категорій результатів: з одного боку, проводиться якісний теоретичний синтез моделей оцінки темпу окупності, з іншого боку, це визначається співвідношення між фінансовою та економічною рентабельністю в сільському господарстві.

Ключові слова: економічні темпи повернення, фінансові ставки прибутковості, коефіцієнт кореляції Пірсона, сільського господарства.

С. Бумбеску, асп.
Университет 1 декабря 1918 года, Альба Юлия, Румыния

АНАЛИЗ МОДЕЛИ РЕНТАБЕЛЬНОСТИ В СЕЛЬСКОМ ХОЗЯЙСТВЕ

В этой статье мы разработали синтетическую теоретическую основу анализа рентабельности через экономические и финансовые нормы прибыли с использованием различных моделей, а также сделали тематическое исследование сходств и различий между различными моделями скоростей обратного анализа в сельском хозяйстве. Мотивация выбора этой темы – определение взаимозвязи между финансовой и экономической рентабельностью, используя коэффициент корреляции Пирсона. Проведенное исследование, приводит к двум основным категориям результатов: с одной стороны, проводится качественный теоретический синтез моделей оценки темпа окупаемости, с другой стороны, это определяется соотношением между финансовой и экономической рентабельностью в сельском хозяйстве.

Ключевые слова: экономические темпы возвращения, финансовые ставки доходности, коэффициент корреляции Пирсона, сельского хозяйства.

Bulletin of Taras Shevchenko National University of Kyiv. Economics, 2015; 9 (174): 42-51
JEL G21, 19
УДК 338.984
DOI: http://dx.doi.org/10.17721/1728-2667.2015/174-9/7

F. Jaseviciene, Doctor of Sciences (Economics),
E. Rudzionyte, PhD in Economics
Vilnius University, Vilnius, Lithuania

ANALYSIS OF BUDGET DEFICIT AND ITS PROBLEMS IN LITHUANIA

Budget deficit is one of the most important parts of macroeconomics. Since 1990, the government of the Lithuanian Republic has been faced with problems in balancing the budget deficit; most of the years, the country's budget was deficit with the lack of incoming money flow. The budget deficit value in Lithuania has been a significant theme since 2004, when Lithuania became part of the European Union, and one of the liabilities was to insure the litas replacement with euro currency and the budget deficit was one of the Maastricht's criteria. Also it is very important to maintain effective management of public finances. The government is responsible for managing the country's budget in respect to various economical parameters, for example, GDP, inflation rate, unemployment rate, etc., in order to plan income level and distribute it to the relevant economic areas. Also, the budget deficit's problems are revealed in this article.

Keywords: budget deficit, macroeconomic parameters, budget, convergence criteria.

Introduction. The budget deficit would be optimal, because it is very important in stabilizing the economy and promoting its development. Response to 2008. crisis in many countries, including Lithuania pay more attention to fiscal deficit reduction. Economics is a constant variable, for this reason balancing the budget deficit is a very complicated process. Due to the fact that all developing countries are faced with a lag in their fiscal policy, Lithuania is not the exception. Lithuania had difficulties managing the budget deficit during the world financial crisis in 2009. Public debt had increased to its highest levels; the lack of income in the public budget brought problems to different sectors due to instability in financial sectors. Budget deficit is often explored in research as one of the variables in macroeconomics' situation in the country.

Budget deficits' analysis is presented in this article, including internal and external variables for budget deficit. Internal factors' analysis, public budget income collection problems and expenditures distributions problems are analysed in this article. Calculation is made to measure the impact of budget deficit redemption methods. The importance of effective and sustainable public finances is revealed in this research.

Purpose. To make Lithuania's budget deficit and its problems analysis, evaluating internal (public income and expenditures) and external (macro economical parameters) factors.

Methods of research: Systematic analysis of scientific literature, statistical analysis, logical comparative analysis, meta-analysis, graphical data analysis and comparison, correlation analysis, using one-regression model, multivariable regression model, the expert forecast, prognosis using regression model.

Theoretical Analysis of Budget Deficit and It's Problems. Budget deficit exists when, during a certain period of time, public expenditures become higher than the public income. According to Buskeviciute (2008), budget deficit exists when income is lower than the expenditures. To widen the description of budget deficit Rakauskiene (2006) says that there are two types of budget deficits: active and passive. Active budget deficit can be recognised when public expenditures are above public income whereas passive budget deficit can be seen when taxes are not collected due to economic growth decrease, public debt is not honoured, taxes privileges. The more detailed budget deficit conception is prepared by Sineviciene ir Vasiliauskaite (2010): fiscal policy can be contra-cycled in developing countries; this fact is explained by non-discrete fiscal policy (self-contained economic stabiliser). This theory explains that having an increase of public income, collected taxes amounts grow together and public expenditures decrease – the public budget is surplus. On the other hand, when the economy is decreasing, public budget does not collect enough income to cover expenditures (social welfare) in this case budget is deficit.

Furthermore, the budget deficit value depends on its calculation method. The possible calculation methods presented below:

Conventional fiscal balance (also known as the absolute position). This balance is calculated as follows: consolidated government revenues to and non-repayable transfers minus costs and net borrowing.

Current balance is calculated from current income minus current expenditure.

Liquidity balance. It is calculated as follows: from the conventional balance subtracted by foreign borrowing and

domestic non-bank loans. According to this balance, budget deficit impact is to domestic monetary policy.

Primary balance is calculated by subtracting the conventional balance of public debt interest paid.

Operational balance. In order to calculate the balance, current balance is deducted by gross debt services which is compensation for the creditors for inflation.

The structural or neutral budget balance. Structural variation is not evaluated as conventional fiscal balance. The calculation of structural balance consists of balance evaluation based on potential GDB growth.

Public budget deficit scheme is explained by the basic fiscal policy model an economist JM Keynes. According to his theory, when the economy is in recession that means countries have high unemployment rate, the need to increase the general demand is actual. In this case, the economy in such a situation, as shown in Figure 1. – Balance of the product is formed at E, and the downturn phase aggregate demand is reflected in the points A and B, then there is a need to stimulate the economy. The government needs to implement fiscal policy, which measures the growth of government expenditures, tax cuts or increase of transfer payments. However, the result is oriented to the budget deficit growth.

Reversed situation, a growing economy has low unemployment, but also the rise of inflation, according to Keynesian theory. Inflation gap indicates that aggregate demand exceeds supply on the potential product. In this case, the government implements suspended fiscal policy, its instruments are government expenditures' cuts, tax increases or reduction of transfer payments. The consequence of this policy is budget surpluses (Snieska and others (2005). In such economic situation budget deficit should not be formed.

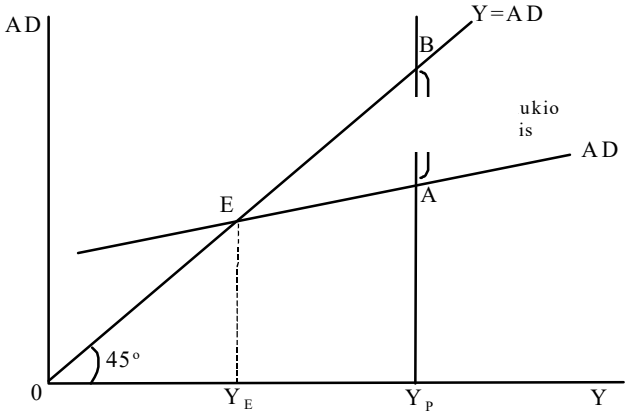


Fig. 1. The recession phase of the common demand and GNP equilibrium

Source: Snieska, 2005

Stabilising the economy should be used instruments as progressive taxation and a smart benefit rules. The higher the tax rate, the more sensitive collected taxes amounts is to GDP growth, because of this, budget deficit or surplus grows faster (Gylys, 2009). The weakness of this model is that it fails to eliminate unwanted variation in GDP, but only reduces economic variation. In order to ensure proper management of the budget deficit; efficient and smart tools have to be applied in relation with other macro-economic indicators (ex. GDP growth and public debt). The methods of public debt redemption should be properly evaluated. Buškevičiūtė (2008) presents five ways of covering the budget deficit (Fig. 2): the additional money issue, the reduction of public expenditures, higher tax rates or expanding the tax base, the official foreign reserves, borrowing in the domestic and foreign markets. Each of these methods has advantages and disadvantages according to different authors' opinions on the deficit recovery methods and their applicability.

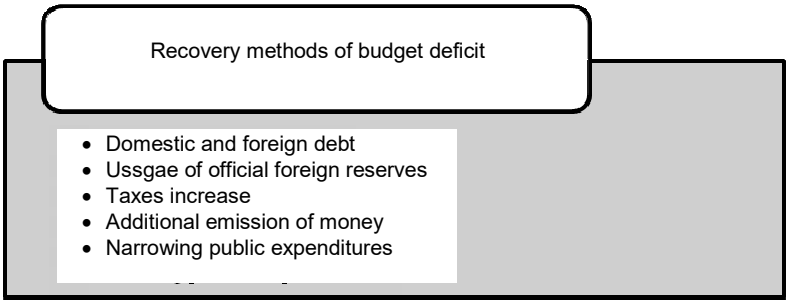


Fig. 2. Recovery methods of budget deficit

Source: created by authors referring to Buškevičiūtę, 2008)

Some authors claim that additional emission of money can be used when low inflation rate and fiscal deficits are observed in countries. Sang Ho (2007) agrees that additional money emission can be beneficial for the economy in order to cover public spending's, but not public debt because the aggregate supply rise together with GDP and growing inflation stimulates consumption and economic growth. In this situation, government expenditures should be at the same level as the revenue in the long run, this is what economists call a fiscal

consolidation, to implement this method, planning must consist of very careful and strategic programs:

- increased taxes;
- expenditures reduction;
- implementation of structural reforms. (Janulyte, 2011)

Covering budget deficit with domestic and foreign debt are one of the most popular methods of modern economy, as the loan markets are quite simple and accessible to all, but the lending rate might alter significantly due to various factors. Fiscal budget can be covered using non-essential methods that do not cause inflation rate growth. This could be a debt, the government securities distributed in the financial market. Sang Ho (2007) states that the budget deficit covering methods are borrowing, but sometimes the increase in public debt might causes only a further increase in the budget deficit. The analysis of the budget deficit and its problems revealed that the biggest problem is the application of appropriate methods of budgeting. These difficulties are caused by administrative and economic problems. Budget deficit covering methods have a negative impact on the country's economy. Reducing public expenditures, citizens might become dissatisfied due to lower transfer payments and might begin a strike, in the long term this might increase emigration. Increasing public revenue while raising tax rates or expanding the taxes base could be hard to implement as the planned funds might not necessarily be collected because of the avoiding of taxes and shadow economy in Lithuania.

Many authors conclude that public budget must be managed with paying attention to the economic situation in the country. The budget deficit might be affected by various macroeconomic factors. The main macroeconomic factors were found out, which are closely related to the budget deficit level. They are the current account balance, GDP, inflation and unemployment rates, interest rates, and public debt management costs. Gu Xin (2012) claims that the current account balance affects the state budget deficit level, but this relationship is reflected in the evaluation of more qualitative than quantitative factors. Meanwhile, Chinna, Ito (2007) considers that the current account balance has a positive impact on the state budget deficit, when current account balance rises, the budget deficit decreases. This effect is stronger in industrially developed countries. Some authors point out GDP and the budget deficit correlation importance, Kregzde (2013) states that the budget deficit and GDP changes could affect the public debt, which increases public spending and borrowing costs. If the budget deficit grows at a certain rate to GDP, there is no debt need, but if budget deficit grows faster than GDP grows, government debt will increase.

When GDP growth is slow and budget deficit increases faster, public debt increases, when the situation is the opposite – public debt decreases (Kregzde, 2013). Budget deficit is related to inflations and unemployment rate by many authors.

When the impact of interest rate on the budget deficit is assessed, it is important that the direct correlation is noticed between these factors, but the highest impact on the interest rate is when the public budget is lacking funds and there is a need to borrow additionally. Whereas borrowing from markets affects debt costs because of the interest payments, which could increase the deficit volume. The analysis of scientific publications revealed that authors agree with the general opinion, but Karmelavicius and Klyviene (2012) distinguish different reasons why these factors have an economic relation. According to the authors, classical economic theory states that if public expenditure policy affects interest rates, later it has a significant impact on the volume of investment and public spending increases moving out private investment from the country.

Fiscal stimulus packages depend for their effectiveness on the assumption of savings behavior. Under the same assumption, higher fiscal deficits can have problematic implications if they turn out to be permanent. First, if they occur in large countries they significantly raise the world real interest rate. Second, they cause a short run current account deterioration equal to around 50% of the fiscal deficit deterioration. Third, the longer run current account deterioration equals almost 75% for a large economy such as the United States, and almost 100% for a small open economy.(Kumhof,Laxion 2013)

Situation analysis of budget deficit and the its problems in Lithuania

As mentioned before, Lithuania through the period of existence was faced with budgetary problems, public revenue downfalls and public spending increases, so most of the period of the Lithuania's budget was deficit.

The increase of the budget deficit in the economic crisis and post-crisis period occurred during 2008-2012. Reduction of the budget deficit to the level of crisis period in 2008-2012, as Lithuania was preparing to have the euro in 2015 (Figure 3). Lithuania's budget deficit reached its highest level in 2009. Budget deficit went down and continued to grow, it was necessary to wait for economic recovery when exports and domestic demand increase. However, lack of funds forced the increase in public debt, since it is complicated to borrow from domestic market for longer period. The government had to find the necessary financial resources abroad.

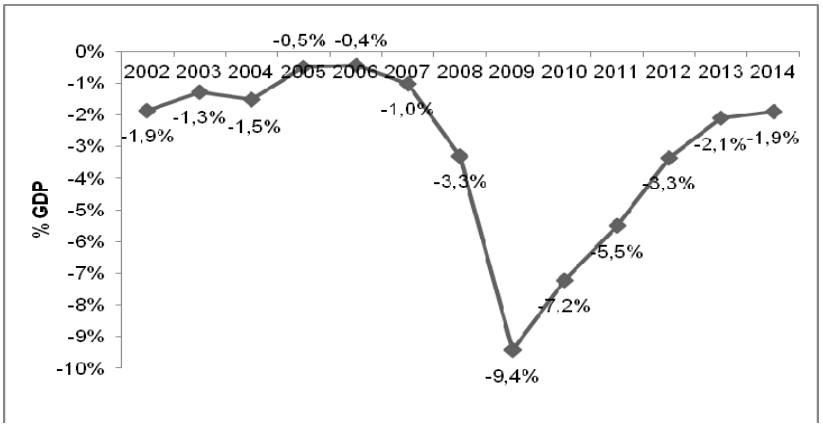


Fig. 3. Lithuania budget deficit in 2002-2014

Source: Department of Statistics in Lithuania and Lithuania Ministry of Finance

The analysis of the public budget showed the current situation in the EU. It is important to find out and compare the size of the public deficit to GDP ratio and the cost income ratio to GDP. The different European national budgets of income and expenditure levels are comparable with those of the country's GDP generated in 2013 (Table 1). As this can be seen in almost all the countries expenditures are over collected from income, with the exception of Germany, whose income is 0.1 per cent point higher than its costs. So this time, the budget deficit is one of the features of the economies. It should also be noted that the national budget revenue and expenditure range from 40-50% of GDP. Among the largest national budgets include countries such as Denmark, France and Finland, their budget level is more than half of the country's GDP and relatively low budget (about 30% of GDP) is characterized by Lithuania, Romania and Slovakia.

EU budget deficit level seen in Table 1. The table shows that the highest budget deficits are in Greece (-12.7% of GDP), Ireland (-7.2%), Spain (-7.1%), Portugal (-4.9%.) in 2013.

Table 1. **Budget deficit level in different EU countries 2013 m.**

Country	Budget deficit% GDP	Country	Budget deficit% GDP
Belgium	-2,6	Lithuania	-2,1
Bulgaria	-1,5	Luxemburg	0,1
Czech Republic	-1,5	Hungary	-2,2
Denmark	-0,8	Malta	-2,8
Germany	0	Netherlands	-2,5
Estonia	-0,2	Austria	-1,5
Ireland	-7,2	Poland	-4,3
Greece	-12,7	Portugal	-4,9
Spain	-7,1	Romania	-2,3
France	-4,3	Slovenia	-4,7
Croatia	-4,9	Slovakia	-2,8
Iltaly	-3	Finland	-2,1
Cyprus	-5,4	Sweden	-1,1
Latvia	-1,0	United Kingdom	-5,8

Source: created by authors using data from EUROSTAT

The main budget deficit problem is determination of covering method. Lithuania currently could use three deficit coverage methods: public expenditure cuts, government revenue increase and domestic and foreign debt. All these methods reduce the state budget deficit, but each of them could negatively affect the balance of public budget. In order to investigate the state budget applicability opportunities of redemption methods in Lithuania, it is needed to make an assessment of method effect on the budget deficit. Lithuanian budget revenues mainly consist of taxes: VAT, excise, personal income and corporate income taxes. Other state budget deficit coverage measure is the reduction of public spending. Calculation of Lithuanian public debt burden is counted using the Lerner (1948) model, estimated debt burden shows that the Lithuanian public foreign debt is a burden for future generations. This makes a negative impact on the country's economy, meaning that funds allocated to the capital increase is less than the interest paid and additional borrowing to repay debt (Figure 4). It can be seen that foreign debt burden continues to grow because it is difficult to borrow the required amount in the long term in Lithuania's domestic market as there is no demand for financial instruments and capital market is not developed enough, for this reason, Lithuania has to borrow abroad and further increase of the debt burden to the population is obvious.

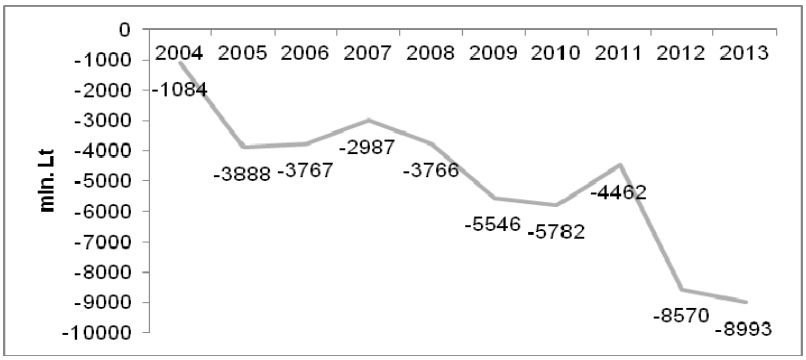


Fig. 4. Foreign debt burden in Lithuania

Source: created by authors according to data from Lithuania Ministry of Finance

The evaluation of the state budget deficit covering methods applicability revealed that significant changes could increase public revenue and reduce public expenditures, since the calculation of the external debt burden by Lerner model shows the growing burden of public debt, and according to the theory, the greater debt burden is, the more it reduces consumption and budget deficits growth is a threat to Lithuania.

Methodology. The Republic of Lithuania's deficit analysis consists of four parts, the first is internal deficit factors evaluation and comparison of the Baltic countries in the context of (public revenue and expenditure comparison). Another part is the regression models with external factors – macro-economic indicators and impact analysis of these factors on the Lithuanian budget deficit including the budget deficit's forecast.

In the first part, budget deficit is analysed through income and expenditure comparison. Selected countries observed and compared in further analysis. Figure 5 provides stages of comparative analysis.

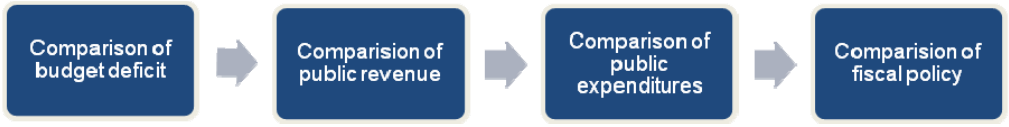


Fig. 5. Stages of comparative analysis

Source: created by authors

Literature review revealed that the budget deficit is influenced by other parameters characterizing the country's economy. In order to analyse how different macroeconomic indicators could affect the state budget deficit correlation-regression analysis is used. Research is done to find a link between the budget deficit and other macroeconomic indicators: inflation, unemployment rate, GDP, current account balance, the base rate and borrowing costs. Statistics for regression model are collected quarterly from 2002-2013 and it consists of 48 data points. Models will be analysed using the following variables: the dependent variable Y – Lithuanian public budget deficit to GDP ratio, expressed as a percentage and independent variables Xj (j = (1; 6)):

X1 – current balance account
X2 – GDP
X3 – inflation rate
X4 – unemployment rate
X5 – EURIBOR
X6 – public debt costs

When most reliable dimensional regression models are determined, the adequacy of regression models is evaluated by using adequacy and reliability of equations, using certain indicators mean square deviation of error (RMSE), mean absolute error (MAE), mean absolute error,% (MAPE) and Teil's overlapping coefficient (U). The evaluation of the reliability of forecasting models is made for 2015-2017. The 2015-2017 year budget deficit is calculated by applying the most reliable (with highest determination coefficients) regression equation, the assessing the macroeconomic indicators forecasted values.

Results.

Comparison of public income and expenditures in Baltic States. Lithuanian state budget revenue and expenditure may explain the origin of the deficit, such as a reduction of public revenue caused by loss of tax revenue, rising cost and difficulties in setting realistic fiscal policy objectives. Lithuanian public budget and the management compared with the Baltic countries, as their economies are similar in size, countries are faced with the same economic problems, for example unemployment, shadow economy, etc.

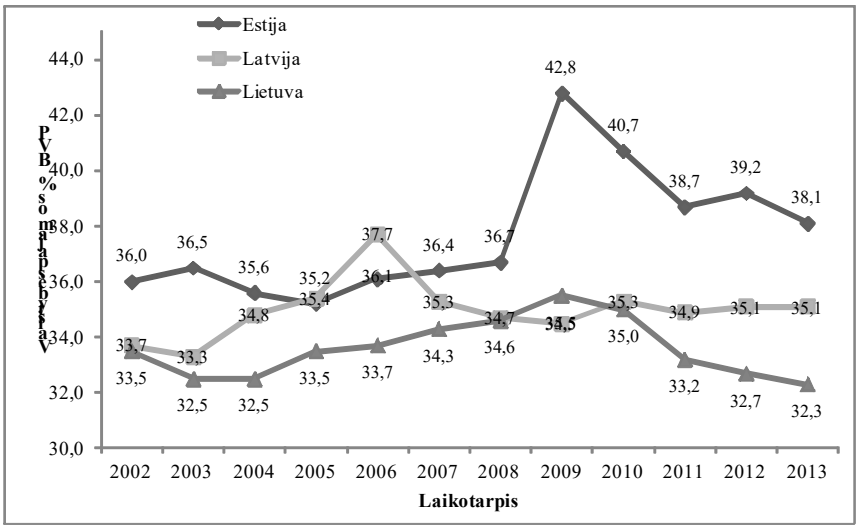


Fig. 6. Baltic Stated public revenue % BVP, 2002-2013 m.

Source: EUROSTAT data

Budget deficit dynamics analysis during 2002-2013 year showed that from 2002 to 2007 Estonian public budget was in surplus during the economic crisis period in 2008-2010 budget deficit increased to 3% of GDP (2008) and then it began to decline again, while Latvia's and Lithuania's budget deficit were in a critical situation -9.2% of GDP and -9.4% of GDP. Almost all over the analysis period in all three Baltic countries' budget deficit did not exceed the EU average, with the exception of 2009-2010. However, Estonia has always had the lowest budget deficits in all three Baltic countries, it is determined that the Estonian budget was managed without any debt. Estonia does not need to borrow in order to refinance the debts of the previous periods. In 2013 all Baltic States countries' public income and expenditures balance does not exceed 3% of GDP satisfying the Maastricht criteria.

Public revenues from the GDP show the size of the collected income. Figure 6 reveals that since 2007, the highest revenue level is collected by the Estonia average over the period of 37.7% of GDP). Lithuanian and Latvian income did not significantly change during the year 2002-2013. Average over the period of Lithuanian public revenue reaches for 33.6% of GDP, while in Latvia – 35% of GDP. The largest part of the public income is tax revenues which are more than 70% of all income in all countries. To sum up, the Baltic state revenue collection rate in the country is similar to about 35%, only Estonia stands higher income levels for the collection, which is about 40% of GDP.

The level of public expenditures is similar enough, most of the time in all countries the spending level is slightly above the income in the Baltic countries. Of course, except for

2009-2010, when due to the economic crisis, public spending has increased significantly in all countries above 40% of GDP because of the increased level of unemployment, inflation and the increased cost of debt (Fig. 7). It should be noted that in 2011-2013 the level of public expenditures changed differentially in the Baltics another.

After the Lithuanian, Latvian and Estonian public budget structure and dynamics analysis, it was discovered that, by 2011 country budgetary trends were the same, and later in 2012-2013 Lithuania stood out for maximum public deficit, reason for this could be start of using euro in Estonia and Latvia. Furthermore, the comparison of fiscal targets shows that Estonia and Latvia fully integrated into the EU aims for sustainable growth. Whereas Lithuania still remains one of the main objectives to be ready to adopt the euro in 2015 and to maintain sustainable public finances. When analysing the revenue structure of Lithuania it was noticed the decrease in tax revenue and cost structure showed that most of the funds allocated to social spending: social security, health services and education. Horizontal and vertical state budget revenue and expenditure analysis revealed that the underlying fiscal problems are tax collection and shadow economy in Lithuania.

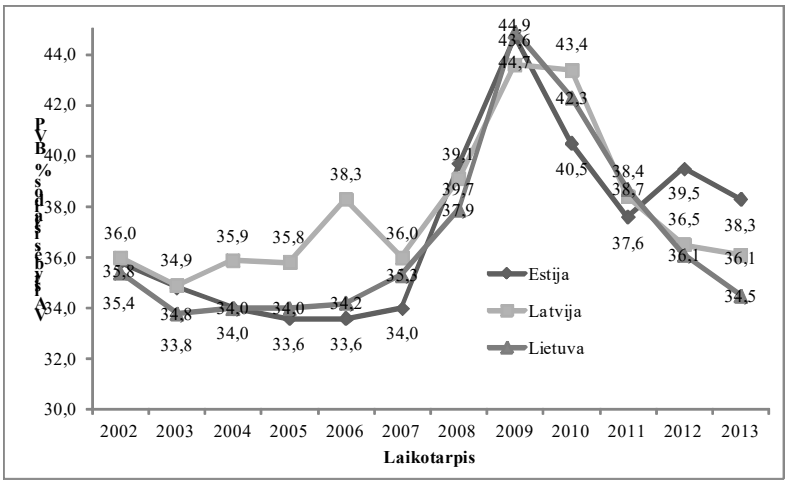


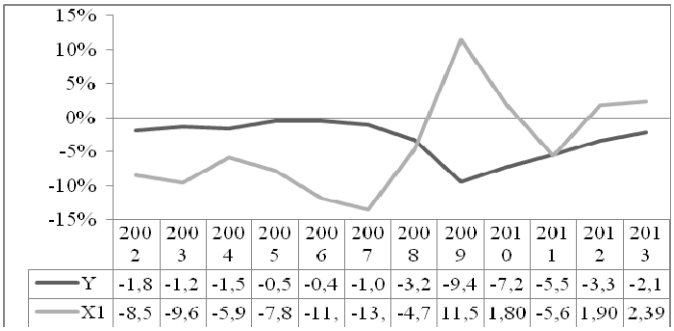
Fig. 7. Baltic States public expenditures % BVP, 2002-2013 m.

Source: EUROSTAT data

To sum up, Baltics budget deficit changed differently, it is necessary to be compared to the budgetary principles in these countries. In the Baltic countries, the budgetary similarity is to achieve the lowest possible budget deficit or even achieve a balanced budget level. According to, Navickas and Stuopyte (2000) goals of balance of the budget must be constantly adjusted to economic changes, but the constant artificial balance could be dangerous to the state and its economy than continuous public borrowing. Comparing the three Baltic fiscal targets, it was noticed that Lithuania had still one of the main aims to adopt the euro and meet the convergence criteria according 2014 budget plan. Meanwhile Estonia and Latvia governments have planned specific goals to improve the economic situation and quality of life for their society.

Lithuanian budget deficit regression analysis with other macroeconomic indicators. The state budget deficit level is constantly linked with other macroeconomic indicators in order to explain the correlation between these variables correlation-regression model methodology is used. Regression models were calculated with Lithuanian budget deficit to current account balance, GDP, inflation, unemployment, GDP and EURIBOR and borrowing costs. The aim of this analysis is to examine the influence of macroeconomic indicators to Lithuania's budget deficit in order to evaluate the possibility of using them for budget deficit planning and management.

Linear regression model with the Lithuanian budget and current account balances is created. The linear relationship is seen between these variables, the correlation coefficient is -0.65 meaning that the variables are negatively correlates (Fig. 8). Chinna and Ito (2007) claim that the indicators correlate in countries with more developed industry. The authors confirmed that the correlation coefficient showed an average dependence and Lithuanian industry was not heavily developed. The model is adequate because Fisher criteria is equal to 33.59 (Fisher's critical value equal to 4.0), whereas 33.59> 4.0, the calculated determination coefficient is significant 40.94% and standard error of regression equals to 2,1 prove that the regression model is adequate and appropriate to continue the research.



	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Y	-1,8	-1,2	-1,5	-0,5	-0,4	-1,0	-3,2	-9,4	-7,2	-5,5	-3,3	-2,1
X1	-8,5	-9,6	-5,9	-7,8	-11,	-13,	-4,7	11,5	1,80	-5,6	1,90	2,39

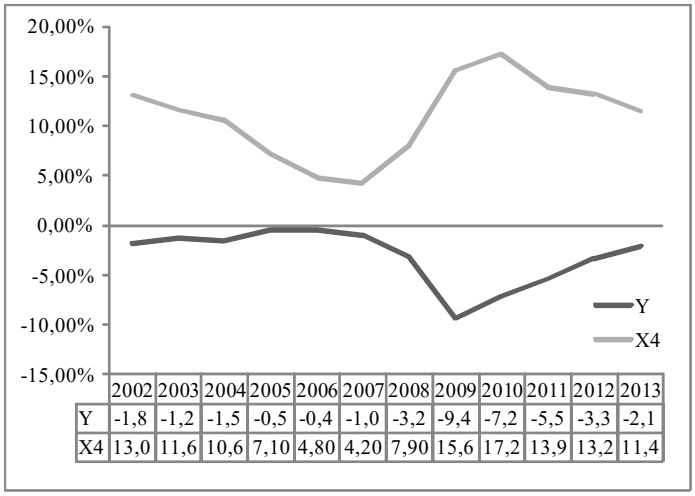
Fig. 8. Lithuania budget deficit and current account balance 2002-2013 m.

Source: EUROSTAT

Further analysis of regression model consists of equation evaluation. Linear regression equation is Y=C +b1X1. Value of b1 = 0.28 indicates that a 1 percentage point increase of the current account balance results budget balance fall 0.28 percentage point. The budget deficit increases and the surplus declines in this case. C = -4.71 indicates that if the current account balance is equal to 0, then the Lithuanian budget deficit would be equal to -4.71%. Literature analysis determines that there is a link between the economic indicators. However, Gu Xin (2012) tells that there is a direct correlation between the budget deficit and the current account balance, but in Lithuania's situation, this dependence is negative.

Other indicators are Lithuanian budget deficit and the unemployment rate. Fig. 9 shows their dynamics. Kregzde (2013) states that high state budget deficit level is increased by unemployment. In fact, we can see a negative trend between these macroeconomic indicators over the analysed year 2002-2013. When the unemployment rate declined, the budget deficit also decreased and vice versa. Such changes in macroeconomic indicators are a reflection of the traditional J.M. Keynes theory, when the unemployment rate is high, the government needs to stimulate the economy (public spending growth, tax cuts or transfer payment increases), then the inevitable consequence of such a fiscal policy – the budget deficit growth. In 10th figure we could see a clear trend, the higher budget balance, the lower unemployment rate. This is confirmed by a correlation coefficient of -0.78 (strong negative linear correlation) and standard error of regression, which value is 1,74.

The state budget deficit and unemployment regression model equation value b1 = -0.51, this means that increase of 1 percentage point of unemployment and the budget balance decrease by 0.51 percentage points. This model crossing value C is equal to 2,45 – where the unemployment rate is equal to 0%, the Lithuanian state budget balance is in surplus and up to 2.45% of GDP. The regression equation Y=0,51∗X4+2,45. Fisher criteria is equal to 71,55> 4, model is adequate. The determination coefficient equals to 0,60.



	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Y	-1,8	-1,2	-1,5	-0,5	-0,4	-1,0	-3,2	-9,4	-7,2	-5,5	-3,3	-2,1
X4	13,0	11,6	10,6	7,10	4,80	4,20	7,90	15,6	17,2	13,9	13,2	11,4

Fig. 9. Lithuania budget deficit and unemployment rate 2002-2013 m.

Source: EUROSTAT

Other regression models showed a weak correlation between the variables and the Lithuanian budget deficit.

The multivariable regression model is the most significant. Lithuania's budget deficit correlates with all the selected macroeconomic indicators in one bundle. Regression equation:

$$Y=-0,0506*X1-0,0003*X2-0,0095*X3-0,7657*X4-0,1448*X5+0,0088*X6+10,4135$$

Regression model is reliable because of the Fisher criteria (33.48> 4), the determination coefficient is 80.57%, and standard error of regression equals to 1,21. Also, Durbin-Watson Statistic shows positive autocorrelation between variables (Durbin-Watson stat=0,60).Lithuania budget deficit level more sensitive reacts to the changes of the unemployment rate, an increase in the unemployment rate 1% point, to reduce the budget deficit of 0.77% points, the least sensitive to the change of GDP budget deficit. This conclusion leads to possibility adapt regression model for budget deficit prognosis and further economical investigations of budget deficit relations between variables.

Lithuania's budget deficit prognosis for 2015-2017. The possibility to create regression models of the state budget deficit and other macroeconomic indicators, allows us to analyse the possible scenarios and forecast a possible trend for budget deficit in Lithuania. According to the most reliable regression models including budget deficit and the unemployment rate and multiple regression models.

The first regression model with unemployment rate is suitable to perform Lithuanian state budget forecast. Using equation calculated based on regression between variables: Y = -0.51 + 2.45 * X4. Assessment of reliability of prognosis calculated indicators showed in Table 2. MAPE is below 100% so the forecast by the regression equation can be considered reliable. Error coefficients satisfy the required values: Tail's rate approaching to zero (0.21), dispersion error, shows the possible predictive values changes, it is equal to 0.12 and covariance coefficient of 0.88. According to coefficients which evaluate reliability of forecast, regression model with the unemployment rate could be used in further analysis.

Table 2. **Indicators to evaluate reliability of regression model with budget deficit and unemployment rate**

Indicators	Value
Mean square deviation of error (RMSE)	1,71
The average absolute error (MAE)	1,44
The average absolute error% (MAPE)	99,38
Teil's overlapping coefficient (U)	0,21
Displacement error	0,00
Dispersion error	0,12
Covariance error	0,88

Source: made by authors

Last prognosis scenario adjusted to multiple regression model (Y=-0,0506∗X1-0,0003∗X2-0,0095∗X3-0,7657∗X4-0,1448∗X5+0,0088∗X6+10,4135). The average absolute error of 59.10% – using the equation forecast is significant (Table 3). Tail's overlap factor of 0.14 is the lowest compared with selected regression models. Teil's displacement error rates is zero, dispersion error rate is 0.05and covariance error is 0,95. The forecast has reasonable statistical properties and appropriate indicators.

Table 3. **Indicators to evaluate reliability of multivariable regression model**

Indicators	Value
Mean square deviation of error (RMSE)	1,12
The average absolute error (MAE)	0,84
The average absolute error% (MAPE)	59,10
Teil's overlapping coefficient (U)	0,14
Displacement error	0,00
Dispersion error	0,05
Covariance error	0,95

Source: made by authors

Lithuanian state budget deficit forecasts regarding regression model with the current account balance is projected by data from the Ministry of Finance's macroeconomic indicators projections (2014). Forecasted period 2015-2017 year according to the current account balance level obtained in 2015. State budget deficit will rise to 3.06%, while next year the growth of the current account deficit should decline in 2016. – 3.03% in 2017. – 2 83%. This suggests that the growth in internal demand, rising import demand and increased level of consumption in the country increases the collected tax revenue, and budget revenues growth and thereby reduces the budget deficit.

According to the calculations obtained from regression model with unemployment, Lithuanian state budget deficit in 2015 equals to 2.12% of GDP. In 2016 it is expected to fall to 1.51%, and in 2017 reach 0.85% of GDP. According to the regression equation with unemployment, the budget deficit is expected to meet the Maastricht criteria for the entire forecast period. Projections results seem logical, since the drop in the unemployment rate in the country is expected to increase consumption, the following increases tax revenue of VAT and also other consumption taxes, taxes related to labour taxation too.

Lithuanian public budget deficit forecast for the years 2015-2017 using a multivariable linear regression model, which consists of six variables, the results are that budget deficit is expected to decline (2015. – 1,52%; 2016. – 1.21%; 2017 – 0.95%).

Summarizing the Lithuanian state budget deficit projections results (Table 4). Regression model to the current account balance is declined, as Lithuania deficit values are not adequate to reality. In the first case, the application of the regression equation with the unemployment rate Lithuanian government deficit is higher and varies more slowly than the multiple regression model equation. After application of the second pair regression equation with unemployment, budget deficit should drop to -0.85% of GDP. The forecast, according to a multivariate regression model is more continuous, you can see a clear decreasing trend in the budget deficit to 0.95% of GDP in 2017.

Table 4. **Lithuania's budget deficit prognosis for 2015-2017**

Regression model	2015	2016	2017
With unemployment rate	-2,12%	-1,51%	-0,85%
Multivariable	-1,52%	-1,21%	-0,95%
Lithuanian Ministry of Finance	-1,2%	-0,5%	+0,2%

Source: created by authors

After the forecast using different regression models, it can be concluded that the budget deficit accurate prediction tool is the multivariable regression model. However, compared with the Ministry of Finance forecast, calculated Lithuania budget deficit is bigger than the forecast of the Ministry of Finance as surplus budget is prognosed till 2017. All projected budget forecasting regression models showed that the budget deficit is expected to fall over the next three years.

Conclusion & Discussion. After literature analysis of the public budgeting, conclusion is found that the public budget deficit is one of the macroeconomic factors, which is important for research of the economic situation in the country. The analysis of the budget deficit reveals that the main factors which might cause the budget deficit is ineffective fiscal policy, inefficient large-scale investment in the country's economic development, unpredictable circumstances, such as wars, natural disasters, and economic crisis.

Lithuania budget deficit dynamics analysis showed that in the 2001-2013 year almost all public spending exceeded revenues for most of the periods. The main objective of the Government of Lithuania is to achieve the budget deficit

level corresponding to the convergence criteria – 3%. Lithuania budget deficit management issues related to avoidance of taxes and the shadow economy, as well as using proper budget deficit covering methods: increase of revenue, reduction of expenditures and government debt. The increase of debt services costs clarifies that fiscal policy in the country is pro-cyclical.

Baltic countries stood out as the best in overcoming the economic crisis, these countries' budget deficits are among the lowest in the European Union. After the analysis of Lithuania, Latvia and Estonia income dynamics and structure of expenditure results are that, the income level is 32-38% of GDP in the Baltic countries, the main reason for the revenue decline is decreasing collected amount of taxes. When the revenue structure of Lithuania analysis was performed, the decrease of taxes revenue and EU sponsorship was noticed but expenditures structure showed that most of the funds are allocated for social expenditure: social protection, health and education services. Lithuania allocates the biggest part of its income to these three areas account in all Baltic countries.

In order to find out the public budget deficit economic dependence with other macroeconomic factors in Lithuania, econometrics models were adapted linear regression models. Selected economic indicators are the current account balance, GDP, inflation and unemployment rates, interest rates and government borrowing costs. After the budget deficit correlation analysis, it is concluded that the strongest influence on the state budget deficit makes the current account balance and the unemployment rate, government borrowing costs and EURIBOR. Multivariate regression equation with all the analysed macroeconomic indicators explains 81% of Lithuania's budget deficit alterations.

Adequate and reliable unemployment and multivariate regression models were used for Lithuanian state budget prognosis. 2014 data was forecasted with expert forecasting methods using date from the Ministry of Finance, the Lithuanian state budget deficit should fall to 1.9% of GDP. 2015-1017 year prognosis was adapted to two regressions with these macroeconomic indicators, according to the forecast of these indicators. Lithuania's budget deficit is expected to fall over the next three years.

References

1. *Buskeviciute, E.* (2008) Public Finances. Kaunas. Technologija. 57-144 p.
2. *Chinn, M. D., Ito, H.* (2007) Current account balances, financial development and institutions: assaying the world "saving glut". Journal of International Money and Finance, Nr. 26 (4), 546-569.
3. *ECB* (2014) EURIBOR statistical data. Link: http://sdw.ecb.europa.eu/browseTable.do PROVIDER_FM_ID=EURIBOR1YD_&DATASET=0&node=bbn175&FREQ=Q&sfl1=4&sfl4=4&SERIES_KEY=143.FM.Q.U2.EUR.RT.MM.EURIBOR1YD_.HSTA
4. *EUROSTAT.* Budget deficit in EU. Link: http://epp.eurostat.ec.europa.eu/portal/page/portal/government_finance_statistics/data/main_tables
5. EUROSTAT. Lithuania, Latvia and Estonia public revenue and expenditures: Link: http://appsso.eurostat.ec.europa.eu/nui/submitViewTableAction.do
6. *Gylys, P.* (2009) The macroeconomic policy trap: Lithuania case. Economics. Nr. 88, p. 33-51.
7. *Gu, X.* (2012) Determinants of China's Trade Balance. School of Business: James Cook University. Townswile campus. Australia.
8. *Janulyte, L.* (2011) Principals of public debt impact to economy. Contemporary Issues In Business, Management And Education'2011. p. 123-133.
9. *Kumhof M.,Laxion* D.(2013) Fiscal deficits and current account deficits. Journal Economic Dynamic and control.Valume 37, Issue 10.
10. *Karmelavicius, J., Klyviene, V.* (2012) Impact for Baltic macroeconomic indicators to changes in fiscal policy analysis. Pinigu studijos. Nr. 16(1), p. 30-48.
11. *Kregzde, A.* (2013) The safe ceiling of Lithuania budget deficit. Economics, Nr. 3 (92), p.74-88.
12. *Lerner, A.P.* (1948) "The Burden of the National Debt", in Income, Employment, and Public Policy: Essays in Honour of Alvin H. Hansen, ed. L.A. Metzler et al. New York: W.W. Norton.
13. Lithuania Republic Ministry of Finance (2013) Planning and confirmation of public budget. Link: http://www.finmin.lt/web/finmin/biudzplan
14. Lithuania Republic Ministry of Finance (2014) Debt of Lithuania Republic. Link: http://www.finmin.lt/web/finmin/leidiniai/skola.
15. Lithuania Republic Ministry of Finance (2014) Lithuania's debt program. Link: http://www.finmin.lt/web/finmin/2014_biudzetas/skola.
16. Lithuania Republic Ministry of Finance. Public budget deficit statistics. Link: http://www.finmin.lt/web/finmin//auktualus_duomenys/biudzeto_pajamos/valstybes_biudzetas.
17. Lithuania Republic Ministry of Finance (2014) Projections of Lithuania's economic indicators. Link: http://www.finmin.lt/web/finmin/aktualus_duomenys/makroekonomika.
18. Lithuania Republic Ministry of Finance (2014) 2015 public budget. Financial indicators. Link: http://www.finmin.lt/finmin.lt/failai/veiklos_kryptys_biudzetas/2015_biudzetas/2015_biudzeto_skaidres_LRS_20141021.pdf
19. Lithuania Department of Statistics. Public budget deficit and debt. Link: http://osp.stat.gov.lt/temines-lenteles41.
20. Lithuania Department of Statistics. GDP. Website address: http://osp.stat.gov.lt/web/guest/statistiniu-rodikliu-analize?portletFormName=visualization&hash=ecf34824-def2-4279-9e74-0810548042d4
21. Lithuania Department of Statistics. Inflation rate. Link: http://osp.stat.gov.lt/web/guest/statistiniu-rodikliu-analize?portletFormName=visualization&hash=3666008c-2b5b-48ab-825e-e8d7231ee04e
22. Lithuania Department of Statistics. Employment and unemployment rates in Lithuania. Link: http://osp.stat.gov.lt/temines-lenteles20
23. *Navickas, V., Stuopytė, Z.* (2000) Public debt and budget deficit impact to economy. Social studies, Nr. 5 (26), p. 34-40.
24. *Rakauskiene, O.G.* (2006) The public economic policy (fiscal, foreign trade and social policy): Monography. Vilnius. Mykolo Romerio universiteto press center. 215-317 p.
25. *Sang Ho, L.* (2007) Government deficit financing and stabilization. Journal of economic studies. Nr. 15 p. 34-44.
26. *Sineviciens, L., Vasiliauskaite, A.* (2010) Features of the cyclical fiscal policies in the context of economic development. Ekonomika ir vadyba. Nr. 15, p. 1024-1030.
27. *Snieska, V., Baumiliene, V. and others* (2005) Macroeconomics. Kaunas. Technologija 195-200 p.

Надійшла до редколегії 07.10.15

Ф. Ясевічєне, д-р екон. наук,
Е. Рудзіоніте, канд. екон. наук
Вільнюський університет, Вільнюс, Литва

АНАЛІЗ БЮДЖЕТНОГО ДЕФІЦИТУ І ЙОГО ПРОБЛЕМНІСТЬ У ЛИТВІ

Дефіцит бюджету є однією з найбільш важливих частин макроекономіки. Починаючи з 1990 року, уряд Литовської Республіки зіткнувся з проблемами балансування дефіциту бюджету; більшість років, у бюджеті країни був дефіцит з відсутністю вхідного грошового потоку. Значення дефіциту бюджету в Литві було великим з 2004 року, коли Литва стала частиною Європейського Союзу, і одним із зобов'язань було застрахування заміни літів на євро валюту та бюджетного дефіциту, сстало одним з Маастрихтских критеріїв. І це дуже важливо для підтримки ефективного управління державними фінансами. Уряд несе відповідальність за управління бюджетом країни відносно різних економічних показників, наприклад, ВВП, інфляція, безробіття і т.д., для того, щоб планувати рівень доходів і поширювати його на відповідних економічних районах. Крім того, у статті розглянуто проблеми бюджетного дефіциту.

Ключові слова: дефіцит бюджету, макроекономічні параметри, бюджет, критерії конвергенції.

Ф. Ясевичене, д-р экон. наук,
Э. Рудзионите, канд. экон. наук
Вильнюский университет, Вильнюс, Литва

АНАЛИЗ БЮДЖЕТНОГО ДЕФИЦИТА И ЕГО ПРОБЛЕМНОСТЬ В ЛИТВЕ

Дефицит бюджета является одной из наиболее важных частей макроэкономики. Начиная с 1990 года, правительство Литовской Республики столкнулся с проблемами балансировки дефицита бюджета; большинство лет, в бюджете страны был дефицит с отсутствием денежного потока. Значение дефицита бюджета в Литве было большим с 2004 года, когда Литва стала частью Европейского Союза, и одним из обязательств было по страхованию замены лита на евро валюту и бюджетного дефицита, стало одним из Маастрихтских критериев. И это очень важно для поддержания эффективного управления государственными финансами. Прави-

тельство несет ответственность за управление бюджетом страны в отношении различных экономических показателей, например, ВВП, инфляция, безработица и т.д., для того, чтобы планировать уровень доходов и распространять его на соответствующих экономических районах. Кроме того, в статье рассмотрены проблемы бюджетного дефицита.

Ключевые слова: дефицит бюджета, макроэкономические параметры, бюджет, критерии конвергенции.

Bulletin of Taras Shevchenko National University of Kyiv. Economics, 2015; 9 (174): 51-56
JEL Q26, Q27, Q56
УДК 330.15
DOI: http://dx.doi.org/10.17721/1728-2667.2015/174-9/8

V. Nicula, PhD in Economics, Associate Professor,
S. Spânu, PhD in Economics
"Lucian Blaga" University of Sibiu, Sibiu, Romania

RURAL TOURISM AND AGRITOURISM – FORMS OF SUSTAINABLE DEVELOPMENT IN MĂRGINIMEA SIBIULUI

The delightful geographical framework, the purity of nature, the accessibility of places, the richness and diversity of cultural heritage, make Mărginimea Sibiului an area with great tourism potential. The area holds more than 30% of the total accommodation capacity available in Sibiu. Although it is a rural area, tourist offer is diverse (active tourism and recreation, traditional cuisine, cultural tourism and business segment coverage through specific facilities, all these in addition to the multitude of leisure), and the degree of comfort is increased. In Mărginimea Sibiului, agritourism and rural tourism creates opportunities for local and regional economic growth and help create new jobs through harnessing the specific cultural and natural heritage. Also, an important part of the new jobs created represents an opportunity for regional female employment. Hence the need to implement many projects, which bring to the forefront the stabilization of the active population in rural areas, the capitalization of natural and anthropic tourism potential in the context of eco-economy, and thus raising living standards.

Keywords: sustainability, rural tourism, agritourism, development.

Introduction

Tourism is one of the industries that should be involved in sustainable development as a resource industry dependent on nature endowment and cultural heritage of each society; tourism sells these resources as part of its product and at the same time, shares some resources with other users, including the local population.

It is in the interest of tourism to be active on the issue of sustainable development and to work in cooperation with other industries in ensuring the quality of the resource base and its survival.

The tourism industry is seen by its specificity, as related to the environment, but its size and presence have created negative physical and social impacts on the environment.

As hundreds of millions of travellers crossing borders each year, the temptation to obtain high income generated by receiving visits, may lead to development decisions, thus resulting a decrease of green, natural elements. However the number of green tourism campaign is growing, causing only some green attitude, but in the end, all have an impact on the brand and credibility sector (Stănciulescu Gabriela Cecilia, State Olimpia, 2012).

In Romania, organized tourism in natural areas is suffering from many viewpoints. The low quality of tourist services is the first negative aspect worth mentioning. Secondly, the national legislation is deficient in this area of natural and anthropogenic environmental protection. A third negative aspect is the practice called "Greenwashing". This refers to companies that call themselves as "sustainable", "green", "responsible", "eco-touristic", but in fact they do not meet generally accepted standards, or even are in contradiction with these concepts (Hornoiu, R., Nistoreanu, P., Tănase, M. O , 2009).

The sustainability of rural tourism and agritourism

Tourism, by nature, is one of the main users of the environment and hence an important contributor to its damage. Enhancing tourism trips generated, as expected, the increased of the negative environmental impact and on the long term, a reduction in tourism development opportunities. Rodica Minciu and collaborators argue that, in this context, there is the increasingly acute problem of finding and promoting those forms of travel with low environmental impact, including ecotourism, rural tourism, tourism in protected areas, cultural tourism, adventure tourism etc., while encouraging, stimulating potential tourists to consume these types of products / holidays (Minciu Rodica, Pădurean Mihaela, Popescu Delia, Hornoiu R., 2012).

Studies conducted worldwide have shown an understanding and an increasing receptivity of tourists towards sustainable forms of travel, but their owned place in the structure of tourist traffic is modest, mainly argued on the insufficient offer, determined on its turn by a misunderstanding of the demand and the additional requirements which the consumers of such holidays must respond, especially regarding their behavior.

Also, promoting its sustainable forms such as ecotourism, rural tourism and agro-tourism, adventure tourism, cultural tourism and, not least, tourism in protected areas as well as encouraging tourists in their practice are able to provide an attenuation of negative environmental consequences (Hornoiu R., 2009).

At the same time, many countries are making significant efforts to develop and operationalize a number of certification systems designed to confirm that a tourist company has improved its performance, in terms of a number of indicators including: health and safety, conservation and biodiversity, environment, product management, quality, etc.

By focusing on quality tourism certification schemes, health, hygiene, safety and the three dimensions of sustainable development (environmental, socio-cultural and economic) the aimed was to increase tourist satisfaction. According to the World Tourism Organization assessments, in the world there are currently more than 80 certification programs for sustainable tourism and ecotourism in which skills are found aspects of tourism impact on the economic, socio-cultural and ambient environmental. Most programs assess accommodation, only a few are certifying sectors and other aspects of the tourism industry (Hornoiu, R., Nistoreanu, P., Tănase, M. O., 2009).

Rural tourism and agritourism in Mărginimea Sibiului

Sibiu and its surroundings are one of the most visited areas in Romania. Mărginimea Sibiului has become during the last years a famous tourist attraction, visited by thousands of foreign and Romanian tourists, an established brand. Most of the villages in the area have retained strong spiritual and folk traditions, giving these communities a