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THE EFFECT OF DEFENCE SPENDING ON ECONOMIC DEVELOPMENT IN CENTRAL EUROPE

Case
Study

Keywords

*Defence spending,
Economic development,
Central Europe
SMD Model*

Abstract

The relationship between economic development and defence has always been the subject of significant literature in the economic environment. The present study examines the impact of defence spending on economic growth from a global perspective for 2009-2016. It takes into consideration the economic size and status of each country in the current geopolitical context. The SMD model and linear regression are used to investigate the economic development-defence connection by using the SIPRI data set for 12 Central European countries. Numerous regression analysis examine the data using different estimated econometric formulas with maximum probability. The empirical results show that in the long run, the linear relationship between defence spending and economic development is sustained only in some cases with positive effects on GDP. The results are unfavourable in most of the analysed countries, defence spending having significant negative effects on economic development.

INTRODUCTION

This paper presents an analysis of the correlation between defense spending and economic development in 12 Central European countries (Albania, Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia, Slovenia) for a time-period of 8 years (2009-2016). Establishing the relationship between defence spending and economic development is essential for decision-makers. They need such information to make decisions that influence other macroeconomic indicators such as economic development, unemployment, investment, productivity, as well as other variables that reflect the economic well-being of society, and also the monetary system, predominantly through interest rates.

At the end of the sec. XX, the international system was characterised by the presence and functioning of two "worlds", namely the military-political world and the trading world. These two worlds were outlined as a communist bloc based on military power and political domination and the Euro-Atlantic bloc based on commerce and economic hegemony.

We can assume from the theory of Rosecrance R. (1986) that in the commercial world, classical wars are replaced by trade wars, becoming the principal form of conflict, in the trade war, the military apparatus subordinating to this type of conflict.

The theory of Rosecrance R. (1986) is not new, but slightly updates an earlier sociological debate, that of military and industrial societies. Functions are the expression of the two ideal types of society identified by Herbert Spencev in the sec. XIX: Military or militant category and industrial or pacifist type, organised for productive economic purposes. In this context, security activates one or the other of the types, thus becoming dominant.

Since 1974, Immanuel Wallerstein (1974, 1980 & 1989) used the distinction between military and commercial functions when he elaborated the theory of the modern world system in which he placed the Soviet military system on the periphery of the world economy controlled by the Euro-Atlantic commercial centre. From the competition of existing theories, it can be evoked that the structure of the international system can be observed depending on the global perspective. The first level of analysis distinguishes the structure of the system of states considered heterogeneous, and after 1991, unipolar. At a second level, there is a structure of the state society with trends of transformation into a world society considered as interdependent in general and integrated into particular, with different degrees of integration, such as the European Union.

In order to explain the stability and security of the international system, it is necessary to use multiple perspectives.

Tensions may also arise as a result of the migration process of the 'centre' of the world system, as the tensions between Brussels and Washington, between Frankfurt and New York, between the euro and the dollar, are already visible, the structure of the World system being multiple.

The fundamental tension at the level of the international system is reduced by the globalisation tendency to overlap the level 1 of the structure (states) and level 2 (the world government). Otherwise at least to transfer as many of the first level responsibilities as the second one, globalisation producing turbulent in both cases, down to states, up to international society.

Prior to the eventual occurrence of global structures, there is an intermediate process at the regional level, in the form of alliances or economic and political unions. These unions regionalise states and organise the security regime at the zonal level, an example of which is the European Union that can be mapped as a composition or a puzzle of regions, sociologists calling this "fragmentary" process.

Through globalisation, states are beginning to have additional external responsibilities when some of their internal attributions are diminished, states being called upon to become more involved in international stability to achieve better internal stability and, as a consequence, security International. The world is globalising, conditions are being created for the expansion of economic space on a world scale, states become increasingly interdependent in the commercial, financial and informational structure, the number of International Organizations increases, but in the political dimension, the world preserves the structure and the international functions (Looney et al 2008).

This study is structured as follows: the second section provides a review of literature on defense spending and economic development debated by other researchers, the third section lists the data and introduces the linear regression methodology, and the fourth section describes the results and is followed by conclusions.

LITERATURE REVIEW ON DEFENCE EXPENDITURES AND ECONOMIC DEVELOPMENT

From an economic point of view, defence and security spending of a state is an essential component of public policies with effects on the real economy. These may have positive or significant negative effects on the creation of social infrastructure, other forms of goods, and the development of the economy in general. Recent empirical theory and research show that the structure and allocation of these expenditures provides a better picture of how the state can intervene to stimulate the growth and development

of the real sector, being more eloquent than the general level of budget spending. In general, economic studies on the correlation of the defence sector on economic development explain both the evolution of the growth rate of GDP and their impact on the welfare of the social life. It can be characterised by unemployment, investment, HDI index, health, education, based on a number of exogenous factors and specifying the significance and intensity of their influence on economic growth. Several schools of thought have expressed their views on the relationship between the defence sector, national security and security and economic development. For example, the Keynesians argue that military spending is an instrument of fiscal policy and can, therefore, be increased to stimulate or diminish demand. This idea claims that they have positive effects on the economy. Unlike the Keynesians' point of view, another school of thought considers that military spending has negative effects if used only as fiscal policy instruments. This is usually based on the argument that resources used in the army would do more if used in other areas. This argument is considered to be stronger when referring to the least developed countries (Jingxi et al., 2015).

Cappelen et al. (1984) analyzed the correlation of defense spending on investment, using data set for 17 OECD states, on the 1960-1980 sample. The results indicated negative outcomes on economic growth. The authors note that the negative effect on economic development is specific for all countries except the Mediterranean countries. Contrary to these findings, recent studies based on extensive samples of different states show a contradictory relationship between these variables. Chang et al. (2011) used the GMM method for the 90 countries surveyed between 1992 and 2006. Their study showed that defense spending induces economic development in low-income countries. This direct relationship between defense spending and economic development was specific to the European countries and also to the Middle East and South Asia (Töngür et al, 2014, Garcia J. et al 2016) Pan et al. (2014) also studied the correlation between military spending and its influence on the Middle East economy.

Its results reflect different causal effects: a unidirectional causality on the relationship between Turkey's military spending and economic growth, a unilateral causal effect between Egypt, Kuwait, Lebanon and Syria's economic and defense development spending and a bilateral causal effect for Israel. The data highlight the fact that there is no causal relationship between defense spending and economic development in Jordan, Oman and Saudi Arabia. Another study, on the causal relationship between defense and economic spending, was studied by Chang et al. (2014) in China and the G7 for the period 1988-2010. These results have shown

a positive effect on military spending on growth for Canada and the United Kingdom, while the Granger Caliber Test for China data has demonstrated the effect of economic growth on military spending. Numerous econometric and theoretical models have been used to map the relationship. The relationship between military expenditure and GDP is mainly used as a measure of military expenditure (Smith 1977, 1978, 1980, Deger and Smith 1983; Chang et al, 2011; Huang et al 2016; Compton, R. 2015, Julide Y, 2003).

Sandino R (2017) also highlighted in his paper the existence of a negative relationship between defense spending and economic development. This is highlighted in its model as Media Local Defenses by model-based treatment suggested that foreign aid has led to insignificant GDP growth, unless the Government would increase defense spending for internal threats.

Mintz and Stevenson (1995) and Yildirim et al (2014) assert that the differences within the literature are due to econometric limitations in studying the relationship

between economic development and defence expenditure. The measure of military expenditure creates heteroscedasticity because a change in military spending should have very different effects on countries with higher capacity and resources, as well as an endogeneity bias in the fact that governments can choose their own military expenditure ratios, and economic growth changes government expenditure decision-making (Goodness A et al 2014).

Ma et al. (2015) also highlights the relationship between economic development and defense spending in: the United States, Russia, Japan, India and China. It uses the various case study statistics and methodologies, analyses how each country's military expenditure is in correlation with increasing production levels in the period 1988 - 2013. According to its models, economic growth in these countries has an effect on military spending in a positive sense, thus increasing the capacity for defence. The researchers' conclusion is that each country is unique in its own way and strong economic growth does not automatically involve increasing spending or defense and security capabilities in that country.

The analysis by Ma et al. (2015) studies the relationship between defense spending, economic output and investment growth varies over time with each country. For most countries, the most influential predictor of defense spending is the one made in the past, regardless of whether these costs are measured as a percentage / absolute or as part of production.

While it is not surprising that decisions on the budgeting of defence spending are strongly influenced by what has been in the past, this also

indicates the reasons and effects produced during the allocation of defence spending in different states.

Gokmenoglu K et al. (2015) analyzes Johansen and Granger in his work on the long-term equilibrium relationship and the causality between defense spending (MIE) and economic growth (GDP) for Turkey, the country where the economy grew heavily. The data set has been used to conduct empirical investigations, and the results of the analysis show that in the long run, military expenditure and economic growth are cointegrated. Conclusions of the Granger causality test also suggest that there is a direct relationship between economic growth and military spending. Empirical analysis also shows that these two variables have long been in an equilibrium relationship.

Korkmaz S (2015), in his work selected 10 states in the Mediterranean region and analyzed data for the 2005-2012 period on the correlation of defence spending on economic development and unemployment, as too T. Bernauer (2009) in this study. According to the results of the analysis, the effects of defense spending on economic growth and other macroeconomic variables of the selected countries were different. While defence expenditure has a negative impact on growth, it indicates an increase in unemployment. So, we mention it because of some of the events it faces countries in the vicinity of the Mediterranean region, the importance of security of the countries under consideration increases, with governments spending large amounts of defense spending on budget allocations.

One by one, the literature contains a variety of investigations and studies on the causal relationship between defense spending and economic development. We also mention Shahbaz M and Shabbir M (2015), who use the self-degraded delayed distribution model or ARDL cohort limits, and apply the RWA approach to cointegration, confirming a long-term relationship between the two variables. The VECM Granger test examines the causal relationship between defense spending and economic development, empirical analysis raising a long-term negative relationship between defense expenditures and economic development. This work contributes to existing literature through the recently used data set (2009-2016) and the results of the correlation between military expenditure and economic growth in the 12 Central European countries.

As previous studies analyse these aspects, this research will highlight that the results differ significantly according to the development stage of the countries under consideration, the periods and variables considered. Studying the impact of defense spending and its influence on economic growth and development in the 12 representative countries in Central Europe (taking into account the GDP growth rate) over a period of 8 years using the SMD model

and linear regression reveals an effect on the long-term, negative for most cases, confirmed on the basis of several causal models. The results are unfavourable in most of the analysed countries, defence spending having significant negative effects on economic development.

This paper opens new policy goals authorities that need to support economic growth by reducing or balancing the percentages of spending on defence spending.

DATA AND METHODOLOGY

There are many studies on which the correlation between economic development and defense spending is highlighted in the literature, but its findings are often contradictory and inconclusive (Pavel Y. 2007). Alptekin and Levine (2012) analyzed the impact between defense spending and economic development in its work through meta-analysis based on 32 studies, 169 estimates and observed the combined effect of the two variables.

The results are unfavourable in most of the analysed countries, defence spending having significant negative effects on economic development. The same conclusions were obtained by Uk H. (1998) in his study.

The results show that there are negative correlations of defence spending on economic development in most states studied in the paper, with very few cases where the positive effects of defence spending on the economy are relevant (Heo U. 2010). It confirms the hypothesis of a non-linear relationship of defense spending with the economic development of a state, as the findings of studies that have been developed by researchers so far in the general literature on the relationship between defense spending and economic growth are often contradictory and inconclusive (Muhammad et al., 2017).

Based on the analysis, the idea is emerging as developing countries with limited resources; defence spending is constrained by rising incomes and rigorously allocating percentages to defence budgets. So, when a country's economy grows, it is stable and developed, governments can increase their defence budgets, and strengthen their state defence position in the EU and NATO, as is the case with the countries studied in this paper.

This study covers 12 Central European countries in 2009-2016 and wants to investigate the relationship between defence spending and economic development. Data for the resulting variable, GDP growth in the analysed period, are constant between countries and are obtained from the official tables for the period 2009-2016. Defence data measured both as a percentage of GDP and in absolute amounts are from the SIPRI databases of expenditures, using data reported by the government

and SIPRI estimates for all countries over a certain number of years. Revenue categories identify the countries in the sample (Albania, Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia, Slovenia) according to the World Bank classifications.

The data used in this research refers to defence expenditures and GDP level in the countries of Central Europe, over the period 2009-2016. Two variables were considered for each of these indicators in order to test the relationship between defence expenditures and GDP growth through three different models, and observe results robustness in comparison. The defence expenditures were expressed by the fig. no. 1.

The relationships between defence expenditures and GDP in the 12 Central European states (Albania, Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia, Slovenia) were tested through SMD (standardized mean differences) and linear regression method with and without intercept (limitation), with simple two-variable models. Chien - Chiang L (2006) studied , also the relationship between the defence expenditures and GDP to obtain the results with the different causality tests.

The simple model in this case, as expressed by SMD (standardised mean differences), would have the following form:

$$SMD = (\text{mean. e} - \text{mean.c}) / \text{sdp}$$

The regression relationship (classical) with intercept is form: $y = a + b \cdot x$, where y = expenses, x = GDP, a and b are coefficients.

Regression relation without intercept is form: $y = b \cdot x$, where y = expenses, x = GDP, a is a coefficient. Empirical analysis by the statistical method is a useful method that can control the variables used, identify factors that interfere with variables and can influence the allocation of resources of a state's internal economy to the defense sector. In particular, the regression system allows for an understanding of the possibilities and limits of defence spending of a state (y), which in absolute terms could influence the government's decision in the allocation of allowances of GDP (x). We point out here that the analysis indicates that if relations shown in the graphs appear robust then means they are also dependent on other variables. In our study, we focus more on statistical signs than on the magnitude of certain variables, due to the correctness of the data. The data consists of annual measures on defense spending, defence personnel, national production and government spending for each analyzed state. The data set used is taken from SIPRI (2017), Eurostat 2017 for the establishment of GDP values,

defense spending, military personnel and government spending.

RESEARCH RESULTS AND DISCUSSION

The first model analyses the most efficient and efficacious allocation of defence spending by GDP for the countries analysed. Taking into account that these selected countries to be analysed are part of both NATO, and the EU, two analysis groups, one control group and one experimental group was formed. Moreover, the countries belonging to these two groups differ between by other factors, such as geographic region, income, population, investment, accession date to NATO and the EU. In the study, the control group consists of the following countries: Belgium, Denmark, France, Germany, Greece, Italy, Luxembourg, the Netherlands, Norway, Portugal, Spain, United Kingdom.

The experimental group consists of Albania, Bulgaria, Czech Republic, Estonia, Croatia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia, Slovenia (countries in central Europe).

For the military expenditure metadata analysis (continuous data), the SMD model used the metacont function in the meta package (meta-4.9_0 version), the R software and tracked the fixed effect and the random effect:

a)fix effect $y_i = \mu + e_i$, where errors e_i are normal of mean 0 and variant v_i therefore, $\text{Var}(y_i) = v_i$, the weights correcting heteroscedasticity are $w_i = 1 / v_i$
 b)Random effect $y_i + e_i = \theta_i$, where errors e_i are normally distributed by mean 0 and variant v_i again $\theta_i = \mu + \delta_i$, where δ_i are normally distributed by mean 0 and variation τ^2 so $\text{Var}(y_i) = v_i + \tau^2$ and the weights are $w_i = 1 / (v_i + \tau^2)$, as Hedges et al (2015) in his study about behavioral sciences.

As Figure 1 shows, the first method of analysis - the SMD model does not reflect the existence of any difference between the fixed and the random effects for the two groups analysed on the sample 2009-2016. The data are homogeneous with p-value over 99%, which means that the modalities of allocating defence spending to the budgets of the states are similar, and they are allocated according to the policies of the government, in percentages set by governments according to GDP.

The meta-analysis model, SMD, uses the idea that there are no major differences between the distribution of budgets in the analyzed countries, the sums allocated in the 2009-2016 sample being similar. Also, due to the fact that the division of defence expenditures is made as a percentage of GDP in each state, they are directly influenced by the GDP of the country and by the economic development of the state.

By the second method of analysis, classical linear regression, we analysed the 12 Central European countries particularly, using the SIPRI 2017 data set for the period 2009-2016. In this study we took into account the GDP achieved and the real defense expenditures of the period 2009-2016 in the countries of Central Europe. The analysis has led to the idea that the impact of defense spending have somewhat negative effects on developing countries or those that have recently joined the EU and NATO and have imposed a budget defense budget regardless of revenue (Albania, Bulgaria, Croatia, Estonia, Hungary, Slovakia, Slovenia). Also, there was a unidirectional causal relationship with slightly negative effects between defense spending and GDP, taking into account the size of their income and the economic well-being of the society (Albania, Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Slovakia). One unidirectional causal relationship, with positive effects between defense spending and GDP, was found for Romania and for those countries that have experienced a slight decrease in security and defense (Latvia, Lithuania, Poland). As shown in Figure 2 and 3, Estonia, Slovakia, the impact of defense spending on GDP has slightly negative effects on the economic development of society. The regression method more eloquently reflects the relationship between defense expenditure and GDP, namely, a linear / non-intercept link, with no limitations and constraints on budgets. Figures 4 and 5 illustrate the declining trends of the defence sector in Latvia, Lithuania and Poland. Latvia has seen a similar reduction in force, reducing its presence in Mali and removing the forces from the centre of the Republic of Africa, and by 2015 Lithuania has increased its strength by about 40%. The above graphical analysis illustrates that the distribution of defence expenditure is in long-term correlation with GDP, thus with the economic development of the analysed states. The results of the analyses are different from the point of view of the impact of defence spending on the economy. The results depend on the degree of state development, the limitation and the imposition of percentages of allocation in the defence sector by the new EU and NATO states, the geographical area, GDP, and how governments assign or not a high degree of security to the state.

CONCLUSIONS

This study highlights the relationship between defense spending and economic development in Central European countries, using SMD meta-analysis and linear regression. Although the association between defense spending and economic growth has been evident in many studies, a significant part of the research has led to contradictory results between countries, incoherent

in different time frames. The results are unfavorable in most of the countries under consideration, with defense spending having significant negative effects on economic development. We preach economic destabilization in terms of investment, trade, consumption, education, health and the money market due to the improvement of economic conditions and the increasing pressure of allies in NATO. It could also lead several member states to increase their defense allocations to 2% of GDP over the next five years, at the periphery or later in the EU and NATO.

It should be noted that in the field of security and defense, is made some progress in supporting the Union at this level: answer the causes and external conflicts, strengthen the capacity of partner states, the European Union and its citizens protection. In this context, the operational dimension of the EU's commitment has been strengthened by creating the planning and leadership capability of the Union's non-executive missions. In the same context, the measures taken to optimize the engagement of the EU Battlegroups, including the size of the financial resources for their deployment, are also placed. Regarding strengthening resilience and mainstreaming / comprehensive response to conflict and crisis, the implementation is based on adapting the regulatory strategy for the adoption of a new Joint Communications with emphasis on neighboring regions and adjacent regions (region of EU), in synergy with the revised European Neighborhood Policy, as well as with the already existing key policies, including the external aspects of the European Security Strategy.

In the field of security and defense in the circumstances created by Brexit, the rise of the terrorist phenomenon in Europe and its consequences, emerged the opportunity of overcoming divergent positions. In this respect, Romania's position is shaped by a position of openness, constructive towards evolutions, but with the pursuit of specific interests - the consolidation of the European security and defense pillar, without it being competed or doubled by NATO. On this latter issue, Romania supported the deepening of the cooperation framework launched after the Warsaw NATO Summit. In the context of the launch of the CFSP (European Security and Cooperation Policy), Romania's position was centered on the need to maintain the inclusive and transparent nature of the initiative, coupled with the strengthening of geographical balance in program development.

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Annexes

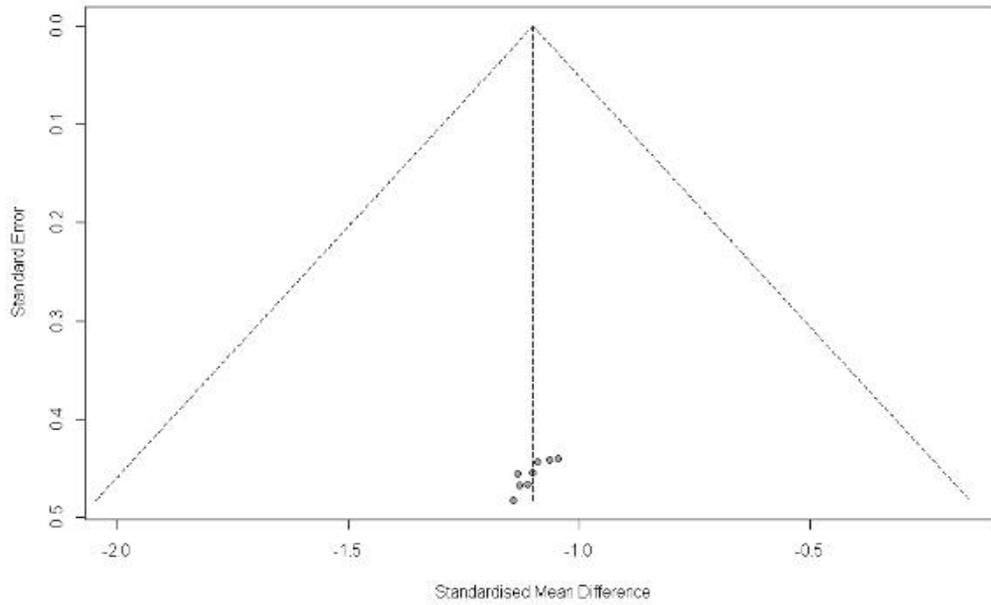


Figure No. 1 SMD (standardised mean differences)

Source: Authors' estimations

- defence expenditures as a percentage of GDP
- defence expenditures per capita in USD
- The GDP variables comprised in the models were:
 - annual growth of GDP
 - annual growth of GDP per capita in USD

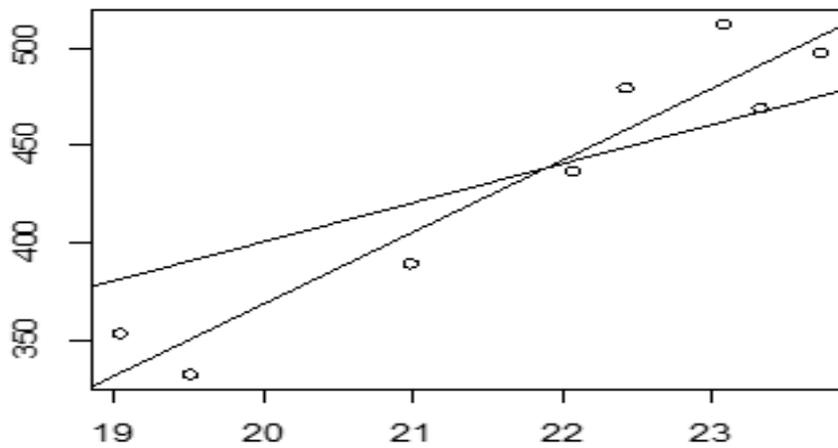


Fig. No 2 Simple linear regression with and without intercept Estonia

Source: Authors' estimations

- GDP is represented on the horizontal line
- Defence expenditures are represented on the vertical line

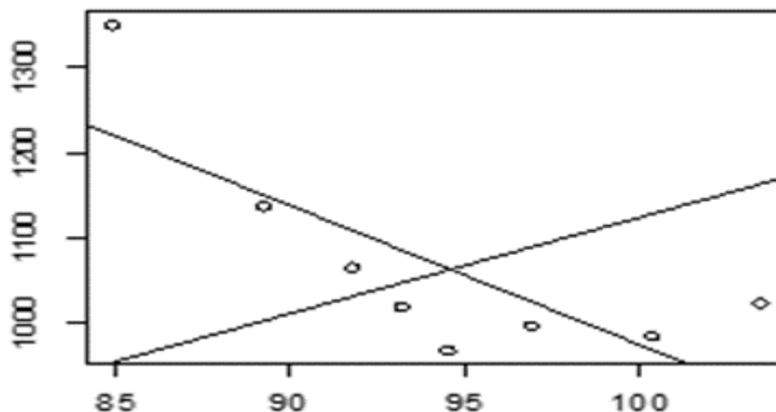


Fig. No 3 Simple Regression Slovakia

Source: Authors' estimations

· GDP is represented on the horizontal line

· Defence expenditures are represented on the vertical line

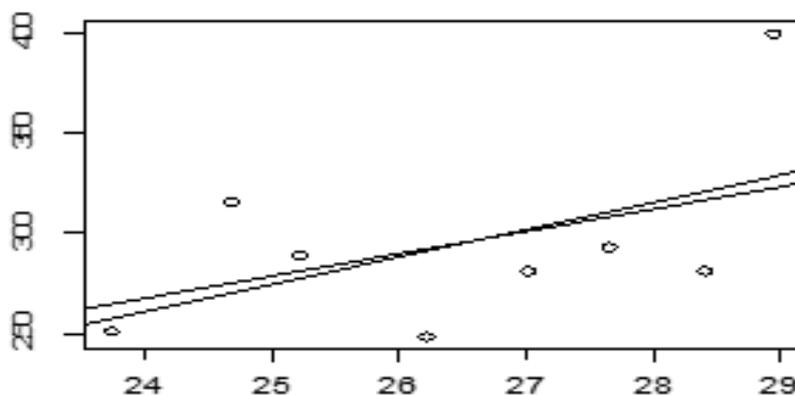


Fig. No 4 Simple linear regression with and without intercept Latvia

Source: Authors' estimations

· GDP is represented on the horizontal line

· Defence expenditures are represented on the vertical line

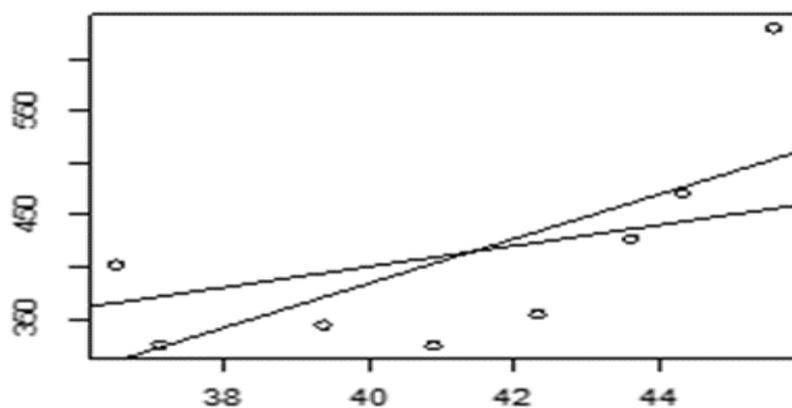


Fig. No 5 Simple linear regression with and without intercept Lithuania

Source: Authors' estimations

· GDP is represented on the horizontal line

· Defence expenditures are represented on the vertical line