

# Structural Trends of General Government Expenditure in the Baltic and Scandinavian Countries

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**Abstract:** This paper has analyzed the patterns of government expenditure in the Baltic countries (Lithuania, Latvia and Estonia), comparing them with those in Scandinavian countries (Denmark, Finland and Sweden). The investigation has summarized the tendencies of structural changes of government expenditure and extent to which countries expenditure structures have been dissimilar in a period of 2004 – 2013. Breakdowns of these expenditures on the basis of the activities they support have been provided and analyzed. The authors have done this by looking both at general government expenditure statistics, and also by considering a number of descriptive statistical indicators. Firstly, based on the statistical data, structural changes of government expenditure have been analyzed. To this end, the indicators of absolute structural changes and intensity of structural changes have been applied. Secondly, Finger-Kreinin index has been calculated in order to compare government expenditure patterns and determine their dissimilarities.

**Index Terms:** general government expenditure, government expenditure by function, economic growth, structural changes, Finger-Kreinin index.

JEL: H50, H75, H76.

## I. INTRODUCTION

The investigation has been based on Eurostat information. Eurostat has collected data on government expenditure by function according to Classification of Functions of Government (COFOG). It has provided a possibility to compare expenditures on different activities across the European countries over time. Data are available at two levels. The first level splits spending into ten classes according to functions, and the second level further splits the first level classes into further groups (OECD 2014).

In 2013, general government expenditure amounted to 48.6 percent of EU-28 GDP (Eurostat 2015). Based on the latest available government expenditure data by function for 2013, the important sectors of government spending were social protection, which made 40.2 percent of total

general government expenditure, health with 14.8 percent, public services with 14.1 percent and education with 10.3 percent.

Taking into consideration the Baltic and Scandinavian countries, advanced economies differ over the aggregate scope of general government expenditure. In 2013, Finland and Denmark recorded the highest government expenditure share relative to GDP, at 57.8 % and 57.1 % respectively. In Sweden government expenditure made 53.3 % of GDP. In contrast, Estonia recorded the share relative to GDP, at 38.9 %. In Latvia and Lithuania general government expenditure made 36.1 % and 35.5 % of GDP respectively (Eurostat 2015).

The association between government expenditure and economic growth has been a hot issue today and widely debated among scholars and policy-makers. According to Hamzah (2011), in many countries, public taxes have been the main source of government expenditures. The tax payers have expected that the government effectively allocate their tax contributions. At the same time, the government also hopes to satisfy the public interests and expectations (Hamzah 2011).

The dominant view among economists and policy makers is that the government can play a very important role in the country's economy. Then economic success is often attributed to the government role (Bataineh 2012). However, the subject of association between government expenditure and economic growth has been still unresolved issue theoretically and empirically as well. In the study, Bataineh (2012) has presented two major theories on economics concerning the relationship between government expenditure and economic growth. Keynesian macroeconomic theory has assumed that increased government expenditure tends to lead to high aggregate demand and rapid economic growth. While Wagnerian theory has presented the opposite view, that an increase in national income causes more government expenditure (Bataineh 2012). A number of recent studies have revealed that many scientists (Arpaia, Turrini 2008; Gomez 2008; Irmen, Kuehnel, 2009; Pappa 2009; Hall 2009; Abu, Abdulahi 2010; Mehmood, Sadiq 2010; Taiwo, Abayomi 2011; Ramey 2011; Barro, Charles 2011; Bataineh 2012; Anwar *et al.* 2012; Patricia, Izuhukwu 2013; Aye *et al.* 2014) from different countries have focused on this issue. Their researches have suggested different results, such as positive relationship between government expenditure and economic growth, significantly negative relation or no relation.

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*This research attempts to provide* more reliable estimates of the structural trends in general government expenditure patterns in the Baltic and Scandinavian countries during the period of 2004 – 2013. Scandinavian countries have been selected as advanced economies due to successful economic development, which has been presented by high living standards, social-economic indicators, social conditions and welfare and others. Taking into consideration economic performance of the Scandinavian countries, they could be as a leading objective for the Baltic countries.

The paper is organized as follows. Introduction presents general information about government spending. Section 2 reviews previous studies on the government expenditure and economic development aspects and research methodology. The investigations of different countries are summarized and the main insights are provided. Section 3 provides breakdown and analyses the structural trends in general government expenditure and compares the patterns across the countries observed. Section 4 concludes summarizing the main trends.

## II. EMPIRICAL EVIDENCE AND RESEARCH METHODOLOGY

### A. The overview of recent studies

The relationship between government expenditure and economic development has been the subject to intense debate among scholars in recent years. Economic theory has suggested that on some occasions lower levels of government expenditure would enhance economic growth while on other occasions higher levels of government expenditure would be more desirable (Alexiou 2009). The researches on government expenditure – economic growth nexus have been done analyzing government expenditure by different activities and economic performance indicators, such as growth, poverty, unemployment, revenue, current account, private activity, consumption and others. Despite a great number of investigations (Pappa 2009; Hall 2009; Atesoglu, 2009; Mehmood, Sadiq 2010; Feridun *et al.* 2011; Alptekin, Levine 2012; Danek 2013; Dimitraki, Ali 2013; Khalid, Mustapha 2014; Dunne, Tian 2015), the results have been inconclusive. There is no consensus about the existence of relationship between the variables, because of different level of socio-economic development of the countries observed, the period analyzed and methodology applied as well. Hereafter, some results from the recent investigations have been described.

The paper of (Arpaia and Turrini (2008) analyzed both the long and the short-run relationship between government expenditure and potential output in EU countries over the period of 1970-2003. Results have approved the hypothesis of elasticity between government expenditure and potential output close to unity. However, the long-run elasticity has been significantly higher than unity in low-debt countries, fast-ageing countries, and in countries with weak control of government expenditure.

Irmen and Kuehnel (2009) studied and compared the link between productive government activity, economic growth and welfare in different economic settings. The authors have revealed that productive government expenditure impacts on the growth rate of consumption through a direct effect on the technology and an indirect effect on investment incentives through the financing.

The research done in seven transition economies of the South Eastern Europe has generated significant results which may enhance the economic performance of the countries. The results of research have indicated that four out of the five variables, such as government expenditure on private investment, capital formation, development assistance and trade-openness have had positive and significant impact on economic growth. In contrast, population growth has been found to be statistically insignificant (Alexiou 2009).

Other research has been focused on structural changes of public expenditures in China in the past 30 years. The results have demonstrated an increasing need of the public for education services, housing, social security, and health care. The authors have specified a proper proportion of public spending in total governmental expenditure and discuss possibilities to this structure (Zhu, Wang 2011).

Taiwo and Abayomi (2011) examined the trends and effects of government expenditure on the growth rates of real GDP in Nigeria over 1970-2008. The findings have shown a positive relationship between real GDP and capital expenditure. The authors have recommended that government should promote efficiency in the allocation of development resources.

Bataineh (2012) investigated the impact of public expenditures on economic growth in Jordan for the period of 1990 – 2010. The research has suggested that the government expenditure at the aggregate level has positive impact on the growth of GDP.

The study of Patricia and Izuhukwu (2013) investigated the impact of public expenditure in education on economic growth in Nigeria over a period of 1977- 2012. The results have indicated that a positive relationship exists between the expenditure on education and economic growth in the long run. The authors have concluded that government should direct its expenditure towards the productive sectors like education because it would raise the standard living in the country.

To sum up, the studies have concluded that in many cases the relationship between government expenditure and economic growth has been detected, but the practices of different countries lead to different results. The evidence has suggested that on some cases lower level of government expenditure promotes economic development while on other occasions higher level of government expenditure is more desirable. There is no consensus about the existence of relationship between the variables, because of different level of socio-economic development of the countries observed, the period analyzed and methodology applied as well.

### B. Research methodology

This research has been guided by the estimation of

general government expenditure structure in the Baltic and Scandinavian countries. The authors refer to methodology considered in studies of different authors and institutions (Memedovic, Iapadre 2010; Cortuk, Singh 2010; Zhu, Wang 2011; Freysson 2012; OECD 2014; Dudzevičiūtė *et al.* 2014). The indicators of structural changes (absolute structural change and intensity of structural changes) have been employed. The dissimilarities of general government expenditure patterns across the countries have been analyzed applying Finger-Kreinin index.

The *absolute structural changes indicator* shows structural change of the pattern analyzed. Positive value means that structural change promotes growth of the pattern; and negative value restricts growth. The absolute structural changes indicator is calculated as follows:

$$M = D_i - D_0 \quad (1)$$

where:  $M$ - the absolute structural change indicator;  $D_i$  – activity's share, %;  $D_0$  – activity's share, % in the basic year.

The *intensity rate of structural changes* shows the shift of the pattern in time  $t_i$ , compare with basic period. The higher ratio reveals more intensive structural changes of the pattern analyzed, and conversely. The intensity rate is calculated as follows:

$$K = \frac{\sqrt{\sum_{i=2}^n (S_{ti} - S_{t_0})^2}}{m} \quad (2)$$

where:  $K$ - the intensity rate of structural changes;  $S_{ti}$  – activity's share;  $t_i, t_0$ - current and basic time;  $n$ - number of activities;  $m$ - year.

*Finger-Kreinin dissimilarity index* (D index) measures how much a given distribution differs from a chosen. It is calculated as follows:

$$D = \frac{1}{2} \sum_{i=1}^n |a_i - b_i| \quad (3)$$

where:  $a_i$  and  $b_i$  show the share of sector  $i$  in each of the two distributions.

When a given distribution at a given time is compared to the same distribution in a previous period, the D index can be used as a measure of structural change (Memedovic & Iapadre 2010; Dudzevičiūtė 2013).

D index ranges between zero, denoting equality and one, showing maximum dissimilarity.

In general, all these described indicators give general information about economic patterns, but they do not reveal the reasons for the structural changes.

### III. THE INVESTIGATION OF GENERAL GOVERNMENT EXPENDITURE TRENDS

A. The tendencies of general government expenditure: detailed analysis by economic functions

In this section, we have investigated the main tendencies of general government expenditure in the Baltic and Scandinavian countries. To this end, firstly, referring to the latest Eurostat data (2015), general tendencies of government expenditure as a percentage of GDP have been presented (Fig. 1). Secondly, detailed analysis of structural changes in government expenditure patterns has been performed (Table 1). Over a period of 2004-2013, general government expenditure as percentage of GDP varied across the countries, as shown in Figure 1.

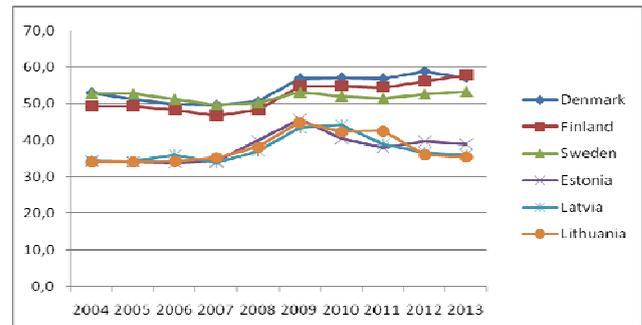


Fig. 1. General government expenditure as percentage of GDP

Source: Eurostat data 2004-2013.

As a figure above shows, over an analyzed period, the Scandinavian countries have reported greater government expenditure contribution to GDP than the Baltic countries. Advanced economies differ over the scope of general government expenditure. They have devoted around 53 percent of GDP, whereas government expenditure has accounted for around 38 percent of GDP in the Baltic countries.

Making comparison across the Baltic countries, Estonian government expenditure as a percentage of GDP has been greater than in Lithuania and Latvia. Denmark has been the highest spender of Scandinavian countries comparing with the size of economy.

To get the completed picture of general government expenditure across the countries, detailed structural analysis by economic functions has been carried out. Table 1 has revealed the structural shifts in the government expenditure patterns of the Baltic countries.

In the Baltic countries as a whole, government spending on social protection has received the largest share in total general government expenditure. In 2013, social protection spending in total general government expenditure amounted to around 30 percent in Lithuania, Latvia and Estonia as well. The next most important spending has been education amounting to 16 percent in the Baltic countries. Public services (on average 13 percent of total) followed in the Baltic countries in 2013. 2013 compared to 2004, Lithuania has reported the most significant shifts in health, social protection and economic affairs spending by government. The shares of spending on health and social protection have increased by 3.7 and 2.1 percentage points respectively. The contribution of economic affairs has decreased by 2.6 percentage points.

Over the same period of time, Latvia has represented the most important changes in the shares of social protection, public order and safety and education spending as well. The share of the expenditure on social protection has increased by 2.4 percentage points; spending on public

order and safety, and education has dropped by 1.5 and 1.4 percentage points respectively.

Estonia has reported the biggest shifts in the shares of education (decrease of 2.9 percentage points) and public order and safety (decrease of 1.5 percentage points).

TABLE1. GOVERNMENT EXPENDITURE AND ITS STRUCTURAL CHANGES IN THE BALTIC COUNTRIES

Country/ General government expenditure by function	2004	2013	Absolute structural change, percentage points	Intensity of structural change, percentage points
<b><i>Lithuania</i></b>				
Public services	14.8	14.9	0.1	0.0
Defence	4.1	2.8	-1.3	0.1
Public order and safety	5.5	4.7	-0.8	0.1
Economic affairs	12.4	9.8	-2.6	0.3
Environment protection	1.2	1.3	0.1	0.0
Housing and community amenities	0.8	0.7	-0.1	0.0
Health	12.1	15.8	3.7	0.4
Recreation, culture and religion	2.3	2.3	0.0	0.0
Education	16.9	15.7	-1.2	0.1
Social protection	29.9	32.0	2.1	0.2
<b>Total</b>	<b>100.0</b>	<b>100.0</b>	<b>-</b>	<b>1.2</b>
<b><i>Latvia</i></b>				
Public services	12.1	13.2	1.1	0.1
Defence	3.6	2.4	-1.2	0.1
Public order and safety	6.7	5.2	-1.5	0.2
Economic affairs	13.4	13.0	-0.4	0.0
Environment protection	1.4	1.8	0.4	0.0
Housing and community amenities	3.6	3.3	-0.3	0.0
Health	9.7	10.0	0.3	0.0
Recreation, culture and religion	3.6	4.2	0.6	0.1
Education	17.1	15.7	-1.4	0.2
Social protection	28.8	31.2	2.4	0.3
<b>Total</b>	<b>100.0</b>	<b>100.0</b>	<b>-</b>	<b>1.0</b>
<b><i>Estonia</i></b>				
Public services	9.1	10.3	1.2	0.1
Defence	4.0	4.7	0.7	0.1
Public order and safety	6.4	4.9	-1.5	0.2
Economic affairs	11.2	12.5	1.3	0.1
Environment protection	2.0	1.7	-0.3	0.0
Housing and community amenities	0.9	1.4	0.5	0.1
Health	12.2	13.0	0.8	0.1
Recreation, culture and religion	6.4	5.4	-1.0	0.1
Education	18.3	15.4	-2.9	0.3
Social protection	29.5	30.7	1.2	0.1
<b>Total</b>	<b>100.0</b>	<b>100.0</b>	<b>-</b>	<b>1.2</b>

Source: Authors calculations based on Eurostat data 2004-2013

Taking into consideration the intensity rates of structural changes of government expenditure patterns, no significant variations have been noticed across the countries. The intensity rate of structural changes has been

1.2 percentage points in Lithuania and Estonia and 1 percentage points in Latvia.

Table 2 has represented the patterns of government expenditure and their structural trends in the Scandinavian countries.

TABLE 2. GOVERNMENT EXPENDITURE AND ITS STRUCTURAL CHANGES IN THE SCANDINAVIAN COUNTRIES

Country/ General government expenditure by function	2004	2013	Absolute structural change, percentage points	Intensity of structural change, percentage points
<b><u>Denmark</u></b>				
Public services	13.5	13.6	0.1	0.0
Defence	2.7	2.4	-0.3	0.0
Public order and safety	1.8	1.8	0.0	0.0
Economic affairs	6.5	6.3	-0.2	0.0
Environment protection	1.1	0.7	-0.4	0.0
Housing and community amenities	0.8	0.5	-0.3	0.0
Health	13.6	15.3	1.7	0.2
Recreation, culture and religion	3.3	3.2	-0.1	0.0
Education	12.5	12.3	-0.2	0.0
Social protection	44.2	43.9	-0.3	0.0
<b>Total</b>	<b>100.0</b>	<b>100.0</b>	<b>-</b>	<b>0.2</b>
<b><u>Sweden</u></b>				
Public services	14.5	14.6	0.1	0.0
Defence	3.3	2.8	-0.5	0.1
Public order and safety	2.4	2.6	0.2	0.0
Economic affairs	7.5	8.1	0.6	0.1
Environment protection	0.6	0.6	0.0	0.0
Housing and community amenities	1.5	1.4	-0.1	0.0
Health	12.3	13.1	0.8	0.1
Recreation, culture and religion	1.8	2.0	0.2	0.0
Education	12.7	12.4	-0.3	0.0
Social protection	43.4	42.4	-1.0	0.1
<b>Total</b>	<b>100.0</b>	<b>100.0</b>	<b>-</b>	<b>0.4</b>
<b><u>Finland</u></b>				
Public services	14.2	14.4	0.2	0.0
Defence	3.0	2.6	-0.4	0.0
Public order and safety	2.6	2.4	-0.2	0.0
Economic affairs	9.5	8.2	-1.3	0.2
Environment protection	0.6	0.4	-0.2	0.0
Housing and community amenities	0.6	0.7	0.1	0.0
Health	13.3	14.5	1.2	0.1
Recreation, culture and religion	2.2	2.5	0.3	0.0
Education	12.6	11.2	-1.4	0.2
Social protection	41.4	43.1	1.7	0.2
<b>Total</b>	<b>100.0</b>	<b>100.0</b>	<b>-</b>	<b>0.7</b>

Source: Authors calculations based on Eurostat data 2004-2013

The breakdowns of general government expenditure on the basis of the activities they support (Table 2) have revealed that government spending on social protection has dominated in the Scandinavian countries as well as in the Baltic economies. In 2013, social protection activity in total government expenditure amounted to around 44 percent in Denmark, 42 percent in Sweden and 43 percent in Finland. The spending on health and public services has followed. Over the period of 2004 – 2013, Denmark and Sweden have reported the most significant shifts in health. In Denmark and Sweden, spending for health has increased by 1.7 and 0.8 percentage points respectively. In Finland, the most significant structural changes have been in spending of social protection (increase of 1.7 percentage points), education and economic affairs (decrease of 1.4 and 1.3 percentage points respectively).

The intensity rate of structural changes has varied across the Scandinavian countries. It has amounted to 0.2 percentage points in Denmark, twice greater in Sweden and 0.7 percentage points in Finland.

In general, it could be concluded, that over the period of 2004 – 2013, government spending on social protection has dominated in the Baltic countries as well as in the Scandinavian, however the patterns' volatility of the Baltic countries has been greater than in Scandinavian. It could be interpreted as a sign of the Scandinavian countries ability to adjust to changes in international economy.

Another statistical indicator, which has been applied for the investigation of the structures of government expenditure across the countries, is Finger-Kreinin index of the patterns' dissimilarity. Next section has been devoted for this issue.

#### B. Assessing of the government expenditure patterns' dissimilarity

In order to assess the patterns of the government expenditure dissimilarity across the countries, Finger-Kreinin index has been applied. This index has summarized how much a given distribution of government expenditure differs from other country. Finger-Kreinin index ranges between 0 and 1. When value is equal to 0, this means that the structures of pair of countries being considered are identical; and when it is equal to 1, this means maximum dissimilarity.

Table 3 gives the Finger-Kreinin index of government expenditure patterns for all pairings for the period of 2004 – 2013.

TABLE 3. FINGER-KREININ INDEX OF GOVERNMENT EXPENDITURE PATTERNS OVER 2004 – 2013 (AVERAGE DATA)

Countries	Lithuania	Latvia	Estonia	Denmark	Sweden	Finland
Lithuania	1	0.094	0.076	0.136	0.127	0.111
Latvia	0.094	1	0.075	0.214	0.185	0.189
Estonia	0.076	0.075	1	0.200	0.174	0.175
Denmark	0.136	0.214	0.200	1	0.051	0.045
Sweden	0.127	0.185	0.174	0.051	1	0.025
Finland	0.111	0.189	0.175	0.045	0.025	1

Source: Authors calculations based on Eurostat data of 2004-2013.

According to the index value in the period of 2004 – 2013, some sightings can be identified. In general, the structures of government expenditure across the countries being observed have been similar. Finger-Kreinin index has varied in the interval of 0.025 – 0.214. It has shown low degree of dissimilarity. Assessing the pairs of the countries, the most significant dissimilarity has been revealed between the government expenditure structures of Latvia and Denmark, Estonia and Denmark, Latvia and Sweden as well as Latvia and Finland. Finger-Kreinin index has suggested that Finland and Sweden, Denmark and Finland as well as Denmark and Sweden have the lowest rate of dissimilarity in distribution of government expenditure. Finally, it could be concluded, that the patterns of general government expenditure have been more similar among the Scandinavian countries than the Baltic ones.

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

#### IV. CONCLUSIONS

After the surveying theoretical and empirical material on structural changes, we have presented a descriptive analysis of long-term trends in the structure of general government expenditure of the Baltic and Scandinavian countries. To better understanding of these changes, we have conducted a more detailed analysis of general government distributions across the countries.

Taking into consideration the Baltic and Scandinavian countries, advanced economies differ over the aggregate scope of general government expenditure. On average, the Scandinavian countries have reported 53 percent government expenditure share relative to GDP. In contrast, the share of government expenditure relative to GDP has amounted on average to 38 percent in the Baltic countries.

In general, we might conclude that the Scandinavian countries tend to show more stability than the Baltic countries. The breakdowns of general government expenditure on the basis of the activities they support have revealed that government spending on social protection has dominated in the Baltic as well as Scandinavian countries. Education and public services have followed in the Baltic countries. In the Scandinavian countries, the next most important spending has been health and public services.

For a long time, the structural change has been accompanied by rising expenditure on social protection in the Baltic countries and health in the Scandinavian countries.

Lithuania and Estonia have shown the highest intensity rate of structural changes in 2004 – 2013, due to the sharp shifts in health, social protection and economic affairs as well in Lithuania; and economic affairs, social protection and education in Estonia. The structure of the government expenditure has changed more rapidly in the Baltic countries than in Scandinavian as an effect of the transition process and abilities to adjust to changes in the international markets.

Finger-Kreinin index has suggested that the distributions of general government expenditure have had the lower rate of dissimilarity among the Scandinavian countries than the Baltic. The most significant dissimilarity has been revealed between the government expenditure structures of Latvia and Denmark as well as Estonia and Denmark. Finland and Sweden have demonstrated the lowest rate of dissimilarity in their government expenditure patterns.

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