

OVERVIEW OF DEFENCE EXPENDITURE TRENDS: EVIDENCE FROM THE BALTIC STATES

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Abstract. In recent years, security is one of the most important issues in political arena. Every country must ensure internal and external security for its citizens. In this context, the policy-makers have to decide how much to spend on this hot issue. The aim of this paper is to provide empirical insights of defence spending trends and its structural changes over the period of 2007–2013. The authors have employed comparative approach in order to assess the trends of defence expenditure in the context of the Baltic States, such as Lithuania, Latvia and Estonia. To that end, the findings have suggested the following: 1) different trends of defence expenditure and economic growth have been detected within the Baltic States. Lithuania and Estonia have reported a negative association between these indicators, while Latvia has demonstrated a positive one; 2) on the basis of intensity rate, Lithuanian defence expenditure pattern could be characterized as shifting over the analyzed period. It have been some times greater than in Latvia and Estonia; 3) Latvia and Estonia have almost identical structures of defence expenditure, while Lithuania and Estonia have the most significant dissimilarity.

Key words: real gross domestic product, economic growth, defence expenditure.

JEL code: H50, H76, O47.

Introduction

Nowadays, security of each human is one of the most important and essential needs. The countries of the world have to ensure internal and external security (Danek, 2013). Defence expenditure is an inseparable part of the national budget. Defence spending has provided protection to the citizens. Over the last decade, defence expenditure has been cut across the Baltic States. They spent about 1.4 % of GDP on average in 2007–2013 (Eurostat, 2013). Recently, growing instability in the world has promoted debates of increase in defence expenditure.

The growth theories have suggested that government expenditure has an important impact on long-run economic growth. The influence depends on the size of government intervention and on the different components of public spending. Government has played a prominent role in financing the military sector. According to Compton and Paterson (2015), defence expenditure impact on growth could depend on the quality of political institutions that underlie this spending. Defence spending can be described by a situation where the country ensures its security for the inhabitants. From the economics

point of view, it means that defence spending has competed with other public goods the citizens may need (Mosikan, Matiwa, 2014; Dudzeviciute, Tamosiuniene, 2015).

This paper aims to describe the trends of defence expenditure and its structural changes in the Baltic States over the period of 2007–2013.

The authors have applied comparative approach and used research methods, such as correlation analysis and the rates of structural changes as well as Finger-Kreinin index in order to assess the dissimilarities of defence expenditure's patterns across the Baltic States.

Further the authors have highlighted prevailing theoretical insights and discussed research results.

1. Theoretical insights

In academic research, the defence expenditure impact on economic growth has been analyzed from different aspects. Opinions on the effects of defence spending have been divided among two groups, such as the "pro" and the "against" group (Dunne, Tian, 2015). The "pro" group has viewed defence spending as a guarantee of security, peace, and welfare. The

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investigations have revealed that the increase in defence expenditure promotes total demand by stimulating output. Also the increase in defence expenditure may lead to improvements of infrastructure, if some of the spending is used for the creation of socio-economic infrastructure like roads and airports etc. (Shahbaz et al., 2013). During the crisis times if the part of expenditure is allocated for revamping the economy, defence expenditure can improve productivity and generate welfare (Pradhan, 2010). The "against" group has treated such expenditure as a wasteful that influences the economy beyond the resources it takes up.

Duella (2014) has summarized previous research on defence expenditure – growth effects and distinguished three categories of empirical studies. The first category of studies has demonstrated positive impact of defence expenditure on economic growth. The second one has led to opposite conclusions describing negative effects. Finally, the third category of the investigations has revealed inconclusive results on the direction of defence spending effects on economic growth. The results of the research depend on the sample of countries, time period or empirical approach used for a study (Compton, Paterson, 2015). Although the effect of defence spending has been debated for about 40 years, the answer is almost always an empirical one (Dunne, Tian, 2015).

In the recent surveys (Hirnissa, Baharom, 2009; Kollias, Paleologou, 2010; Pradhan, 2010; Yang et al., 2011; Feridun et al., 2011; Alptekin, Levine, 2012; Anwar et al., 2012; Danek, 2013; Chairil et al., 2013; Tiwari, Shahbaz, 2013; Duella, 2014; Farzanegan, 2014; Khalid, Mustapha, 2014; Mosikan, Matiwa, 2014; Topcu, Aras, 2015), the following hypotheses have been developed and tested: 1) defence expenditure reduces economic growth; 2) defence expenditure is detrimental to economic growth in less developed countries; 3) the effect of defence

Jelgava, LLU ESAF, 21-22 April 2016, pp. 33-34 expenditure on economic growth is positive; 4) the effect of defence expenditure on economic growth is non-linear. The first hypothesis has suggested that there is a trade-off between productive and unproductive government expenditure. The second one has implied the existing differences among countries. The third hypothesis has related with supply-side and aggregate demand effect. The last one has been due to the first three hypotheses. The empirical investigations have tested each of these hypotheses (Alptekin, Levine, 2012).

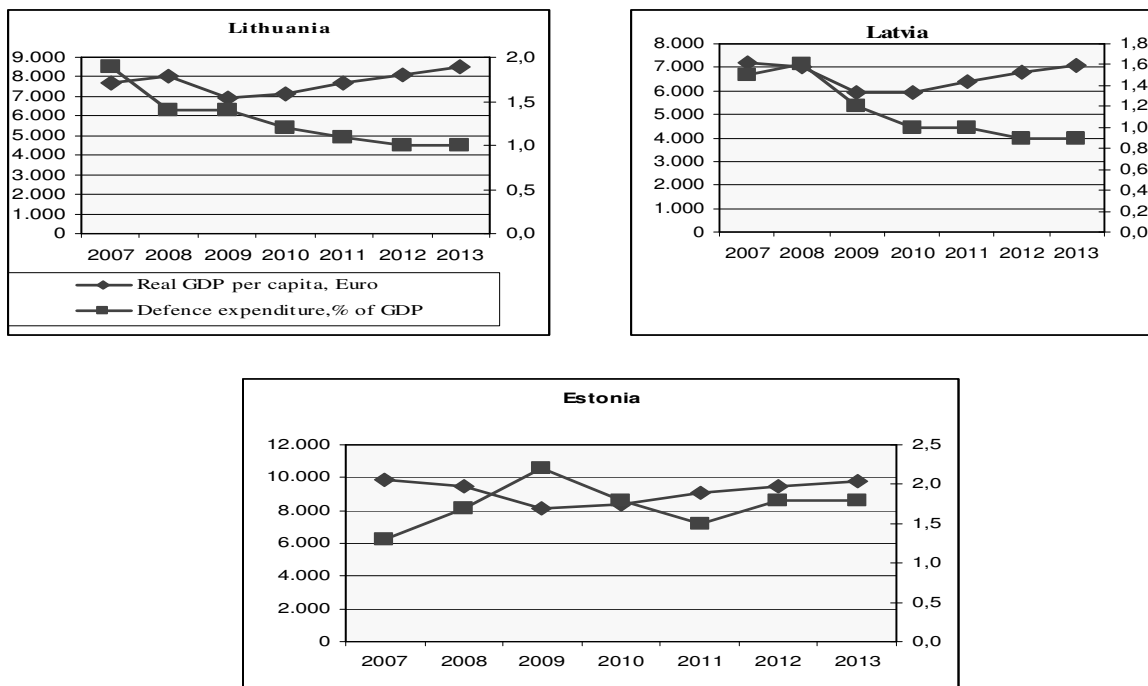
To sum up theoretical insights, it should be noted that in many cases the association between defence spending and economic growth has been evident, but the practices of different countries lead to different results.

2. Research results and discussion

The research has been guided by the assessment of defence spending tendencies in the Baltic States. The authors refer to methodology considered of different researchers (Domingo, Tonella, 2000; Gawlikowska-Hueckel, Uminski, 2008; Memedovic, Iapadre, 2010; Pradhan, 2010; Cortuk, Singh, 2010; Beeres et al., 2012; Dudzeviciute et al., 2014). To this end, the authors have applied absolute rate of structural change and intensity rate in the calculations.

Absolute rate has implied structural change of the defence pattern analysed. Positive rate value means that structural change accelerates the growth of the pattern; and negative rate diminishes. Intensity rate has informed about the intensity of changes in the structure of the pattern over the period. These two indicators give the general view about the tendencies of structural changes.

Over a period of 2007-2013, defence expenditure as percentage of GDP as well as GDP per capita have varied in the Baltic States, as Figure 1 shows.



Source: Eurostat, 2007-2013.

Fig. 1. Dynamics of defence expenditure and GDP per capita in the Baltic States

Within the Baltic States, there are clearly different variations in defence expenditure and economic growth. Estimating the general tendencies of two ratios, a negative association could be detected in Lithuania and Estonia. Over the examined period, Lithuania has demonstrated economic growth and at the same time defence expenditure reduction. In Estonia, GDP per capita has declined while the defence expenditure has been growing. Latvia has demonstrated a weak positive interrelationship between these two indicators. In the case of Latvia, as economy grows, the government tends to increase defence expenditure and conversely.

Further, in order to get a completed picture, the authors have carried out the analysis of structural change. According to classification of Eurostat (2013), defence expenditure consists of some activities, such as military defence, civil defence, research and development (R&D) defence and defence of network-enabled capability. The main insights have been provided over the period of 2007-2013.

In 2007 as well as 2013, spending for military defence dominated in the structure of total defence expenditure of the Baltic States (Table 1). In 2013, spending for military defence made 76.6 % in Lithuania. In Latvia and Estonia, this accounted to 91.7 % and 95.5 % respectively.

The patterns of defence expenditure in the Baltic States, %

Country / expenditures	2007	2013	Structural changes	
			Absolute rate, percentage point	Rate of intensity, percentage point
Lithuania				
Military defence	60.8	76.6	15.8	2.6
Civil defence	0.3	0.4	0.1	0.0
R&D defence	0.1	0.2	0.1	0.0
Defence of network-enabled capability	38.8	22.8	-16.0	2.7
Total	100.0	100.0	-	5.3
Latvia				
Military defence	88.6	91.7	3.1	0.5
Civil defence	3.8	1.7	-2.1	0.4
R&D defence	0.0	0.0	0.0	0.0
Defence of network-enabled capability	7.6	6.6	-1.0	0.2
Total	100.0	100.0	-	1.1
Estonia				
Military defence	92.4	95.5	3.1	0.5
Civil defence	0.0	0.0	0.0	0.0
R&D defence	0.5	0.2	-0.3	0.1
Defence of network-enabled capability	7.1	4.3	-2.8	0.4
Total	100.0	100.0	-	1.0

Source: authors' calculations based on Eurostat data 2007 and 2013

Over the period of 2007-2013, absolute rate of structural changes and intensity rate have varied across the Baltic States. The structural analysis of defence expenditure has revealed that the share of military defence has increased in all the Baltic States. It should be noted that the most significant growth has been in Lithuania, where military defence contribution to total defence expenditure has increased by 15.8 percentage points. In Latvia and Estonia, the growth has been the same and accounted to 3.1 percentage points. In Lithuania, the intensity rate of structure in defence pattern has been five times greater than in Latvia and Estonia. Therefore, the Lithuanian defence expenditure pattern could be characterized as shifting over

the analyzed period. Taking into consideration the results of analysis, the authors argue that increase in military defence has promoted growth of the defence expenditure as a percentage of GDP, while the drop in defence of network-enabled capability impacted on decline of total defence expenditure of the Baltic States.

Further, the authors have used Finger-Kreinin index in order to summarize how much a given distribution of defence expenditure differs across the Baltic States. Finger-Kreinin index can vary between 0 and 1 (Memedovic, Iapadre, 2010). If value is equal to 0, this shows identical structures of defence expenditure. The value accounted to 1 means maximum dissimilarity. Table 2 gives the Finger-Kreinin index of defence

patterns for the pairings of the Baltic States over

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the period of 2007 - 2013.

Table 2

Finger-Kreinin index of the defence expenditure's structure

Baltic States	Lithuania	Latvia	Estonia
Lithuania	1	0.19	0.21
Latvia	0.19	1	0.04
Estonia	0.21	0.04	1

Source: authors' calculations based on Eurostat data 2007 -2013.

According to the index value, the authors have identified some sightings. Finger-Kreinin index has varied in the interval of 0.04 – 0.21. It has informed about high degree of similarity. Assessing the pairs of the Baltic States, the most significant dissimilarity has been revealed between the defence expenditure's structures of Lithuania and Estonia. Latvia and Estonia have shown the most similar distribution of defence expenditure.

Finally, it should be noted that the Baltic States have similar structures of defence expenditure.

Next section summarizes the results of the research and provides the main conclusions.

Conclusions

Theoretical insights have shown that in academic studies, defence expenditure in the context of economic growth has been analyzed from different aspects. It should be noted that in

many cases the association between defence spending and economic growth has been evident, but the research of many countries lead to different results.

Within the Baltic States, there are different associations between defence expenditure and economic growth. Estimating the general tendencies of two ratios, Lithuania and Estonia have reported a negative association between these indicators, while Latvia has demonstrated a positive one. In 2007–2013, expenditure for military defence dominated in total defence pattern of the Baltic States. It is noticeable that the Lithuanian defence pattern's intensity rate has been significantly greater than the Latvian and Estonian.

Comparing the pairs of the Baltic States, Latvia and Estonia have almost identical structures of defence expenditure, while Lithuania and Estonia have the most significant dissimilarity.

Bibliography

1. Alptekin, A., Levine, P. (2012). Military Expenditure and Economic Growth: a Meta-Analysis. *European Journal of Political Economy*, Volume 28, p.p. 636-650.
2. Anwar, M.A., Rafique, Z., Joiya, S.A. (2012). Defense Spending-Economic Growth Nexus: a Case Study of Pakistan. *Pakistan Economical Social Review*, Volume 50, Issue 2, p.p.163-182.
3. Beeres, R., Bakker, E. J., Bollen, M., Westerink, E. (2012). Country Survey: an Economic Analysis of Military Expenditures in the Netherlands, 1990-2009. *Defence and Peace Economics*, Volume 23, Issue 4, p.p. 365–387.
4. Chairil, T., Sinaga, Dedy S., Febrianti, Annisa I. (2013). Relationship Between Military Expenditure and Economic Growth in ASEAN: Evidence from Indonesia. *Journal of ASEAN Studies*, Volume 1, Issue 2, p.p. 106-121.
5. Compton, R., Paterson, B. (2015). Military Spending and Growth: the Role of Institutions. *Defence and Peace Economics*, Volume 23. Retrieved: <http://dx.doi.org/10.1080/10242694.2015.1060022>. Access 10.11.2015
6. Cortuk, O., Singh, N. (2010) Structural Changes and Growth in India. *Economics Letters*, Volume 2, pp. 178-181.
7. Danek, T. (2013). Analysis of Relationship Between Military Expenditure and Economic Growth. *The Business and Management Review*, Volume 3, Issue 3, p.p. 51-57.
8. Dimitraki, O., Ali, F. M. (2013). The Long-Run Causal Relationship Between Military Expenditure and Economic Growth in China: Revisited. *Defence and Peace Economics*, Volume 24, p.p. 1-16. Retrieved: <http://dx.doi.org/10.1080/10242694.2013.810024>. Access 22.11.2015.
9. Domingo, C., Tonella, G. (2000). Towards a Theory of Structural Change. *Structural Change and Economic Dynamics*, Volume 11, Issue 1, p.p. 209-225.

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10. Dudzeviciute, G., Maciulis, A., Tvaronaviciene, M. (2014). Structural Changes of Economies: Lithuania in the Global Context. *Technological and Economic Development of Economy*, Volume 20, Issue 2, p.p. 339-356.
11. Dudzeviciute, G., Tamosiuniene, R. (2015). Tendencies of Defence Expenditure and its Structural Changes in the European Union Countries. *KSI Transactions on Knowledge Society*, Volume 8, Issue 1, p.p. 53-59.
12. Duella, A. (2014). Military Burden and Economic Growth: Evidence from a Multivariate Cointegration Analysis. *Journal of Global Economics*, Volume 2, Issue 3. Retrieved: <http://www.esciencecentral.org/journals/military-burden-and-economic-growth-evidence-from-a-multivariate-cointegration-analysis-2375-4389.1000119.pdf?aid=30159>. Access 05.12.2015
13. Dunne, J.P., Nikolaidou, E. (2012). Defense Spending and Economic Growth in the EU15. *Defence and Peace Economics*, Volume 23, Issue 6, p.p. 537-548.
14. Dunne, J.P., Tian, N. (2015). Military Expenditure, Economic Growth and Heterogeneity. *Defence and Peace Economics*, Volume 26, Issue 1, p.p. 15-31. Retrieved: <http://dx.doi.org/10.1080/10242694.2013.848575>. Access 05.12.2015
15. Eurostat Database on Economic Growth Indicators. (2013). Retrieved: http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=nama_aux_gph&lang=en. Access 05.12.2015
16. Eurostat Database on General Government Expenditure. (2013). Retrieved: <http://ec.europa.eu/eurostat/data/database>. Access 05.12.2015
17. Farzanegan, M. R. (2014). Military Spending and Economic Growth: the Case of Iran. *Defence and Peace Economics*, Volume 25, Issue 3, p.p. 247-269.
18. Feridun, M., Sawhney, B., Shahbaz, M. (2011). The Impact of Military Spending on Economic Growth: the Case of North Cyprus. *Defence and Peace Economics*, Volume 22, Issue 5, p.p. 555-562.
19. Gawlikowska-Hueckel, K., Uminski, S. (2008). Structural changes in the Economy of Polish Regions. *European Integration Studies*, Volume 2. p.p. 88-97.
20. Hirnissa, M.T., Baharom, A.H. (2009). Military Expenditure and Economic Growth in Asean-5 Countries. *Journal of Sustainable Development*, Volume 2, Issue 2, p.p.192-202.
21. Khalid, M.A., Mustapha, A.B. (2014). Long-Run Relationship and Causality Tests between Military Expenditure and Economic Growth in India. *The Economics and Finance Letters*, Volume 1, Issue 6, p.p. 49-58.
22. Kollias, C., Paleologou, S. (2010). Growth, Investment and Military Expenditure in the European Union-15. *Journal of Economic Studies*, Volume 37, Issue 2, p.p.228-240.
23. Memedovic, O., Iapadre, L. (2010). Structural Change in the World Economy: Main Features and Trends. UNIDO: Working Paper, Volume 24, p. 62.
24. Mosikan, T.J., Matiwa, K. (2014). An Analysis of Defence Expenditure and Economic Growth in South Africa. *Mediterranean Journal of Social Sciences*, Volume 5, Issue 20, p.p. 2769-2776.
25. Pradhan, Rudra P. (2010). Modelling the Nexus Between Defense Spending and Economic Growth in Asean- 5: Evidence from Cointegrated panel Analysis. *African Journal of Political Science and International Relations*, Volume 4, Issue 8, p.p. 297-307.
26. Shahbaz, M., Afza, T., Shabbir, M. S. (2013). Does Defence Spending Impede Economic Growth? Cointegration and Causality Analysis for Pakistan. *Defence and Peace Economics*, Volume 24, Issue 2, p.p. 105-120.
27. Tiwari, A.K., Shahbaz, M. (2013). Does Defence Spending Stimulate Economic Growth in India? A Revisit. *Defence and Peace Economics*, Volume 24, Issue 4, p.p. 371-395.
28. Topcu, M., Aras, I. (2015). Defense Spending and Economic Growth: Extended Empirical Analysis of the European Union Countries. *Defence and Peace Economics*, Volume 26, Issue 2, p.p. 233-246.
29. Yang, Albert J.F. Trumbull, William N., Yang, CH. W., Huang, Bwo-Nung. (2011). On the Relationship Between Military Expenditure, Threat, and Economic Growth: a Nonlinear Approach. *Defence and Peace Economics*, Volume 22, Issue 4, p.p. 449-45.