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LITHUANIAN ECONOMY IN 2011-2020: FORECAST OF MAIN MACROECONOMIC PARAMETERS AS A TOOL TO CONSIDER SUSTAINABLE DEVELOPMENT OF HEALTH FINANCING

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Abstract: The forecast of the Lithuanian economy is developed according to the national trends apparent in 2000-2010 as well as by applying the theory of convergence in the EU region. The main parameters of scrutiny are GDP, inflation, employment/unemployment, budget revenues and expenditures, public debt, public health financing. Interdependence of parameters of the forecast is tuned by using Philips curve, Ocun's law, model of political cycle. Lithuania joining the Euro in 2015 has been used as a fixed element of the model. Uncertainty of the future has been reflected by developing pessimistic, optimistic and most likely (basic) scenarios. Midterm trends of development (not the business cycle) are the main objective of the study. The paper presents the results of the study commissioned by the Lithuanian Statutory Health Insurance Fund in 2011 (Černiauskas *et al.*, 2012).

Jel classification: E0, I10, I11.
Key words: Lithuanian economy, economic forecast for 2011-2020, convergence theory, public health financing
Reikšminiai žodžiai: Lietuvos ekonomika, ekonomikos prognozavimas 2011- 2020 metų laikotarpiui, konvergencijos teorija, sveikatos finansai.

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1. Introduction

During the first decade of the 21st century Lithuania has experienced a boom in 2002-2007, a bust in 2008-2009 and a relatively robust recovery of 2010-2011. The recent history of the country indicates a probability to have the next decade with certain ups and downs that are difficult to predict and quantify. On the other hand, economic theory has developed plenty of tools to foresee the main development trends. The midterm forecast of the Lithuanian economy developed by the authors for 2000-2010 (Černiauskas, 2010) indicates certain opportunities for modelling the future.

The model for the forecast is based on the assumptions that there will be no drastic changes in the global, European and Lithuanian economies. Convergence of the Lithuanian economy with those of the other EU peers as well as globalisation of economy will continue. It is likely that the Lithuanian economy will have to endorse stricter budget rules, confront the problem of aging by increasing retirement age. The most likely scenario predicts that annual growth of GDP will be around 5% in 2011-2015 and 4% in 2016 -2020 and public health financing will grow somewhat faster than GDP.

Uncertainty for the future has been reflected by developing pessimistic, most likely (basic) and optimistic scenarios. The pessimistic one is based on an assumption that neither the EU nor Lithuania will manage to solve problems apparent in 2010-2011. Economic growth will be suppressed by imbalances of public finances, slow technological progress, low competitiveness of the European industries, and high unemployment. According to the pessimistic scenario, the development of the Lithuanian economy will be similar to the growth of Portugal and Hungary in 2000-2010. Under these assumptions, it is predicted that the annual growth of GDP will be around 2% in 2011-2015 and 1.5% in 2016-2020. Higher figures of 2011-2015 do reflect opportunities of economy in the process of reaching the potential output after the recession of 2008-2009.

The optimistic scenario is based on very strong internal growth on the basis of large investment projects like Ignalina Nuclear Power Plant, recovery of private consumption and external demand supported by robust recovery of the EU's economy, strong growth of Russia and other Eastern economies. Under these assumptions, it is predicted that the annual growth of GDP will be around 6.5% in 2011-2015 and 5% in 2016-2020.

The slowdown of economic growth in the second half of the forecasted period in basic and optimistic scenarios is reflecting the convergence theory (catching with more advanced peers makes it difficult to promote technological progress).

The forecast of the labour market is based on an assumption that its parameters are strongly correlated with those of growth (unemployment will remain on high level if economy stagnates and will go down in case of medium or strong growth). The interaction between inflation and growth is less clear cut with certain arguments (e.g. based on the Philips curve) in favour of positive correlation between growth rate and inflation.

Revenues and expenditures of social health insurance are predicted according to the macroeconomic and demographic development.

2. The Forecast of GDP. National experience

History of economic development in the region around Lithuania is reflected in Figure 1. Lithuania and neighbouring sates had a recession in 1990-1995 and growth by 1997, halted by the bust of the global economic recession of 2008-2009.

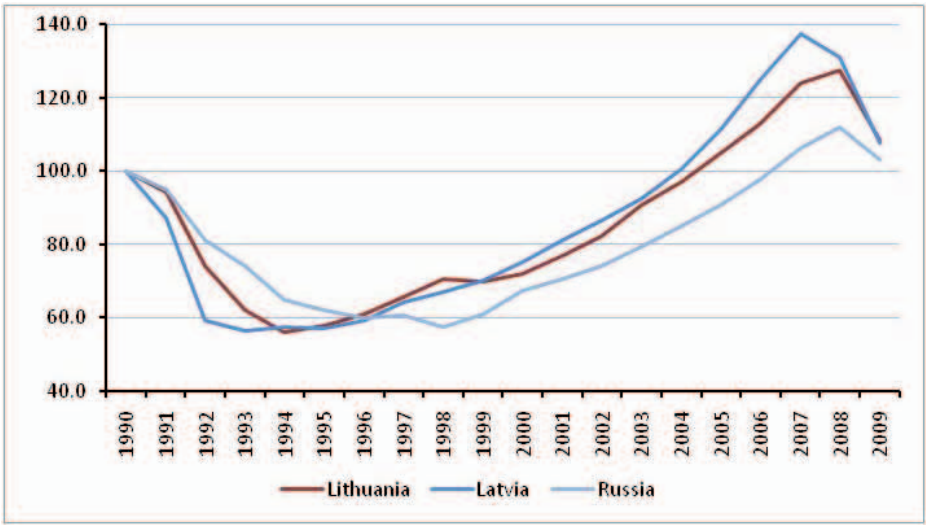

Fig. 1: Real gross domestic product (index, 1990 = 100) *Source: World Bank database (10 June 2011)*

The regional experience of 1990-2000 created opportunities for midterm forecasting. In 2000 a forecast of the Lithuanian economy for 2000-2010 was developed by the Lithuanian consultancy firm Health Economic Centre. The GDP figures of that forecast developed according to 3 scenarios are compared with the actual statistical data in Figure 2.

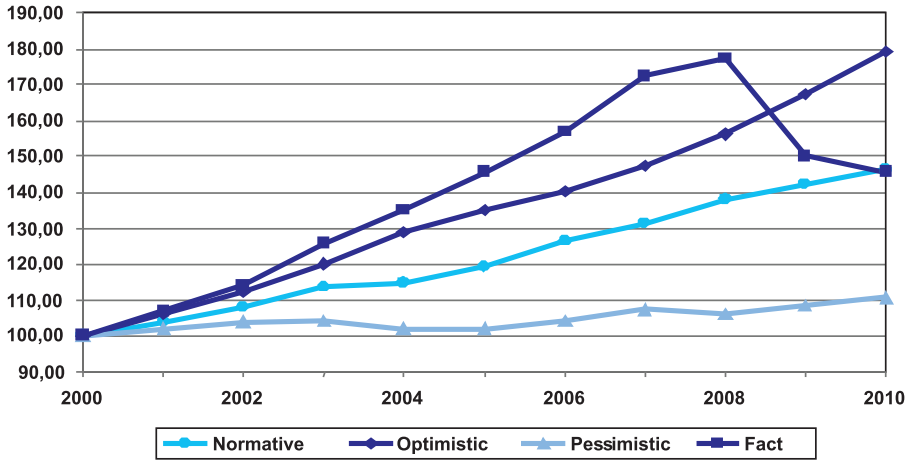

Fig. 2. Match between the GDP predicted by the forecast (pessimistic, optimistic and basic scenarios) and actual data. Source: Černiauskas et al, 2010 p. 253, Statistics Lithuania, 2011

The comparison of prognostic and actual figures shows that, on one hand, the basic scenario by predicting the data for 2010 very closely matches the actual figures, but, on the other hand, as the boom of 2004-2007 delivered GDP exceeding even the optimistic forecast, there are opportunities for improving the forecasting model. Accuracy of the forecast may be partially reassessed taking in to account the fact that recent studies do provide certain evidence that economic growth in 2004-2007 was overestimated and in 2009 – underestimated by official statistics (Černiauskas, Dobravolskas, 2011).

Even if additional studies to clarify historical development as well as efforts to tune modelling of the future are probably needed, the experience of the previous decade shows that the midterm forecasting does provide a certain level of accuracy in understanding the future.

Forecast of GDP for 2011-2020

Modelling of the future was performed in two steps. The first step consisted in application of *convergence theory* of the EU (Aghio *et al.*, 2004; EC 2010). Annual statistical data of the eurozone countries and the Baltic States for the period of 2000-2010 were used to measure interdependency between the development of economy and the annual GDP growth. The GDP accounted according to purchasing power parity methodology was used to reflect economic development.

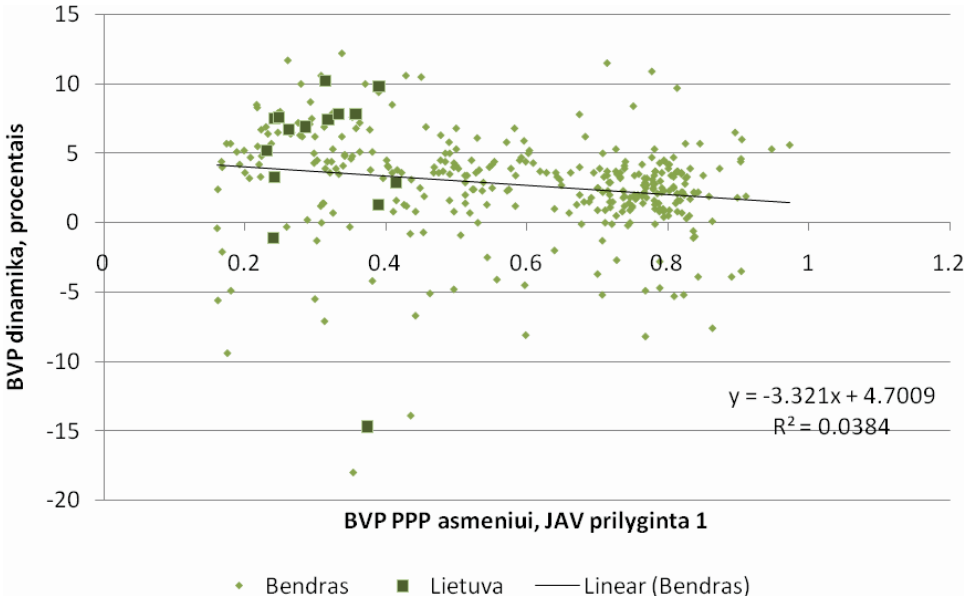

Fig. 3. Economic growth and convergence model, GDP per capita for the USA = 1 Source: Eurostat database, 2011

According to the convergence model, the Lithuanian economy will slowly catch up with that of more advanced countries. The approach provides an opportunity to use data forecasted for large economies for the modelling of Lithuania's future. The applica-

tion of this model regarding the period of 2010-2020 is reflected in Table 1.

Table 1. Annual growth of the Lithuanian GDP

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Annual growth of the Lithuanian GDP, %.	4.4	4.4	4.4	4.3	4.3	4.3	4.3	4.2	4.2	4.2

Source: IMF database, modelling results

As correlation between the development of economy and the annual GDP growth is very week, the model do provides signs into the future, but not a clear picture of economic reality. The second step has been used to capture economic *parameters not reflected by the convergence model*.

2011–2016. GDP is an aggregate of private consumption, investment, consumption of the government and external trade. It is assumed that in 2010 the Lithuanian economy has been performing below the potential created in 2004-2007 (Ohnsorge, Obiora, 2008). Catching with the potential will generate production and consequently relatively fast growth of private consumption in 2011-2015. Investment will recover from the depressed level of 2009-2010, thus contributing to robust economic growth in 2011-2016. As economy grows, the Government will increase its revenues and expenditures (even taking budget deficit reduction and moderating inflation in to account). Exports and imports will grow quite healthily. Cumulative effects of all elements of the demand (with private consumption and investments accelerating the growth and government spending as well as foreign trade being neutral) will lead to growth in 2011-2016 above the level predicted by the convergence model.

2017-2020. Most of the factors accelerating growth will run out in 2011-2016. Thus the second half of the decade will demonstrate growth below the level predicted by the convergence model.

Political cycle. Lithuania is heading for general elections in 2012 and 2016. It is assumed that internal policy is going to speed up economic growth during the election year and slightly depress growth during the first year of the new Government (Alesina, 1997).

Table 2 reflects final result of the modelling process.

Table 2. Basic forecast of GDP growth for Lithuania

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
GDP annual growth, %	6	5	4	4,8	5	5	3,6	4	3,6	4

Source. Černiauskas et al., 2012

The comparison of the basic, pessimistic and optimistic scenarios is presented in Figure 4.

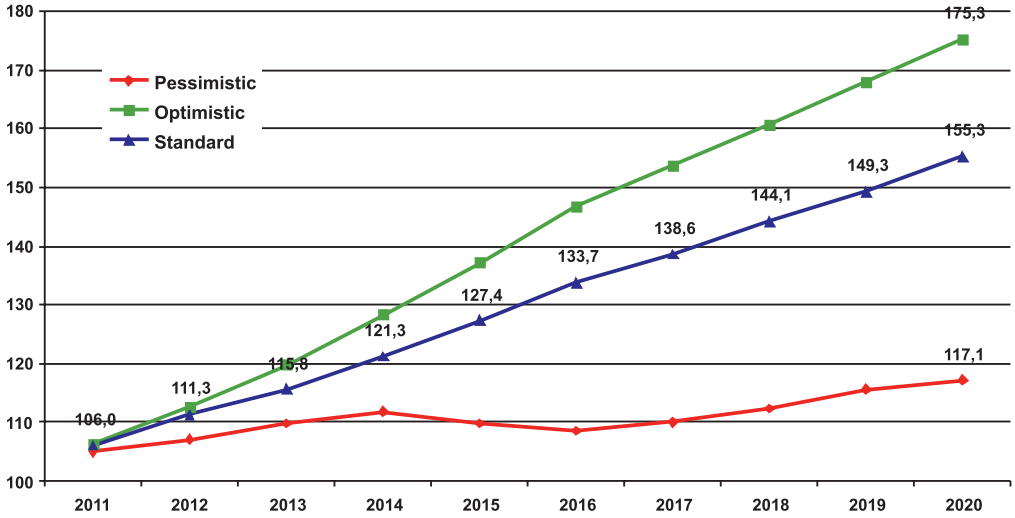

Fig. 4. GDP growth in Lithuania according to the basic (standard), pessimistic and optimistic scenarios. 2010 = 100. Source: Černiauskas *et al.*, 2012

3. The forecast of Inflation

The Lithuanian currency Litas pegged with the Euro and being replaced by the later in 2015 are the core assumptions of the model for optimistic and basic scenarios. Under this assumption, the monetary policy of the European Central Bank as well as inflation level maintained in Euro countries is of critical importance for national development. The implication of this assumption is that probability to have high inflation in Lithuania during 2011-2020 is relatively low. The main reason for the deviation of the Lithuanian figures from those of the current Euro region is actual difference in price levels. As integration of the EU countries continues, the price level of the "new" Member States is going to converge with that of the "old" ones, thus inflation in countries like Lithuania is "destined" to be above the EU average. Inflation in Lithuania will go down as the gap between price levels will narrow. For the basic forecast see Table 3.

It is assumed that in order to reach the Maastricht criterion and to introduce EURO in 2015 certain measures to keep inflation below the midterm trend are going to be undertaken by the Lithuanian Government and the Bank of Lithuania in 2014. History of recent enlargement of the eurozone shows that all the successful candidates (Estonia, Slovenia, Slovakia) had managed to perform according to the Maastricht criterion for 1-2 years and returned to the pattern of relatively high inflation immediately after the introduction of the Euro.

Table 2. Basic forecast of inflation for Lithuania

	2011	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**
Annual inflation, %	3.96	3.90	3.84	1.8	5.09	4.36	3.62	3.67	3.74	3.86

Source: Černiauskas et al., 2012

The basic scenario does not foresee strong cyclical changes, thus inflation is considered mainly the matter of monetary and structural policy.

The pessimistic scenario of economic growth reflects strong volatility in labour market. The assumption is that Philips curve has prognostic powers to reflect the impact of unemployment on inflation. Annual deflation of around 1% is foreseen in 2014-2016 under the assumption that high unemployment in combination with decrease in energy prices will be in place.

4. The forecast of the labour market

This section of the forecast is based on the results of the section on GDP growth, the demographic data reflected by the forecast of the Eurostat (Eurostat database, 2011), interdependence between economic growth and employment described by the Ocun's law (Knotek, 2007) and interdependence between the growth of labour productivity, unemployment and real wages (Blanchard, 2000; Samuelson, 2008). Insights into the future of the labour market are as follows.

Table 2. Basic forecast of the Lithuanian labour market

	2011	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**
Labour force, thousand	1632	1629	1626	1623	1620	1617	1613	1609	1605	1601
Unemployment rate, %	15.56	13.96	13.12	11.60	9.88	8.12	7.44	6.40	5.64	4.52
Annual growth of real wages, %	1.78	2.38	2.53	3.28	3.28	3.57	3.51	3.85	3.70	3.75

Source: Černiauskas et al., 2012

At the time that the paper is going to be published (spring 2012) the statistical figures are indicating no growth of real wages in 2011. The reason why authors decided not to reflect those statistical findings are twofold:

- The paper reflects the main results of the study undertaken in mid 2011
- The statistical figures for 2011 are preliminary and they are reflecting problems due to extensive use of non-recorded wages in Lithuania.

5. The forecast of the budget deficit, public debt

Having relatively low public debt (according to the Maastricht criterion), Lithuania has an opportunity to go different ways. 3 options of managing public finances have been under scrutiny in the framework of the forecast:

- The option foreseen by the IMF (IMF, 2011), considering continuous deficit of 4-5% to GDP. This pattern of development (taking the basic forecast for GDP in to account) may lead to the increase of debt to GDP ratio from 40% in 2010 to about 50-60% (depending on inflation rate) in 2020.
- The option based on the assumption that the perception of no-cyclical budget deficit will prevail in economic policy. Having no budget deficit from 2016 (taking the basic forecast for GDP into account) may lead to the decrease of debt to GDP ratio from 40% in 2010 to about 25-30% (depending on the inflation rate) in 2020.
- The option to have the surplus of the national budget from 2014 in order to have no public debt in 2030.

6. Macroeconomic data as a basis to forecast public health expenditures

Demographic change (mainly ageing of population) is traditionally considered as a driver of health care expenditures. On the other hand, statistical analysis of the 2000-2009 period shows that the demographic impact on public health care expenditure measured by expenditure of the Lithuanian Statutory Health Insurance Fund (SHIF)) is not strong, responsible for up to 7% of cumulative growth of SHIF per decade (Černiauskas *et al.*, 2010). The same study indicates that about 80% of health financing growth in Lithuania was caused by the increase of GDP. The similar pattern (GDP as the main contributor to the growth of health expenditures is common for the majority of the EU countries.

The wealthier the country, the higher its relative expenditure on its citizens' health. Health expenditure of the EU Member States is well defined by their wealth. Annual data of 2000-2008 for Euro zone countries and Estonia, Latvia, Lithuania have been used for the statistical analyses presented in Figure 5.

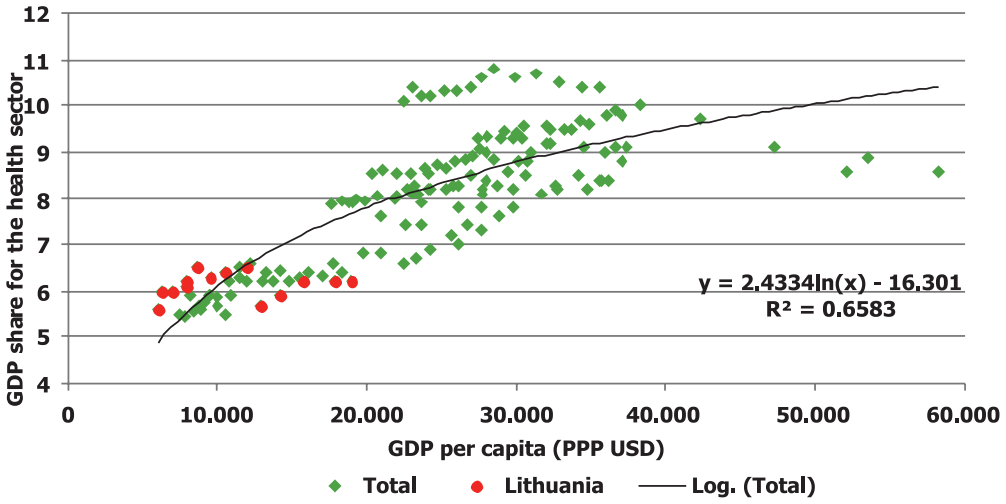

Fig. 5. ***Health expenditure as a share of GDP. Comparison of the European countries.*** *Source: WHO data base*

If Lithuania increases health funding within the next decade at a similar pace as most of the EU Member States, moderately exceeding GDP growth, GDP dynamics will be a key indicator of health system development in 2011-2020. .

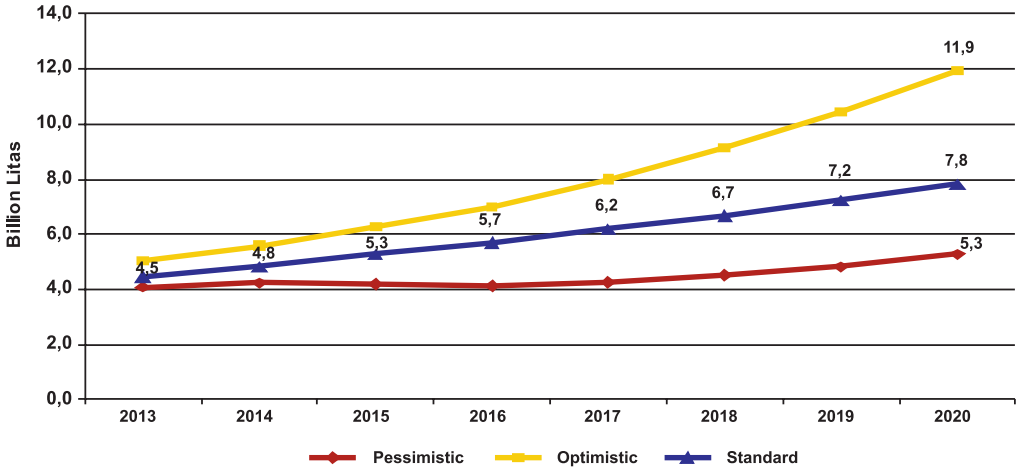

Fig. 6. ***SHIF revenue forecast.*** *Source:* Černiauskas *et al.*, 2012

The basic scenario of SHIF revenues is based on an assumption that GDP and inflation will grow according to basic scenarios of the macroeconomic forecast and the correlation between GDP and health financing presented in Table 5. The pessimistic forecast is based on pessimistic forecast of both GDP growth and inflation. The optimistic forecast is based on optimistic forecast of GDP growth and that of inflation exceeding figures of the basic scenario.

7. Conclusions

Forecasting of the economy is an inspiring exercise, even if recent history of the international economy indicates a probability to have the next decade with certain ups and downs that are difficult to predict and quantify.

The model for the forecast of Lithuanian up to 2020 is based on assumptions that there will be no drastic changes in global, European and Lithuanian economies. Uncertainty for the future has been reflected by developing pessimistic, optimistic and normative (most likely) scenarios.

According to the most likely scenario, the Lithuanian economy will develop as follows:

- As correlation between Lithuania and its Baltic and eurozone neighbours is very week, the application of *convergence theory* of the EU provides only insights into the future, but not a clear picture of the economic reality
- Cumulative effects of all elements of the demand (with private consumption and investments accelerating growth and Government spending as well as foreign trade being neutral) will lead to growth in 2011-2016 above the level predicted by the convergence model
- Most of the factors accelerating growth will run out until 2015. Thus, growth of economy will slow down in the second half of the decade
- As integration of the EU countries continues, the price level of the "new" Member States is going to converge with that of "old" ones, thus inflation in countries like Lithuania is "destined" to be above the EU average. "Outplaying" of the markets and introduction of the Euro is foreseen for the year 2015 according to the basic scenario
- Labour market (according to the basic scenario) is going to remain stable in terms of labour force figures with the positive impact of growth on unemployment rate and real wages
- With a relatively low public debt (according to the Maastricht criterion), Lithuania has an opportunity of certain freedom in its fiscal policy. The option based on the assumption that the perception of no-cyclical budget deficit will prevail in economic policy is considered as the most likely.
- GDP growth is considered as the main factor of real public health care expenditure dynamics in the mid-term future. Accounting for inflation is important for the forecasts of nominal public health care expenditures.

References

1. Aghio, Philippe *et al.* (2004) The Effect of Financial Development on Convergence: Theory and Evidence Retrieved on 23 October 2011 from http://www.degit.ifw-kiel.de/papers/degit_09/C009_021.pdf
2. Alberto Alesina, Nouriel Roubini and Gerald D. Cohen Political Cycles and the Macroeconomy, 1997, 314 p. ISBN-0-262-51094-4
3. Blanchard, Olivier (2000). Macroeconomics (Second ed.). Prentice Hall. ISBN 0-13-013306-X
4. Černiauskas, Gediminas et al. Finansų valdymo sistemos optimizavimas: studija: 2012 m. vasario 22 d. [electronic resource] / Vilnius : Sveikatos ekonomikos centras, 2012. 169 p. 100 p.
5. Černiauskas, Gediminas et al. Lietuvos sveikatos sektorius amžių sandūroje: [kolektyvinė monografija] / Lietuvos sveikatos mokslų universitetas, Mykolo Romerio universitetas. Vilnius : Sveikatos ekonomikos centras, 2010. 408 p.: iliustr, lent. ISBN 9789955562757.
6. Černiauskas, Gediminas; Dobravolskas, Algis. Emerging of market economy in Lithuania (1990-2010) // Intelektinė ekonomika: mokslo darbų žurnalas = Intellectual economics: Mykolo Romerio universitetas, Lietuvos mokslų akademija, Vroclavo universitetas. Vilnius: ISSN 1822-8011. 2011, t. 5, Nr. 3(11), p. 371–387.
7. Convergence Report 2010, European Economy 3/2010. 236 p. ISSN 0379-0991. European Commision
8. Égert, B. 2007. "Real Convergence, Price Level Convergence and Inflation Differentials in Europe" CESifo Working Paper No. 2127
9. European Bank of Reconstruction and Development (2010) Transition report 2010: Recovery and Reform
10. Eurostat Database http://epp.eurostat.ec.europa.eu/portal/page/portal/eurostat/
11. Eurostat database: Retrieved on 23 October 2011 from http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database
12. Knotek, Edward S. "How Useful Is Okun's Law." Economic Review, Federal Reserve Bank of Kansas City, Fourth Quarter 2007, pages 73–103
13. LR Finansų ministerija. 2012 m. balandį paskelbtos vidutinės trukmės ekonominių rodiklių projekcijos http://www.finmin.lt/web/finmin/aktualus_duomenys/makroekonomika
14. LR Finansų ministerija. 2011 m. kovą paskelbtos vidutinės trukmės ekonominių rodiklių projekcijos. http://www.finmin.lt/web/finmin/aktualus_duomenys/makroekonomika
15. Ohnsorge F., Obiora K. (2008) 'Republic of Lithuania: Selected Issues' IMF Country Report April
16. Samuelson, Paul, Foreword to "Understanding Inflation and the Implications for Monetary Policy: A Phillips Curve Retrospective", FRBB Conference Series 53, June 9–11, 2008, Chatham, Massachusetts
17. Statistics Lithuania. Databases: http://www.stat.gov.lt/en/
18. World Bank database: http://data.worldbank.org/
19. World Economic Outlook: Slowing Growth, Rising Risks September 2011, International Monetary Fund: http://www.imf.org/external/pubs/ft/weo/2011/02/index.htm

LIETUVOS EKONOMIKA 2011–2020: PAGRINDINIAI MAKROEKONOMINIAI PARAMETRAI KAIP PRIEMONĖ PROGNOZUOTI SVEIKATOS FINANSAVIMO DARNŲ VYSTYMĄSI

Gediminas ČERNIAUSKAS, Igoris PANOVAS

Santrauka. Lietuvos makroekonominė prognozė atlikta remiantis šalies ūkio vystymosi tendencijomis 2000–2010 metais ir ES valstybių konvergencijos teorija. Vertinta BVP, infliacijos, užimtumo / nedarbo, biudžeto pajamų ir išlaidų, valstybės skolos, visuomeninio sveikatos finansavimo dinamika. Vertintų rodiklių sąveika aptariama remintis Philips kreive, Ocun dėsniu, politinio ciklo modeliu. Lietuvos ekonomikos dinamikos modeliavimas yra grindžiamas prielaida, kad šalis 2015 metais taps euro zonos nare. Ateities neapibrėžtumą atspindi pesimistinis, optimistinis ir labiausiai tikėtinas scenarijai. Straipsnio, kuris parengtas 2011 metais Lietuvos Valstybinės ligonių kasos užsakymu atliktos studijos pagrindu, tikslas yra vidutinės trukmės tendencijų, o ne ekonomikos ciklo nagrinėjimas.

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