".

Next, a research by **Doerrenberg and Peichl (2014)** uses a panel of developed, OECD countries for a time span 1981-2005, using different country-level datasets. Their research analyses the impact of levels of redistributive categories of public spending on post-tax income inequality. The authors first present the trend of income inequality in OECD countries. Different data sources for measure of their dependent variable, i.e. Gini Coefficient are used in this research. The authors use three different independent variables: public expenditures, public expenditure on social protection and progressive taxation. In this research, different identification strategies, namely FE and IV approach give an indication that public policies are able to affect the distribution of income. The authors use within-country-level differences in an instrument to determine the desired impact, aiming to control for any country systematic unobservable effect. The authors chose to use the initial values of chosen public spending category (i.e. its value in 1981) and than extrapolate them with the growth rate of GDP (for public expenditures and public expenditure on social protection). For the level of progressivity, the authors use the growth rate of the highest marginal tax rate. Their findings indicate that one percentage point of increase in public expenditures and public expenditure on social protection lead to 0.3 percentage points and 0.2 percentage point, respectively, reduction in GINI. Social expenditure policies show stronger effect compared to progressive taxation. The authors chose IV approach to tackle the issue of endogeneity. They justify their choice of IV approach due to the small N and large T in their dataset. Additionally, due to lack of data, the authors deal with the highly unbalanced panel. The results also indicate that different data sources present different values and different trends of income inequality measured by GINI. This leads to an important assumption: findings of empirical analysis involving GINI could vary depending on the selected data source. Similarly, the regression shows that coefficients vary in size and in terms of precision, depending on selected data source.

Another study focusing on income inequality in 26 selected OECD countries is the one by **Afonso et al. (2010)**. The authors use a cross-country empirical research focusing on the influence that the quality of both: education and public institutions might have on the improvement of income distribution. The dependent variable in their research is income distribution measured by the three different indicators: the Gini Coefficient, the Income Share of the Poorest 40%, and the per capita Income of the Poorest Quintile of the population in United States dollars (hereafter: USD), adjusted for Purchasing Power Parties for the year 2000. The authors rely on multiple data sources. The authors use

Ordinary Least Squares (hereafter: OLS) cross-section regression analysis and Data Envelopment Analysis. The findings of this research indicate that public institution in some Southern and large Continental European countries seem to be less efficient in reducing inequalities in income, compared to some more efficient Nordic countries. Also, in countries with substantial education achievements and higher public expenditures on education the efficiency of public expenditures on social protection is improved. Additionally, their results confirm that government policies significantly affect the distribution of income in selected OECD countries through public spending on social protection, and indirectly through sound economic institutions.

Another research regarding redistributive spending and income inequality is the one done by **Hatch and Rigby (2015)**, focused on different states of the United States of America (hereafter: USA) between 1980 and 2005. In their research, the authors examine if selection of public policy on a state-level could explain the differences among rates of income inequality. The findings of this research emphasize the significance that selection of redistributive public policies could have on market inequality levels. The authors identify four common approaches that are likely to influence income inequality: taxes on the wealthy, taxes on the poor, expenditures on the poor, and labour market policies. To analyse impacts of different policy approaches across states, the authors use factor analysis and form indices of these policies. They later include these indices in their FE model. The outcome of the research is summarized in a factor index that represents a weighted linear combination of the scores from the indicators. The authors use pooled cross-sectional time-series data and a FE model to assess the relationship between states' use of each policy approach. For their dependent variable, the authors use two different measures of market income inequality: the Gini Coefficient and the Income Share of the Top 1 Percent. For three out of these four measures (taxing the wealthy, taxing the poor, and labour market policies), the authors find positive relationship with income inequality. However, the authors concluded that higher redistributive expenditures on the poor seem to increase income inequality in the USA. Hatch and Rigby (2015, p. 181) conclude the following: "The results indicate that redistributive policies have the potential to make large changes in levels of income inequality over time. It is important that policymakers know that there non of the redistributive policies have a uniform impact on rates of income inequality. Yet, the basket of redistributive policies forms the distribution of income and wealth in a country over time."

Furthermore, we find one interesting research focused on the 19 Latin American and Caribbean countries from1980 to 2000. **Ospina (2014)** uses an unbalanced panel dataset with 200 observations to analyse the determinants of income inequality (measured by Gini Index). The author focuses on public spending on: education, health care, and social protection. The author choses FE to regress the model. Also, in order to control for economic shocks or other time specific effects, she employs time dummies and a decade

dummy variables. Ospina (2014, p. 12) argues that FE are valuable when one want to control for idiosyncratic differences of income distribution between different countries. Also, the author considers that country specific effects are crucial because most of the differences happen across nations rather than over time. While the intercept of the FE model estimates the variations of income inequality cross-countries, time dummy variables measure differences within a country through time. Aiming to check the causal relationship of the link public expenditures on social protection and income inequality, the author selects Two-Stage Least Squares (hereafter: 2SLS). To deal with the issue of endogeneity for the variables reflecting social expenditures, the author uses two additional models and estimates them by selecting FE and first differenced Generalized Method of Moments (hereafter: GMM) model. The results seem to be robust and consistent across various specifications. The author believes that public spending is linked to the inequality of income, and that rise in income inequality is linked to different social, economic and political changes, which could affect levels of public spending. This research leads to assumption that variables reflecting social expenditures could be considered endogenous. However, when the endogeneity is accounted for, the results become different. In this case, public spending on education and health care seem to negatively affect income inequality, while public spending on social protection does not affect income inequality at all. Findings also imply that when the endogeneity of the variables reflecting public spending on social protection is not controlled for, the impacts of public spending on both health care and education are being overestimated.

Furthermore, **Niehues (2010)** explores whether more generous social spending leads to less income inequality by selecting a dynamic panel approach. He selects 24 European countries in a time span 1993-2007. The author combines three different micro data sources for the collection of data regarding the dependent variable, i.e. Gini Coefficient. This research is consisted of an unbalanced, pooled Cross-Sectional Time Series. The author includes the lagged dependent variable because he considers income inequality to be rather persistent over time. Besides, the author uses OLS and FE estimator. The author applies the System GMM estimator in order to control for the potential issue of endogeneity of social policies regarding rates of income distribution. Also, the one-step estimator with small sample correction and robust standard errors are used in this research to control for heteroskedastic error structures. The findings confirm that a higher public spending on redistributive categories has a significant and strong impact on lowering rates of income inequality in selected countries. Additionally, the results assume that higher spending of the general government on social protection negatively affect GDP. Finally, the findings confirm a U-shape link among income inequality and GDP per capita. Consequently, the results are not in line with the Kuznets hypothesis stating that the link among GDP and income inequality is inverted-U shape.

Furthermore, **Holzner (2011)** investigates the link between income distribution and economic growth. The focus of his analysis is putted on the impact of government expenditures in transition countries. The research includes data for 28 transition economies (including seven countries from SEE region) over the period 1998-2006. The research estimates two structural models, where economic growth and income distribution are selected dependent variables. The author selects the value of annual growth rate of GDP per capita as an indicator for economic growth, while he selects Gini Coefficient (collected from different surveys) as an indicator for income distribution. The author chose to estimate base models using the Generalized Least Squares (hereafter: GLS) estimator in order to control for heteroscedasticity and panel specific autocorrelation. The selection of GLS estimator over a System GMM estimator, which would potentially deal better with the problem of endogeneity, is justified by the fact that precise data on public spending are missing for many transition counties/years selected for this research. At the end, the research contains a panel dataset with an N (number of countries) of 14 and an average t (time periods, i.e. years) of 6, which is not adequate if one wants that instruments in the System GMM estimator to be properly used. Also, GLS estimator seems as a better solution concerning heteroscedasticity and autocorrelation in the data. Once the author tested his base model, results show that economic growth in GINI equation and GINI in economic growth equation have significant and negative impact. Yet, these findings could be linked with issues of endogeneity and multicollinearity. After controlling for both, the results showed that economic growth is significant in the Gini equation, but not the other way around. Finally, the findings of this analysis indicate that countries that record higher levels of public spending on social protection and healthcare seem to face lower income inequality levels.

Finally, one of the most interesting studies for our research is the one done by **Efendic and Trkic-Izmirlija (2013)**. The authors focus their research on income inequality solely in Bosnia and Herzegovina over the period 1996-2010. Efendic and Trkic-Izmirlija (2013, p.2) argue that: “there seems to be no firmly established research tradition in this field and that, additionally, empirical work is guided by a lack of relevant data for transition countries.” Their main indicators in their research are: income distribution, institutional performance and general government expenditures. For their empirical analysis authors use the OLS cross-time methodology. This is considered very challenging, since they have very small sample (maximum 15 observations, i.e. years). However, the authors conclude that caused by limited data availability panel data analysis or other more advanced econometric technique cannot be used here, and other issues such as: spurious regression, endogeneity, and co-integration cannot be properly controlled. Most importantly, since available data for income distribution in BiH is very limited, the authors establish their own proxy for the GINI (their dependent variable) for BiH for period 2000-2010. Later, these values of GINI will be used in our investigation. The findings of this study indicate that higher general government expenditures and improvements in quality of public

institutions in the country lead to reduction of GINI in BiH in selected time span. Finally, the authors conclude that global economic crisis lead to rise in income inequality in BiH.

3.2 Major Issues in Existing Empirical Modelling

The majority of authors (e.g. De Gregorio and Lee, 2003; Doerrenberg & Peichl, 2014; Hatch & Rigby, 2015; Holzner, 2011; Ospina, 2014; Sylwester, 2002) use *GINI* to capture income inequality in their researches. As it is case in many income inequality studies (e.g. Dorrenberg & Peichl, 2014; Holzner, 2011; Niehues, 2010), due to the data unavailability, we combine different data sources for collection of Gini Coefficient. De Gregorio and Lee (2003, p. 400) argue that three major differences exist when using different sources of Gini Coefficients. First problem is determining if the unit of investigation is a household or an individual. Second issue is determining if income data refer to income before-tax (or gross income), or after-tax income (i.e. net income). Finally, while some countries measure the distribution of income other countries measure the distribution of spending. Accordingly, in their research, Doerrenberg and Peichl, (2014, p. 2068) argue that the usage of data for measuring income inequality often implies important limitations. If someone is interested in doing a cross-country analysis through time period, they need to pay special attention to consistency and comparability of the data used across years selected and between different countries involved in a research as well. Even though data for GINI can be found for many developed of countries, their comparability still represents a key issue since methods of GINI calculation are generally not consistent among numerous datasets, and occasionally even among the same dataset. Additional limitation is that numerous GINI datasets do not contain data for certain group of countries or time periods or are highly unbalanced. This often results in inability of a researcher to employ advanced econometric panel data techniques in their work. Likewise, for our independent variables we combine different data sources. As Efendic and Trkic-Izmirlija (2013, p. 2) discuss, unavailability of relevant data is a generally a problem in researches covering transition economies. Reliable indicators for many transition countries, especially consolidated in a way useful for empirical modelling often, unfortunately, do not exist.

As previously discussed, the size of the public sector is often expressed as ratio of total general government expenditures and country's GDP. Findings of existing research (e.g. Doerrenberg & Peichl, 2014; Efendic & Trkic-Izmirlija, 2013) mostly confirm an inverse relationship between public spending (i.e. size of public sector) and income inequality. Regarding our expectations of results regarding the link between redistributive categories of public expenditures and income distribution, we rely on the existing research. First, Ospina (2014, p. 16) believes that general government expenditures on healthcare and education positive effects on GINI cannot be seen in the short-run. Moreover, after taking endogeneity into account in her research, Ospina (2014) finds that the increase in general government expenditures on healthcare and education leads to decrease in income

inequality. Yet, the author argues that if endogeneity is not controlled, impacts of general government expenditures on healthcare and education on income distribution can be overestimated. Similarly, Sylwester (2002) reports that higher expenditures on public education lead to reduction in income inequality. Likewise, Holzner (2011) find that public spending on social protection and healthcare is negatively correlated with income inequality. Also, Efendic and Trkic-Izmirlija (2013) find that higher public spending on social protection has a negative impact on income inequality. Yet, the authors point out that public spending on education is long run oriented. Interestingly, this research points out that timing effect is crucial and that majority of categories of public expenditures make impact only in a medium run. Finally, Niehues (2010) finds that higher public spending on social protection has a strong and negative effect on income inequality.

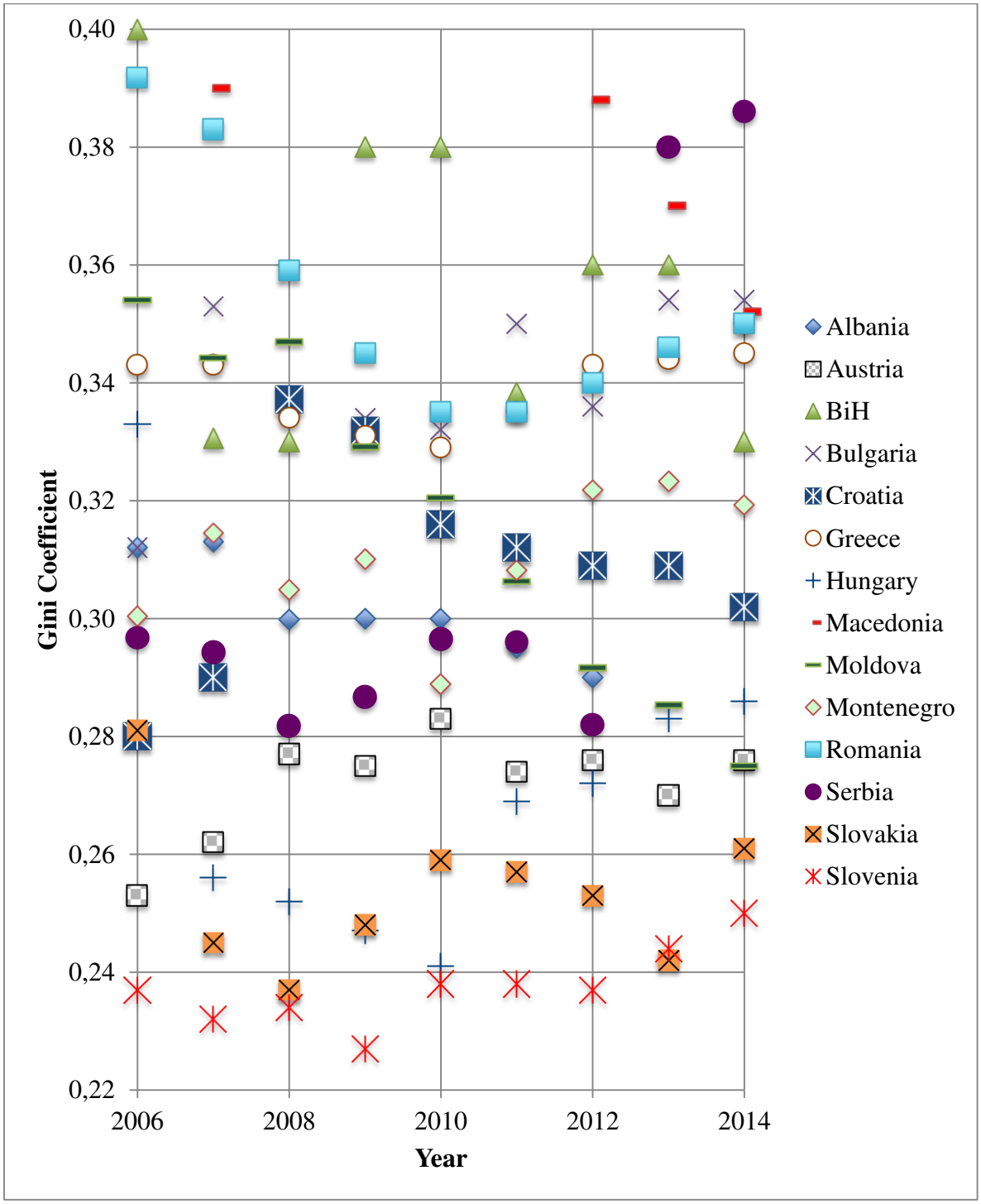
4 RESEARCH DATA

Below, we present selected variables for our research: the dependent variable, independent variables, as well as standard set of control variables. Also, in this chapter, we will present the rationale and arguments for their inclusion in our empirical model presented.

4.1 Dependent Variable – Gini Coefficient

The dependent variable in our research is income distribution, measured by the Gini Coefficient (hereafter: *GINI*), a measure generally used for capturing income inequality. The data for *GINI* in our research is obtained from different, available sources. In the first place, we use available databases: International Labour Organization Database of Labour Statistics (hereafter: ILOSTAT), Statistical Office of the European Union Database (hereafter: Eurostat), World Bank DataBank and World Income Inequality Database (hereafter: WIID). Additionally, we use data from the following sources: Bertelsmann Stiftung's Transformation Index (hereafter: BTI) (2012; 2014), Economist Intelligence Unit (2015), International Business Publications (2016) and United Nations International Children's Emergency Fund (2014). Finally, we use data from the following researches: Kozuharov, Pektovski, & Ristovska (2015), as well as Efendic and Trkic-Izmirlija (2013). Gini Coefficients for SEE Countries for years from 2006 to 2014 are presented below on the Figure 7.

Figure 7. Gini Coefficients for SEE Countries 2006-2014



Source: BTI, *Bosnia and Herzegovina Country Report*, 2012, p.2; BTI, *Albania Country Report*, 2014, p.2; Efendic & Trkic-Izmirlija, *Effects of the Global Economics Crisis and Public Spending on Income Distribution in Bosnia and Herzegovina*, 2013, p. 20, Graph 4.8; Economist Intelligence Unit, *Global Microscope 2015: The Enabling Environment for Financial Inclusion*, 2015, p. 51; Eurostat; ILOSTAT; International Business Publications, *Bosnia and Herzegovina Investment and Business Guide Volume 1: Strategic and Practical Information,* 2016, p. 8; Kozuharov et al., *The Impact of Taxes Measured by Gini Index in Macedonia,* 2015, p. 44, Table 1; United Nations International Children's Emergency Fund, *Analysis of Policies and Reforms Affecting the Situation of Children in Albania*, 2014; WIID; World Bank DataBank.

As we can see from the Figure 7, it seems that countries with the highest *GINI* (countries with highest income inequality) in SEE region are: Serbia, Romania, Bulgaria and Greece, while the countries that seem to have the lowest *GINI* (i.e. countries with most equal income distribution) in SEE region are: Slovenia, Slovakia and Austria. Interestingly, Slovenia (after Denmark) is the OECD Member State with the lowest income inequality measured by GINI.

4.2 Key Independent Variables of Interest

For our independent variables, we combine data from multiple sources. Mostly, we rely on data from Eurostat and World Bank DataBank. Additionally, we use data from countries' statistical offices (Agency for Statistics of Bosnia and Herzegovina; Institute for Statistics of the Republic of Albania; National Bureau of Statistics of the Republic of Moldova; State Statistical Office of the Republic of Macedonia; Statistical Office of Montenegro; Statistical Office of the Republic of Serbia), countries' central banks (Bank of Albania; Central Bank of Bosnia and Herzegovina; National Bank of Moldova; National Bank of the Republic of Macedonia), and countries' ministries of finances (Ministry of Finance of the Republic of Albania; Ministry of Finance of the Republic of Macedonia; Ministry of Finance of the Republic of Moldova; Ministry of Finance of the Republic of Montenegro; Ministry of Finance of the Republic of Serbia). Moreover, we use data from different researches (Bortoi, n.d.; Directorate for Economic Planning of Bosnia and Herzegovina, 2015; Efendic & Trkic-Izmirlija, 2013; European Commission, 2014; Government of the Republic of Macedonia, 2009; Ministry of Finance and Treasury of Bosnia and Herzegovina & United Nations Development Programme in Bosnia and Herzegovina, 2013). Finally, we use data from several websites (DeviInfo; European Training Foundation; me4eu). Lastly, in some cases we convert values from national currencies or USD to EUR to represent the whole sample uniformly. To do this, we use official currency exchange rates available on the official web pages of countries' National/Central Banks and Eurostat as of December 31, for each year examined.

4.2.1 Total General Government Expenditures – PSPEND

Total General Government Expenditures (as % of GDP) (hereafter: *PSPEND/GDP*) is first (explanatory) policy variable of interest in our study. Following authors (e.g. Doerrenberg & Peichl, 2014; Efendic & Trkic-Izmirlija, 2013; Galli & van der Hoeven, 2001;) include this indicator with regards to income distribution in their research. Therefore, we would expect that *PSPEND/GDP* affect income inequality. Levels of *PSPEND/GDP* in selected SEE countries for years from 2006 to 2014 are presented in Appendix E - Figure 6. As we can see, between SEE's developed and developing countries there exist a widening gap, but also the different cultural attitudes towards the role of government in providing services across the region. Also, it shows that Albania and Macedonia have the lowest levels of

PSPEND/GDP in SEE (29.5% and 32%, respectively). Moreover, we can notice that the poorest SEE countries have the lowest levels of PSPEND. Instead, SEE countries with the highest *PSPEND/GDP* in 2014 are the SEE most developed countries, namely: Austria, Greece, Hungary and Slovenia, with 52.7%, 49.9%, 49.9% and 49.8%, respectively. For Greece, these high levels of *PSPEND/GDP* were caused by the Greek government-debt crisis. It is interesting to notice that in 2014, Slovenia and Greece reduced their *PSPEND/GDP* by over 10%, making it the largest fall across the EU[25]. Bulgaria experienced a significant growth of *PSPEND/GDP* from34.7% in 2012 to 42.1% in 2014[26]. Additionally, we can see that during the global financial crisis, all SEE countries experienced significant growth their total public spending, and only in 2010, some of them reached pre-crisis levels.

Later, in the model, we will substitute *PSPEND/GDP* with the three selected categories of redistributive public spending. We expect the following public spending indicators to be mostly negatively associated with income inequality.

4.2.2 Total General Government Expenditures on Social Protection – PSOC

Total General Government Expenditures on Social Protection (as % of GDP) (hereafter: *PSOC/GDP*) is the first selected redistributive expenditure category chosen as our (explanatory) policy variable of interest. The following authors (e.g. Afonso et al., 2010; Bulir & Gulde, 1995; De Gregorio & Lee, 2003; Efendic & Trkic-Izmirlija, 2013; Holzner, 2011; Huber, Nielsen, Pribble, & Stephens, 2004; Moene & Wallerstein, 2001; Niehues, 2010) use this variable as explanatory variable with regards to income distribution. Levels of *PSOC/GDP* are presented in Appendix E - Figure 7. When looking at *PSOC/GDP* in SEE in 2014, we can see that Austria and Greece had the highest rates of *PSOC/GDP* around 19% each. These countries were followed by Slovenia, Serbia and B&H with 16.5%, 16.1%, and 15.8% of *PSOC/GDP*, respectively. On the other hand, SEE countries with lowest rates of *PSOC/GDP* in 2014 were Albania, Romania, and Moldova with 8.9%, 10.5%, and 10.9%, respectively. Besides, it is evident that *PSOC/GDP* in all SEE countries were affected by the recent global economic crisis. However, countries recovered very soon and reached their pre-crisis levels. Also, it is noticeable that *PSOC/GDP* in most SEE countries during the period 2006-2014 showed the tendency of growth. This growth is mostly noticeable in Greece (from 14% in 2006 to 19.4% in 2014), in B&H (from 13% in

[25] For Slovenia, such a high expenditure in 2013 was the result of the capital injections into banks in amount of 10.1% of Slovenia's GDP. On the other hand, the Greek government will need to continue with deep economic reforms and budget cuts, as it is required by the bailout deal.

[26] This might be the result of tense protests and social context in Bulgaria.

2006 to 15.5% in 2014) and in Bulgaria (from 9.9% in 2006 to 12.2% in 2014). Only Serbia experienced fall of *PSOC/GDP*, from 18.7% in 2006 to 16.1% in 2014[27].

4.2.3 Total General Government Expenditures on Healthcare – PHEALTH

Next, *Total General Government Expenditures on Healthcare* (as % of GDP) (hereafter: *PHEALTH/GDP*) is the second selected redistributive expenditure category, chosen as our (explanatory) policy variable of interest. Several authors (e.g. Efendic & Trkic-Izmirlija, 2013; Holzner, 2011; Huber et al., 2004) use this variable with regards to income distribution. *PHEALTH/GDP* are presented in Appendix E - Figure 8. We can see that from SEE countries, Austria (11.2%), Serbia (10.4%) and Moldova (10.3%) had highest rates of *PHEALTH/GDP* among SEE countries in 2014. On the other hand, Romania (5.6%) and Albania (5.9%) had the lowest rates of *PHEALTH/GDP* among SEE countries in 2014. All countries experienced growth of *PHEALTH/GDP* in 2009, caused by the recent global economic crisis. However, countries soon recovered and returned to pre-crisis levels in 2011. Greece reduced its *PHEALTH/GDP* from 9.3% in 2013 to 8.1% in 2014 probably as an aspiration to mitigate its government-debt crisis.

4.2.4 Total General Government Expenditures on Education – PEDUC

Finally, *Total General Government Expenditures on Education* (as % of GDP) (hereafter: *PEDUC/GDP*) is the final selected redistributive expenditure category, chosen as our (explanatory) policy variable of interest. Many authors (e.g. Afonso et al., 2010; Efendic & Trkic-Izmirlija, 2013; Holzner, 2011; Huber et al., 2004; Sylwester, 2002; Zhang, 2008) used this variable concerning income distribution. *PEDUC/GDP* for SEE countries are presented in Appendix E - Figure 9. It seems that Moldova (7.5%) and Slovenia (5.9%) have highest rates of *PEDUC/GDP*. Oppositely, Albania (3.3%) and Romania (3.0%) had lowest rates of *PEDUC/GDP* in 2014 among selected SEE countries.

4.3 Other Independent Variables of Interest – Control Variables

Our aim is to find and include the confounding elements in our research in order to avoid potential problem of misspecification. Accordingly, we decided to include a standard set of control variables in our research. We chose five variables that are very often used by other researchers in their study of income distribution and public spending. The selected variables can possibly affect both sides of our research: dependent variable (i.e. *GINI*) and independent variables. The natural logarithm (hereafter: ln) of the **Gross Domestic Product per capita** (*ln GDP pc*) is the most commonly used control variable in the studies

[27] This might be the result of the decision made by the Serbian Parliament to make cuts and revisions in pension system.

in this field (e.g. Afonso et al., 2010; Bulir & Gulde, 1995; De Gregorio & Lee, 2003; de Mello & Tiongson, 2008; Gregorini & Longoni, 2009; Gustafsson & Johansson, 1999; Niehues, 2010; Ospina, 2014; Sylwester, 2002; Zhang, 2008). As previously discussed, we expect GDP pc to be positively associated with *GINI*. Next, **Age Dependency Ratio**[28] (hereafter: *AGEDEP*) is the second control variable used in our research. Many authors used this variable with regards to income distribution (e.g. Afonso et al., 2010; de Mello & Tiongson, 2008; Gregorini & Longoni, 2009; Gustafsson & Johansson, 1999; Hatch & Rigby, 2015; Moene & Wallerstein, 2001; Niehues, 2010; Ospina, 2014). One would expect that this variable is important, as people in dependent ages often have lower equivalent incomes than people in work active ages (Gustafsson & Johansson, 1999, p. 10). Following Deaton & Paxson (1997), we would expect that higher *AGEDEP* lead to increase in income inequality. Next, following works by several authors (e.g. Afonso et al., 2010; Doerrenberg & Peichl, 2014; Gustafsson & Johansson, 1999; Hatch & Rigby, 2015; Moene & Wallerstein, 2001; Ospina, 2014) we will use **Unemployment Rate**[29] (hereafter: *UNEMPLOY*) as next control variable in our research. Following Gustafsson and Johansson (1999) we would expect that *UNEMPLOY* has inequality-increasing effects. Our next control variable, **Urbanization Rate**[30] (hereafter: *URBAN*) is believed to affect income distribution by Huber et al. (2004) and Ospina (2014). Following Ospina (2014), we would expect that the larger proportion of the labour force in agriculture leads to the higher degree of income inequality. Finally, following Sylwester (2002), we control for the size of the country by the ln of the **Total Population in the Country** (hereafter: *POPUL*). We would expect an inverse relationship between *POPUL* and income distribution. Finally, while the levels of *GDP pc* for selected SEE countries in period 2006-2014 are presented in the Appendix D – Figure 5, the remaining control variables are presented in the Appendix F.

4.4 Summary Statistics

In the Table 2 below, we present the descriptive statistics of all selected variables from our research. This table shows the following: Mean, Standard Deviation, Minimum, Maximum and number of observations for our variables of interest. Additionally, i represents a country, t denotes the year, and N represents the number of country-year observations for each selected variable. We can say that we have a strongly balanced dataset, meaning that

[28] According to Gregorini and Longoni (2009, p. 7): "Age dependency ratio is a good measure to proxy the extent of the economically dependent part of the population to the productive part. It is normally given by the fraction of the population that is aged 65 or higher."

[29] International Labour Organization (hereafter: ILO) (2016) defines unemployment as: "The number of unemployed persons as a percentage of the labour force, where labour force presents the total number of people employed and unemployed."

[30] Urbanization Rate usually measures the percentage of the population in a country, which live in areas defined as urban (Edmonds, 2013).

we have data for all countries/years. Moreover, we present variation of *GINI* within and between selected SEE countries. However, we will focus only on these within-country variations. As we observe variation of inequality measure (i.e. *GINI*), we notice that within variation is noticeably smaller over the time span of interest. The average income inequality (i.e. *GINI*) in our sample is 0.31. The highest income inequality is recorded in Macedonia in 2011, with *GINI* of 0.442. Oppositely, the lowest income inequality is recorded in Slovenia in 2009, with *GINI* of 0.227. Regarding our other variables, again, within variation is considerably smaller. About the size of public sector of SEE countries from 2006 to 2014 the average size is (measured by the overall public spending) 43.12% of *GDP*, which seems high, concerning that the "optimal" size of the public sector should not exceed 25% of GDP. However, Greece records highest values regarding the size of its public sector, peaking in 2013, when overall public spending amounted 60.80% of *GDP*. On the contrary, Albania seems to have the smallest public sector in our sample over the investigated period, amounting only 28.40% of *GDP* in 2012. When speaking about redistributive public spending in SEE, the biggest part refers to social spending (14.11% of GDP on average), followed by spending on healthcare (8.20% of GDP on average), while spending on education takes the smallest part in GDP out of these categories (only 4.62% of GDP on average). Interestingly, highest social spending is recorded in Greece in 2012 (20.31% of GDP), while lowest spending on social protection is recorded in Albania in 2008 (only 6.65% of GDP). Concerning *PHEALTH/GDP*, the highest spending is recorded in Moldova in 2009 (12.49% of GDP), while lowest healthcare spending is recorded in Romania in 2006 (5.06% of GDP). Similarly, highest spending on education is recorded in Moldova in 2009 (9.50% of GDP), while lowest *PEDUC/GDP* is recorded in Romania in 2013 (only 2.80% of GDP). One of the best ways to see the disparities between SEE countries is to compare our control variables of interest. For example, while Austria had *GDP pc* of €42,107 in 2013, Moldova had *GDP pc* only €722 in 2006. Moreover, Macedonia recorded the highest *UNEMPLOY* in 2006 (36.00%), while the same indicator amounted only 3.90% in Moldova in 2014. Additionally, *AGEDEP* seems to be highest in Greece (20.87% in 2014), and lowest in Albania (9.02% in 2006). Besides, while Greece has *URBAN* of 77.68% (recorded in 2014), B&H recorded 39.16% in 2007. Finally, regarding demographic data, Romania seems to be the most populous country with 21.26 million of inhabitants in 2006. On the contrary, Montenegro had only 0.61 million inhabitants in the same year.

Table 2. Summary Statistics

Variable		Mean	Standard Deviation	Maximum	Minimum	Observations
	Overall		4.89	44.20	22.70	N = 126
GINI	Between	31.38	4.55	40.85	23.74	n = 14
	Within		2.12	38.87	25.72	T = 9
	Overall		7.15	60.80	28.40	N = 126
PSPEND/GDP	Between	43.12	6.94	52.19	30.01	n = 14
	Within		2.44	54.92	36.03	T = 9
	Overall		3.06	20.31	6.65	N = 126
PSOC/GDP	Between	14.11	2.94	18.68	8.31	n = 14
	Within		1.13	16.86	10.52	T = 9
	Overall		1.78	12.49	5.06	N = 126
PHEALTH/GDP	Between	8.20	1.78	11.15	5.46	n = 14
	Within		0.47	9.54	6.97	T = 9
	Overall		1.26	9.50	2.80	N = 126
PEDUC/GDP	Between	4.62	1.23	8.24	3.17	n = 14
	Within		0.41	5.94	3.57	T = 9
	Overall		0.88	10.65	6.58	N = 126
ln GDP pc	Between	8.82	0.89	10.48	7.12	n = 14
	Within		0.15	9.22	8.28	T = 9
	Overall		3.01	20.87	9.02	N = 126
AGEDEP	Between	14.95	3.05	19.38	10.08	n = 14
	Within		0.59	16.45	13.26	T = 9
	Overall		8.49	36.00	3.90	N = 126
UNEMPLOY	Between	14.12	8.24	32.14	4.99	n = 14
	Within		2.92	25.63	5.93	T = 9
	Overall		10.08	77.68	39.16	N = 126
URBAN	Between	57.94	10.37	76.28	39.30	n = 14
	Within		0.94	62.20	53.61	T = 9
	Overall		0.85	3.06	-0.49	N = 126
ln POPUL	Between	1.55	0.88	3.02	-0.48	n = 14
	Within		0.02	1.60	1.49	T = 9

5 EMPIRICAL STRATEGY EMPLOYED

In this chapter, we explain the empirical strategy employed to answer our main research questions and discuss different econometric methods used in our research regarding the link public spending and income distribution in SEE countries. First, we present methodology and then the empirical models used in our research.

5.1 Research Methodology Selected

Following the majority of existing research (e.g. de Mello & Tiongson, 2008; Doerrenberg & Peichl, 2014; Holzner, 2011; Niehues, 2010; Ospina, 2014), we use the multivariate regression approach. This approach can analyse the influence of large variations in levels of public spending and its categories across selected countries. This is considered to be the main advantage of this technique, since, frequently, these variations are not observed within the context of country case studies. Also, this approach lets us research the evolution over time of the impact of different categories of public spending on income distribution within selected countries. However, due to data unavailability, we were unable to introduce in our research of income inequality in SEE countries the specific details on public spending/redistributive policies for each individual country. According to Claus, Martinez-Vazquez, & Vulovic (2012, p. 12) these specific details could have made a significant difference on the overall impact of public spending/redistributive policies. Therefore, this type of information will be ignored in regression analysis. If these policies and institutions don't undergo significant changes in the time period examined, we can capture them by employing panel data FE.

We decided to use panel data methods because we work with cross-sectional time-series data. By combining time and cross-sectional dimension we obtain more data variation, less collinearity and more degrees of freedom leading to better efficiency of parameter estimates. More importantly, panel data allows controlling for omitted (unobserved or mismeasured) variables. There exist two generally used approaches: FE and Random Effects (hereafter: RE).

If we apply OLS to the variations within each country over time, we employ FE estimator. On the other hand, RE estimator calculates coefficients from a matrix of weighted averages of the estimates produced by the between and within estimators. Since RE incorporates data across both: the different countries and the different time periods, we can say that the RE is a more efficient estimator compared to FE estimator. Yet, the RE estimates are consistent only when the specific details at country-level are not correlated with the other independent variables (Greene, 2008).

Following Doerrenberg and Peichl (2014), as well as Hatch and Rigby (2015), we use FE model to assess the relationship between income inequality and public spending.

According to Torres-Reyna (2007, pp. 9), if we want to examine the impact of variables that vary over time, the best solution is to employ FE. FE model can be expressed as following equation (2):

$$Y_{it} = \beta_0 + X'_{it}\beta + \epsilon_{it} \qquad (2)$$

In equation (2), X_{it} represents a K-dimensional vector of independent variables, without a constant term. The intercept β_0 is independent of both: i and t. β, a (K x 1) vector, the slopes, is independent of both: i and t. The error ε_{it} varies over i and t. Unobserved individual factors may be captured by α_{it}, which is part of the error term ($\varepsilon_{it} = \alpha_{it} + \mu_{it}$). μ_{it} has mean 0, is homoscedastic and not serially correlated while all unobserved individual country characteristics, which do not vary over time are summarized in the $\alpha_{i.}$. $\alpha_{i,}$, the unobserved factor, is part of the error term. Consequently, we can say that OLS parameter calculations are biased and inconsistent. Also, since we have repeated observation for each country within-unit, error correlation leads to inefficiency of OLS estimates. If we assume no contemporaneous correlation of the errors and the explanatory variables, OLS estimates may be consistent but inefficient.

The main distinction between FE and RE is the treatment of individual specific effects. Torres-Reyna (2007, p. 25) states that the justification for selecting RE model is that the variation across countries/years is expected to be random and uncorrelated with the explanatory variables included in the model, which is not the case in FE model. FE explore the relationship among independent and dependent (GINI in our case) variables within country/year. It is assumed that each of these entities posses distinct characteristics. These characteristics might influence the independent variables. If we decide to select FE, we presume that, in this case, all changes in the dependent variable are caused by any influence except these unobserved fixed characteristics (Stock & Watson, 2003). Hence, this impact must be controlled. This is explanation for the expectation of the correlation among entity's error term and explanatory variables. Moreover, as FE eliminate the consequence of time-invariant peculiarities, it enables us to measure the net effect of the explanatory variables on the dependent variable. FE model is link with additional significant assumption: any time-invariant specific details of an individual entity are unique to this entity and should not be correlated with other entity's specific details. Error term and the constant (that measures entity's unique details) should not be mutually correlated, as every entity is considered individual. As argued by Torres-Reyna (2007, p. 23): "FE models are created to research the causes of changes within an entity. All time-invariant differences between the entities are controlled for when one uses FE. Consequently, the calculated coefficients of the FE models cannot be biased due to omitted time-invariant characteristics." If we speak about time-series cross-sectional data (Bartels,

2008, p. 6) believes that we can interpret these effects as it follows: "For a given country, as X varies across time by one unit, Y increases or decreases by β units."

However, we should bear in mind that FE is not a panacea for all sources of endogeneity bias, as it does not control for time-varying unobserved effects, measurement errors or simultaneity bias. In addition, if data in the empirical model are slowly changing over time it can produce poor estimates and it is less efficient than RE model. To choose among FE and RE models, we use Hausman test. Our desired model is RE (compared to FE), which is our null hypothesis (Greene, 2008). The null hypothesis also states that the unique errors (u_i) are not correlated with the independent variables. Since the null hypothesis has been rejected, our analysis is based on FE estimation. In our research, we use both country and time FE. Unobserved country-level elements, which have impact on levels of income inequality and do not vary over time, are measured by country FE. On the other hand, unobserved elements that have impact on income inequality rates in all selected countries and change over time are measured by year FE.

5.2 Model Specification

Our main research question is: "Whether different redistributive policy measures or total general government expenditures effectively reduce income inequality in SEE countries?" To answer this question, we employ several identification strategies. Also, we try to overcome potential problems of endogeneity by using 2SLS method.

5.2.1 Fixed Effects Panel Estimation

We specify our models to estimate the effects of total government expenditures (i.e. public spending) and redistributive public policies on income distribution in SEE countries over a time span 2006-2014. In order to research the impact of chosen public spending/redistributive policies on levels of income distribution in selected SEE countries we employ FE. Our fully augmented model contains all three redistributive policy components (social protection, healthcare, and education) measured by their share in country's GDP. Also, we include several control variables described in Section 4.3 in our analysis with the aim to find the consequences of selected public spending/redistributive policies on income distribution.

The equation (3) below shows our initial model:

$$GINI_{it} = \beta_0 + \beta_1 lnGDPpc_{it} + \beta_2 lnGDPpcsq_{it} + \beta_3 PSPEND/GDP_{it} + \beta_4 AGEDEP_{it} + \beta_5 UNEMPLOY_{it} + \beta_6 URBAN_{it} + \beta_7 \ln POPUL_{it} + \theta_i + \gamma_t + \varepsilon_{it} \quad (3)$$

In order to examine different types of government spending, namely social, health and education expenditure the following equation (4) depicts our fully augmented, i.e. disaggregated model:

$$GINI_{it} = \beta_0 + \beta_1 lnGDPpc_{it} + \beta_2 lnGDPpcsq_{it} + \beta_3 PSOC/GDP_{it} + \beta_4 PHEALTH/GDP_{it} + \beta_5 PEDUC/GDP_{it} + \beta_6 AGEDEP_{it} + \beta_7 UNEMPLOY_{it} + \beta_8 URBAN_{it} + \beta_9 ln\, POPUL_{it} + \theta_i + \gamma_t + \varepsilon_{it} \quad (4)$$

In equation (4), i represents a country (i = 1, . . . , 14) and t denotes the year (t = 2006, . . . , 2014). Country FE are captured by θ_i and time FE are captured by γ_{it}. The dependent variable $GINI_{it}$ represents the level of income inequality. The natural logarithm is represented as *ln*. Finally, ε_{it} represents a standard error term. Our coefficients of interests are those related to total government expenditures (β_1) in the equation (3) and those related to redistributive public expenditure categories (β_1, β_2 and β_3) in equation (4).

Below, we will discuss certain econometric problems, which might occur during the estimation of equations previously presented. Due to reverse causality (between income distribution and selected public/redistributive spending category), the independent variables of public spending could potentially be considered endogenous. More precisely, the countries that record higher income inequality rates might be relatively more dependent on public/redistributive spending, or the other way around. Consequently, these independent variables reflecting public expenditures could be correlated with the error term. Additionally, as Martinez-Vazquez, Vulovic, & Dodson-Moreno (2012, p. 107) believe, endogeneity could be the consequence of omitted variables and measurement error.

In order to overcome the problem of endogeneity, we take several steps as in Doerrenberg and Peichl (2014, p. 2072). The following control variables: *ln GDP pc*, *AGEDEP*, *UNEMPLOY*, *URBAN*, and *ln POPUL* are included in our research as our first step since we believe that these variables could be confounding elements. Neglecting these variables could lead to omit variable bias, which could, likely, affect the coefficients of selected public spending categories, i.e. independent variables. We have already discussed these variables in the previous chapter. Thus, it is evident why we consider these variables to have influence on *X* and *Y*. Even after this, we are not completely sure that every confounding variable is excluded from error. Consequently, as the second step, in our research we decide to employ country FE. Thereby, we examine long-lasting variations between selected countries in terms of their public expenditures and its categories and income distribution, but in our research we only use within-country differences. FE allow us to take into account any reverse causality mechanism, which appears to be systematic on country-level. In other words, country FE control time invariant characteristics and

systematic channels on a country-level, if the way in which income distribution rates are influenced by public spending in a consistent way across time span on a country-level. We employ a set of year FE in our research as our next step, as they control for potential year specific effects. Also, if there exist a misleading relations caused by mutual trends in both dependent and independent variables of interest, year FE allow us to control for it. Finally, we cluster adjust the estimated standard errors on a country-level, in order to correct for heteroscedasticity and within country autocorrelation.

5.2.2 Instrumental Variable Approach

Although, the above empirical strategy has described steps to control for possible endogeneity, there still could be space for unbiased estimates. It may be that we have reverse causality problem where the levels of inequality affect redistribution policies. The endogenous nature of our main variables of interest implies that OLS estimates will be biased and inconsistent, since they are correlated with the error term. To tackle this issue, one could find an instrumental variable *Z*, which needs to satisfy the following conditions (Stock & Watson, 2003, p. 333):

- Instrument Relevance (Z_i must be related to the endogenous variable X_i);
- Instrument Exogeneity (Z_i must be related to the outcome Y_i only through X_i);
- Further, instrument must be independent of the error term in equation (3) or equation (4).

Although the last assumption cannot be tested, we can test the first assumption by regressing each endogenous variable ($PSPEND/GDP_{it}$; $PSOC/GDP_{it}$; $PHEALTH/GDP_{it}$; $PEDUC/GDP_{it}$) on the instrumental variable *Z* and other exogenous variables as in equation (3) or (4) as well as country FE. Following Baltagi (1995), we adopt standard 2SLS to process panel data. Baltagi's method makes possible the estimation of a single equation (e.g. model 4) from a system of equations. Here, each endogenous repressors is a dependent variable, whose functional form does not need to be estimated. Yet, a minimum of three instruments must be provided (one for each endogenous variable in equation (4)), in order to satisfy exclusion restriction. Otherwise, equations will be under identified, as there are more unknowns then equations.

In practice, in the First Stage, each endogenous variable ($PSPEND/GDP_{it}$; $PSOC/GDP_{it}$; $PHEALTH/GDP_{it}$; $PEDUC/GDP_{it}$) is regressed on the instrumental variable Z and remaining exogenous variables as in equation (3) or (4), as well as country FE. After, we can examine if the additional IV is in fact correlated to the endogenous variable. In all regressions, the lagged values of our endogenous variables are statistically significant, while external instruments in most cases are not, shedding some doubt on their suitability to act as instruments, which will also determine the choice of IV estimation strategy.

Doerrenberg and Peichl (2014, p. 2074) state that: "The IV Z must not affect error after conditioning on the confounding variables in vector of control variables and the FEs."

Although 2SLS and other IV estimators are consistent as Angrist and Krueger (2001, p. 70) argue, they are not unbiased. "IV estimates are not unbiased since they involve a ratio of random quantities, for which expectations need not exist nor have a simple form. Oppositely, expectations of OLS estimates usually happen and can be measured simply. Since results of IV estimation are considered consistent but not unbiased, one should prefer the work with large samples if considering employing IV."

Our instrumentation strategy is based on employing the set of internal instruments represented by lagged values of our total government expenditure and redistributive policies and a set of external instruments. As our N is equal to 14 and T is equal to 9, we decide to use IV approach following Doerrenberg and Peichl (2014, p. 2074), which examine differences on a country-level in an instrument to identify the desired impact. Therefore, we use initial levels of total general government expenditures and redistributive general government expenditure categories (social protection, healthcare and education) as of 2006 (starting year of our research) and extrapolate them with the growth rate of *GDP*. These values are later used as instruments for the desired independent variable. Hence, our IVs take the initial value of the respective independent variable reflecting public spending in the starting year of our research 2006 and later grow together with *GDP* (measured by GDP annual growth rate). In addition, we employ lagged values of our redistribution policies, as an additional set of instruments.

Following Doerrenberg and Peichl (2014, p. 2075), we believe that our instruments are exogenous, since we do not use the actual observed annual values of public spending categories. The instrument for one of the independent variables could increase between two years of observation on a country-level. However, the actual value of the independent variable remains stable. Also, need to suppose that conditional on our control variables and FE, the trends of income distribution are uncorrelated with growth rates of *GDP* (that are used for extrapolation). Therefore, this could be justified since *GDP* is, like our other variables, controlled on both stages of our estimation. However, the results of IV regression will solely depend on the presupposition of instrument validity. In other words, conditional on all control variables as well as the country and year FE, the instruments need to influence income distribution only through the desired predictor variable. Validity of this presumption needs to be approached intuitively, since it is untestable. As our instruments are not randomly assigned to each year-country observation it is, consequently, difficult to claim that we are able to establish a casual relationship that is based on our quasi-experimental set-up. Still, as we extrapolate total general government expenditures and redistributive categories of government spending in 2006 with the growth rate of *GDP*

to create our IV, we believe that we exploited some exogenous variation, meaning that income inequality is not directly related to these extrapolated values.

6 EMPIRICAL FINDINGS

Below, we will present and explain our empirical results obtained. We apply two different model specifications and estimation procedures to get our results. Firstly, we will explain the results from our panel data analysis using FE and our initial model. Secondly, we will present and explain results of employing IV estimator, used due to possible endogeneity of our independent variables.

6.1 Fixed Effects Regression

Table 3 below provides displays coefficients and their statistical significance. Column 1 provides results for our initial model as in equation (3), while columns 2-4 present the results for each redistribution policy separately. Finally, column 5 provides the result of our augmented empirical model as in equation (4), where all redistribution policies are included simultaneously.

Before the explanation of results, we will discuss some of the standard diagnostics tests. Hausman test suggest that FE is preferred to RE specification since in all models the null hypothesis stating there does not exist correlation among country FE and regressors is rejected at 1% significance levels. We have also tested potential crossectional correlation of errors across countries using Pesaran test. Again, in all specifications, we are unable to reject the null hypothesis declaring no crossectional dependence. Finally, the inclusion of time dummies proves to be insignificant. They are typically used to deal with unobserved mutual shocks that lead to cross-sectional dependence. Therefore, all models are estimated using Rogers' heteroskedasticity and autocorrelation-corrected (robust) standard errors.

As can be seen from Table 3, it seems that higher *GDP pc* causes drop in income inequality levels. These findings are robust across several different specifications.

Table 3. Fixed Effects Panel Estimation[31]

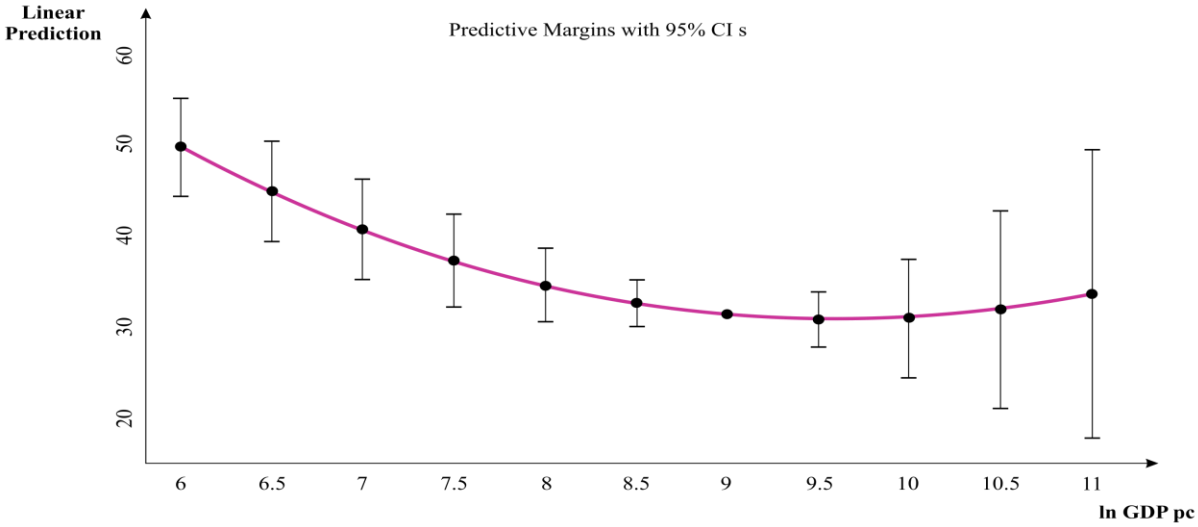
VARIABLES	(1) Fixed Effects	(2) Fixed Effects	(3) Fixed Effects	(4) Fixed Effects	(5) Fixed Effects
ln GDP pc	-27.98**	-25.96**	-24.39**	-27.31**	-21.24**
	(10.21)	(10.01)	(9.088)	(9.960)	(9.453)
ln GDP pcsq	1.454*	1.356*	1.227*	1.413*	1.083
	(0.708)	(0.679)	(0.626)	(0.696)	(0.646)
PSPEND/GDP	0.0673				
	(0.0825)				
PSOC/GDP		-0.431			-0.748**
		(0.271)			(0.281)
PHEALTH/GDP			0.675*		0.927*
			(0.357)		(0.483)
PEDUC/GDP				0.736	1.128**
				(0.500)	(0.463)
AGEDEP	0.499	0.857	0.508	0.692	0.970
	(1.162)	(1.141)	(1.086)	(1.111)	(1.013)
UNEMPLOY	-0.0333	0.0203	-0.0381	-0.0445	0.0230
	(0.113)	(0.109)	(0.106)	(0.115)	(0.101)
URBAN	0.302	0.390	0.387	0.262	0.498
	(0.558)	(0.503)	(0.548)	(0.536)	(0.442)
ln POPUL	-1.300	9.968	4.989	-1.323	11.17
	(31.95)	(23.99)	(27.99)	(27.54)	(18.97)
Constant	138.6	108.8	107.4	135.1*	70.43
	(80.39)	(64.47)	(66.32)	(70.55)	(46.11)
Observations	126	126	126	126	126
R-Squared	0.132	0.164	0.148	0.147	0.249
Number of Countries	14	14	14	14	14
Country FE	YES	YES	YES	YES	YES
Hausman Test (p-value)	0.0001	0.0000	0.0000	0.0000	0.0000
Pesaran Test (p-value)	0.4379	0.1092	0.9719	0.8874	0.2113
F Test for Time Dummies (p-value)	0.4212	0.5151	0.4217	0.2371	0.5253

However, when we look at the square term, the findings suggest that after a certain threshold, the increase in *GDP pc* leads to higher income inequality, which somewhat contradicts Kuznets curve. By running a "margins" command in Stata, we are able to plot the predicted values of GINI at different levels of *ln GDP pc* shown in the Figure 8 below. As we can see, after countries reach the levels of *ln GDP pc* of around 9.5 (which translates to around 13,400 EUR), the effect of growth of income levels causes growth of income inequality in our initial model presented in the first column.

[31] Robust standard errors in parentheses

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

Figure 8. Predicted Values of GINI at Different Levels of ln GDP pc sq



Turning to our main variables of interests, it seems that most of them are not precisely estimated (as we obtain relatively large standard errors). The results from our initial model in column 1 in Table 3 suggest non-significant effects of government spending on income inequality, which somewhat contradict existing empirical findings (Goni, Lopez, & Serven, 2011; Martinez-Vazquez et al., 2012). Yet, as argued by Anderson, d'Orey, Duvendack, & Esposito (2016), the link public spending – income distribution is very complex. Consequently, numerous questions regarding government results in reducing income inequality in middle-income countries exist. In meta regression analysis, Anderson et al. (2016) suggest the results regarding the link public spending - income distribution are influenced by a numerous elements. These elements are the following: the selection of countries/time periods, the selection of control variables, the chosen analytical approach and selection of indicators for capturing public spending and its categories. They also find that studies using *GINI* as a measure of income inequality tends to produce weaker results in comparison to share of the richest 10% or 20% in national income and vice versa, when focusing on the poorest 20% or 40%. This suggests that government spending benefits only middle-income groups and does not extend to entire income distribution.

In the remaining columns in the Table 3, we focus on the effects of different categories of government spending. When redistribution policies are observed in isolation from each other, only those related to health expenditure (column 3) seem to affect income inequality. Results from column 3 suggest that increase in health expenditure increase income inequality, which contradicts some of the previous findings (Ospina, 2014). This result suggests that health spending is slightly digressive in income. The effects of social

expenditure and educational expenditure turn out to be insignificant, the latter finding being in line with Dollar, Kleineberg, & Kraay (2013).

One of the potential reasons for insignificant effects of categories of public expenditure is that changes in income do not necessarily lead to increased welfare. For example, studies based on income distribution do not convey information on final beneficiaries and the value they attach to the benefits (Schwartz & Ter-Minassian, 2000). Therefore, instead of using income inequality as a measure of effectiveness of public policy, health expenditure should be evaluated based on increase in life expectancy or in the case of education expenditure, increased tertiary enrolment.

When all variables of interest are estimated simultaneously, their signs remain the same, however, they all become significant. The results suggest that social spending is related to decrease in income inequality as one percentage point increase in public spending on social care causes decrease of about 0.748 percentage points of *GINI*. We notice that our finding is similar to those empirical researches discussed in Section 3. Instead, public spending on health care and education causes growth of *GINI*. While certain studies find similar link (Bergh & Fink, 2008), we must say that this finding appears to be rather unusual. We would expect that higher educational attainment would lead to more balanced distribution of human capital resulting in reduction of income gaps. In addition, our model is not able to capture different levels of educational expenditure as in Holzner (2011), and, therefore, it may be that the results are led by specific expenditure of one category. Finally, since our time period is relatively short, we are not able to capture the long-term effects of increased educational expenditure.

Finally, our results show that none of the control variables selected for our research had an impact on income inequality levels in SEE countries.

6.2 Instrumental Variable Regression

To check the stability of our findings conditional on addressing potential endogeneity bias, Table 4 below presents the results based on 2SLS method, where we employ instruments discussed in the previous Section.

In implementing instrumental variable regression we used 2SLS. Also, we used two additional methods to IV estimation: Two-Step Generalized Method of Moments (hereafter: 2SGMM) and Limited Information Maximum Likelihood (LIML) estimation. The reason for using 2SGMM is the presence of heteroscedasticity, while the use of LIML is justified on the basis that some of the instruments may be weak as indicated in the unsubstantial connection among external variables and our endogenous explanatory

variables in the first stage of 2SLS. In addition, Baum, Schaffer, & Stillman (2007, p. 23) state that LIML has better small sample properties compared to 2SGMM.

Table 4 reports basic diagnostics from FE IV estimation, where each endogenous variable is instrumented by its own lagged value plus one external instrument described in Section 5.2.2. IV estimators can perform poorly when the instruments are uncorrelated or weakly correlated with endogenous variables (Guicciardi, 2015). Therefore, we report tests for under identification and weak identification. The Kleibergen and Paap (2006) test statistics lead to assumption that under identification is not a problem at conventional levels of significance except in the fully augmented model. The values of the Kleibergen-Paap rk Wald F statistic also suggests that the null of weak correlation of instruments and endogenous independent variables should be rejected; except in the initial and fully augmented model. Moreover, the orthogonality of the instruments is tested by the Hansen (1982) J statistics, which suggest that there is no correlation between instruments and residuals and therefore are valid.

Since in all three approaches to IV regression the results are very similar and consistent, we report the result based on 2SGMM, since LIML was not able to satisfy over identifying restrictions. Finally, the endogeneity test for which the null hypothesis is that each endogenous regressor or their combination can be treated as exogenous is also reported. Since the null hypothesis cannot be rejected, we can assume that government expenditure and its components can be treated as exogenous. This cautions against a presumption of endogeneity.

Nevertheless, we also interpret the results of IV estimation to examine the robustness of our findings. In comparison to FE regression shown in Table 3, the IV estimations in Table 4 are very similar; namely, the effects of total government expenditure are insignificant in explaining income inequality. The effect of *GDP pc* again shows sign of nonlinearity, suggesting that increase in average income firstly has a strong effect on reducing *GINI*. However, when it reaches a certain level, it becomes positive and therefore contributes to growth of *GINI* in our sample. Quantitatively, the magnitude is larger in comparison to results reported in Table 3. Turning to individual categories of government expenditures, the results from Table 4 suggest that only health expenditure has an impact on *GINI*. One percentage point increase in health expenditure causes 1.2 percentage point increase in *GINI*, which is almost twice in size in comparison to coefficient reported in FE model suggesting that OLS estimates underestimate the effects of health expenditure on income inequality. The control variables again prove to be insignificant in explaining income inequality. When looking at all three categories simultaneously in column 5 in Table 4, all the variables lose their significance, which may be the consequence of weak instruments. For that reason, we have excluded external instruments and rerun the IV regression including only lagged values of endogenous regressors, but the results remained

qualitatively the same. The only exception here seems to be the results of PHEALTH that showed to be significant within the fully augmented model in this case and had a positive sign[32]. Given that the results of both FE and IV regression are very similar and since our model diagnostics suggest that government expenditure and its components can be treated as exogenous, we have some reasons to believe that our results are not driven by endogeneity issues.

Table 4. Instrumental Variable Regression[33]

VARIABLES	(1) Instrumental Variable	(2) Instrumental Variable	(3) Instrumental Variable	(4) Instrumental Variable	(5) Instrumental Variable
ln GDP pc	-34.49***	-34.72***	-26.24***	-30.43***	-18.579
	(9.704)	(9.259)	(8.585)	(8.990)	(15.48)
ln GDP pcsq	1.859***	1.846***	1.370**	1.622***	0.956
	(0.643)	(0.612)	(0.570)	(0.596)	(0.967)
PSPEND	0.0545				
	(0.287)				
PSOC		-0.555			-1.078
		(0.572)			(0.715)
PHEALTH			1.278**		0.731
			(0.610)		(1.089)
PEDUC				0.578	2.002
				(0.696)	(1.376)
AGEDEP	0.723	1.135	0.604	0.944	1.660
	(1.104)	(1.186)	(1.102)	(1.118)	(1.282)
UNEMPLOY	-0.0297	0.0422	-0.0184	-0.0485	0.040
	(0.130)	(0.139)	(0.116)	(0.125)	(0.093)
URBAN	0.422	0.505	0.432	0.365	0.428
	(0.522)	(0.429)	(0.558)	(0.543)	(0.421)
ln POPUL	3.625	14.37	4.968	4.223	11.022
	(39.90)	(18.82)	(26.04)	(26.43)	(17.218)
Observations	112	112	112	112	112
R-Squared	0.159	0.175	0.166	0.163	0.196
Number of Countries	14	14	14	14	14
Country FE	YES	YES	YES	YES	YES
KP Weak Identification Test	4.869	34.73	18.53	45.13	3.180
KP Under Identification Test (p-value)	0.0253	0.0250	0.0145	0.0584	0.1161
Endogeneity Test (p-value)	0.991	0.690	0.202	0.748	/
Hansen Test (p-value)	0.896	0.534	0.460	0.929	0.1192

[32] The results of this alternative specification are available on request.

[33] Robust standard errors in parentheses

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

6.3 Main Limitations of Research

Every research has some limitations, and in this section we list some of the main shortcomings that we recognize in our study. The below listed acknowledgements of our research limitations can be seen as an opportunity for further development of future research in this filed. Finally, we believe that our research provides valuable data that could be used for future research.

The main limitation of our research is, undoubtedly, limited data, as in many studies covering transition countries. Therefore, we combined multiple data sources. To unify our dataset, we sometimes converted values from national currency or USD to the euro. Sometimes we used available data to calculate the missing variables. In order to increase our initial sample of Western Balkan Countries, we included data for other SEE countries, based on their geographical position. However, this could be considered as a shortcoming. Austria and Greece are the only non-transition countries in the sample, with Austria being apparently the most developed country compared to others. Moreover, Moldova is the only lower-middle-income country in the sample and only CIS country. Therefore, these countries significantly differ from the rest of the sample. Also, we were unable to include in our research a set of desired variables, i.e. indicators that are being used by other researchers exploring this field in samples covering developed or OECD countries.

Another limitation of our research is a rather short time period covered 2006-2014, i.e. period of nine years. This is closely linked to historical context and preconditions in SEE countries covered since data for Serbia and Montenegro are merged for years prior to 2006. Data for years 2015 and 2016, on the other hand, is not yet available for the majority of countries from our sample. As we previously discussed, effect of general government expenditures on education and on income distribution are usually felt after longer period. Hence, due to rather limited time span of the data, it is possible that we were unable to catch this impact.

We used the multivariate regression approach, as it can analyse the impact of differences in levels of public expenditures across selected countries on income distribution over selected time span. However, due to data unavailability we were unable to include in our research certain specific country-level facts that would, potentially, have an important impact on the overall effect.

Besides, we were faced with the potential problem of endogeneity. To tackle this issue, we've combined data from numerous sources and we've employed several identification strategies. However, endogeneity is a mute issue and we can never be sure that the endogeneity bias has been fully accounted for.

Moreover, in all regressions, the lagged values of our endogenous variables are statistically significant, while external instruments in most cases are not, shedding some doubt on their suitability to act as instruments. However, due to the difficulty of finding available data, we were faced with an issue of limited instruments and were unable to find additional external instruments to use.

CONCLUSION

The overall objective of our research was to research the link between public spending and income distribution in 14 selected SEE countries over a time span 2006-2014. Additionally, we aimed to investigate the effects of redistributive public spending categories (social protection, healthcare and education) on income distribution. The first hypothesis was stated as follows: Higher total general government spending is negatively associated with income distribution in SEE countries. Our second hypothesis was: Higher spending of the general government on redistributive categories is negatively associated with income distribution in SEE countries. The selected dependent variable in our research was GINI. The independent variables of interest in our research included the total general government spending and redistributive public spending categories, measured by their share in country's GDP.

In our research, we employ panel data methods of estimation. To tackle the issue of endogeneity, we took several remedies, including an IV estimate. Our first step was to include a chosen control variables in our research. As our second step, country and time related dummies were included. As our remedy to heteorskedasticity, the estimated standard errors were cluster adjusted for each individual country in order to correct for heteroscedasticity and within country autocorrelation. Since initial conditions in individual SEE countries were different, we controlled for initial conditions where possible. Finally, due to potential reverse causality problems, we decided to follow IV approach. As set of instruments, we employed lagged values of our redistribution policies together with initial conditions as our exogenous instruments.

The results from the initial model, in both of our regressions (exogenous and IV estimate), suggest that public spending does not have a significant effect on income distribution in selected SEE countries in selected time span. This finding is not in line with our first hypothesis. When redistributive categories of public spending are observed in isolation from each other, in both of our regressions, only those related to healthcare proved to be significant and positively associated with income distribution. When all the three redistributive categories of public spending are estimated simultaneously in FE regression, they all become significant in explaining income distribution, but their coefficients have different signs. Therefore, the latter finding is also not in line with our second hypothesis and expectations.

The results suggest that only public spending on social protection is associated negatively with income distribution in SEE countries. On the contrary, other redistributive public spending categories (healthcare and education) have a positive effect on income distribution. However, when looking at all three categories of redistributive public spending simultaneously in IV regression, all the variables lose their significance, which may be the consequence of weak instruments. Therefore, we tried to exclude external instruments and rerun the IV regression including only lagged values of endogenous regressors. Yet, the results remained qualitatively the same, with the exception that public expenditures on healthcare turned out to be significant and positively related to income distribution in the fully augmented model. Hence, these results proved to be not stable to changes in estimators, and we cannot make strong inference out of it.

Given that the results of both FE and IV regression are very similar and since our model diagnostics suggest that public spending and its redistributive components can be treated as exogenous, we believe that our results are not driven by endogeneity bias. From both of our regressions, it comes out that *GDP pc* is negatively associated with income distribution. Regarding the effects of control variables in both of our regressions, the results suggest that none of them is able to explain with conventional precision the effect on income inequality.

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APPENDIXES

TABLE OF APPENDIXES

APPENDIX A: List of Abbreviations

2SGMM	Two-Step Generalized Method of Moments
2SLS	Two-Stage Least Squares
AGEDEP	Age Dependency Ratio
ALBANIA	Republic of Albania
AUSTRIA	Republic of Austria
B&H	Bosnia and Herzegovina
BTI	Bertelsmann Stiftung's Transformation Index
CIS	Commonwealth of Independent States
CROATIA	Republic of Croatia
EU	European Union
EUR	The euro
Eurostat	Statistical Office of the European Union
FE	Fixed Effects
GDP	Gross Domestic Product
GDP pc	Gross Domestic Product per capita
GINI	Gini Coefficient/Index
GLS	Generalized Least Squares
GMM	Generalized Method of Moments
GNI	Gross National Income
GREECE	Hellenic Republic
HUNGARY	Republic of Hungary
IBRD	International Bank for Reconstruction and Development
ILO	International Labour Organization
ILOSTAT	International Labour Organization Database of Labour Statistics
IMF	International Monetary Fund
IV	Instrumental Variable
LIML	Limited Information Maximum Likelihood
KOSOVO	Republic of Kosovo
MACEDONIA	Former Yugoslav Republic of Macedonia
MOLDOVA	Republic of Moldova
MONTENEGRO	Republic of Montenegro
OECD	Organisation for Economic Co-operation and Development
OLS	Ordinary Least Squares
PEDUC/GDP	Total General Government Expenditures on Education as % of Gross Domestic Product
PEDUC	Total General Government Expenditures on Education in million euro
PHEALTH/GDP	Total General Government Expenditures on Healthcare as % of Gross Domestic Product

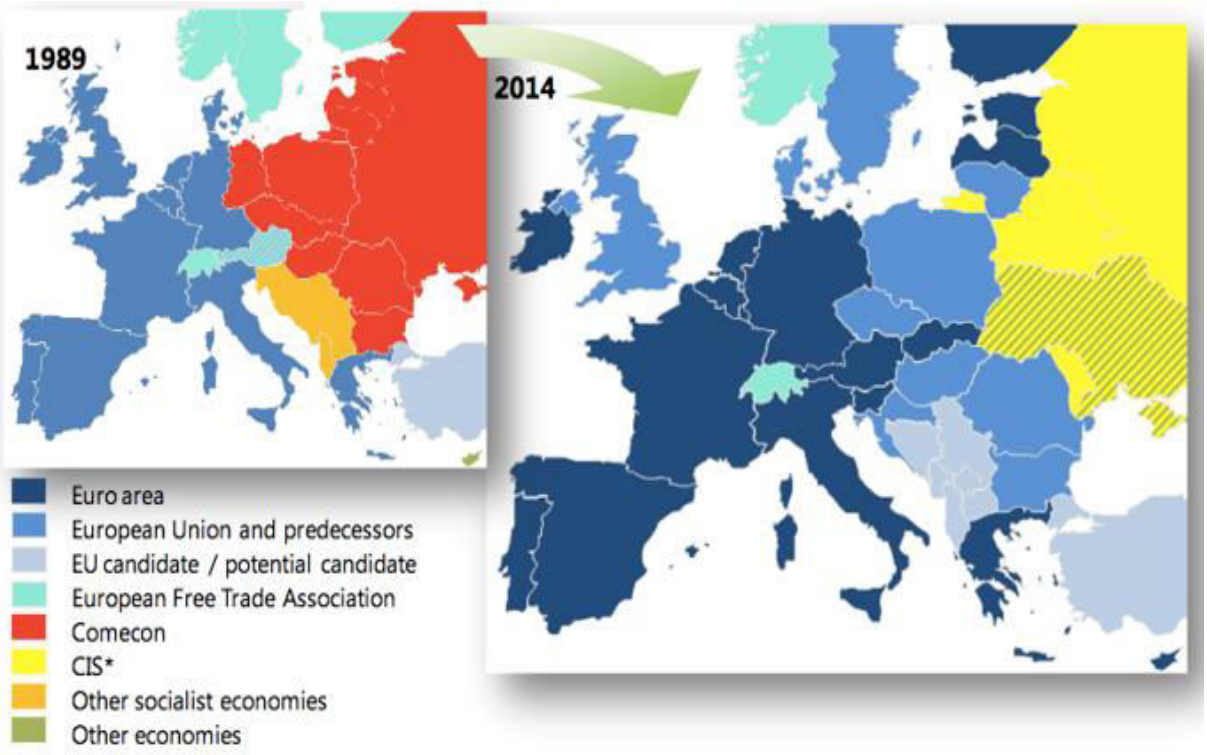
PHEALTHL	Total General Government Expenditures on Healthcare in million euro
POPUL	Total population
PSOC/GDP	Total General Government Expenditures on Social Protection as % of Gross Domestic Product
PSOCL	Total General Government Expenditures on Social Protection in million euro
PSPEND/GDP	Total General Government Expenditures as % of Gross Domestic Product
PSPENDL	Total General Government Expenditures in million euro
RE	Random Effects
SERBIA	Republic of Serbia
SLOVAKIA	Slovak Republic
SLOVENIA	Republic of Slovenia
SU	Soviet Union
UNEMPLOY	Unemployment Rate
URBAN	Urbanization Rate
USA	United States of America
USD	United States dollars
WIID	World Income Inequality Database

APPENDIX B: Maps

Figure 1. Map of SEE Countries

Source: Adapted from *South East Europe Programme Area,* 2016.

Figure 2. European Integration: 1989-2014



Source: International Monetary Fund, 2014b, p. 13, Figure European Integration.

APPENDIX C: General Information

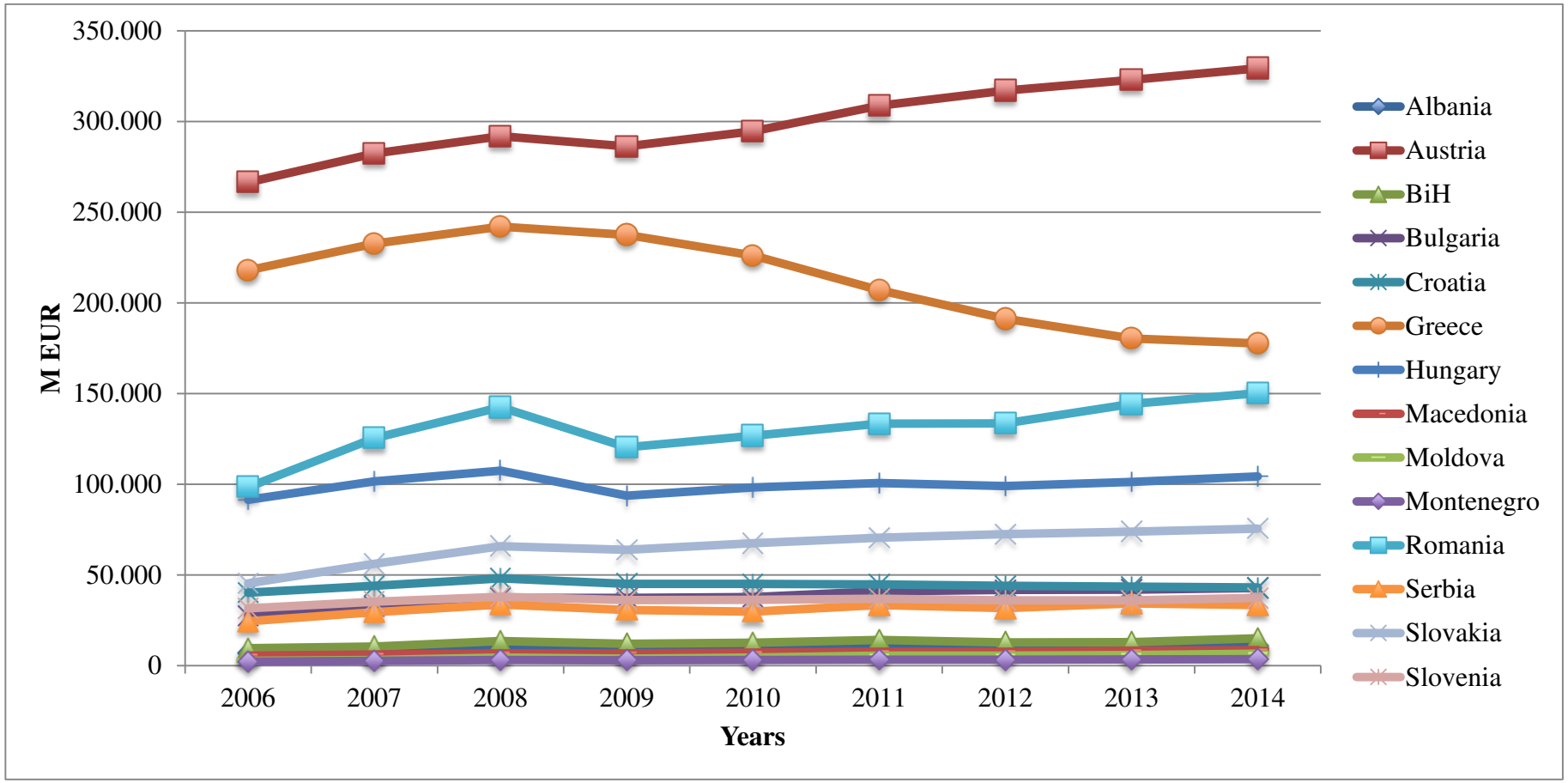
Table 1. SEE Countries Data, 2014

Country	Former Communist /Socialist Country	Transition Country	EU Membership Status	Currency	Income Level	OECD Membership Status	Population (in M)
Albania	Yes	Yes	Candidate	National	Upper-Middle	Non-OECD	2.9
Austria	No	No	Member State	EUR	High	OECD Member	8.5
B&H	Yes	Yes	Potential Candidate	National	Upper-Middle	Non-OECD	3.8
Bulgaria	Yes	Yes	Member State	National	Upper-Middle	Non-OECD	7.2
Croatia	Yes	Yes	Member State	National	High	Non-OECD	4.2
Greece	No	No	Member State	EUR	High	OECD Member	10.9
Hungary	Yes	Yes	Member State	National	High	OECD Member	9.9
Macedonia	Yes	Yes	Candidate	National	Upper-Middle	Non-OECD	2.1
Moldova	Yes	Yes	Bilateral Cooperation	National	Lower-Middle	Non-OECD	3.6
Montenegro	Yes	Yes	Candidate	EUR*	Upper-Middle	Non-OECD	0.6
Romania	Yes	Yes	Member State	National	Upper-Middle	Non-OECD	19.9
Serbia	Yes	Yes	Candidate	National	Upper-Middle	Non-OECD	7.1
Slovakia	Yes	Yes	Member State	EUR	High	OECD Member	5.4
Slovenia	Yes	Yes	Member State	EUR	High	OECD Member	2.1

Source: *European Neighbourhood Policy and Enlargement Negotiations*, 2016; *Eurostat*, 2016; *World Bank,* 2016a; *OECD*, 2016b.

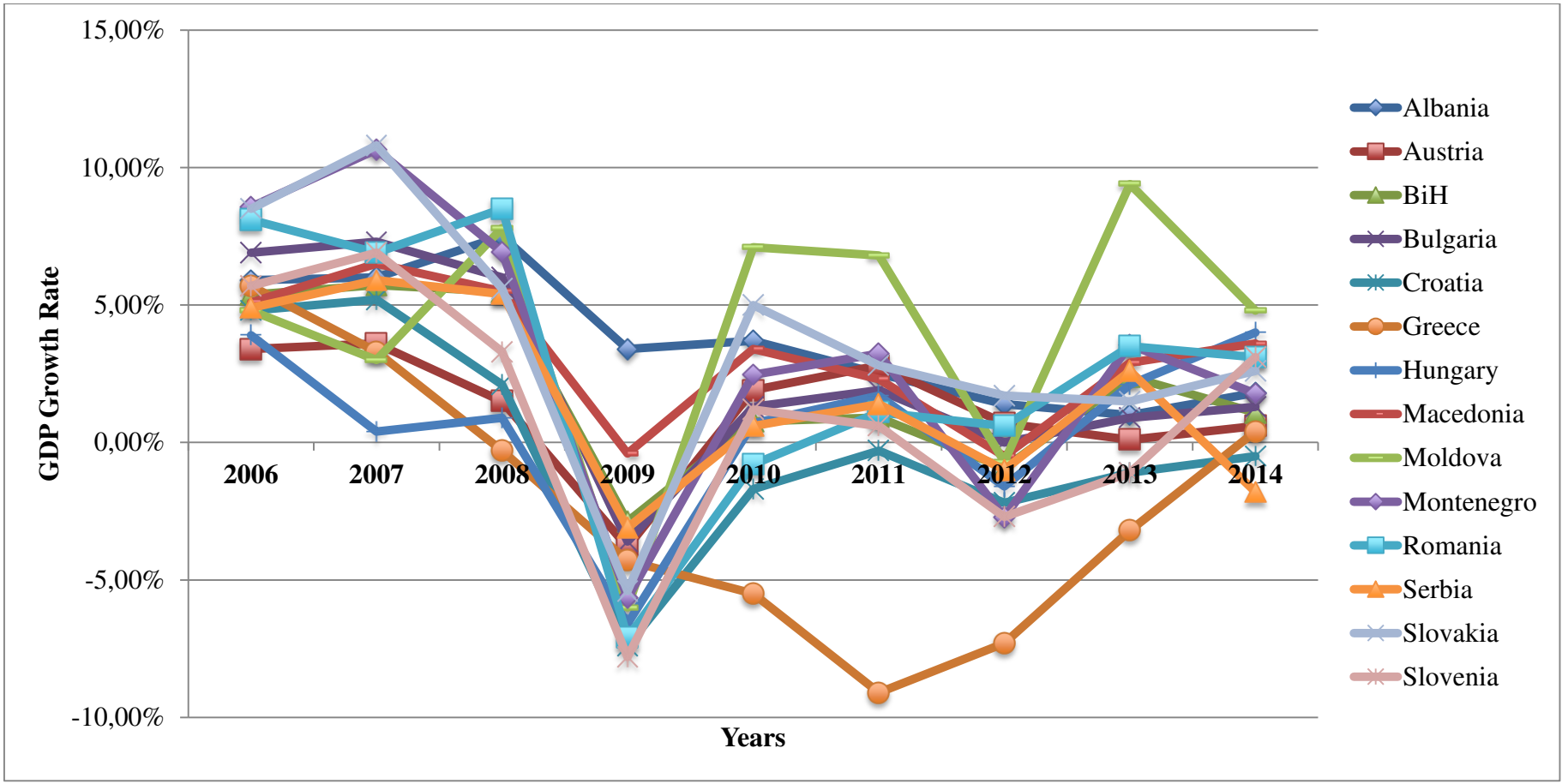
APPENDIX D: Gross Domestic Product

Figure 3. Gross Domestic Product (in million EUR, current prices)



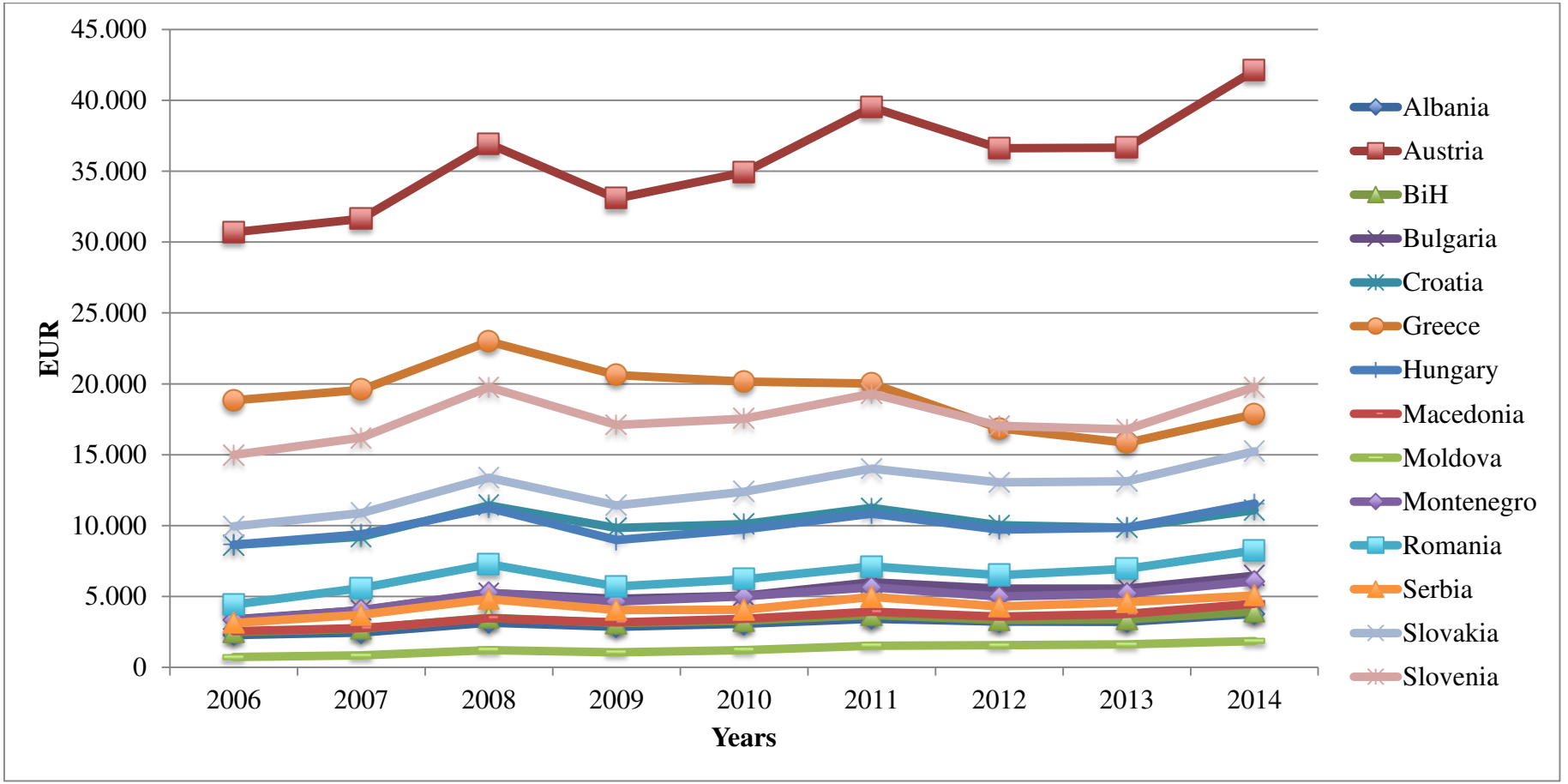
Source: *Eurostat; World Bank Databank.*

Figure 4. Annual GDP Growth Rate



Source: *Eurostat; World Bank DataBank.*

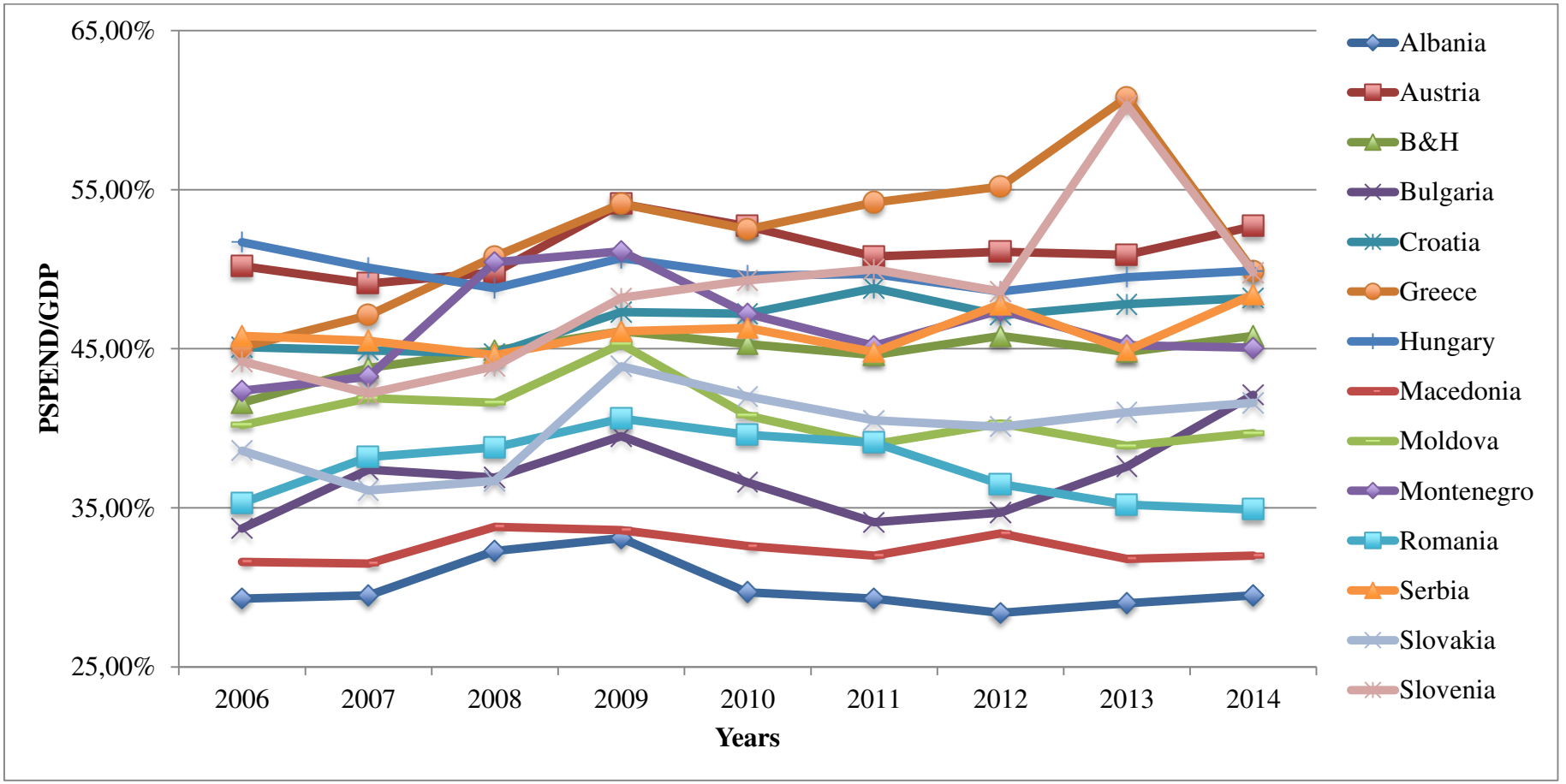
Figure 5. GDP per capita (in EUR)



Source: *World Bank DataBank.*

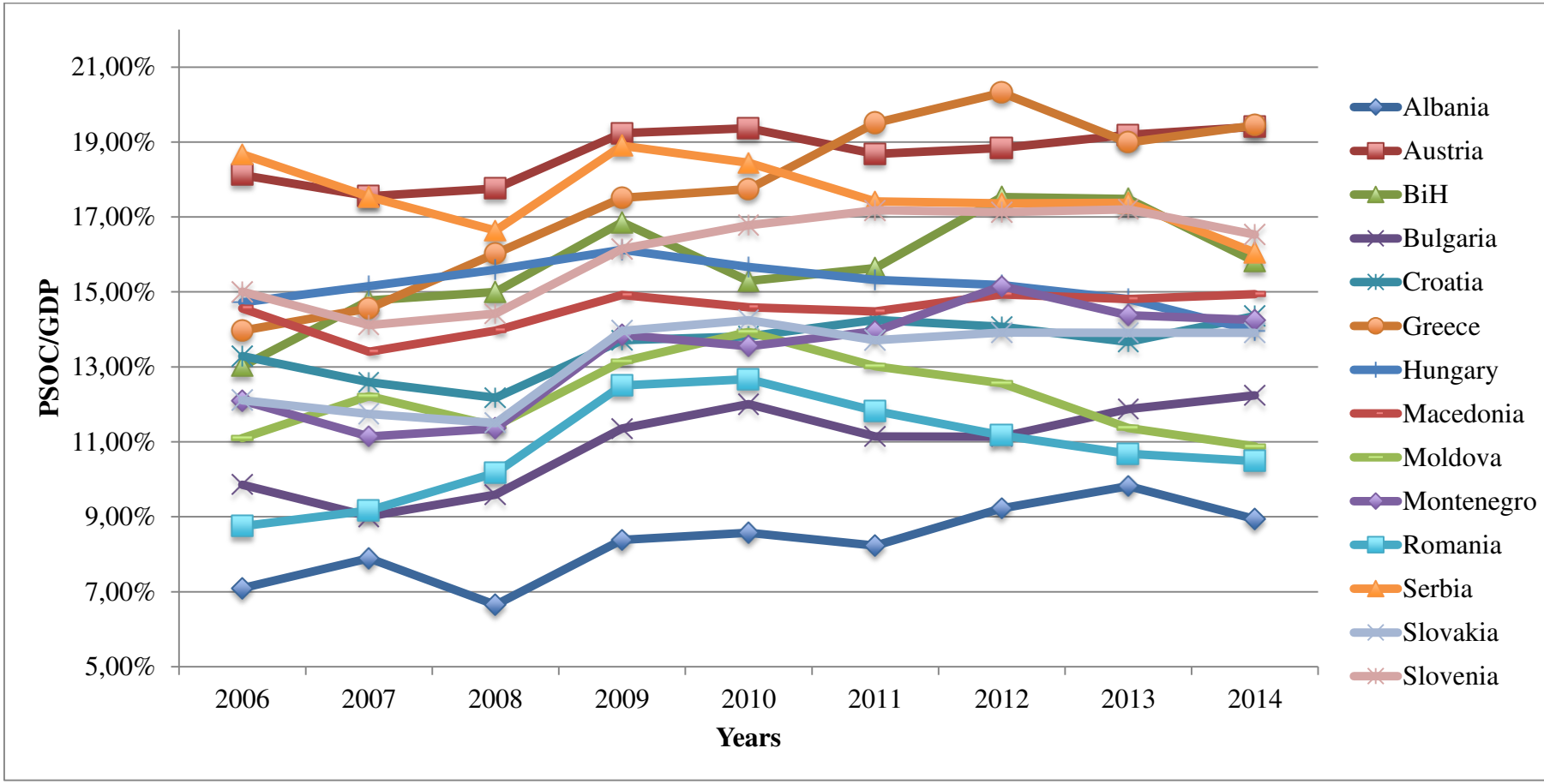
APPENDIX E: Independent Variables

Figure 6. Total General Government Expenditures (in % of GDP)



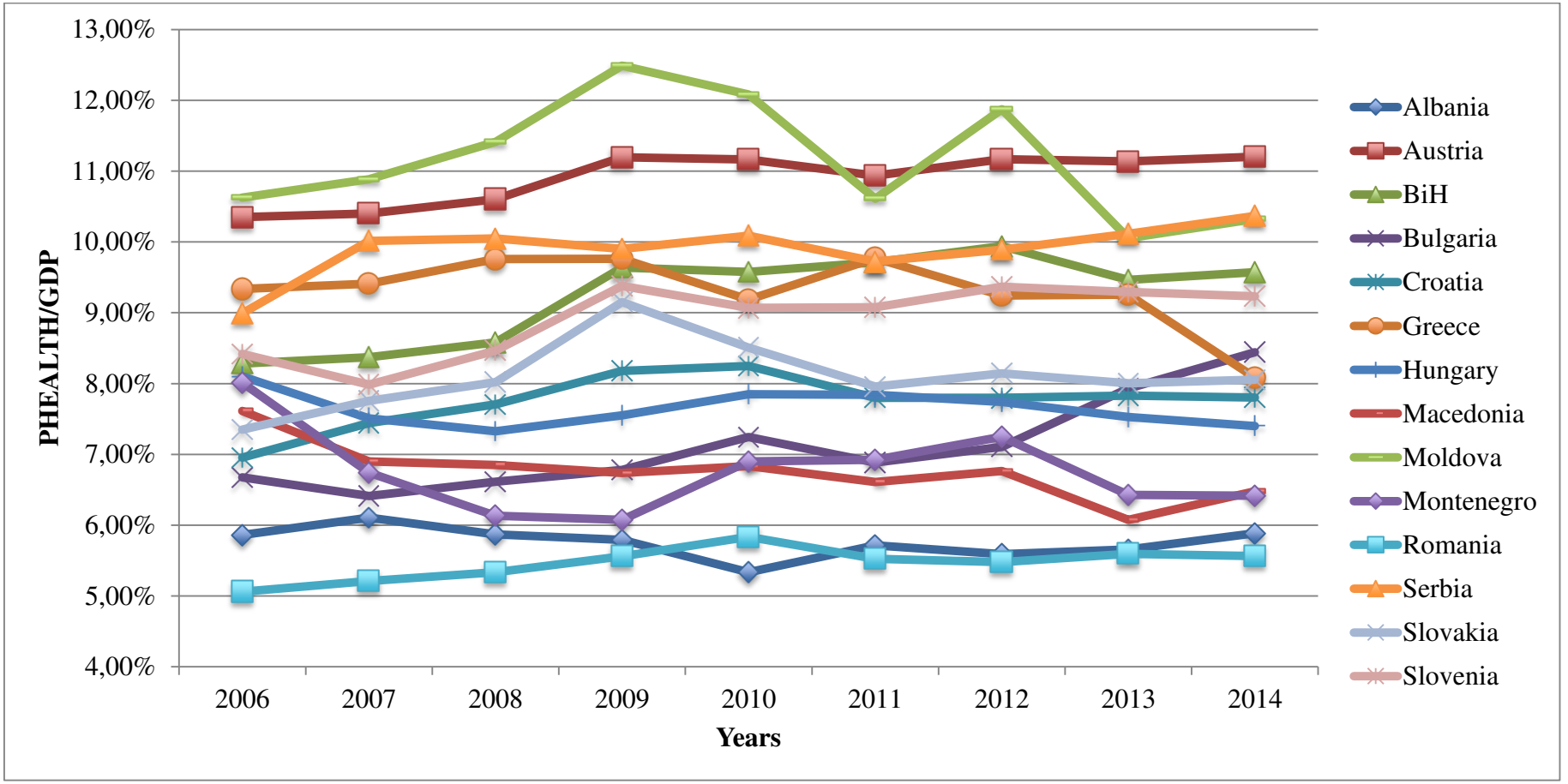
Source: *Bank of Albania; Central Bank of Bosnia and Herzegovina; Eurostat; Ministry of Finance of the Republic of Albania; Ministry of Finance of the Republic of Macedonia; Ministry of Finance of the Republic of Montenegro; World Bank DataBank.*

Figure 7. General Government Expenditures on Social Protection (in % of GDP)



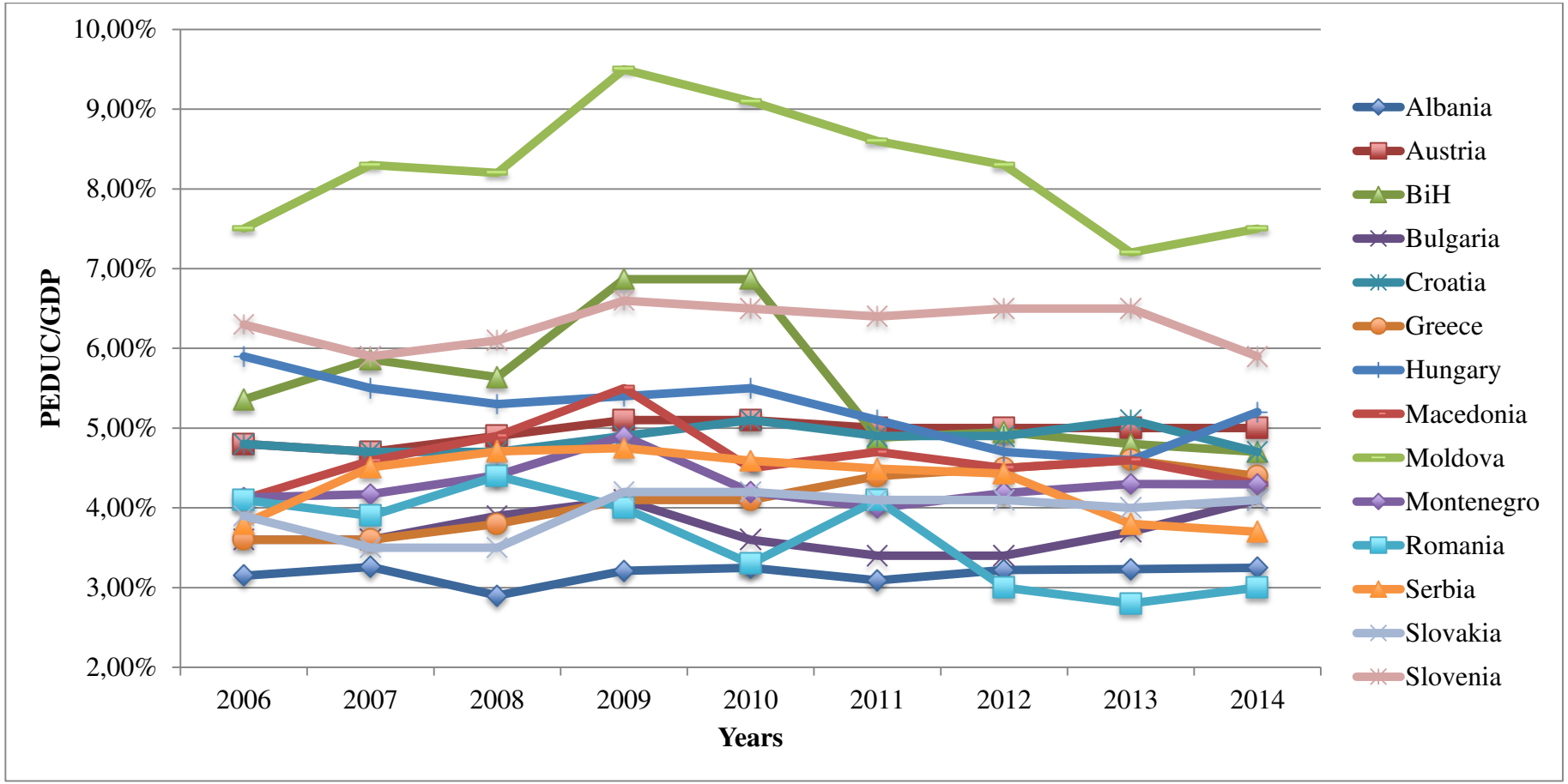
Source: *Author's Calculations using Excel.*

Figure 8. General Government Expenditures on Healthcare (in % of GDP)



Source: *World Bank DataBank.*

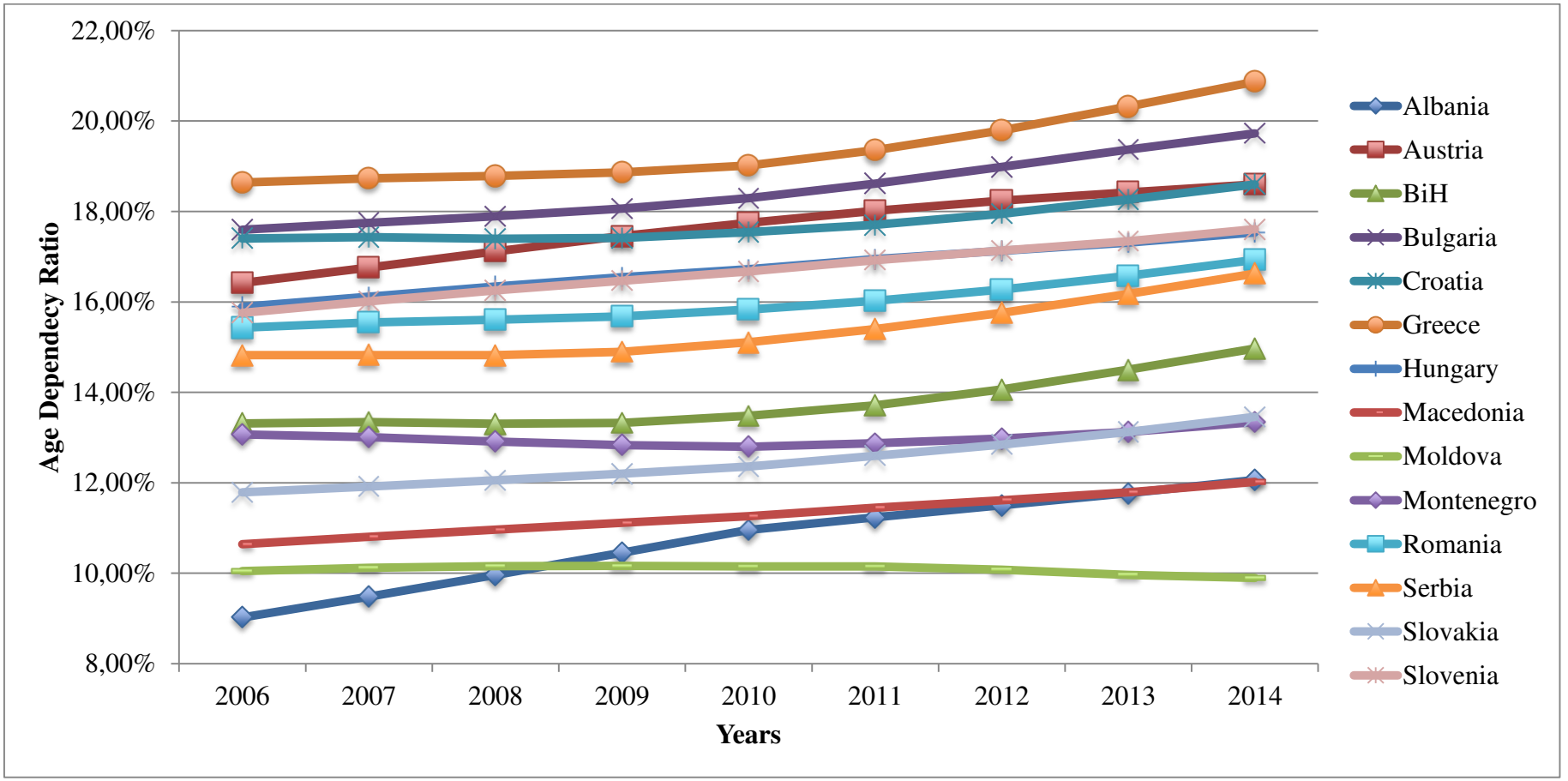
Figure 9. General Government Expenditures on Education (in % of GDP)



Source: *Author's Calculations; Bank of Albania; Brankovic et al.,* 2016; *DeviInfo; Directorate for Economic Planning of Bosnia and Herzegovina,* 2015; *European Commission,* 2014; *European Training Foundation; Eurostat; Government of the Republic of Macedonia,* 2009; *me4eu; Ministry of Finance and Treasury of Bosnia and Herzegovina & United Nations Development Programme in Bosnia and Herzegovina,* 2013; *Ministry of Finance of the Republic of Republic of Montenegro; Ministry of Finance of the Republic of Serbia; Svetlana Bortoi,* n.d.; *World Bank,* 2012; *World Bank,* 2013; *World Bank DataBank.*

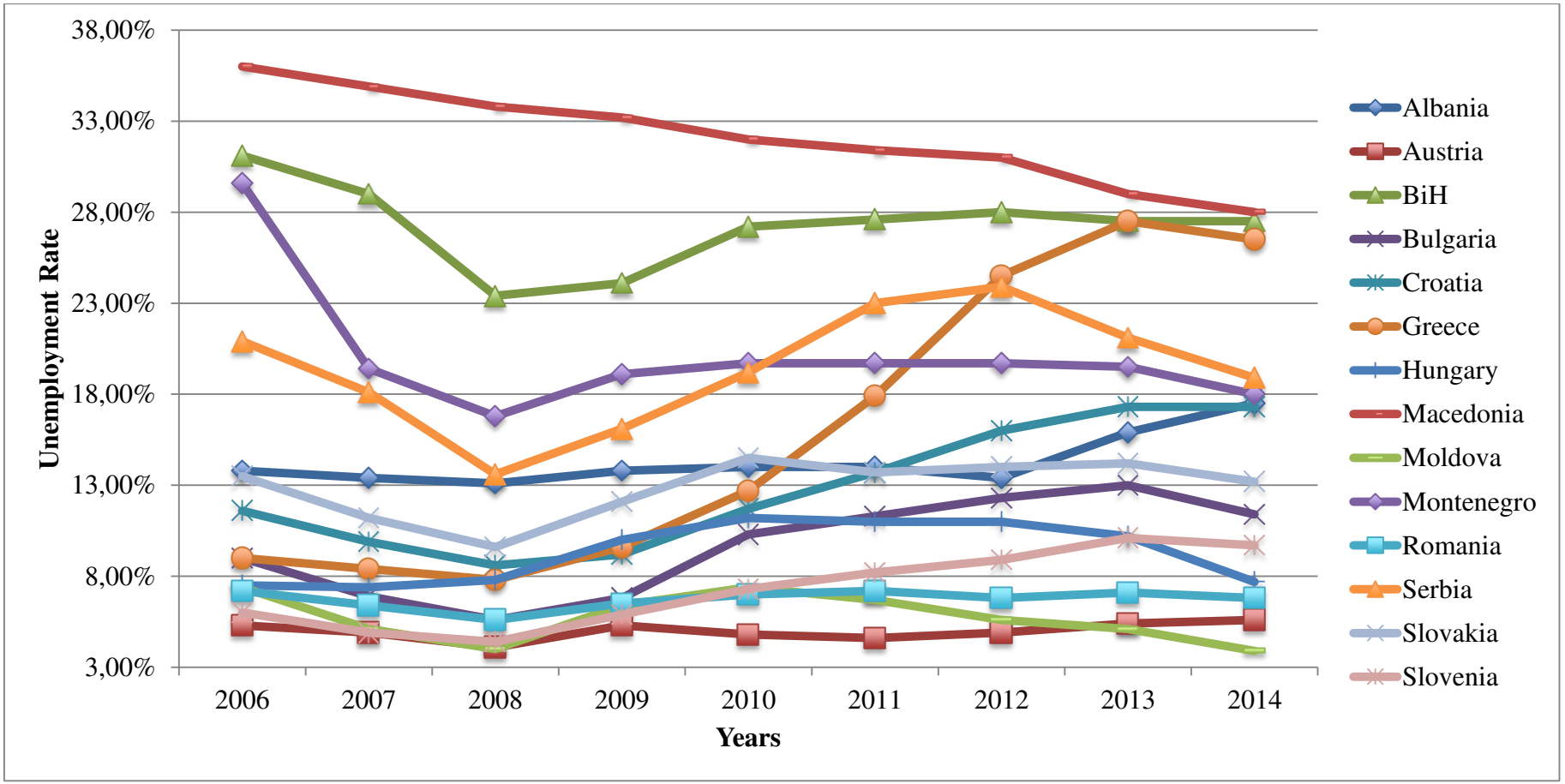
APPENDIX F: Control Variables

Figure 10. Age Dependency Ratio (population ages 65 and above as % of total population)



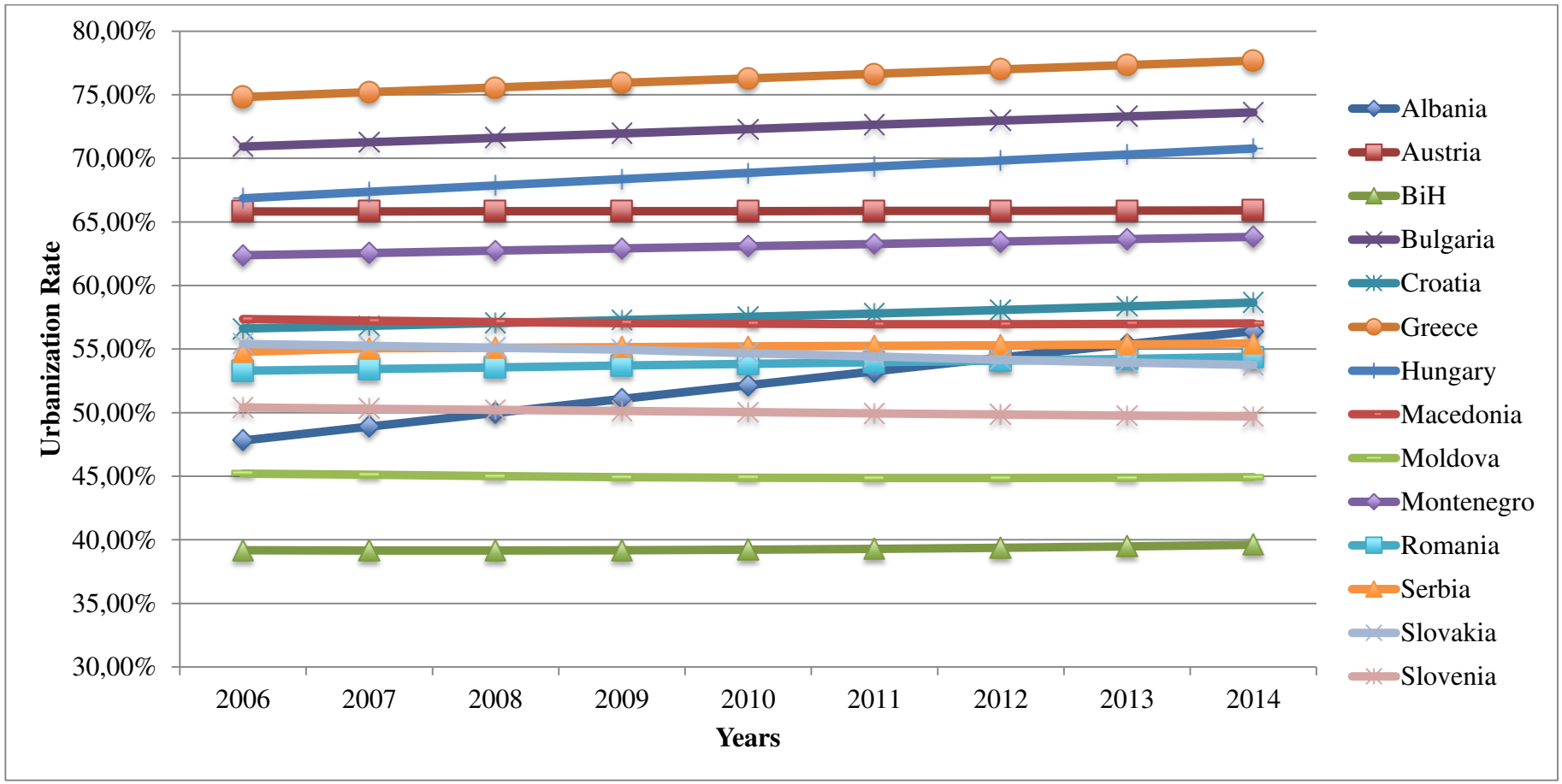
Source: *World Bank DataBank.*

Figure 11. Unemployment Rate (annual average)



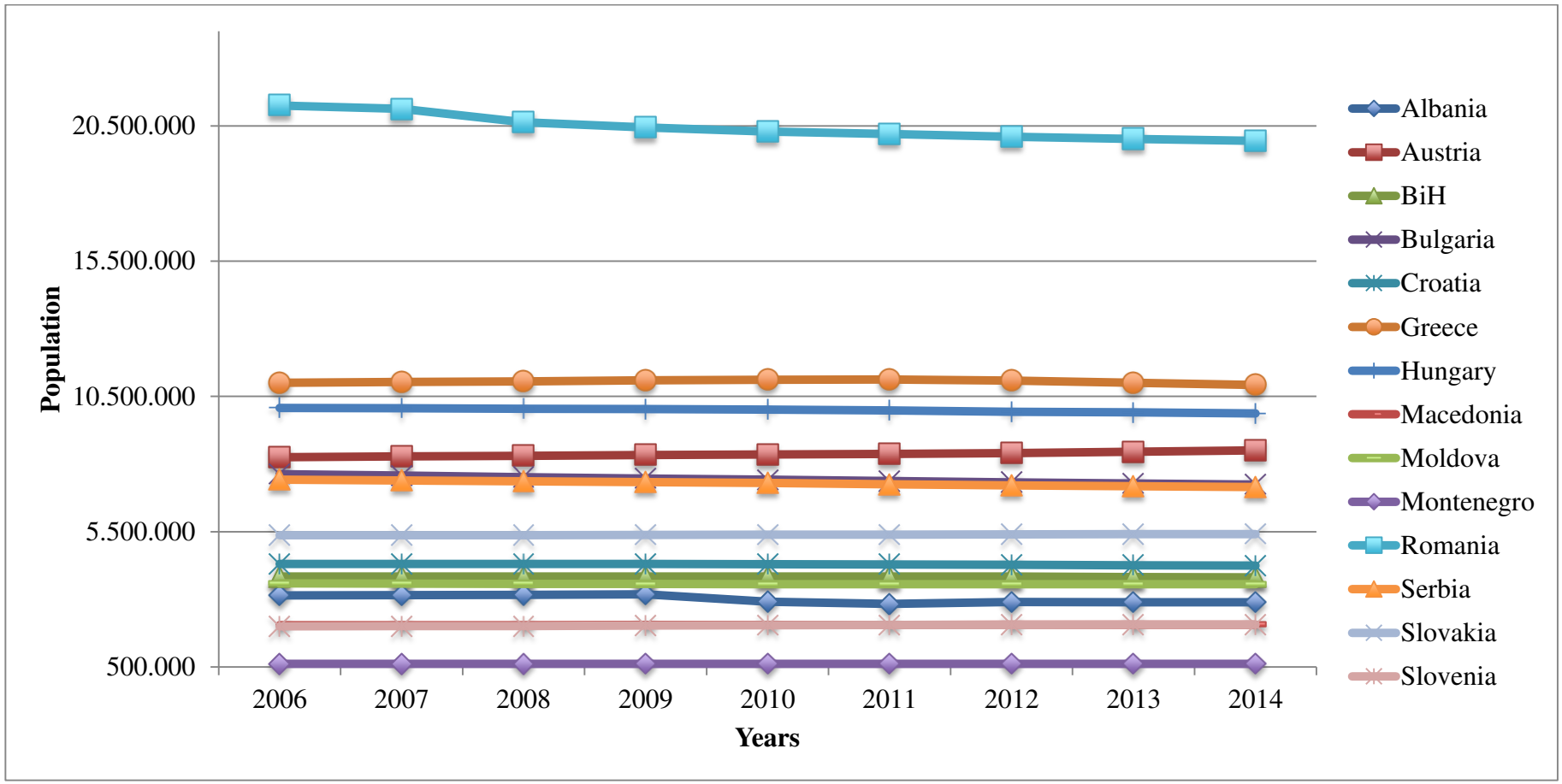
Source: *Agency for Statistics of Bosnia and Herzegovina; Institute for Statistics of the Republic of Albania; Eurostat; National Bureau of Statistics of the Republic of Moldova; State Statistical Office of the Republic of Macedonia; Statistical Office of Montenegro; Statistical Office of the Republic of Serbia.*

Figure 12. Urbanization Rate (% of population living in urban areas)



Source: *World Bank DataBank.*

Figure 13. Total Population



Source: *Eurostat.*

APPENDIX G: Instrumental Variables

Table 2. Total General Government Expenditures in SEE Countries (in M EUR)

Country/Year	2006	2007	2008	2009	2010	2011	2012	2013	2014
Albania	2,306.82	2,886.35	2,839.26	2,753.70	2,614.40	2,708.56	2,695.04	2,810.98	3,131.50
Austria	133,823.60	138,699.50	145,373.40	154,877.00	155,409.80	156,831.20	162,074.80	164,062.40	173,119.80
B&H	3,858.21	4,514.09	5,419.49	5,452.67	5,542.56	5,577.53	5,711.54	5,592.92	5,803.22
Bulgaria	9,226.40	12,237.40	13,808.20	14,695.30	13,827.90	13,968.10	14,457.20	15,777.60	17,985.80
Croatia	18,192.30	19,751.20	21,522.00	21,448.90	21,361.80	21,829.50	20,659.70	20,776.00	20,700.60
Greece	98,292.00	109,528.00	122,957.00	128,412.00	118,586.00	112,282.00	105,675.00	112,068.00	89,939.00
Hungary	47,206.10	50,910.40	52,445.30	47,472.80	48,659.90	50,099.10	48,111.60	50,276.10	51,951.40
Macedonia	1,719.43	1,919.15	2,283.29	2,404.75	2,473.23	2,570.42	2,728.68	2,778.43	2,910.23
Moldova	910.45	1,128.93	1,507.07	1,397.26	1,646.20	1,939.15	2,018.54	1,954.68	2,113.95
Montenegro	910.21	1,159.26	1,556.50	1,524.04	1,465.41	1,461.25	1,493.34	1,508.47	1,543.11
Romania	34,648.90	47,865.60	55,216.70	49,306.10	50,155.10	52,161.30	49,553.50	50,846.10	51,588.70
Serbia	11,378.23	13,232.93	13,685.36	13,222.66	12,907.77	13,978.46	14,292.38	14,384.56	14,378.01
Slovakia	17,508.90	20,267.60	24,136.50	28,042.20	28,282.40	28,524.90	29,348.90	30,488.80	31,682.50
Slovenia	13,955.50	14,830.40	16,649.00	17,438.20	17,857.50	18,447.10	17,476.40	21,642.00	18,621.00

Source: *Author's Calculations using Excel; Bank of Albania; Central Bank of Bosnia and Herzegovina; Efendic & Trkic-Izmirlija,* 2013; *Eurostat; Ministry of Finance of the Republic of Albania; Ministry of Finance of the Republic of Macedonia; Ministry of Finance of the Republic of Moldova; Ministry of Finance of the Republic of Montenegro; Ministry of Finance of the Republic of Serbia; National Bank of Moldova; National Bank of the Republic of Macedonia.*

Table 3. Public Spending on Social Protection in SEE Countries (in M EUR)

Country/Year	2006	2007	2008	2009	2010	2011	2012	2013	2014
Albania	484.46	573.99	615.51	700.93	765.30	819.84	861.81	910.13	972.86
Austria	48,279.20	49,571.20	51,843.00	55,045.70	57,073.10	57,643.40	59,727.50	61,961.70	63,890.70
B&H	1,240.65	1,549.52	2,017.10	2,020.11	1,927.72	2,214.05	2,246.82	2,261.80	2,381.60
Bulgaria	2,696.20	2,947.40	3,584.10	4,229.00	4,528.70	4,563.20	4,643.30	4,977.70	5,232.20
Croatia	5,340.00	5,530.20	5,861.60	6,182.40	6,217.10	6,373.90	6,182.50	5,943.40	6,176.10
Greece	30,437.00	33,879.00	38,773.00	41,584.00	40,114.00	40,392.00	38,838.00	34,257.00	34,526.00
Hungary	13,450.50	15,398.50	16,759.80	15,103.90	15,384.80	15,432.30	15,028.00	15,000.60	14,548.90
Macedonia	796.84	816.83	946.13	1,009.30	1,037.09	1,092.50	1,132.94	1,207.10	1,274.65
Moldova	287.16	365.33	497.03	496.22	605.86	705.87	693.72	658.38	713.31
Montenegro	260.05	298.78	350.42	413.07	423.59	455.52	482.09	483.40	492.75
Romania	8,610.40	11,497.00	14,486.70	15,052.90	16,060.20	15,759.30	14,921.40	15,404.80	15,752.90
Serbia	4,562.29	5,165.37	5,607.22	5,794.55	5,490.00	5,819.60	5,500.40	5,954.05	5,347.67
Slovakia	5,498.50	6,588.20	7,575.20	8,910.80	9,600.20	9,660.20	10,077.30	10,269.30	10,507.70
Slovenia	4,735.70	4,962.30	5,472.00	5,840.10	6,081.90	6,338.50	6,163.70	6,177.20	6,165.80

Source: *Author's Calculations using Excel; Bank of Albania; Central Bank of Bosnia and Herzegovina; Efendic & Trkic-Izmirlija, 2013; Eurostat; Ministry of Finance of the Republic of Albania; Ministry of Finance of the Republic of Macedonia; Ministry of Finance of the Republic of Moldova; Ministry of Finance of the Republic of Montenegro; Ministry of Finance of the Republic of Serbia; National Bank of Moldova; National Bank of the Republic of Macedonia.*

Table 4. Public Spending on Healthcare in SEE Countries (in M EUR)

Country/Year	2006	2007	2008	2009	2010	2011	2012	2013	2014
Albania	400.22	443.71	543.26	484.19	476.21	569.34	521.88	524.10	640.18
Austria	27,584.60	29,367.68	30,956.10	32,037.18	32,895.89	33,750.49	35,409.49	35,961.51	36,899.13
B&H	789.35	877.95	1,153.87	1,155.37	1,207.60	1,374.89	1,273.62	1,224.40	1,441.70
Bulgaria	1,825.19	2,096.70	2,470.96	2,524.54	2,732.92	2,818.93	2,962.60	3,323.70	3,609.42
Croatia	2,795.00	3,269.55	3,708.17	3,687.07	3,711.89	3,486.87	3,425.61	3,404.29	3,356.94
Greece	20,338.00	21,893.00	23,615.35	23,191.10	20,760.68	20,230.64	17,672.11	16,698.51	14,354.38
Hungary	7,398.90	7,630.13	7,876.22	7,071.51	7,709.05	7,895.26	7,661.15	7,623.12	7,714.51
Macedonia	416.61	420.49	463.98	455.82	485.73	498.76	512.93	494.99	552.40
Moldova	274.99	325.41	496.56	471.59	525.48	575.31	655.55	582.19	677.06
Montenegro	172.18	180.73	189.26	181.09	215.69	226.08	230.58	216.05	221.88
Romania	4,979.86	6,534.65	7,596.70	6,694.26	7,392.91	7,366.73	7,314.20	8,071.83	8,360.32
Serbia	2,197.07	2,949.58	3,386.63	3,035.89	3,003.07	3,249.90	3,133.79	3,465.89	3,454.74
Slovakia	3,335.57	4,349.99	5,280.90	5,840.67	5,733.71	5,605.23	5,898.77	5,909.93	6,085.68
Slovenia	2,656.78	2,806.31	3,212.79	3,391.92	3,287.58	3,349.13	3,371.11	3,336.86	3,444.54

Source: *Author's Calculations using Excel.*

Table 5. Public Spending on Education in SEE Countries (in M EUR)

Country/Year	2006	2007	2008	2009	2010	2011	2012	2013	2014
Albania	215.09	236.98	268.42	268.37	290.10	307.85	300.66	299.35	353.66
Austria	12,790.94	13,270.30	14,304.59	14,595.61	15,026.00	15,431.52	15,852.79	16,143.92	16,464.78
B&H	510.77	614.88	758.00	823.12	866.02	690.84	634.26	620.98	707.89
Bulgaria	984.60	1,177.49	1,457.56	1,527.05	1,358.06	1,392.47	1,417.57	1,550.74	1,752.79
Croatia	1,929.49	2,064.51	2,262.10	2,209.44	2,295.22	2,190.72	2,152.75	2,217.84	2,021.93
Greece	7,843.02	8,377.01	9,195.64	9,738.90	9,267.29	9,109.27	8,604.18	8,297.89	7,812.61
Hungary	5,389.36	5,588.32	5,697.66	5,058.22	5,400.91	5,135.93	4,651.72	4,658.57	5,420.43
Macedonia	224.91	279.74	331.83	372.16	319.87	354.58	341.32	374.88	366.76
Moldova	194.09	248.15	356.75	358.70	395.79	466.27	458.26	416.90	491.87
Montenegro	88.75	111.78	136.07	146.07	131.25	130.59	133.15	144.59	148.49
Romania	4,035.16	4,890.73	6,265.44	4,816.37	4,182.63	5,465.54	4,005.34	4,039.10	4,506.90
Serbia	928.51	1,328.27	1,587.48	1,456.10	1,366.27	1,500.73	1,403.56	1,301.99	1,232.79
Slovakia	1,770.45	1,963.17	2,304.39	2,680.38	2,830.26	2,888.18	2,969.22	2,953.40	3,097.98
Slovenia	1,988.36	2,074.00	2,315.02	2,386.97	2,356.41	2,361.36	2,339.24	2,333.99	2,200.89

Source: *Author's Calculations using Excel; Efendic &Trkic-Izmirlija,* 2013; *Government of the Republic of Macedonia,* 2009; *World Bank,* 2013.