

ASSESSMENT OF THE GOVERNMENT DEBT POSITION IMPACT ON THE GENERAL TAXATION POLICY

Nadezhda Semjonova⁺, Mg.oec;

Riga Technical University

Abstract. During recent financial crisis number of researchers investigated mutual influence of government debt on the fiscal policy. The present paper contributes to this topic by observational analysis of the world economics, having the goal to evaluate correlation between the value of debt and tax policy indicators over the recession period. The paper analyses public data on 176 countries, extracted from the IMF and the World Bank databases. The findings demonstrate general absence of correlation between the volumes of the state debt and the amounts of the collected taxes both in short-term and long-term perspective. This implies that world countries tend to increase debt and use refinancing to pay debt service costs to keep taxes at the present level at all costs.

Key words: government debt, tax policy

JEL code: H63, H68

Introduction

Reicher (Reicher, 2014) indicated that literature on systematic fiscal policy and macroeconomic performance in industrialized countries is large but fragmented. The empirical literature points toward strong anticyclical policy, which consists of procyclical tax revenues, acyclical tax rates and government purchases, and countercyclical transfer payments. Consolidation in response to the debt has come primarily through adjustments to taxes and possibly purchases. Large governments usually are associated with reduced macroeconomic volatility. Meanwhile, the theoretical literature on anticyclical fiscal policy has turned from focusing mostly on government purchases and tax rates toward transfer payments, although quantitative link between theory and empiric data still is poor.

Díaz-Giménez, J., Giovannetti, G., Marimon, R., & Teles, P. (Díaz-Giménez et al., 2008) considered fiscal discipline as a precondition for price stability, mentioning such rationale behind the Growth and Stability Pact in Europe. The underlying policy debate shows the concern regarding a time inconsistency problem associated with high levels of nominal debt

⁺ Corresponding author. Tel.: + 371 67089015; fax: + 371 67089345.
E-mail address: nadezda.semjonova@rtu.lv

that could be monetized. This model describes the optimal sequential choice of monetary policy in economies with either nominal or indexed debt.

During recent financial crisis, researchers investigated some effects of government debt interaction with the fiscal policy. Klaus (Klaus, 2011) emphasised the fact that larger government debt gives rise to larger risks to the fiscal budget and to the tax rate. This, in turn, has important implications for optimal debt dynamics. In particular, it provides incentives to reduce government debt over time to reduce budget risk (provided the initial debt level is positive). As a result, debt dynamics deviates from random walk behaviour toward a second-order approximation to optimize policy. Typical analyses assume passive fiscal behaviour that couples higher government spending with an equivalent increase in lump-sum taxes to pay for the spending, and active monetary policy (see, for example, Gali et al., 2007; Monacelli and Perotti, 2008). Contrary to above approach, Davig & Leeper (Davig & Leeper, 2011) estimated Markov-switching policy rules for the United States and found that monetary and fiscal policies fluctuate between active and passive behaviour. Some authors are creating data sets for deeper analysis in the Eurozone area. For instance, the policy modelling, displayed in Paredes J et al. (Paredes et al., 2014), analyses fiscal and monetary consequences and points out that the most recent crisis had the largest negative impact on total government revenues. Indeed, in a historical period, which covers a number of economic downturns in the 1980s, in the mid-1990s, in the 2000s and the most recent crisis, only the latest, also called by researchers Great Recession, caused total government revenues of Euro zone countries to enter into negative territory in nominal terms. Kirsanova, T. and Wren-Lewis, S. (Kirsanova et al., 2012) analysed the impact of different degrees of fiscal feedback on debt when monetary policy is determined optimally, rather than following a simple rule. Recent studies indicate that fiscal and monetary policy regimes are not fixed over time and hence fiscal and monetary rules equations should be estimated within a stochastic framework (Cevik et al., 2014; Favero and Monacelli, 2005; Takero et al., 2012; Dewatcher and Toffano, 2011; Ito et al., 2011). For Latvian realities, tax policy is considered separately from debt policy problems. For example, S.Stucere and G.Mazure (Stucere and Mazure, 2013) analyzed tax policy as fundamental instrument for investment promotion affecting the economic competitiveness. This research was aimed on the analysis of basic socio-economic development indicators and the application of immovable property tax. Some aspects of budget policy and state debt were analysed by E.Zubule (Zubule, 2012) and S.Eglite (Eglite, 2006). N. Semjonova (Semjonova, 2012) explored the correlations between public debt and average debt interest rate, taxation rate and long-term growth (evaluated as GDP in 2011 in comparison to 2003).

The aim of the present research is to evaluate correlation between the value of debt and tax policy indicators over the recession period. The corresponding tasks are to analyse correlation between accumulation of the government debt, changes in the average tax rate and debt service costs both in short-term and long-term perspective.

Data and methodology

The object of the research is the world countries economies. The research used public data on 176 world countries from the IMF and the World Bank databases (World Economic Outlook Databases, 2013, World Bank Open Data, 2013). Selection of these 176 countries was made owing data availability: countries with no data were censored out. The analysis covered period from 2003 to 2011.

The paper analyses the following indicators that characterize current economic situation and allow evaluate long-term growth tendencies:

- D/Y - government debt to GDP ratio in 2003 and 2011;
- T - collected taxes to GDP ratio in 2003 and 2011;
- b - debt service costs share of the collected taxes in 2003 and 2011;
- ΔT – long-term changes of the collected taxes, calculated as difference between T_{2011} and T_{2003} ;
- $\Delta D/Y$ - long-term changes of the government debt to GDP ratio, calculated as difference between D/Y_{2011} and D/Y_{2003} .

While analysing taxes, one did not take into account the social insurance payments.

All 176 countries were broken down into six regions and two categories. Grouping by regions was based on geographic and cultural closeness: Western Europe; Eastern Europe and Central Asia (former CIS countries); South and East Asia and Pacific; Middle East and North Africa; Sub-Saharan Africa; Latin America and Caribbean. The greatest world economies (USA, Canada, Germany, France, Italy, UK, Spain, Japan and Korea) formed the G9 category. The last category included the most significant players on the international debt market, whose debts are indicated by the "Debt Clock" service: G9 plus Argentina, Australia, Brazil, China, Greece, India, Ireland, Mexico, Portugal, Russia, Saudi Arabia (World Debt Clock, 2014).

The correlations between the value of state debt and other indicators were evaluated by means of Pearson correlation coefficient. The statistical significance of the correlation coefficient was tested using Student's criterion with the level of significance $\alpha = 0.05$. Although scatter diagrams were analysed as well, this paper presents only some most interesting examples.

Research results and discussion

The topic of the present research is the relationship between the state debt policy and the tax policy. The main question is whether the states increase their debts to reduce tax burden and minimize distortional effect of taxes on economy. The USA is a typical example of such behaviour (Martin, 2009).

Table 1 summarizes data on correlation between the volumes of the state debt and collected taxes, broken down by world regions. The existence of negative correlation could

indicate, that, indeed, “low tax countries” tend to borrow more, and thus, have higher level of the state debt.

Table 1

Correlation coefficients between collected taxes and the value of the government debt ($T - D/Y$)

Group of countries	Correlation with debt in 2003	Correlation with debt in 2011
G9	-0.23 (P=0.56)	-0.19 (P=0.62)
“Debt Clock” countries	-0.26 (P=0.31)	0.06 (P=0.83)
South and East Asia and Pacific	-0.46 (P=0.05)	-0.29 (P=0.26)
Western Europe	0.23 (P=0.19)	0.18 (P=0.31)
Eastern Europe and Central Asia	-0.43 (P=0.29)	0.02 (P=0.95)
Latin America and Caribbean	0.30 (P=0.20)	0.50 (P=0.03)
Middle East and North Africa	0.65 (P=0.04)	0.15 (P=0.68)
Sub – Saharan Africa	-0.31 (P=0.23)	0.51 (P=0.04)
Seychelles and Lesotho excluded	-0.75 (P=0.00*)	0.05 (P=0.85)
Whole world	-0.05 (P =0.72)	0.13 (P =0.17)

Source: author's calculations based on the World Bank data

*P is < 0.005

Analysis of Table 1 data demonstrates that for the whole world there is no correlation between volume of the state debt and collected taxes: the correlation coefficient is close to zero and corresponding P-value is high. Graphic evaluation by the scattering diagram (Figure 1) leads to the same conclusion.

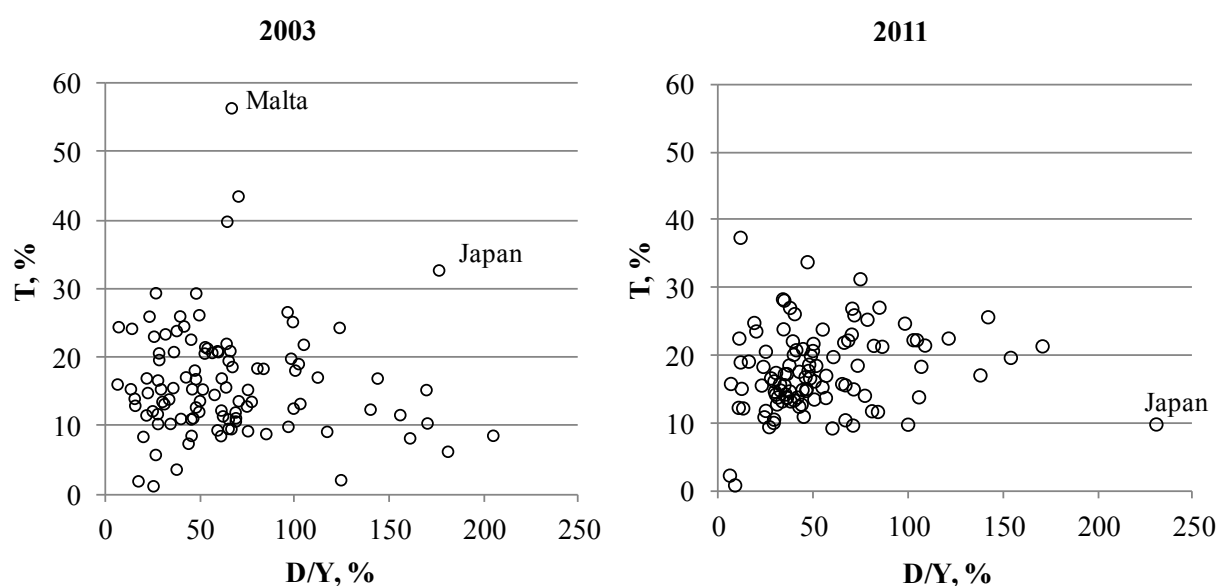


Fig.1. Correlation between collected taxes and government debt, world data

Nevertheless, while analysing situation by regions, one have observed statistically significant correlation between the debt and taxes in some regions. First example is Sub – Saharan Africa region, where, after exclusion of the two obvious outliers, Seychelles and Lesotho, strong negative correlation exists for the year 2003 data (Figure 2). It is remarkable that the correlation disappears in 2011. This could be linked to the debt relief initiative, from

which many Sub – Saharan Africa countries benefited between 2003 and 2011 (Debt Relief..., 2013).

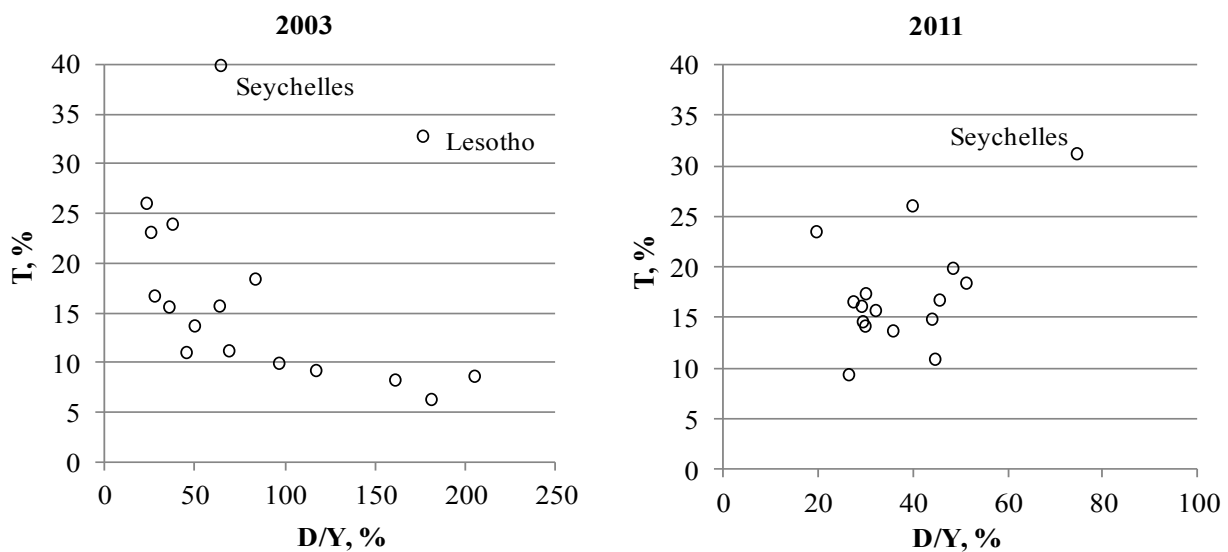


Fig.2. Correlation between collected taxes and government debt for Sub-Saharan Africa region

Moderate negative correlation existed in 2003 in the South and East Asia and Pacific region, although there was no correlation in 2011.

Moderate positive correlation appeared in 2003 in the Middle East and North Africa region and in 2011 in the Latin America and Caribbean region, the scatter diagrams for the latter are presented in Figure 3. Such a positive correlation could indicate the attempts of these region countries to keep up with the debt by they own.

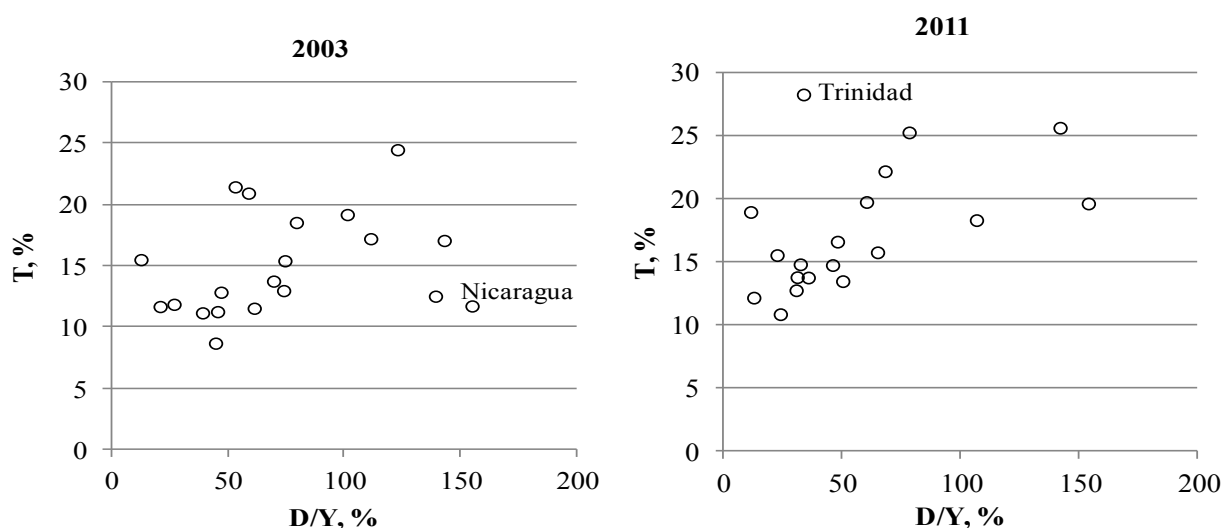


Fig.3. Correlation between collected taxes and government debt for Latin America and Caribbean region

With the increment of the government debt, the debt service costs increases, too. Thus, the share of the collected taxes to be spent on debt service has to increase. Generally, this is true for the world economics, which demonstrated significant positive correlation between taxes share, spent to the debt service and debt itself (Table 2).

Table 2

Correlation coefficients between debt service costs share from the collected taxes and the value of the government debt ($b-D/Y$)

Group of countries	Correlation with debt in 2003	Correlation with debt in 2011
G9	0.68 ($P=0.05$)	0.84 ($P=0.01$)
"Debt Clock" countries	0.56 ($P=0.01$)	0.45 ($P=0.07$)
Brasilia and India excluded		0.90 ($P=0.00$)
South and East Asia and Pacific	0.31 ($P=0.23$)	0.23 ($P=0.37$)
Japan and Singapore excluded	0.68 ($P=0.01$)	0.56 ($P=0.03$)
Western Europe	0.76 ($P=0.00^*$)	0.77 ($P=0.00^*$)
Eastern Europe and Central Asia	0.80 ($P=0.02$)	0.78 ($P=0.01$)
Latin America and Caribbean	0.58 ($P=0.01$)	0.69 ($P=0.00^*$)
Middle East and North Africa	0.87 ($P=0.00^*$)	0.91 ($P=0.00^*$)
Sub – Saharan Africa	0.21 ($P=0.41$)	0.51 ($P=0.04$)
Whole world	0.51 ($P=0.00^*$)	0.54 ($P=0.00^*$)

Source: author's calculations based on the World Bank data

* P is < 0.005

Nevertheless, this correlation appeared non-significant in some regions. Detailed analysis demonstrated that such result is due to influence of some individual countries. For example in the "Debt Clock" group (Figure 4), Brasilia and India have relatively small debt (about 66%) but spend nearly 24% of the collected taxes for the debt service. Such a high expenditures could appear due to low credit reputation of these countries.

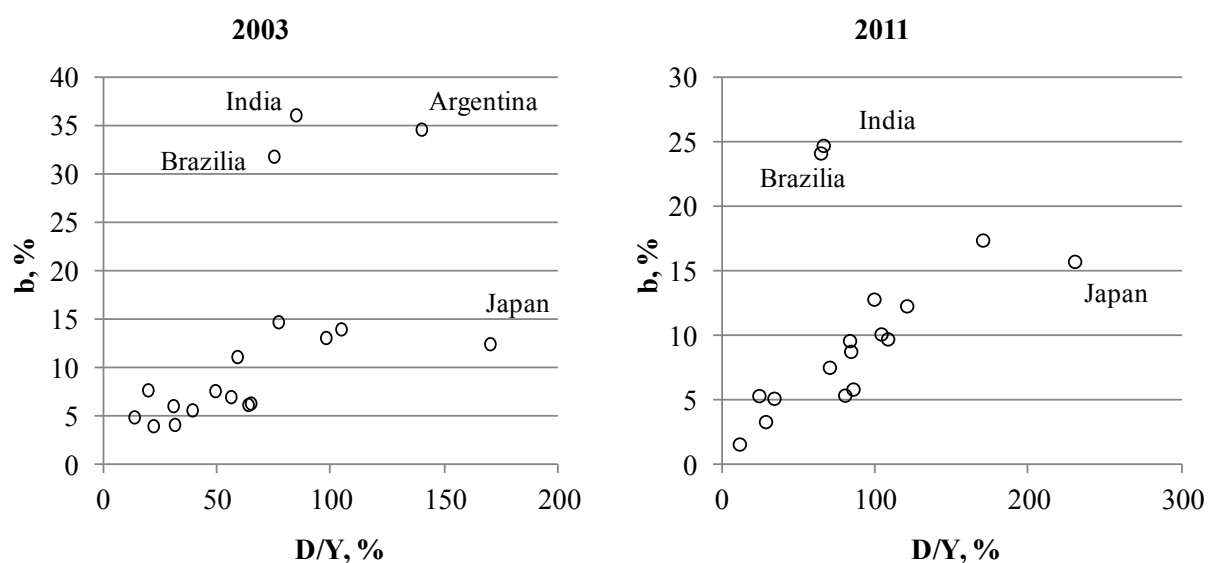


Fig.3. Correlation between debt service costs (in % from the collected taxes) and government debt for the "Debt Clock" countries

In turn, Japan and Singapore (in South and East Asia and Pacific region) have debt of 230% and 105% of GDP, correspondingly, but spend only 16% and 0.01% from the collected taxes to pay debt service.

In both considered cases, exclusion of the “outlying” countries from consideration bring correlation coefficient between the share of the taxes that is spent on the debt service, and the debt itself back to the significance.

Non-significant correlation in Sub-Saharan Africa in 2003 may indicate absence of the sustainable debt policy in the region that finally led to the necessity to implement debt relief initiative.

Another important question is whether the state increases the taxes to cope with the increased debt corresponding service costs. Table 3 shows correlation between long-term changes in the average tax rate and long-term change of the state debt over the period from 2003 to 2011.

Table 3

Correlation coefficients between long-term changes in the average tax rate and the value of the government debt ($\Delta D/Y - \Delta T$)

Group of countries	Correlation with debt	
G9	0.44	($P=0.24$)
“Debt Clock” countries	-0.28	($P=0.28$)
South and East Asia and Pacific	-0.11	($P=0.68$)
Western Europe	0.10	($P=0.60$)
Eastern Europe and Central Asia	0.17	($P=0.71$)
Latin America and Caribbean	-0.19	($P=0.48$)
Middle East and North Africa	0.22	($P=0.61$)
Sub – Saharan Africa	-0.22	($P=0.50$)
Whole world	-0.16	($P=0.13$)

Source: author’s calculations based on the World Bank data

The absence of correlation for the whole world and each group/region clearly demonstrates that countries do not increase taxes in response to the increment of the state debt. Instead, they could use other means, such as debt restructuring or re-financing.

Conclusions

1. There is no correlation between the state debt and the amounts of the collected taxes in the whole world and in the major part of the world regions. Besides, in Latin America and Caribbean region in 2011 countries with higher debt had higher level of taxes.
2. There is a significant moderate positive correlation in the world between the part of the collected taxes, that states spend on debt service. Absence of such correlation for some regions is due to influence of few countries that could be treated as exceptions.

3. There is no correlation between long-term changes of the state debt and corresponding long-term changes in the average tax rate both in the whole world and in the each considered region.
4. Observed behaviour implies that the world countries tend to increase debt and use refinancing or re-borrowing to pay debt service costs to keep taxes at the present level, possibly to prevent social tension.

Bibliography

1. Cevik, Emrah I., Dibooglu, S., Kutan, Ali M. (2014) Monetary and Fiscal Policy Interactions: Evidence from Emerging European Economies, *Journal of Comparative Economics*, Volume 42, pp. 1079-1091.
2. Davig, T., Leeper, Eric M., (2011), Monetary–Fiscal Policy Interactions and Fiscal Stimulus *European Economic Review*, Volume 55, Issue 2, pp. 211-227.
3. Debt Relief under the Heavily Indebted Poor Countries (HIPC) Initiative. *IMF Factsheet*. Retrieved: <http://www.imf.org/>. Access: 10.09.2013
4. Dewatcher, H., Toffano, P., (2011) Fiscal Activism and the Cost of Debt Financing *International Journal of Finance & Economics*, Volume 17, pp. 14–22.
5. Díaz-Giménez, J., Giovannetti, G., Marimon, R., & Teles, P. (2008). Nominal Debt as a Burden on Monetary Policy. *Review of Economic Dynamics*, Volume 11(3), pp. 493-514.
6. Favero, Carlo A., Monacelli, T. (2005) Fiscal Policy Rules and Regime (In) Stability: Evidence from the U.S., Working Paper No. 282, IGIER (Innocenzo Gasparini Institute for Economic Research), Bocconi University. <http://EconPapers.repec.org/RePEc:igi:igierp:282/> Access: 10.11.2014
7. Gali, J., Lopez-Salido, J.D., Valles J. (2007) Understanding the Effects of Government Spending on Consumption, *Journal of the European Economic Association*, Volume 5 (1), pp. 227–270.
8. Ito, A., Wanatabe, T., Yabu, T. Fiscal Policy Switching in Japan, the US, and the UK *Journal of the Japanese and International Economies*, Volume 25 (2011), pp. 380–413
9. Kirsanova, T. and Wren-Lewis, S. (2012), Optimal Fiscal Feedback on Debt in an Economy with Nominal Rigidities. *The Economic Journal*, Volume 122, pp. 238–264.
10. Klaus, A. (2011) Government Debt and Optimal Monetary and Fiscal Policy, *European Economic Review*, Volume 55, pp. 57-74.
11. Martin, F. M. (2009) A Positive Theory of Government Debt. *Review of Economic Dynamics*. *Journal of Monetary Economics*, Vol. 12, pp. 608-631.
12. Monacelli, T., Perotti, R. (2008). Fiscal policy, wealth effects, and markups. NBER Working Paper No. 14584. <http://www.nber.org/papers/w14584/> Access: 05.11.2014
13. Paredes, J., Pedregal, Diego J., Pérez, Javier J. (2014) Fiscal Policy Analysis in the Euro Area: Expanding the Toolkit *Journal of Policy Modelling*, Volume 36, Issue 5, pp. 800-823,
14. Reicher, C. (2014). Systematic Fiscal Policy and Macroeconomic Performance: A Critical Overview of the Literature. *Economics: The Open-Access*, Volume 8, pp.1-37.
15. Stucere S., Mazure G. (2013) Application of Immovable Property Tax in the Regions of Latvia. *Economic Science for Rural Development' 2013*. Vol. 30, pp.182-189.
16. Takero, D., Takeo, H., Tatsuyoshi, O., 2012. Japanese Government Debt and Sustainability of Fiscal Policy, NBER Working Paper Series. <http://www.nber.org/papers/w17305/> . Access: 02.01.2014
17. World Bank Open Data. Retrieved: <http://data.worldbank.org/>. Access: 05.11.2013

18. World Debt Clock. Retrieved: <http://www.usdebtclock.org/world-debt-clock.html>. Access: 02.01.2014
19. World Economic Outlook Databases. Retrieved: <http://www.imf.org/>. Access: 05.11.2013
20. Eglite, S. (2006). Fiskalas un monetaras politikas piemerosana Latvijas ekonomikas attistiba. Promocijas darba kopsavilkums, Riga. Latvijas Universitate. (Application of Fiscal and Monetary Policies during Development of Latvian Economy. Thesis)
21. Semjonova, N. (2012). Valsts parada ietekme uz noteiktiem ekonomiskiem raditajiem ES valstis. Economics & Business, Volume 25, pp. 68-73 (Government Debt Influence on Some Economic Indicators in EU countries)
22. Zubule, E. (2012). Valsts budzeta procesa analize un pilnveidosana. Promocijas darba kopsavilkums, Rīga. Latvijas Universitāte. (State Budget Process Analysis and Improvement. Thesis)