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Automatic Fiscal Stabilization: Lithuania in the EU

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ABSTRACT

This essay discusses fiscal policymaking in Lithuania as a member state in the European Union and in the European Monetary Union. More specifically, looking at official forecasts of the development of some economical and fiscal variables made by Lithuanian authorities and the European Commission for 2005-2008 and simulating business cycles in 2009-2030, it is concluded that it would be thoughtful to increase the cyclical sensitivity of Lithuanian budget, thus making the national fiscal policy more predictable without risk to violate fiscal obligations to the European Union. This conclusion is based on the calculations of the safety margins with different budget balance elasticity and applying the theoretical advantages of automatic fiscal stabilization.

Keywords: Budget balance elasticity; Budget deficit; Fiscal policy; Lithuania

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1. INTRODUCTION

1.1. Background

On the 1st of May 2004 ten new Central and Eastern European countries, including Lithuania, joined the European Union (EU). Many of these countries intend moreover to become member states of the European Monetary Union (EMU). Being a member of the EMU in turn implies loss of the independent monetary policy as the monetary policymaking is governed centralized by the European Central Bank (ECB) for the Euro area as a whole. Thus the domestic fiscal policy becomes the essential stabilizer on the national level of the normal cyclical fluctuations as well as asymmetrical shocks arising out of for instance common monetary policymaking. In order to sustain the stable macroeconomic environment in the EU, the national fiscal policymaking is however bounded by the certain rules defined in the Stability and Growth Pact as well as the Maastricht Treaty and fulfillment of these objectives is carefully supervised by the European Commission (EC).

Entrance to the EU and intention to become a member of the EMU implies therefore that candidate countries along with the current EMU members have to fulfill these formal criteria. Those criteria are principally directed towards four economic indicators: the price level, the level of the long-term interest rates, the level of the exchange rates in the economy and sustainability in the public finance.

Lithuania was one of these ten states that have accessed the EU in 2004 and therefore the country is obliged to comply with these official criteria in order to among others become a member state in the EMU. The present overall ambition of Lithuanian government is therefore to ensure that the country will be able to introduce Euro in 2007. Fulfilling the formal convergence criteria, including the fiscal one, has however shown to be a problematic issue for the country in the past, but preparation for the accession and entrance to the EU have surely helped the country to balance its public finance. Accessing the EMU would in turn again imply changes in the country from the national stabilization policy perspective.

1.2. Purpose

Hence, the purpose of this essay is to discuss how Lithuania might form its national fiscal stabilization policy as a member state of the EU and EMU. Through the short presentation of the formal convergence criteria formalized in the Stability and Growth Pact and Maastricht Treaty, afterwards focusing on the particular objective - budget deficit ceiling – the possible formation of the national fiscal policy is analyzed. The idea behind the budget deficit rule and its possible consequences for the new EU member states are to a large extent discussed in the recent scientific articles where the arguments on advantages and disadvantages of enforcement of this criterion are based on traditional economic theory as well as empirical research.

Introducing the concept of the safety margin, the determinants that influence the size of this indicator, such as the total budget balance elasticity, the medium-term objective and the volatility of the economies with a specific application towards small open and catching-up economies, such as Lithuania, are presented. Afterwards, the theoretical approach and mathematical alternatively econometrical models are applied to analyze whether these variables may change over time in Lithuania in order to answer following question:

- Is there any space left for the country to raise the cyclical sensitivity of the general government budget thus strengthening the smoothening capacity of the automatic stabilizers for stabilization policy purposes at the same time ensuring that the obligations to the EU will be sustained?

1.3. Disposition

The essay is organized as follows: in the theoretical and empirical part, in Chapters 2-5, the formal convergence criteria are presented afterwards focusing on the specific requirement – the budget deficit ceiling and its possible implications for the new EU member countries. This part finishes with Chapter 5 where Lithuania's past and present fiscal performance is presented. Chapter 6 involves the description of the methodologies used to analyze some particular fiscal variables in Lithuania. Finally, in Chapter 7, the results are presented, analyzed and concluding remarks are made.

2. ENLARGEMENT OF THE EU

2.1. Formal convergence criteria

The exceptional feature of the EMU is that the monetary policy is governed centralized by the European Central Bank (ECB) while the fiscal policymaking is left in hands of each individual member state. One of the responsibilities of the ECB is to stabilize the symmetrical shocks in the Euro area as a whole with monetary policy means while the stabilization of normal cyclical fluctuations and asymmetrical shocks falls to the national fiscal policy. There are therefore several rules of how the EU member states should govern their public finance in order to maintain the macroeconomic stability in the EU as a whole. These norms are formalized in the Stability and Growth Pact as well as the Maastricht Treaty and are applied to both current and candidate states of the EMU. These formal criteria thus are:

2.1.1. Price development

The fundamental requirement enforced by the Stability and Growth Pact and the Maastricht Treaty regarding price development is to maintain price stability in the EU member states. In order to sustain the price level stability in the region, each individual member or candidate state obliges to design the national fiscal and monetary policy in such way that the observed average annual inflation does not exceed 1,5 percent, compared to three member states that

have had the lowest inflation rates under the same period. Inflation is measured in Harmonised Consumer Price Index (HCPI) which takes into account the national calculation differences and therefore makes the inflation measurement comparable among all the candidate and member states. (ECB 2005)

2.1.2. Fiscal development

The central issue concerning the fiscal discipline is that the member and candidate states are obliged to achieve the government budgetary position without the excessive annual deficit. The reference value of excessive planned or actual budget deficit is 3 percent measured as a ratio of the annual general government¹ budget deficit to gross domestic product (GDP). (ECB 2005) Member and candidate states that violate this rule are supposed to be penalized.

Under exceptional circumstances it is however allowed to violate this objective. It is allowed to run the excess deficit if the ratio of the annual budget deficit to GDP exceeds the reference value but has declined significantly in the last periods and is sufficiently close to the reference value, or if the ratio of the annual budget deficit to GDP exceeds the reference value but it is close to 3 percent ceiling and it can be proved it to be of temporary matter. (ECB 2005) The main exceptional circumstance might be furthermore defined as a fall in real GDP with at least 2 percentage points compared to the previous year. (Kutan & Pautola-Mol 2001, p.11)

The ratio of the gross government debt to GDP is not allowed to exceed 60 percent. An exception is made for the countries that are successfully reducing excess ratio of their debt level to this reference value. (ECB 2005)

2.1.3. Exchange rate development

The fundamental requirement for the candidate states concerning the exchange rate development is to ensure that the fluctuations in the domestic currency will fall into the normal fluctuation margins. The ECB observes the exchange rate fluctuations of the candidate states against the currency of any other EMU member state for at least two years before the entrance. (ECB 2005)

The candidate states should avoid the considerable fluctuations of the national currency that could be caused by policymaking to achieve price stability or reduce fiscal deficit and therefore the exchange rates should fluctuate within the reasonable interval. For the candidate states with the fixed exchange regime it is prohibited to devalue the national currency over the whole observation period due to the same reasons. (ECB 2005)

¹ The general government consist of four major public sub-sectors in the economy: the central government, the state government, the local government and the social security funds.

2.1.4. Long-term interest rate development

The exchange rate criterion is directly connected to other convergence criterion, in particular the long-term interest rate level in the economies. Long-term interest rates in the EU framework refer to the rates on the long-term government bonds. The difference between the average nominal long-term interest rates should not be higher than 2 percent compared to the reference value. The reference value is calculated as the average of the long-term interest rates in three other member states that have had the lowest inflation rates at the same time interval. The observation period is one year. (ECB 2005)

These criteria are applied to the current members of the EMU as well as to the candidate countries. At present the EU law requires to observe the development of these indicators for at least two years, with the exception of the long-term interest rate level, and the candidate states are allowed to join the EMU only after the fulfillment of these objectives. (Viksnins 2000, p.216)

The favourable macroeconomic environment with stable prices and sustainable public finances in the EU is supposed to be maintained in the region if the countries fulfil these formal criteria. The stability in the whole region in turn is assumed to promote growth in employment and long-term GDP growth through favourable conditions for investments. (Papademos 2005, p. 31)

2.2. Reasoning behind the budgetary deficit ceiling requirement

Thus, current EU fiscal discipline rules are based on the set of objectives formalized in the Stability and Growth Pact and the Maastricht Treaty. One of them which is discussed in this essay more detailed is the rule regarding the general government deficit.

The ratio of the annual budget deficit is not allowed to exceed 3 percent of GDP. The states that violate this rule formally are supposed to be penalized. Another fiscal objective that is closely interrelated to the budgetary deficit ceiling is the general government debt. The gross government debt level should be kept below 60 percent of GDP or if it already above the reference values the adequate policy measures should be taken to decrease it to the requested level. In practice this objective implies that the excess debt ratio should at least remain stable. (Boije 2005, p.74)

The member states are moreover expected to achieve the medium-term budgetary objective, the so called close-to-balance-or-in-surplus budgetary position over the business cycle that is basically measured in terms of the estimated structural budget balance². There is however no risk that the member states will be penalized if this target is not achieved. (Boije 2005, p.74-75)

The reasoning behind the introduction of the close-to-balance-or-in-surplus budgetary position is that if the member states set sufficiently ambitious medium-term objective, taking into account at least variability of budget's cyclical component, 3 percent budgetary deficit ceiling will not be breached even under unfavourable economic conditions once this objective is achieved. (Buti, Franko & Ongena 1998, p.83)

From the stabilization policy perspective it is moreover assumed that when the countries achieve their medium-term objectives, the automatic stabilizers are allowed to operate fully over the business cycles to stabilize the fluctuations in the output at the same time ensuring that 3 percent budgetary deficit ceiling will not be breached. (Orban & Szapary 2004, p. 840) This issue is also important in a way that full and symmetrical functioning of the automatic stabilizers over the cycle is considered to leave the underlying budgetary position unaffected. (van den Noord 2000, p.4-5)

3 percent deficit ceiling is regarded to ensure that the other fiscal objective - the gross government debt - will be kept at the requested level in the member states. It is considered that the gross government debt will converge towards 60 percent if the deficit was kept at 3 percent level under the supplementary assumption that the nominal GDP grows at 5 percent rate annually.³ The nominal GDP growth rate is further decomposed into two its elements: 2 percent annual inflation rate and 3 percent real growth that is assumed to be trend GDP growth rate for the old members of the EU. (Orban & Szapary 2004, p. 841)

² The distinction between two technical definitions – structural budget balance and cyclically-adjusted budget balance is not made here. Cyclically-adjusted budget balance is obtained by subtracting the cyclical component, which is limited only to the size of the automatic stabilizers, from the actual budget balance while structural budget balance is obtained by subtracting the cyclical component and the impact of the discretionary policy measures that are commonly used in the stabilization policy from the actual budget balance. (Boije 2004, p.8) Here it is assumed that these two technical terms have the same meaning as both of these definitions are broadly used in the scientific articles in the same sense.

³ It is assumed that the debt develops in a following way: $d(t) - d(t-1) \approx -b - gd$ where $d(t) - d(t-1)$ is the change in the ratio of debt to GDP over a year. Furthermore, b indicates the annual budget deficit to GDP ratio and g is the annual nominal GDP growth rate that are assumed to be equal to -3 % and 5% respectively in the EU framework. Assuming that the change in debt ratio is held constant, that is $d(t) - d(t-1) = 0$, the quote of the debt to GDP moves approximately towards 60%, that is $60\% = -(-3\%)/5\%$. (Boije 2005, p.74)

2.3. Problems associated with the budgetary deficit rule towards the new EU members

As mentioned above, the enforcement of these formal criteria is supposed to help to maintain the stable macroeconomic environment in the region, thus promoting the long-term economic growth. The convergence criteria, including the fiscal one, are applied to both old and new EU members⁴ independently on their development level and their fiscal position at the time of entrance to the EU. The new EU member states however differ much in their current development level as well as they face different trends in their future development from the old ones. The formal fiscal criteria were besides introduced before the EU enlargement and therefore particular issues require some additional attention when applying them to the new EU member states. This necessity arises out of the facts that these countries face additional burden on their budgets after the entrance to the EU, these countries are expected to grow faster than the old EU member states, a number of them have relatively low debt levels and possibly are not close enough to their medium-term objectives.

2.3.1. Additional expenditure

The important approach is that the new EU members in the early years of membership face the additional pressure on their budgets in form of raise in expenditure that are associated with the participation in the EU. This fact should be taken into account when applying the budgetary deficit ceiling objective to those countries. (Orban & Szapary 2004, p. 839)

Increase in expenditure is associated with the structural reforms in the educational, social security and pension systems that basically cause the additional burden on the budget's spending at least in the early years of membership. Besides, these countries need to invest in the infrastructure in order to accelerate the long-term economic growth. (Losoncs 2004, p. 251) Increase in spending in the early years of membership may require cut in the other expenditure categories if there is some risk to run into the excess deficit. It is therefore considered that the annual budget deficit ceiling may slow down the public sector investments in these states.

Even if initially the reasoning behind the budget deficit ceiling was to allow the member states to borrow funds up to this level and finance the real public sector investments, this spending category however is the primary objective of the expenditure cut if there is some risk to breach the budgetary deficit requirement. (Barrell 2001, p. 279)

⁴ The new EU members are: Lithuania, Latvia, Estonia, Cyprus, Malta, Hungary, Slovenia, Slovakia, Czech Republic and Poland.

It might be therefore thoughtful to let the catching-up economies, such as the new EU members are, to loosen their medium-term objectives, run higher budget deficits and accumulate debt as it is very important for these states to invest heavily in the infrastructure. Giving more freedom for these economies in governing their public finance is considered to promote the robust growth in the long-term perspective.

2.3.2. Debt approach

- Close-to-balance-or-in-surplus position

Another questionable issue is the close-to-balance-or-in-surplus budgetary position in general. If the close-to-balance-or-in-surplus position is achieved over the business cycle it basically leads to that the debt ratio will move towards zero. (Orban & Szapary 2004, p. 842) The zero budgetary position over the cycle implies that the positive and negative actual budget positions are likely to cancel each other assuming that GDP gap is approximately symmetrical. The zero budgetary position implies therefore that the debt ratio will gradually converge towards zero (see note ³ for the approximation of the debt development).

It could be however questioned whether the zero debt is the most appropriate debt level for any country at all as it disregards the intergenerational benefits that arises out of, for instance, debt-financing public investments in the infrastructure that gains the future generations in terms of robust long-term growth. The appropriate debt level consequently depends on whether the debt servicing costs on the current and future debt crowds out the public sector investment or it would cause the increase in the tax rates for future generations to finance the debt servicing costs. (Orban & Szapary 2004, p. 842)

Taking these factors into account the approximately zero budgetary position over the cycle could be the reasonable aim for the high-debt countries to reduce their debt levels.

That is on the other hand not a case for the low-debt countries. These countries should be allowed to loosen their medium-term objectives, run higher budget deficits and possibly accumulate debt. (Orban & Szapary 2004, p. 849) It is besides not definite that the loosened medium-term objective and higher annual budget deficit would lead to the debt accumulation as increase in debt also depends on the growth rate of potential GDP.

- Economic development

As stated above, in the EU fiscal discipline framework it is assumed that the nominal GDP grows at 5 percent rate annually where 3 percent is the potential GDP growth and 2 percent is the annual inflation rate in the old member states, so that the debt converges at 60 percent level.

Economical activity in developing countries however in general is more volatile in comparison to the one in the highly industrialized nations. (Lane 2003, p. 95) Therefore, the catching-up economies, as a rule are likely to have higher levels of inflation because of the greater volatility in the economy. Besides, these countries tend to exhibit higher potential GDP growth. These economies should therefore be allowed to loosen their medium-term objectives and run higher actual budget deficit without risk to accumulate higher debt levels. (Orban & Szapary 2004, p. 841-842) If these economies however are allowed to run higher budget deficit without exhibiting the sufficient enough growth in trend GDP at present, the debt level would increase. The increase in the debt level consequently leads to that these countries are obliged to pay higher risk premiums when borrowing funds on the international market.

Increase in the debt level would in turn be related with higher debt servicing costs in the future. It could be therefore argued that instead of accumulating debt and facing the increasing burden on the budgetary expenditure in form of interest payments, it should be more reasonable instead to use these spending in the other economical and social spheres. (Papademos 2005, p. 31)

Summarizing all these aspects, the low-debt countries that are expected to exhibit high potential GDP growth rates in the future should be allowed to run higher budget deficit and possibly even accumulate debt as long as the excess deficit arises out of the expenditures associated with the public sector investments. (Kutan & Pautola-Mol 2001, p.33)

2.3.3. Asymmetrical shocks

As the monetary policy is entirely governed by the ECB for the Euro area as a whole, the fiscal policy becomes the essential stabilizer on the national level. Asymmetry in the cyclical positions among the member states call for higher fiscal flexibility to deal with these asymmetrical shocks or the different reactions of the economies to the same type of shocks. Therefore it is fundamentally important that the budget deficit ceiling rule applied commonly for all member states leaves enough flexibility for the automatic and, if needed, discretionary fiscal stabilization policies to respond to these shocks and smooth the fluctuations in the output arising out of the common monetary policy impulses. It is therefore important to take into account the country-specific factors, such as the initial level of the underlying budgetary position and the smoothening capacity of the automatic stabilizers, to see what the annual budget deficit levels are appropriate for each individual member state. (Orban & Szapary 2004, p. 843)

2.3.4. Starting fiscal position and pro-cyclicality

3 percent budgetary deficit ceiling is applied for all EU countries disregarding their starting fiscal position at the time of entrance. In the other words, it is assumed that the countries have reached or are close enough to their medium-term objectives so that there is no risk to run into

excess deficit even in the downturns of the economic activity. If however the governments are not close enough to the medium-term objective there is a risk that the 3 percent budgetary deficit ceiling will be breached in the recessions as it usually takes some time to implement the structural reforms and improve the structural balance position.

As a result, the countries that are not close enough to their targeted medium-term objectives might be forced to run the pro-cyclical fiscal policies in the recessions in order to insure that the budget deficit ceiling would not be breached. (Orban & Szapary 2004, p.842) Cut in the expenditures and/or raise in the tax rates in the economical downturns thus ensuring that 3 percent budgetary deficit rule will not be breached consequently may lead to the prolonged recession. Besides, if cut in expenditure is primary associated with the reduction in the public investment, it would threaten GDP growth in the long-run.

It should however also be mentioned that there is no empirical evidence that the fiscal sustainability rules in the EU have caused the reduction in the public investment at least in the current EMU member states. The fiscal discipline objectives enforced by the EU led to the reduction in the deficit and debt levels while the public investment expenditure or the stabilizing effects of the national fiscal policies have remained basically unaffected. (Orban & Szapary 2004, p. 859)

2.3.5. Lack of fiscal discipline in the old EU member states

Another important approach is that number of governments has recently faced problems of failure to strengthen their fiscal positions and accumulate surpluses during the periods of improvement in economic activity. Therefore, some old EU members, namely France, Germany, Greece and the Netherlands have failed fulfilling the budgetary deficit requirement one or several times between 2001 and 2004. (Papademos 2005, p. 32) The budgetary ceiling rule was breached and violating this objective was supposed to lead to a fine. In reality it has however shown to be difficult to penalize these countries for violating this requirement. (Orban & Szapary 2004, p.843) It is therefore questioned why the new member states should be obliged meeting the budget deficit criterion if the old member states do not achieve themselves the required objectives. (Losoncs 2004, p. 249)

3. MAIN ECONOMIC INDICATORS IN THE EU FISCAL SUSTAINABILITY FRAMEWORK

Anyhow, the fiscal variable – the actual budget deficit – is one of the most important indicators in the EU fiscal sustainability framework. Decomposition of it into its structural and cyclical parts is necessary in order to analyse the factors affecting the size of this variable that in turn helps the member states to comply with the budgetary deficit rule imposed by the Stability and Growth Pact and the Maastricht Treaty.

3.1. Structural budget balance

In the EU fiscal discipline framework the structural budget balance is the medium-term sustainability in the public finance indicator.

The structural budget balance shows what the budget balance would be if real GDP was equal to potential. The positive structural balance indicates that there is an underlying budget surplus that does not depend on cyclical fluctuations in the economy and there is possibly some space left for a particular country to implement the permanent structural reforms by for instance cutting the certain tax rates or raising expenditure. The reverse may also be valid – the underlying structural budget deficit suggests that some structural reforms might be needed to improve the budgetary position. In the other words, the structural budget balance indicates what the budget balance would be if the actual budget balance was cleared from the impact of the cyclical fluctuations in the economy. (Boije 2004, p.5-9)

Mathematically, the difference between the actual budget balance and its cyclical component gives a measure of the structural budget balance. (Boije 2004, p.7)

3.2. Cyclical component of the actual budget balance

The cyclical budget component in turn indicates what part of the actual budget balance surplus or deficit arises out of the upturn or slowdown in the economical activity. (Boije 2004, p.5)

Mathematically, the cyclical component of the budget can be calculated by multiplying the total budget balance elasticity to GDP gap. The total budget balance elasticity thus identifies the average percentage change in the actual budget balance when GDP gap changes with 1 percent. (Boije 2004, p.7)

3.3. Safety margin

In the EU fiscal discipline framework it is very important to be aware of variability of budget's cyclical component, that depends on the volatility of the economy and the sensitivity of the budget balance to the cycle, when determining what the underlying budgetary position should at least be achieved in each individual member state, thus ensuring that 3 percent budgetary deficit objective will not be breached even in the recessions.

The technical definition - the safety margin - indicates what the structural budget balance position should be achieved to be able to comply with 3 percent budgetary deficit target within the EU fiscal sustainability framework. (Ohlsson 2002, p. 266) In the other words, the safety margin identifies what the underlying budgetary position should at least be achieved being aware of the volatility of the economy and the average response of the actual budget balance to these fluctuations that is compatible with 3 percent annual budget deficit ceiling.

The total budget balance elasticity may change over time as well as may change the volatility of the economy. These changes would have a high impact on the results when calculating the safety margin. Besides, there are some additional aspects, not only the present variability of budget's cyclical component, that are important when determining the appropriate medium-term objective for each individual member state in order to comply with the budget deficit rule in the future. Therefore the factors that have effects on the total budget balance elasticity, the interconnected aspect that determines the volatility of the economy as well as additional aspects that have impact on characterization of the appropriate medium-term objective are described in the sections below.

4. DETERMINANTS OF THE SIZE OF FISCAL INDICATORS

4.1. Size and smoothening capacity of the automatic stabilizers

Normally in the upturns of the economical activity the budget revenue raises while expenditure declines automatically thus causing the improvement in the actual budget balance. The reverse accordingly is valid in the downturns – revenue declines and expenditure raises thus deteriorating the actual budget balance position. These automatic countercyclical effects help to smooth domestic demand to some extent. The degree of the automatic variability of the actual budgetary position depends on the volatility of the economy and the size of the automatic stabilizers in the budget or the total budget balance sensitivity to the fluctuations in the output.

In the EU fiscal sustainability framework it is very important to be aware of the size and variability of budget's cyclical component that depends in turn on the budget balance elasticity and the volatility of the economy in order to set the appropriate medium-term objective thus ensuring that the 3 percent budgetary deficit target will not be breached even under unfavourable economic conditions. As the total budget balance elasticity is a weighted average of the sensitivities of each individual cycle-sensitive tax and expenditure categories in the budget, the factors affecting the elasticity of revenue and expenditure require therefore some additional consideration.

Traditionally it is considered that the size of the automatic stabilizers increases with introduction of the progressive tax system. The increase in the ratio of cycle-sensitive tax revenues to GDP or raise in ratio of the cycle-sensitive expenditure categories to GDP also lead to the increase in size of the automatic stabilizers. The increase in sensitivity of unemployment to fluctuations in GDP has the equivalent effect. (Brunila, Buti & In 'T Veld 2003, p. 3)

4.1.1. Tax system

Firstly, the progressive tax system is an important determinant of the size of automatic stabilizers. (OECD 1993, p. 37) The progressive taxes react to the upturns or downturns in the economical activity in somewhat higher amplitude than for instance proportional taxes.

Usually it is considered that direct taxes are more sensitive to the business cycle compared to indirect. The indirect taxes are generally proportional, that is, they lack the feature of progressivism. Due to this attribute direct taxes as a rule respond stronger to the fluctuations in the economical activity. (Fatas & Mihov 2001, p. 15) The implementation of progressive tax system can raise the cyclical sensitivity of the budget as well as the share of the progressive taxes to the total budget revenue plays a significant role for the total budget elasticity.

It is important to note here that the budget structure in highly industrialized countries tend to differ from the ones in developing economies. The distinguishing feature of developing countries is that the budgets of these economies are more dependable on the indirect or consumption taxes meanwhile in highly industrialized countries - on the direct. (Talvi & Vegh 2004, p. 162)

Secondly, the structure of the tax system plays an important role in determining the size of the automatic stabilizers in the budget. The increase in the tax rates of cycle-sensitive revenue categories leads to the increase in their proportion to the total revenue and GDP thus having an impact on the total budget balance elasticity. (OECD 1993, p.37) The decrease in the other tax rates is however also necessary in this case to leave the size of the budget unaffected.

Thirdly, the elasticity in each individual tax base has the same effect on the size of automatic stabilizers. (OECD 1993, p.37) If the elasticity of the particular tax to the cycle increases it consequently leads to the increase in the total budget balance elasticity.

Finally, the change in the proportions of the taxes to the total revenue and GDP may affect the size of the automatic stabilizers if these cycle-sensitive revenue categories differ in their elasticity.

4.1.2. Expenditure structure

Traditionally it is regarded that the unemployment benefits are the most sensitive expenditure category in the government budget. (OECD 1993, p. 38) As the unemployment rates fluctuate over the cycle, the spending on unemployment benefits varies also. The significance of this expenditure category to the total budget elasticity depends therefore on the generosity of the transfer system in a country and the sensitivity of the labor market itself to the changes in economical activity. (Brunila, Buti & In 'T Veld 2003, p. 3)

4.1.3. Size of the public sector

Finally, the most important factor affecting the budget elasticity is the size of the public sector in the economy. (van den Noord 2000, p.7)

The empirical research supports the fact that larger elasticity of cycle-sensitive taxes and expenditure are associated with larger governmental sectors. The growth of the public sector implies that the higher share of the total GDP in the economy is produced by this particular sector. As the cycle-sensitive budgetary items as a ratio of GDP also increase that consequently cause the increase in the total budget balance elasticity. (Fatas & Mihov 2001, p. 4-8) Larger public sector is in addition the distinguishing feature of a small open economy.

Small open economies tend to have higher volatility in GDP due to larger dependency of these countries on the fluctuations in the output in the world market. That is, the volatility in GDP is positively interrelated with country's openness that is commonly measured as a sum of country's export and import to GDP. This approach may be applied for both high- and low-income countries. (Rodrik 1998, p.998) As the households can not totally smooth their consumption over the life-time due to imperfections in the credit markets, they may at least desire to protect themselves against the risk of foreign origin and smooth the consumption. Therefore the households are expected to make adequate political decisions and vote for the increase in the public sector. (Fatas & Mihov 2001, p. 5-12) As the output produced in the private and public sectors could often be viewed as substitutes and the public sector is a relatively "safe" sector compared to the private one, the countries that are extensively affected of the foreign origin shocks may reduce these risks by enlarging the government sector. (Rodrik1998, p.1011-1028)

Therefore, the growth of the public sector always lead to the decrease in the output volatility in the economy regardless of how the size of the public finances or output volatility is quantified. On the other hand, the most traditional quantitative way to measure the public sector is the ratio of the budget revenue to GDP. (Fatas & Mihov 2001, p. 5-19) The growth in the public sector consequently leads to the increase in the ratio of the budget revenue to GDP that implies the increase in the size of automatic stabilizers in the economy and stronger response of them to the fluctuations in the output.

The size of the budget is therefore a key determinant when analyzing the size of the automatic stabilizers in economy and one of the most important determinants in characterizing the magnitude of the business cycles. It is empirically showed that the larger is the public sector, the stronger is ability of automatic stabilizers to smooth the output gap in the economy. (Fatas & Mihov 2001, p. 5-25)

4.1.4. Smoothing capacity of the automatic stabilizers in Europe

– Theoretical approach

The smoothing capacity of the automatic stabilizers can be considerable or insignificant depending on the several factors in the economy. One of them is definitely the size of the automatic stabilizers in the budget that depends on the factors mentioned above, namely, the size of the public sector, the progressive tax system and the proportion of the cycle-sensitive revenue and expenditure categories in the total budget. (OECD 1993, p. 42)

The size of the automatic stabilizers in the budget depends basically on the reasons mentioned above, but the smoothing capacity of them increases only partially through the increase in the cycle-sensitive budgetary components. The smoothing effects of them also depend on the interrelationship of these cycle-sensitive budgetary items to the changes in the economical activity such as the types of shocks that hit economies. (Brunila, Buti & In 't Veld 2003, p. 5-7)

Besides, in the small countries the stabilizing effects are more generous due to greater dependency of these economies to the foreign origin shocks. The stabilizing effects are on the other hand considerably higher in the small open economy if the size of automatic stabilizers is relatively high. (OECD 1993, p. 42)

– Empirical approach

The recent empirical research for OECD countries has showed that the automatic stabilizers were capable to smooth around 25 percent on average of GDP gap over 1990's. Besides the smoothing capacity of the automatic stabilizers is proved to be highest in the countries that have highest budget sensitivities. In these countries the estimations show that the automatic stabilizers were able to smooth the half of GDP gap. (van den Noord 2000, p. 9)

The other studies point towards the considerably lower results. These studies indicate that in the EMU countries the automatic stabilizers were able to smooth 11 percent of the GDP gap on average. (Barell & Pina 2003, p. 20)

In these studies however the types of the possible shocks that hit economies are not distinguished and therefore these results identify only the average smoothing capacity of the automatic stabilizers. (Boije 2005, p. 88)

The third studies therefore estimate that the smoothing capacity of the automatic stabilizers differ across countries, depending on the types of shocks that hit economies. In the EU countries the smoothing effects vary between 20-37 percent under consumption shock. The smoothing capacity is moreover higher in the countries that budgets are more dependable

on the indirect taxes. Under other demand-side shocks, such as private investment and export demand, the smoothening capacity is estimated to be 3-10 and 5-14 percent respectively. If the economies are hit by the supply-side shocks, namely productivity shock, the automatic stabilizers were able to smooth between 1 and 10 percent of GDP gap in the EU economies. (Brunila, Buti & In 'T Veld 2003, p. 17-19)

4.2. Structural budget balance

The size of the public sector, the progressive tax system and the share of the cycle-sensitive budgetary components to the total budget are the determinants of the size of the automatic stabilizers in the budget. Besides, these factors partially determine volatility of the economy. When the size of automatic stabilizers changes over time, so consequently change their smoothening effects that in turn leads to the change in the volatility of the economy. These two factors furthermore determine the size of budget's cyclical component – one of the elements of the actual budget balance. The other part – the structural budget balance – may also change over time depending on the factors described below.

First of all the discretionary fiscal stabilization policy means have impact on the underlying budgetary position. (Boije 2004, p. 10) Cut in the tax rates and/or increase in certain expenditure categories would deteriorate the structural budget balance while the reverse reforms would improve it independently of whether these discretionary fiscal policy measures are pro-cyclical or countercyclical.

Secondly, the demographic changes in the society may cause shifts in the structural budget balance position. (Boije 2004, p. 10) The adverse demographical changes in the society would permanently increase spending associated with pension payments.

Thirdly, the interest payments on debt may affect the structural budget balance position. (Boije 2004, p. 10) The debt accumulation would imply increase in debt servicing costs that would worsen the underlying budget balance position.

It should be however noted that the interest payments on debt are cycle-sensitive expenditure category. In the economical downturns the interest payments tend to increase as the borrowing increases while in the expansions they fall as governments are able to reimburse the part of the loans when the budget revenue rises. Typically however these fluctuations are quite small. (OECD 1993, p. 39)

The reason of why the interest payments are excluded from cycle-sensitive expenditure category is that the degree of these fluctuations are relatively small and therefore it is usually assumed that this expenditure group is inelastic in the methods to estimate the size of the automatic stabilizers in the economies. As a result the change in the interest payments influences the structural budgetary position instead of the actual budget's cyclical component.

4.3. Appropriate medium-term objective

In the EU fiscal sustainability framework the budgetary position of close-to-balance-or-in-surplus is defined in terms of the structural budget balance and is used as the medium-term sustainability in the public finance measure. The general requirement enforced by the EU fiscal institutions to the member states is to achieve the close-to-balance-or-in-surplus target over the business cycle, that is, to strive for the neutral or positive underlying budget balance position. (Artis & Buti 2000, p. 564)

As mentioned above, the main reasoning behind the introduction of the medium-term objective is to ensure that 3 percent budget deficit ceiling will not be breached under the unfavourable economic conditions with the guarantee that the debt sustainability will be maintained. There are therefore several issues that should be mentioned when setting the appropriate medium-term objective for each individual member state.

4.3.1. Current deficit ceiling

Firstly, the medium-term objective should be set by taking into account variability of budget's cyclical component that is determined by the present budget balance elasticity and volatility in the output. (Buti, Franko & Ongena 1998, p. 87-88) The average budget elasticity depends in turn on the factors described above.

If these variables are carefully examined and the medium-term objective is appropriately determined and achieved, the country ensures itself that 3 percent budgetary deficit target will not be breached during the economical downturns. Countries within the EU have different budget balance elasticity as well as they face different cyclical behaviour. Therefore countries that have highly sensitive budget balance and relatively volatile business cycles should set the positive structural budget balance as their medium-term objective, while countries that have lower elasticity may possibly strive for the close-to-balance budgetary position. In the other words, the medium-term objective should be sufficiently ambitious for each individual member state to ensure that there is no risk to run into excess deficit. (Artis & Buti 2000, p. 564-565)

In this case, however, the medium-term objective is determined only taking into account the variability of budget's cyclical component. Countries that have low budget balance elasticity and relatively low volatility in GDP may set the negative medium-term objective that would possibly lead to the debt accumulation.

4.3.2. Future deficit ceiling and current debt

As the requirements for deficit ceiling and debt stabilisation are closely connected, countries that reach the negative structural budget balance position over the business cycle at present risk to accumulate debt if GDP growth is not sufficient enough. That would lead to larger

interest payments on the debt service, deterioration of the underlying budgetary position and consequently it could cause problems when fulfilling the budget deficit requirement in the future. This factor should also be taken into account when defining the appropriate medium-term objective for each individual member state.

Keeping the debt ratio constant over the business cycle may be a suitable measure in this case when determining the medium-term objective. Countries, that exhibit high GDP growth rates and have sufficiently low debt levels may therefore have the negative structural budget balance positions as their medium-term objective. (Boije 2005, p. 83-84)

The negative underlying budgetary position may be compatible with the stable debt ratio, but may on the other hand lead to the excess deficit in the recessions if variability of budget's cyclical component is high.

4.3.3. Implicit future liabilities and expected future debt

Besides, to make sure that the budget deficit and debt obligations to the EU will be fulfilled in the future, it is necessary to take into account the adverse demographic changes in each individual member state when determining the appropriate medium-term objective. The sufficiently ambitious medium-term objective at present, that is the positive underlying budgetary position over the business cycle, would lead to the reduction of the present debt level. The necessity to reduce the present debt level emerges especially for the countries have not yet altered their social security and pension systems for structural reforms as unfavourable demographic changes imply the additional burden on budget's spending and accumulation of debt in the future. (Boije 2005, p.78-79)

If the medium-term objective is not sufficiently ambitious at present and the social security and pension spheres are not restructured, the necessity of increase in tax rates would have undesirable effects on intergenerational income distribution and would be harmful for the economic activity as a whole as the budget deficit ceiling and debt sustainability requirement to the EU remain for the future. (Boije 2005, p.78)

As a result, the appropriate medium-term objective could be determined taking into account variability of the budget's cyclical component, implicit future liabilities and initial debt level to ensure that obligations to the EU will be fulfilled at present and in the future.

4.4. Advantages and disadvantages of high alternatively low budget balance elasticity

One of the important aspects when determining the appropriate medium-term objective is accordingly variability of budget's cyclical component that depends on the volatility of the economy and the total budget balance elasticity. Countries within the EU have different budget sensitivities and are quite different in their development levels. Therefore there are several aspects when considering what implies high alternatively low size of the automatic

stabilizers in the budget, especially for the small open catching-up economies within the EU, when the national fiscal policy is bounded by the rules imposed by the Stability and Growth Pact and the Maastricht Treaty.

High budget balance elasticity and consequently substantial smoothening effects of the automatic fiscal stabilizers are traditionally considered to be a positive feature for the country from the stabilization policy perspective. However, there are also several negative sides of the high budget sensitivity especially if a county has to follow rules enforced by the fiscal institutions.

4.4.1. Stabilization policy

As the monetary policy is governed entirely by the ECB for the Euro area as a whole, the fiscal automatic and discretionary policies are the essential stabilizers on the national level to deal with normal cyclical fluctuations as well as with asymmetric shocks or different reactions of the economies to the same type of shocks. (Orban & Szapary 2004, p. 843)

The automatic fiscal policy however becomes less effective in small open economies of the EU and EMU. (Buti, Franco & Ongena 1998, p.88) Due to leakages through imports the smoothening capacity of the automatic stabilizers are usually weaker in the small open economies than the big ones. Low size of the automatic stabilizers in the budget combined with dampened smoothening effects of them forces small EU countries to rely more on discretionary fiscal stabilization policy means. (Orban & Szapary 2004, p. 854)

Even if both fiscal stabilization policy means, the automatic and the countercyclical discretionary ones, have stabilizing effects on the domestic demand, the response of automatic stabilization policy is more predictable and automatic stabilizers react quicker to the changes in the economic activity than the discretionary policy means. Discretionary policy means take usually longer time to implement due to political restrictions while the response interval of automatic stabilizers is considered to be rather short. (Taylor 2000, p. 26-28) Besides, discretionary policy means may easily lead to the change in the structural budget balance position due to time restrictions when the tax rates or composition of expenditures is changed if these changes do not cancel each other over the business cycle. (Orban & Szapary 2004, p. 854) Meanwhile, the automatic stabilizers, that are countercyclical by their origin, do not have these effects on the underlying budgetary position if they are allowed to work freely and symmetrically over the business cycle. (Brunila, Buti & In 'T Veld 2003, p.2)

From the stabilization policy perspective, the higher is the size of automatic stabilizers in the economy, the higher is the smoothening capacity of them and consequently the discretionary countercyclical policy means are less required to stabilize the normal cyclical fluctuations as well as fluctuations arising out of the common monetary policymaking in the Euro area.

4.4.2. Pro-cyclicality in economic expansions

The most traditional view to the fiscal policy is that it should be countercyclical, that is, expansionary in the economical downturns to help the economy to recover from recessions and contractive in the upturns with smoothing effects on the boost in the domestic demand. The empirical research however shows that in the developing countries public spending follow highly pro-cyclical pattern. (Talvi & Vegh 2004, p. 156-158) The new EU member states may to some extent be regarded as developing countries as they differ much in their development level from the old EU member states.

Pro-cyclicality in the upturns in turn implies that these economies tend to increase expenditure and/or reduce tax rates during economical expansions even if the underlying fiscal position of these countries suggests that there is no space left for such structural reforms. (Lane 2003, p. 98-99)

One of the reasons of why developing countries tend to run pro-cyclical fiscal policies is that in these states economical activity in general is more volatile than in highly industrialized countries. (Talvi & Vegh 2004, p. 158) High volatility of the economy combined with high budget elasticity implies consequently larger fluctuations in budget's cyclical component. (van den Noord 2000, p. 7) Larger automatic fluctuations in budget's cyclical component lead in turn to high budget surpluses in expansions and large deficits in recessions.

High surpluses in the expansions may call for the stronger political incentive to cut certain tax rates and/or change composition of expenditure. (Talvi & Vegh 2004, p. 158)

Therefore, it could be considered that for the developing countries, such as partially the new EU members are, those often lack the experience in governing their public finance in the proper way, it would be less politically tempting to use discretionary pro-cyclical fiscal policy means to implement such reforms if surpluses were lower in the upturns. That is the negative side of the high size of the automatic stabilizers in the budget taking for given high volatility in the economy. It could be therefore considered that from the EU fiscal discipline perspective, it is better for the new EU member states to have less sensitive budget balance as it is less politically tempting to implement such reforms in the upturns thus deteriorating the structural budget balance and risking to breach 3 percent budgetary deficit objective in the recessions.

4.4.3. Initial structural budget balance position

Pro-cyclical fiscal policy in the expansions weakens the structural budget balance position. But it could be also the other reasons of a weak underlying budgetary position, such as for instance additional pressure on the budget expenditure associated with the entrance to the EU for the new EU members.

In general, if the initial structural budget balance is not yet strong enough while the total budget balance is rather sensitive to the cyclical fluctuations the country may face difficulties to fulfil the deficit ceiling target in the recessions. It is conversely less risky to breach the budgetary deficit target when the total budget balance is rather inelastic to the fluctuations in economical activity. (Boije 2004, p.8) Therefore, in the new EU countries that have rather weak underlying budgetary positions and low impact of the automatic stabilizers in their budgets, the risk is lower to breach the budget deficit rule in the recessions.

5. PUBLIC FINANCE IN LITHUANIA

In 2004 Lithuania was one of those Central and Eastern European countries that accessed the EU.

It is believed that Lithuania as well as two other Baltic states has decided to join the EU primary due to political reasons but the economical approach however should not be underestimated. The economical benefits are also expected from this accession. (Viksnins 2000, p.215) Several research about how Lithuania succeeded to govern its public finance in the past and present has been made and the important facts and conclusions of these works are summarized in the sections below.

5.1. Empirical research 1993-2000

Empirical research regarding Lithuania has been made in order to investigate whether the traditional tax-smoothing principles were followed in the economical upturns and downturns and whether the fiscal discipline rules enforced by the Stability and Growth Pact and the Maastricht Treaty leave enough room for automatic stabilizers to operate fully in the country. This study was made before the country became the member in the EU.

The analysis of the government deficit indicated that the country did not comply with 3 percent budgetary deficit objective four years from five and ran the deficit above the reference value in 1996-2000. At the same time the country reported positive real GDP growth rates, with exception to 1999 when real GDP growth rate turned to be negative due to the influence of the financial crisis in Russia in August 1998. It is thus concluded that, in accordance to the fiscal discipline rules, the government ran the excess deficit. Besides, it is found that usually the change in the ratio of the annual deficit to GDP moved to the opposite direction than the change in the annual real GDP growth rate. (Kutan & Pautola-Mol 2001, p. 14-15) Using furthermore the Hodrick-Prescott (HP) filter method to estimate GDP gap, the calculations showed that it had varied between +/- 6 percent over the period of 1993-2000. Plotting the actual budget balance figures in absolute terms against the estimated GDP gap it was found that the country had shown some signs of following the traditional tax-smoothing principle therefore improving its budget balance in the upturns and reporting higher deficits in the downturns. (Kutan & Pautola-Mol 2001, p. 29-31)

The interpretation of these facts would be that there was a sign that the country had followed the countercyclical fiscal stabilization policy principles, at least to some extent. However, it is hard to judge from this analysis whether the budgetary balance reacted in the countercyclical fashion only through the countercyclical behaviour of the automatic stabilizers or in addition the countercyclical discretionary policy measures on the expenditure side were used. It is difficult to make more concrete conclusions, as the degree of the changes in the variables are not quantified, only tendencies could be perceived out of this analysis.

Afterwards GDP gap is plotted against the ratio of the average budget deficit to GDP in order to estimate what was the average deficit when actual GDP was equal to the potential for the period 1996-2000. The results have shown that the average budget deficit was much higher in Lithuania than the Maastricht Treaty and the Growth and Stability Pact suggested at the zero output gap. (Kutan & Pautola-Mol 2001, p. 31-32) This finding indicated that the average deficit had been around 6 percent of GDP over 1996-2000 when the economy was on its trend growth path. (Kutan & Pautola-Mol 2001, p. 45) Following these findings it was concluded that the fiscal discipline objectives enforced by the EU did not necessarily leave enough room for automatic stabilizers to operate fully given the past fiscal development of the country. (Kutan & Pautola-Mol 2001, p. 31-32)

The method applied to calculate the structural budget balance indicated that the country was far away from close-to-balance-or-in-surplus budgetary position, that is, its structural budgetary position was equal to -6 percent of GDP on average during 1996-2000. Therefore, given the past fiscal performance and past cyclical volatility, the government was able to comply with the budgetary rules only in economical upturns however having small prospects to fit within the interval in the recessions. This finding suggests that there is a big probability to breach the budget deficit ceiling, especially in the downturns and even in the weak upturns given the past fiscal performance and even lower volatility of the economy, unless the structural reforms take place to improve the underlying budgetary position.

5.2. Public finance in 2000-2005 and other important fiscal aspects

The present overall objective of Lithuanian government may be defined as ambition to introduce Euro in January 2007 and change the present national currency Litas, that is currently fixed to Euro, to the common EMU currency. Nevertheless, in order to become an official participant in the EMU, Lithuania is required to meet the formal convergence criterions. When these criterions are met the country is supposed to introduce Euro and become a member of the EMU. (LKP 2004, p.1-2)

5.2.1. Debt development and annual budget deficit

Meeting the fiscal convergence criterion at present does not seem to be a problematic issue for the country. The general government deficit was below the reference value already in 2000. The gross government debt is well under 60 percent of GDP because of historical reasons as

the country did not inherit any financial liabilities from the former Soviet Union. Thus, the country has a relatively low debt level compared to the other EU member states.

The fiscal convergence criterion - the annual budget deficit ceiling – is achieved after 2000's due to rather conservative fiscal policy in late 1990's. Lithuania has changed the direction of the fiscal policy in these years in order to be capable to become a member of the EU and the EMU. (LKP 2004, p.1-2) The strict fiscal policy orientation in 2000s, which was primary targeted to meet the convergence criterions, has resulted the annual budget deficit to decrease from 5,6 percentage points in 1999 to 1,4 percentage points in 2004. Thus, at present one of the main goals of the fiscal policy is to ensure that the annual budget deficit will not exceed 3 percent of GDP in the future. (LKP 2004, p.24) The official figures of the debt development, annual budget deficit statistics and some other fiscal indicators for 1997-2004 as well as forecast for 2005-2008 are presented in Appendix A in table A.1.

There is however a reason to think that the official figures of the general budget deficit and debt are slightly misrepresenting the actual fiscal position. The EC estimates that the share of the unobserved economy composes 15-19 percent of the total output in Lithuania. It follows that if the black economy was taken into account the figures of the budget deficit as well as gross government debt would be considerably lower than the official sources announce. Nevertheless it is hard and untrustworthy to readjust these estimated figures of the black economy directly to the official figures (Losoncs 2004, p.248-249) and therefore the reduction in the share of the black economy is the present and future concern of Lithuanian government.

5.2.2. Medium-term objective and budget elasticity

In addition, Lithuanian government makes commitment to strive in the medium-term for the close-to-balance-or-in-surplus budgetary position. (LKP 2004, p.24) This target was however revised in 2005 and set to be equal to -1 percent of GDP. The reasons of this revision are that the government faces additional spending associated with implementation of the structural reforms in the country, the debt level is relatively low and the nominal and real GDP growth rates are expected to be sufficiently high in the future. The achievement of close-to-balance-or-in-surplus budgetary target is therefore postponed until needed structural reforms are implemented. It is however estimated that if the structural budget balance remains negative at 1 percent level up to 2050, the debt level would converge towards 80 percent of GDP after 45 years. Moreover, taking into account the adverse demographical changes, the European Commission has recently suggested the government to set the medium-term objective equal to 2,6 percent of GDP in order to sustain the fiscal discipline in the future. As a result, after the implementation of the structural reforms the medium-term objective will be redefined to the neutral or positive budgetary position over the business cycle. (LKP 2005, p.3)

The structural deficit has been however higher then the targeted value over the 2000's with the exception of 2002 when the underlying budget balance was equal to -0,8 percent of GDP. (LKP 2005, p.24) The Ministry of Finance of the Republic of Lithuania has estimated the

structural budget balance in 2000-2004 and has made a forecast for 2005-2008 using the Hodrick-Prescott (HP) filter methodology to estimate GDP gap. These figures are presented in table 1.

Table 1. The structural budget balance 2000-2008

	2000	2001	2002	2003	2004	2005	2006	2007	2008	
	actual data					forecast				
General government net lending/borrowing (% of GDP) ⁵	-2,50%	-2,00%	-1,40%	-1,20%	-1,40%	-1,50%	-1,40%	-1,30%	-1,00%	
GDP-gap (%)	-3,08%	-2,13%	-2,00%	1,65%	1,70%	1,72%	0,88%	-0,47%	-0,22%	
The cyclical component of the budget balance (% of GDP)	-1,00%	-0,65%	-0,60%	0,49%	0,50%	0,52%	0,26%	-0,14%	-0,06%	
The structural budget deficit (% of GDP)	-1,50%	-1,35%	-0,80%	-1,69%	-1,92%	-2,04%	-1,66%	-1,16%	-0,92%	

Source: The Ministry of Finance of the Republic of Lithuania
Year 2000-2001 Lithuanian Convergence program 2004
Year 2002-2008 Lithuanian Convergence program 2005

The Ministry of Finance has also estimated the elasticity of some cycle-sensitive revenue and expenditure groups and these figures are presented in table 2.

Table 2. Elasticity of cycle-sensitive revenue and expenditure groups

Revenue:	Customs tax	0,84
	VAT	0,97
	Excises (average)	1,36
	Personal income and corporate taxes (group)	1,03
	Social security contributions	0,98
Expenditure:	Current expenditure	0
	Unemployment benefits	N.A.

Source: The Ministry of Finance of the Republic of Lithuania

In table 2 it can be seen that the highest elasticity figure belongs to excises in the revenue group and equals to 1,36. This figure implies that when GDP gap changes with 1 percent, tax revenue from excises rises alternatively falls by 1,36 percentage point. The lowest elasticity figure on the other hand belongs to VAT in the cycle-sensitive revenue group and is equal to 0,97. This implies that when GDP gap changes with 1 percent, tax revenue from VAT changes with 0,97 percent.

⁵ General government net lending/borrowing should not exceed -3 percent of GDP per year in the EU fiscal sustainability framework.

The elasticity of the main cycle-sensitive expenditure category, namely unemployment benefits, is not estimated. The motive behind that is historically low transfers associated with the unemployment in the country. The total budget balance elasticity under the estimation period 1995-2003 is calculated to be equal to 0,33. (LKP 2004, p.31)

5.3. Budget sensitivities in the new EU member states

The other recent research paper investigates the cyclical sensitivities of the budgets of the new EU member states and possible effects associated with that.

The government budgets of the new EU member states are generally less sensitive to the cyclical fluctuations than of the old ones. The reason of that is the difference in the budget structures of the old and new EU member states. The revenue side of the government budgets are more dependent on the income from the direct taxes in the old member states while in the new ones – on the indirect or consumption taxes. In these economies it appeared to be easier to collect indirect taxes and the level of the corporate taxes tends to be lower in order to attract foreign capital investments. As direct taxes are usually more elastic than indirect, lower share of these taxes in the total budget consequently lead to the lower total budget balance sensitivity. It is calculated that the ratio of direct taxes to GDP was 14 percent in the old EU member states while in the new ones it was 10 percent on average during 1992-2002. Besides, expenditure on the unemployment benefits is also lower in the new EU countries. Estimations show that spending on unemployment benefits as a share of GDP formed 0,68 percent on average in the new member states compared to 1,73 percent in the old ones. These factors are considered to be the key explanations of the lower budget sensitivities in the new EU economies. (Orban & Szapary 2004, p.853-854)

As the cyclical sensitivity of the government budgets of the new EU member states are generally lower, it consequently leads to that the smoothing capacity of the automatic stabilization policy is weaker and these countries to a larger extent may be forced to use the discretionary stabilization policy measures to stabilize the fluctuations in the output. Using this type of stabilizer may however lead to deterioration of the structural budget balance if these means are not correctly adjusted over the business cycle. (Orban & Szapary 2004, p.854) As mentioned above the use of the countercyclical discretionary fiscal stabilizers may have the effect on the underlying budgetary position is they are not appropriately distributed over the cycle while the automatic stabilizers lack these properties if they are allowed to operate freely and symmetrically.

Using the HP filter methodology to calculate the output gap, it is found that the highest negative output gap was 6,05 percent in Lithuania during the period 1995-2002. Afterwards the cyclical safety margin, which indicates how much the actual budget balance deteriorates when the economy is in the recession, is calculated to be equal to 2,01 percent for Lithuania given the budget balance elasticity equal to 0,33 and the highest historical negative GDP gap equal to 6,05 percent. The difference between the budgetary deficit reference value of 3

percent for the EU countries and the cyclical safety margin gives a so called “minimal benchmark” that should be achieved over the business cycle to ensure that a country does not run into the excess deficit. For Lithuania the “minimal benchmark” is estimated to be equal to -0,99 percent. (Orban & Szapary 2004, p.852-853) In the other words it is estimated that the structural budget balance should be at least equal to -0,99 percent of GDP over the business cycle in order to comply with the budget deficit rule given the present value of the budget balance elasticity along with past volatility of the economy.

To what extent the automatic stabilizers could smooth GDP gap was not however estimated in this paper and this issue is referred to the future research. (Orban & Szapary 2004, p.854) The only conclusion is made that the smoothing capacity of the automatic stabilisers should be weaker in these countries applying the theoretical approach about the factors determining the ability of automatic stabilizers to smooth GDP gap and estimated historical highest output gaps that tended to be higher on average in the new EU countries than in the old ones.

6. METHODS – THE MATHEMATICAL ALTERNATIVELY ECONOMETRICAL APPROACH

The EC has approved the methods to estimate GDP gap and the elasticity of the total budget balance. All the EU member countries are obliged to use these generally verified methods when estimating these fiscal indicators. Therefore, the same three methods, namely Hodrick-Prescott (HP) filter, short-run elasticity estimation method and the method to determine the elasticity of the total budget balance are shortly described and further used when analysing Lithuania’s fiscal variables. Besides, some other methodologies, namely simulation of the possible business cycles and method to estimate the safety margin are additionally applied to make wanted analysis complete:

- Hodrick-Prescott (HP) filter⁶
- Simulation of the business cycles
- Short-run elasticity estimation method
- Elasticity of the total general budget balance
- Safety margin

6.1. Hodrick-Prescott (HP) filter

The useful tool for the short-run policymaking is estimation of the existing output gap in the economy. The positive output gap indicates the upturn in the economic activity while the negative one – the downturn. The cyclical component of real GDP – the output gap - helps furthermore to calculate the cyclical component of the actual budget balance and identify the underlying budgetary position. Thus, the HP filter is used to estimate the output gap in Lithuanian economy from annual data.

⁶The production function method is usually used to estimate GDP gap for the EU economies. (EC 2004, p. 87) However the production function method is not yet used to calculate GDP gap for Lithuania due to data constraints associated with the variables that are needed in this model. Therefore the HP filter methodology instead is used to estimate GDP gap by the Ministry of Finance of the Republic of Lithuania.

The HP filter methodology estimates the potential output in the economy from the actual time series. Thus, with a number of observations of real GDP at time t , where $t=1, 2, \dots, T$, and real GDP function, $Y(t) = Y^*(t) + Y^c(t)$ where $Y^*(t)$ and $Y^c(t)$ are the potential and the cyclical component of real GDP respectively at time t , the HP filter decomposes the actual values of real GDP into its trend and cyclical components.

The HP filter estimates the trend component $\hat{Y}^*(t)$ by minimising the following equation:

$$\min_{Y^*(t)} \sum_{t=1}^T (Y(t) - Y^*(t))^2 + \lambda \sum_{t=2}^{T-1} [(Y^*(t+1) - Y^*(t)) - (Y^*(t) - Y^*(t-1))]^2, \lambda > 0,$$

where all the values are in logs and the smoothing parameter λ must be given a predetermined value. For annual data it is common to use $\lambda = 100$. (Mise, Kim & Newbold 2005, p. 54-55)

6.2. Simulation of the business cycles

Simulations of some possible ways of economic development in Lithuania for 2009-2030 are based on several assumptions. As Lithuania is a catching-up economy, it is assumed that the real and potential GDP would grow faster than in highly-industrialized nations at least in some period of time due to the past and present investments in the real capital stock and growth in productivity. Therefore the historical values for 1998-2004 and forecasts for 2005-2008⁷ of annual real GDP growth rates in Lithuania are used to determine the real growth in 2009-2030. However, it is also assumed that the growth rates will decrease in comparison to the past performance due to diminishing growth in productivity and thus the simulations are formed in two different ways:

- Estimation of GDP gap using values in original turn

Two different ways of economic development for 2009-2030 are simulated using the values of annual real GDP growth rates in 1998-2008 in their original turn. In the first simulation it is assumed that in 2009-2019 real GDP will grow less by 1 percentage point and in 2020-2030 less by 2 percentage points per year than in 1998-2008. In the second simulation it is assumed that in 2009-2019 real GDP will grow less by 2 percentage points and in 2020-2030 less by 4 percentage points per year than in 1998-2008. In accordance to this method, the future business cycles in 2009-2030 are assumed to follow the same pattern as in 1998-2008.

⁷ In several scientific papers the authors exclude the first part of 1990's when analyzing among other things the output volatility of Eastern and Central European countries as these years were characterized by very high volatility of these economies associated with transitional process. (Orban & Szapary 2004, p.854) Therefore the period of 1998-2008 is chosen instead for further analysis of Lithuania.

- Estimation of GDP gap using the bootstrap procedure

Applying the bootstrap, annual real GDP growth rates from the original sample of 1998-2008 again are used to simulate the business cycles for 2009-2030. All the values of the real growth for 2009-2030 are obtained by randomly drawing annual real GDP growth rates from the original sample and afterwards placing each observation back to the sample. In such way two new samples for the future economic development in 2009-2030 are constructed.

Using the first new sample it is again assumed that in 2009-2019 real GDP will grow less by 1 percentage point and in 2020-2030 less by 2 percentage points per year than in 1998-2008. Using the second sample consequently it is assumed that in 2009-2019 real GDP will grow less by 2 percentage points and in 2020-2030 less by 4 percentage points per year than in 1998-2008. In accordance to this method, the future business cycles are assumed to follow random pattern.

The full description of the bootstrap procedure and its application may be found in Dowd K. (2005) “Measuring market risk”.

Afterwards, applying the HP filter methodology, four different estimates of GDP gap are obtained and the simple average of the statistical parameters is calculated for further application of them for analysis of the fiscal indicators in Lithuania.

6.3. Short-run elasticity estimation method

The purpose of estimating the short-run sensitivity of the tax and expenditure is to evaluate how the major groups of revenue and spending react to the fluctuations in the output. The short-run elasticity shows the automatic percentage change in budget revenue or expenditure when GDP changes with 1 percentage point. (EC 2004, p.87)

Usually it is assumed that four groups of tax revenue, namely personal income tax, corporate taxes, indirect taxes and social security contributions, are the most sensitive to the fluctuations in the output. The expenditure category that is the most responsive to the business cycles is unemployment benefits. (van den Noord 2000, p.18-19) In addition it is assumed that the other revenue and expenditure are not sensitive to the fluctuations in when real GDP and therefore their elasticity may be assumed to equal zero.

The general formula to calculate the sensitivity of revenue and expenditure can be written as:

$$\eta_R = (dR/R) / (dY/Y)$$

$$\eta_G = (dG/G) / (dY/Y)$$

where η_R and η_G are tax and expenditure sensitivity respectively, dR/R and dG/G is a percentage change in the revenue and spending over the time interval and dY/Y is a percentage change in the real GDP over the same period of time. (EC 2004, p.87)

Deriving the elasticity of each individual tax or expenditure group however requires making the additional assumptions depending on the structural relationship between revenue or expenditure and GDP (Fatas & Mihov 2001, p.7-8) in order to separate policy-neutral or automatic responsiveness of these taxes or spending to the fluctuations in the output.

As the EC uses the elasticity estimated by OECD for further fiscal analysis of the EU countries, the full description of the methodologies to derive the elasticity for each individual cycle-sensitive tax or expenditure category can be found in van den Noord P. (2000) “The size and role of automatic stabilizers in the 1990’s and beyond”.

6.4. Elasticity of the total general budget balance

The budget balance elasticity shows the average percentage response of the actual budget balance to 1 percentage change in GDP. This figure mathematically can be expressed as a difference between the sensitivity of revenue and expenditure

$$\varepsilon = \eta_R \cdot (R/Y) - \eta_G \cdot (G/Y)$$

where η_R and η_G are estimated sensitivities of revenue and expenditure respectively and expressions R/Y and G/Y show the ratio of these particular groups of revenue and expenditure to the total GDP (EC 2004, p.87), or in the extensive form

$$\varepsilon = \eta_{CT} \cdot (CT/Y) + \eta_{PIT} \cdot (PIT/Y) + \eta_{SSC} \cdot (SSC/Y) + \eta_{IT} \cdot (IT /Y) - \eta_{UB} \cdot (UB/Y)$$

where η_{CT} , η_{PIT} , η_{SSC} , η_{IT} and η_{UB} are estimated sensitivities of the corporate taxes, personal income taxes, social security contributions, indirect taxes and unemployment benefits respectively. The terms CT/Y , PIT/Y , SSC/Y , IT /Y and UB/Y are the ratio of each tax and expenditure category to GDP.

6.5. Structural budget balance and the cyclical component of the actual budget balance

The actual budget balance as a share of GDP at time t can be decomposed into two parts - the structural budget balance and the cyclical component of the actual budget balance:

$$B(t) = B^{ST}(t) + B^C(t),$$

where $B^{ST}(t)$ and $B^C(t)$ are the structural budget balance and the cyclical component as a share of GDP respectively at time t .

The cyclical component is furthermore obtained by multiplying the total budget balance elasticity figure to GDP gap at time t :

$$B^C(t) = \varepsilon \cdot (Y(t) - Y^*(t)) / Y^*(t),$$

where ε is the budget balance's elasticity and $(Y(t) - Y^*(t)) / Y^*(t)$ is GDP gap in percent at time t .

Hence, the structural budget balance can be obtained by deducting the cyclical component from the actual budget balance:

$$B^{ST}(t) = B(t) - \varepsilon \cdot (Y(t) - Y^*(t)) / Y^*(t)$$

6.6. Safety margin

The safety margin indicates what the structural budget balance position should at least be achieved over the business cycle alternatively each year in order to comply with 3 percent budget deficit target in the EU fiscal sustainability framework (Ohlsson 2002, p.266) and is calculated as follows:

$$B^{ST}(t) = SM = -3 \% + (\varepsilon \cdot \max (Y(t) - Y^*(t)) / Y^*(t)),$$

6.7. Problems associated with the estimation of the main fiscal indicators

6.7.1. Estimation of GDP gap with HP filter

As with every methodology there are several advantages and disadvantages with HP filter method. The main advantage of the HP filter is that it is possible to estimate such unobservable variable as potential output from the actual data. There is however one serious shortcoming associated with the HP filter which is so called the end-point problem. If some economy is exposed for high fluctuation in the real output in the beginning or at the end of the studied period, the trend will be either underestimated or overestimated due to filter's property of symmetry over the sample period. It leads to that there is an uncertainty concerning the estimates for GDP gap at extreme points. (Froyland & Nymoer 2000, p.46-51)

6.7.2. Estimation of structural budget balance

As mentioned above, mathematically the structural budget balance is calculated by subtracting budget's cyclical component from the actual budget balance. The cyclical component of the budget furthermore is estimated by multiplying the total budget balance elasticity to the output gap.

A problematic issue in the EU fiscal discipline framework is that the set of the important fiscal indicators such as the structural budget balance that is used as a medium-term sustainability in the public finance measure and the cyclical component of the actual budget balance can be estimated only with a high degree of uncertainty as many methodologies used for the calculations are based on the particular indicator – GDP gap.

GDP gap is however an unobservable variable and therefore the results obtained depend crucially on the methodologies used to calculate it. The shortcomings of the models to estimate GDP gap imply that the quality of results obtained with these methods may be used only with a high degree of precaution. Moreover, the economical activity is much more complicated than the models assumes it to be. Imperfect information about economy's structure and dynamic limit the confidence of the estimates calculated with a single model and it can hardly be believed that the economy will follow exactly the same pattern predetermined in these models. Limitations of the models damage the quality of these results and it makes the policy decisions, relying only on these estimates, risky and uncertain. (Papademos 2005, p.28-30) The same argument is relevant when estimating other fiscal indicators that includes estimated GDP gap as one of the variables.

The other problematic issue concerning the medium-term objective is that in order to evaluate whether it has been achieved, it is necessary to calculate the structural budget balance over the full business cycle. Usually however the studied periods do not cover the full business cycles and in such a case a simple average of the structural budget position over the certain time interval is not the correct estimate. Therefore, alternatively the structural balance should be around the targeted medium-term objective every year. The latter approach disregards however the fact that discretionary fiscal stabilization policy means may be used to stabilize the output fluctuations each year and that have impact on the underlying budgetary position. (Boije 2004, p.11)

6.7.3. Estimation of elasticity

Estimating the total budget balance elasticity, the EU economies are obliged to use the methods verified by the EC. The EC in turn uses the elasticity estimated by OECD, (EC 2004, p.87) which furthermore is based on several assumptions. It is assumed that only four tax groups – personal income tax, corporate taxes, social security contributions and indirect taxes are sensitive to the fluctuations in the output. On the expenditure side only unemployment benefits are assumed to fluctuate over the cycle. (van den Noord 2000, p.18-19)

It is however argued that the short-run elasticity method is not appropriate measure for determining the medium- and the long-term reaction of the budget balance to the cyclical fluctuations. Assumption that many expenditure categories as well as certain tax groups are absolutely inelastic to the changes in the economic activity are not appropriate in the medium- or long-term and the elasticity of all tax and spending categories should be taken into account when determining the total budget balance elasticity. (Giberni, Maggi & Turco 2005, p.68)

7. ANALYSIS AND CONCLUDING REMARKS

7.1. Analysis of some fiscal variables in Lithuania

7.1.1. Safety margin at present

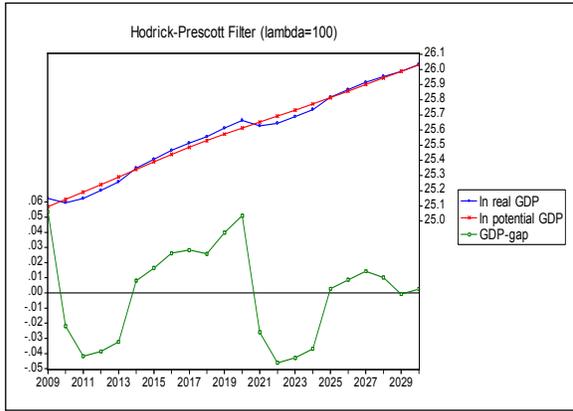
As calculated in Orban & Szapary (2004), the medium-term objective for Lithuania should be set at least equal to -0,99 percent of GDP in order to comply with the budget deficit rule given the present budget balance elasticity and maximum negative historical output gap that was - 6,05 percent over 1995-2002.

However, it is important to be aware of how the safety margin changes when the output volatility or the budget balance elasticity changes taking into account the fact that it is not always appropriate to rely on the historical estimates when predicting the future, especially for the catching-up economies where structural shifts in the economical sphere are common. Therefore the HP filter method is used to simulate some of the possible ways of economic development in Lithuania up to 2030 to see whether the output volatility would follow the historical pattern and what it would mean for the country if it does not. Afterwards the theoretical approach about the factors determining the budget balance elasticity is applied in order to evaluate whether there are any theoretical tendencies of changes in the sensitivity of Lithuanian budget in the short-term perspective.

7.1.2. Volatility of the economy

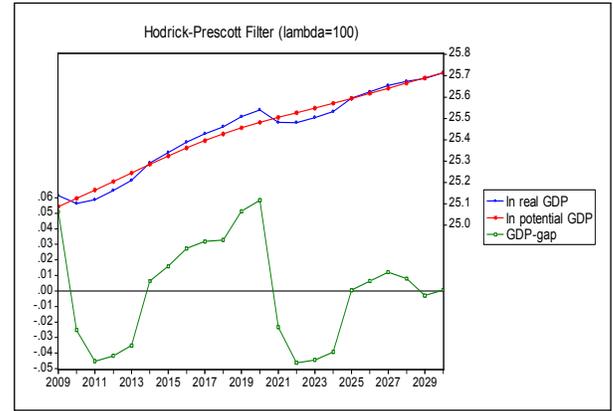
As estimated in Orban & Szapary (2004), the maximum negative output gap during 1995-2002 was equal to -6,05 percent and in Kutan & Pautola-Mol (2001), the output gap has varied between +/- 6 percent over the period 1993-2000. The Ministry of Finance of the Republic of Lithuania has estimated the output gap for 2000-2008 and the results in table 1 show that the maximum negative GDP gap was equal to -3,08 percent in 2000. Data for the simulations of some possible ways of economic development in 2009-2030 can be found in Appendix A table A.2 and the results of these simulations with statistical estimates of GDP gap are presented in figures 1-4.

Figure 1.



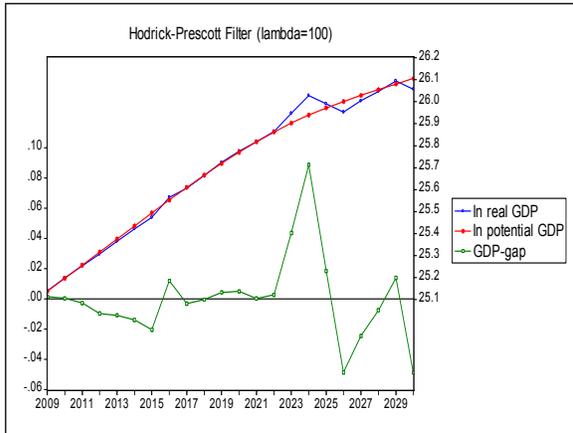
Mean	0,0000
Variance	0,0010
Standard deviation	0,0314
Min value	-0,0461
Max value	0,0535

Figure 2.



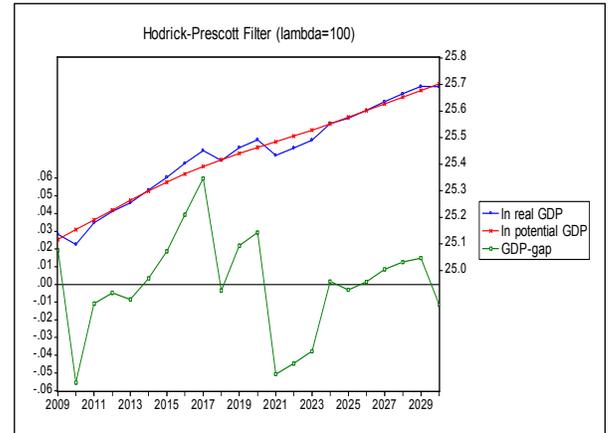
Mean	0,0000
Variance	0,0011
Standard deviation	0,0337
Min value	-0,0462
Max value	0,0584

Figure 3.



Mean	0,0000
Variance	0,0008
Standard deviation	0,0282
Min value	-0,0487
Max value	0,0886

Figure 4.



Mean	0,0000
Variance	0,0008
Standard deviation	0,0285
Min value	-0,0554
Max value	0,0598

The estimations in figures 1-4 show that the average maximum positive GDP gap is equal to 6,51 percent and the average maximum negative output gap is equal to - 4,91 percent. Variations in the output gap consequently remains rather strong.

7.1.3. Budget balance elasticity

It is also useful to evaluate, at least theoretically, whether the budget balance elasticity can change in the future, as this variable has also high impact on the results when calculating the safety margin.

At present Lithuania's budget elasticity is relatively low compared to the other EU countries. The main reasons to that are the proportional tax system, historically low transfers and relatively low size of the public sector. When analyzing whether the elasticity can change in the future the factors affecting this figure are theoretically discussed.

The first factor affecting the budget elasticity is the progressive tax system. Lithuania has a on the other hand the proportional tax system, that is, one of the major tax groups – direct taxes – lack the feature of progressivism. It is not considered by Lithuanian authorities to implement the progressive tax system in the nearest future. Therefore, it can be concluded that it is doubtful that the elasticity of the direct taxes is going to increase.

The change in the proportions of the direct and indirect taxes to the total revenue and GDP can also influence the budget balance elasticity, especially if the sensitivities of these two tax groups differ to a large extent. In table 2 it can be seen that the elasticity of the direct taxes is equal to 1,03 and that is slightly higher then the sensitivity of for instance VAT that is equal to 0,97. VAT can be regarded as the reference tax in the indirect tax group due to its high proportion to the indirect taxes as well as to the total revenue in the budget. The composition of the tax revenue of the consolidated state and municipal budget⁸ and the relative weight of each tax category to the total revenue and GDP over 1993-2004 is presented in the Appendix A in table A.3.

⁸ Revenue of consolidated state and municipal budget forms approximately 60 percent of the total government revenue.

It should be noted, that the distinguishing feature of the developing economies is that the budgets of these economies are more dependable on the indirect taxes than on direct and Lithuania is not exception in this particular way. It might be seen in table A.3 that the revenue structure in the budget has changed a lot since 1993. In 1993 the share of the direct taxes to the total budget revenue was higher than the ratio of the indirect taxes, that is, the budget revenue was mainly dependable on the direct taxes. The ratio of the direct taxes was amounted to more than 46 percent to the total revenue while indirect taxes' share was 36 percent in 1993. The situation has gradually been changing since 1993 and the share of the indirect taxes obtained higher weight to the total budget revenue mainly because of the extensive restructures in the tax system during the last years. In 2004 the proportion of the direct taxes to the total revenue declined to 31 percent while the share of indirect taxes to total revenue increased to 47 percent. One of the reasons to such changes were discussed in Orban & Szapary (2004) where it was concluded that in the new EU member states it appeared to be easier to collect indirect taxes.

Although the tax system has been modified enormously since 1993 and assuming that these tendencies may continue in the short time interval or change to the opposite direction, it would little change the total budget balance elasticity. That is due to the similar sensitivities of the direct and indirect taxes as long as the tax rates remain approximately the same, the proportion of the tax revenue to GDP does not extensively change or the progressive tax system is not introduced.

The generosity of the transfer system as well has impact on the budget balance elasticity. However, as mentioned above, the unemployment benefits historically have been low in Lithuania and the situation doubtfully is going to change as it is not considered by Lithuanian authorities to modify the present system to a large extent. It can be consequently concluded that this particular factor is not going to a great extent influence the budget balance elasticity in the future.

Finally, the size of the public sector is an important factor when determining the budget balance elasticity. The larger is the public sector, the larger is the fraction of the total output produced in this sector and consequently the larger is the proportion of the cycle-sensitive budgetary items to GDP in the economy. If the size of the public sector is quantified in the traditional measures – the ratio of the budgetary revenue to GDP – Lithuania has a relatively small governmental sector. The ratio of the budget revenue to GDP was 31,8 percent in 2004. The total general budget revenue to GDP in 1995-2004 with forecast for 2005-2008 is presented in tables 3 and 4.

Table 3. Size of the government 1995-2004

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Total general government revenue (%of GDP)	34,20	34,30	37,10	37,40	37,30	35,60	33,00	32,80	31,90	31,80

Source: EUROSTAT database

Table 4. Size of the government, forecast 2005-2008

	2005	2006	2007	2008
Total general government revenue, forecast (% of GDP)	33,50	33,80	33,30	33,00

Source: Ministry of Finance of the Republic of Lithuania

In tables 3 and 4 it might be seen that the average size of the public sector was equal to 34,5 percent of GDP during 1995-2004 and the forecasts show that it is going gradually to decrease to 33 percent in 2008.

However, when analyzing economy's openness it should be noted that openness, measured as a sum of country's export and import as a fraction of GDP is high as it should be for a small open economy. The official export and import figures for 1995-2004 are presented in table 5.

Table 5. Export and import, percent of GDP, 1995-2004

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Export (% of GDP)	31,90%	32,89%	32,51%	29,16%	25,40%	30,96%	35,25%	36,80%	37,45%	41,35%
Import (% of GDP)	47,14%	48,10%	51,04%	48,35%	42,68%	45,53%	49,92%	52,90%	51,85%	55,07%
Total	79,04%	80,99%	83,55%	77,51%	68,09%	76,49%	85,16%	89,70%	89,31%	96,42%

Source: Department of Statistics to the Government of the Republic of Lithuania

In table 5 it might be seen that the sum of export and import to GDP has increased over the past few years while the size of government has on the other hand decreasing tendencies. The factors that led to the gradual increase in export and import are not discussed in this essay. The forecast of the growth rates in export and import in 2005-2008 might be found in table 6 which indicates that the foreign trade is going to continue to increase in the future.

Table 6. Growth rates in export and import, forecast 2005-2008

	<i>2005</i>	<i>2006</i>	<i>2007</i>	<i>2008</i>
Export growth, forecast (%)	<i>12,9</i>	<i>7,0</i>	<i>6,0</i>	<i>5,9</i>
Import growth, forecast (%)	<i>13,9</i>	<i>8,9</i>	<i>8,8</i>	<i>5,7</i>

Source: Ministry of Finance of the Republic of Lithuania

It can be therefore assumed that the theory that small open economies tend to have large public sectors does not in fact hold in case of Lithuania. First of all it can be considered that the country is so far politically immature to recognize the fact that the size of the public sector plays a crucial role in determining the magnitude of the business cycles. When discussing whether the public sector may increase in size in the future, it is can be argued with high degree of uncertainty that it might. It could be regarded that even national, cultural, political and historical factors, such as for instance willingness to take risk, trust in political system, and many others, should be taken in the account when applying this particular theory for each individual state.

Therefore it could be considered that the increase in foreign trade does not lead to the growth in the public sector in Lithuania. As the budget does not increase in size even if foreign trade grows, it consequently implies that the size of the automatic stabilizers also is likely to remain the same in the future.

Summarizing all the results it could be concluded that there are no theoretical tendencies indicating the change in the total budget balance elasticity at least in the nearest future.

However, increase in country's openness should theoretically lead to the increase in the volatility of the economy if the budget balance elasticity and consequently the smoothing capacity of the automatic stabilizers remain the same. The simulation of the future economic development, that were based on several assumptions, however showed the opposite results, that is, the maximum negative GDP gap might be lower in the future compared to the estimated historical values. There are definitely many other factors, not only the smoothing capacity of the automatic stabilizers, affecting the volatility of the economies that are beyond the scope of this essay that may eventually lead to the decrease in the output volatility and therefore further analysis is based only on the results obtained by simulations.

7.1.4. Appropriate medium-term objective

So far, it is estimated that the volatility of the economy might decrease and concluded that the budget balance elasticity is likely to remain unchanged in the future. These two factors consequently determine what the underlying budgetary position should at least be achieved in

order to comply with the budgetary deficit rule imposed by the Stability and Growth Pact and the Maastricht Treaty.

However, when defining the appropriate medium-term objective for each individual member state, it is necessary to take into account not only variability of budget's cyclical component but also apply the stable debt ratio approach as well as take into account adverse demographical changes in the country.

The present budget balance elasticity figure combined with the historical output volatility suggests that the country should set the medium-term objective at least equal to -1 percent of GDP in order to comply with the budget deficit rule. Assuming furthermore that the maximum negative output gap may decrease to the value simulated in the section above, namely -4,91 percent, the country may strive for the budgetary position at least equal to -1,38 percent without risk to run into excess deficit.

Applying the constant debt ratio approach, thus having the debt to GDP ratio equal to 19,2 percent and nominal GDP growth rate equal to 9,7 percent in 2005, Lithuania may set the medium-term objective equal to approximately -1,9 percent of GDP to keep the debt level constant over a year, but that would neither be consistent with variability of budget's cyclical component given the historical output volatility, nor with the volatility results obtained by the simulations of the future business cycles.

Besides, taking into account adverse demographical changes, the EC has suggested the country to set the medium-term objective equal to +2,6 percent of GDP. Combining all these three factors together, the appropriate medium-term objective for Lithuania is consequently the one recommended by the EC. At present however the government faces additional pressure on the budget spending and thus the underlying budgetary position is expected to be around -1 percent of GDP in 2008. As a result, this specific target will be redefined to the zero or positive budgetary position only after 2008.

7.1.5. Safety margins with higher budget balance elasticity

As stated above, it is doubtful that the sensitivity of the budget is going to change in the short-term perspective. However, it might be useful to know whether Lithuania would be able to comply with the budgetary deficit ceiling if the budget elasticity changed. Some values of the budget sensitivity are therefore chosen and safety margins with them, along with historical and simulated maximum negative output gap estimates, are calculated in order to evaluate what it would imply for the country in governance of its public finance if the budget sensitivity was higher. These calculations are presented in table 7.

It should be also noted that these calculations disregards the fact that increase in the budget balance elasticity would lead to the stronger stabilizing effects of the automatic fiscal

stabilizers and decrease in the volatility of the output gap that would again have impact on the results.

Table 7. Safety margins with different budget balance elasticity

Medium- term objective (% of GDP), safety margin	Max possible negative value of GDP-gap (%)			
	Budget balance elasticity equal to 0,33	Budget balance elasticity equal to 0,40	Budget balance elasticity equal to 0,50	Budget balance elasticity equal to 0,60
+2,60 ⁹	16,97	14,00	11,20	9,33
+2,00	15,15	12,50	10,00	8,33
+1,90				
+1,00	12,12	10,00	8,00	6,66
+0,63				6,05
+0,03			6,05	
0	9,09	7,50	6,00	5,00
-0,05				4,91
-0,55			4,91	
-0,58		6,05		
-1,00	6,05	4,91	4,00	3,33
-1,38	4,91			

The calculations in table 7 consequently suggest that:

- 1) Given that the targeted medium-term objective remains the same in the future, that is remains at -1 percent of GDP level, and the volatility of the economy follows the historical pattern, Lithuania would not be able to comply with the budgetary deficit objective if the budget elasticity increased.
- 2) However, if the volatility of the economy decreased while the targeted medium-term objective remained the same, Lithuania would be able to comply with the budgetary deficit ceiling having slightly higher budget balance elasticity.
- 3) Consequently, redefinition of the medium-term objective to the zero or positive budgetary position, at least within the interval between 0 and +1 percent of GDP, or striving for the optimal medium-term objective equal to +2,6 percent of GDP, would imply that the country could comply with budgetary deficit rule having much higher budget balance elasticity than at present regardless of whether the volatility of the economy follows the historical pattern or decreases to the simulated value.

⁹This value has been recently recommended by the EC to Lithuanian authorities.

7.2. Concluding remarks

Expecting volatility of Lithuania's economy to decrease in the future and/or redefining country's medium-term objective to the zero or positive budgetary position over the business cycle alternatively each year and achieving it, there is a space left for the increase in the cyclical sensitivity of the government budget without risk to breach the budget deficit objective imposed by the fiscal institutions of the EU. If Lithuanian government continues to govern its public finance in a proper way, it would be thoughtful to strengthen the smoothing capacity of the automatic fiscal stabilizers thus making the national fiscal policy more predictable in stabilization of the normal cyclical fluctuations as well as fluctuations arising out of common monetary policy impulses in the EMU.

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APPENDIX A

Table A.1

SEVERAL STRUCTURAL INDICATORS OF LITHUANIA
1997-2008

	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
	actual data								forecast			
GDP at current prices (million Litass)	39 378	44 377	43 359	45 848	48 563	51 948	56 772	62 440	68 468	75 218	81 368	89 168
Nominal GDP growth rate (%)	22,0%	12,7%	-2,3%	5,7%	5,9%	7,0%	9,3%	10,0%	9,7%	9,9%	8,2%	9,6%
GDP at constant prices 2000=100 (million Litass)	41 541	44 565	43 810	45 848	48 802	52 097	57 568	61 586	65 897	69 851	73 553	78 555
Real GDP growth rate (%)	7,0%	7,3%	-1,7%	3,9%	6,4%	6,8%	10,5%	7,0%	7,0%	6,0%	5,3%	6,8%
Inflation rate, HICP, (%)	10,30%	5,40%	1,50%	1,10%	1,60%	0,30%	-1,10%	1,20%	2,70%	2,70%	2,70%	2,50%
Total general government revenue (% of GDP)	37,10%	37,40%	37,30%	35,60%	33,00%	32,80%	31,90%	31,80%	33,50%	33,80%	33,30%	33,00%
Total general government expenditures (% of GDP)	46,70%	40,40%	40,20%	39,20%	35,00%	34,20%	33,10%	33,20%	35,10%	35,20%	34,60%	34,00%
Net lending/borrowing (% of GDP)	-1,10%	-3,00%	-5,60%	-2,50%	-2,00%	-1,40%	-1,20%	-1,40%	-1,50%	-1,40%	-1,30%	-1,00%
Gross governmental debt (% of GDP)	15,20%	16,50%	23,00%	23,80%	22,90%	22,40%	21,40%	19,60%	19,20%	19,90%	19,80%	18,90%
Export (million Litass)	12 801	12 941	11 015	14 193	17 117	19 117	21 263	25 819				
Import (million Litass)	20 098	21 456	18 508	20 877	24 241	27 479	29 438	34 384				

Source: EUROSTAT database, The Ministry of Finance of the Republic of Lithuania, Department of Statistics to the Government of the Republic of Lithuania

Table A.2

Republic of Lithuania
Gross domestic product

Simulation 1			
Year	Real GDP at constant prices 2000=100	Growth in real GDP (%)	ln real GDP
1998	44 565 000 000	0,073	24,52021
1999	43 810 000 000	-0,017	24,50313
2000	45 848 000 000	0,039	24,54860
2001	48 802 000 000	0,064	24,61104
2002	52 097 000 000	0,068	24,67637
2003	57 568 000 000	0,105	24,77623
2004	61 586 000 000	0,070	24,84370
2005	65 897 000 000	0,070	24,91136
2006	69 851 000 000	0,060	24,96963
2007	73 553 000 000	0,053	25,02127
2008	78 555 000 000	0,068	25,08706
2009	83 503 965 000	0,063	25,14816
2010	81 249 357 945	-0,027	25,12079
2011	83 605 589 325	0,029	25,14938
2012	88 120 291 149	0,054	25,20197
2013	93 231 268 036	0,058	25,25835
2014	102 088 238 499	0,095	25,34910
2015	108 213 532 809	0,060	25,40737
2016	114 706 344 777	0,060	25,46564
2017	120 441 662 016	0,050	25,51443
2018	125 620 653 483	0,043	25,55653
2019	132 906 651 385	0,058	25,61291
2020	139 950 703 908	0,053	25,66456
2021	134 772 527 864	-0,037	25,62685
2022	137 333 205 893	0,019	25,64568
2023	143 375 866 953	0,044	25,68874
2024	150 257 908 566	0,048	25,73562
2025	163 029 830 794	0,085	25,81720
2026	171 181 322 334	0,050	25,86599
2027	179 740 388 451	0,050	25,91478
2028	186 930 003 989	0,040	25,95400
2029	193 098 694 121	0,033	25,98647
2030	202 367 431 438	0,048	26,03335

Simulation 2			
Year	Real GDP at constant prices 2000=100	Growth in real GDP (%)	ln real GDP
1998	44 565 000 000	0,073	24,52021
1999	43 810 000 000	-0,017	24,50313
2000	45 848 000 000	0,039	24,54860
2001	48 802 000 000	0,064	24,61104
2002	52 097 000 000	0,068	24,67637
2003	57 568 000 000	0,105	24,77623
2004	61 586 000 000	0,070	24,84370
2005	65 897 000 000	0,070	24,91136
2006	69 851 000 000	0,060	24,96963
2007	73 553 000 000	0,053	25,02127
2008	78 555 000 000	0,068	25,08706
2009	82 718 415 000	0,053	25,13871
2010	79 657 833 645	-0,037	25,10101
2011	81 171 332 484	0,019	25,11983
2012	84 742 871 114	0,044	25,16289
2013	88 810 528 927	0,048	25,20977
2014	96 359 423 886	0,085	25,29135
2015	101 177 395 080	0,050	25,34014
2016	106 236 264 834	0,050	25,38893
2017	110 485 715 427	0,040	25,42815
2018	114 131 744 037	0,033	25,46062
2019	119 610 067 750	0,048	25,50750
2020	123 557 199 986	0,033	25,53997
2021	116 514 439 587	-0,057	25,48128
2022	116 397 925 147	-0,001	25,48028
2023	119 191 475 351	0,024	25,50400
2024	122 528 836 661	0,028	25,53161
2025	130 493 211 044	0,065	25,59459
2026	134 408 007 375	0,030	25,62415
2027	138 440 247 596	0,030	25,65370
2028	141 209 052 548	0,020	25,67351
2029	143 044 770 231	0,013	25,68642
2030	147 050 023 798	0,028	25,71404

Republic of Lithuania
Gross domestic product

Simulation 3

Year	Real GDP at constant prices 2000=100	Growth rates bootstrapped	Growth in real GDP (%)	ln real GDP
1998	44 565 000 000	0,073	0,073	24,52021
1999	43 810 000 000	-0,017	-0,017	24,50313
2000	45 848 000 000	0,039	0,039	24,54860
2001	48 802 000 000	0,064	0,064	24,61104
2002	52 097 000 000	0,068	0,068	24,67637
2003	57 568 000 000	0,105	0,105	24,77623
2004	61 586 000 000	0,070	0,070	24,84370
2005	65 897 000 000	0,070	0,070	24,91136
2006	69 851 000 000	0,060	0,060	24,96963
2007	73 553 000 000	0,053	0,053	25,02127
2008	78 555 000 000	0,068	0,068	25,08706
2009	82 796 970 000	0,064	0,054	25,13966
2010	87 764 788 200	0,070	0,060	25,19793
2011	92 855 145 916	0,068	0,058	25,25431
2012	97 869 323 795	0,064	0,054	25,30690
2013	103 741 483 223	0,070	0,060	25,36517
2014	109 758 489 250	0,068	0,058	25,42155
2015	115 685 447 669	0,064	0,054	25,47414
2016	126 675 565 198	0,105	0,095	25,56490
2017	132 122 614 501	0,053	0,043	25,60700
2018	140 049 971 371	0,070	0,060	25,66527
2019	148 452 969 654	0,070	0,060	25,72353
2020	156 320 977 045	0,073	0,053	25,77518
2021	163 199 100 035	0,064	0,044	25,81824
2022	171 032 656 837	0,068	0,048	25,86512
2023	185 570 432 668	0,105	0,085	25,94670
2024	201 343 919 445	0,105	0,085	26,02828
2025	193 894 194 425	-0,017	-0,037	25,99058
2026	186 720 109 232	-0,017	-0,037	25,95288
2027	196 616 275 021	0,073	0,053	26,00452
2028	205 267 391 122	0,064	0,044	26,04758
2029	215 120 225 896	0,068	0,048	26,09446
2030	207 160 777 538	-0,017	-0,037	26,05676

Republic of Lithuania
Gross domestic product

Simulation 4

Year	Real GDP at constant prices 2000=100	Growth rates bootstrapped	Growth in real GDP (%)	In real GDP
1998	44 565 000 000	0,073	0,073	24,52021
1999	43 810 000 000	-0,017	-0,017	24,50313
2000	45 848 000 000	0,039	0,039	24,54860
2001	48 802 000 000	0,064	0,064	24,61104
2002	52 097 000 000	0,068	0,068	24,67637
2003	57 568 000 000	0,105	0,105	24,77623
2004	61 586 000 000	0,070	0,070	24,84370
2005	65 897 000 000	0,070	0,070	24,91136
2006	69 851 000 000	0,060	0,060	24,96963
2007	73 553 000 000	0,053	0,053	25,02127
2008	78 555 000 000	0,068	0,068	25,08706
2009	82 482 750 000	0,070	0,050	25,13586
2010	79 430 888 250	-0,017	-0,037	25,09815
2011	86 182 513 751	0,105	0,085	25,17973
2012	89 974 544 356	0,064	0,044	25,22279
2013	92 943 704 320	0,053	0,033	25,25526
2014	97 405 002 127	0,068	0,048	25,30214
2015	102 275 252 234	0,070	0,050	25,35093
2016	107 695 840 602	0,073	0,053	25,40258
2017	113 080 632 632	0,070	0,050	25,45137
2018	108 896 649 225	-0,017	-0,037	25,41367
2019	114 341 481 686	0,070	0,050	25,46246
2020	117 771 726 137	0,070	0,030	25,49201
2021	111 058 737 747	-0,017	-0,057	25,43333
2022	114 168 382 404	0,068	0,028	25,46094
2023	117 593 433 876	0,070	0,030	25,49050
2024	125 237 007 078	0,105	0,065	25,55347
2025	127 741 747 219	0,060	0,020	25,57328
2026	131 573 999 636	0,070	0,030	25,60284
2027	135 915 941 624	0,073	0,033	25,63530
2028	139 993 419 873	0,070	0,030	25,66486
2029	143 913 235 629	0,068	0,028	25,69248
2030	143 769 322 394	0,039	-0,001	25,69148

Table A.3

**CONSOLIDATED STATE AND MUNICIPAL BUDGET OF THE REPUBLIC OF LITHUANIA
1993-2004**

(thousands Litass)

Revenues	Consolidated state and municipal budget											
	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
1	2	3	4	5	6	7	8	9	10	11	12	13
TAX REVENUE	2 396 149	3 766 019	5 535 004	6 404 079	7 813 696	8 666 290	8 376 071	8 033 120	8 104 681	8 990 814	9 723 069	11 086 376
% of GDP	20,67%	22,28%	21,65%	19,83%	19,84%	19,53%	19,32%	17,52%	16,69%	17,31%	17,13%	17,76%
% of total income	87,50%	93,16%	96,13%	95,30%	94,86%	92,41%	93,24%	92,08%	87,38%	85,04%	85,59%	80,25%
Tax on income, profits and capital gains	1 255 440	1 743 910	2 243 614	2 673 431	2 577 921	3 001 972	2 937 222	2 815 953	2 770 830	2 854 999	3 451 062	4 222 540
% of GDP	10,83%	10,32%	8,78%	8,28%	6,55%	6,76%	6,77%	6,14%	5,71%	5,50%	6,08%	6,76%
% of total income	45,84%	43,14%	38,97%	39,78%	31,30%	32,01%	32,70%	32,28%	29,87%	27,01%	30,38%	30,57%
<i>Tax on individual income</i>	<i>614 723</i>	<i>1 189 426</i>	<i>1 689 745</i>	<i>2 086 573</i>	<i>1 957 016</i>	<i>2 421 738</i>	<i>2 576 394</i>	<i>2 504 272</i>	<i>2 511 614</i>	<i>2 547 296</i>	<i>2 666 178</i>	<i>3 053 590</i>
% of GDP	5,30%	7,04%	6,61%	6,46%	4,97%	5,46%	5,94%	5,46%	5,17%	4,90%	4,70%	4,89%
% of total income	22,45%	29,42%	29,35%	31,05%	23,76%	25,82%	28,68%	28,71%	27,08%	24,09%	23,47%	22,10%
<i>Tax on corporate profits</i>	<i>640 717</i>	<i>554 484</i>	<i>553 869</i>	<i>586 858</i>	<i>620 905</i>	<i>580 234</i>	<i>360 828</i>	<i>311 681</i>	<i>259 216</i>	<i>307 703</i>	<i>784 884</i>	<i>1 168 950</i>
% of GDP	5,53%	3,28%	2,17%	1,82%	1,58%	1,31%	0,83%	0,68%	0,53%	0,59%	1,38%	1,87%
% of total income	23,40%	13,72%	9,62%	8,73%	7,54%	6,19%	4,02%	3,57%	2,79%	2,91%	6,91%	8,46%
Taxes on property	27 471	38 220	156 841	177 430	216 857	235 014	246 606	258 503	284 410	328 274	307 523	247 818
% of GDP	0,24%	0,23%	0,61%	0,55%	0,55%	0,53%	0,57%	0,56%	0,59%	0,63%	0,54%	0,40%
% of total income	1,00%	0,95%	2,72%	2,64%	2,63%	2,51%	2,75%	2,96%	3,07%	3,11%	2,71%	1,79%
Domestic taxes on goods and services	981 097	1 429 991	2 589 163	3 115 514	4 512 830	4 952 315	4 784 873	4 628 995	4 912 000	5 671 144	5 806 752	6 468 531
% of GDP	8,47%	8,46%	10,13%	9,65%	11,46%	11,16%	11,04%	10,10%	10,11%	10,92%	10,23%	10,36%
% of total income	35,83%	35,38%	44,97%	46,36%	54,78%	52,81%	53,26%	53,06%	52,96%	53,64%	51,12%	46,82%
<i>VAT</i>	<i>760 399</i>	<i>1 148 067</i>	<i>1 974 926</i>	<i>2 279 536</i>	<i>3 347 782</i>	<i>3 612 132</i>	<i>3 466 514</i>	<i>3 419 412</i>	<i>3 511 812</i>	<i>3 809 678</i>	<i>3 822 994</i>	<i>3 930 096</i>
% of GDP	6,56%	6,79%	7,72%	7,06%	8,50%	8,14%	7,99%	7,46%	7,23%	7,33%	6,73%	6,29%
% of total income	27,77%	28,40%	34,30%	33,92%	40,64%	38,52%	38,59%	39,20%	37,86%	36,04%	33,65%	28,45%
<i>Excises</i>	<i>212 329</i>	<i>281 924</i>	<i>614 237</i>	<i>835 978</i>	<i>1 165 048</i>	<i>1 340 183</i>	<i>1 318 359</i>	<i>1 209 583</i>	<i>1 295 349</i>	<i>1 706 200</i>	<i>1 765 158</i>	<i>1 857 710</i>
% of GDP	1,83%	1,67%	2,40%	2,59%	2,96%	3,02%	3,04%	2,64%	2,67%	3,28%	3,11%	2,98%
% of total income	7,75%	6,97%	10,67%	12,44%	14,14%	14,29%	14,68%	13,87%	13,97%	16,14%	15,54%	13,45%

<i>Other domestic taxes on goods and services</i>	8 369								104 839	155 266	218 600	680 725
% of GDP	0,07%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,22%	0,30%	0,39%	1,09%
% of total income	0,31%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	1,13%	1,47%	1,92%	4,93%
Taxes on international trade and transactions	99 951	282 514	187 412	214 489	270 796	245 423	192 611	142 910	133 831	132 481	146 362	147 487
% of GDP	0,86%	1,67%	0,73%	0,66%	0,69%	0,55%	0,44%	0,31%	0,28%	0,26%	0,26%	0,24%
% of total income	3,65%	6,99%	3,25%	3,19%	3,29%	2,62%	2,14%	1,64%	1,44%	1,25%	1,29%	1,07%
Other taxes	32 190	271 384	357 974	223 215	235 292	231 566	214 759	186 759	3 610	3 916	11 370	0
% of GDP	0,28%	1,61%	1,40%	0,69%	0,60%	0,52%	0,50%	0,41%	0,01%	0,01%	0,02%	0,00%
% of total income	1,18%	6,71%	6,22%	3,32%	2,86%	2,47%	2,39%	2,14%	0,04%	0,04%	0,10%	0,00%
NON-TAX REVENUE	337 074	274 389	222 865	314 403	421 524	704 987	605 203	687 521	1 159 713	1 559 331	1 603 176	1 203 777
% of GDP	2,91%	1,62%	0,87%	0,97%	1,07%	1,59%	1,40%	1,50%	2,39%	3,00%	2,82%	1,93%
% of total income	12,31%	6,79%	3,87%	4,68%	5,12%	7,52%	6,74%	7,88%	12,50%	14,75%	14,11%	8,71%
CAPITAL REVENUE		1 925	148	1 669	2 255	6 488	2 326	3 001	11 249	21 766	33 557	134 744
% of GDP	0,00%	0,01%	0,00%	0,01%	0,01%	0,01%	0,01%	0,01%	0,02%	0,04%	0,06%	0,22%
% of total income	0,00%	0,05%	0,00%	0,02%	0,03%	0,07%	0,03%	0,03%	0,12%	0,21%	0,30%	0,98%
OTHERS	5 349											1 389 794
% of GDP	0,05%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	2,23%
% of total income	0,20%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	10,06%
Total revenues	2 738 572	4 042 333	5 758 017	6 720 151	8 237 475	9 377 765	8 983 600	8 723 642	9 275 643	10 571 911	11 359 802	13 814 691
Total revenues as % of GDP	23,63%	23,91%	22,52%	20,81%	20,92%	21,13%	20,72%	19,03%	19,10%	20,35%	20,01%	22,12%

Source: The Ministry of Finance of the Republic of Lithuania