Efficiency Evaluation of the Implementation of Russia's Fiscal Policy in the Period of 1990-2013

Barkhatov V.I., Professor, Doctor of Economics, Chelyabinsk State University
Belova I.A., Researcher, Chelyabinsk State University

1. Abstract

The modern economy of Russia is characterised by some transformation processes. It is under these conditions that the problem of the efficiency of Russian national economy is becoming urgent. One of the major factors of the efficiency of the national economy is the effectiveness of the on-going fiscal policy. Currently, the problem of the implementation of an effective fiscal policy remains to be debatable in economical publications. In this context, there is no universally received methodology of evaluating the efficiency of a fiscal policy, which would have been elaborated with regard to peculiarities of Russian economy.

The goal of the present Report consists in developing an evaluation methodology of a fiscal policy and assessing the efficiency of the implementation of Russia's fiscal policy in the period of 1990-2013.

The efficiency evaluation of the Russian fiscal policy was carried out based on its impact on the economic growth. In this respect, the development stages of the fiscal policy in the period of 1990-2013 were singled out into six sub-models. Each sub-model of the fiscal policy corresponds to specific phases of an economic cycle. The evaluation methodology of the efficiency of the fiscal policy is based on constructing a regression model for each sub-model and determining the interrelation of the economic growth and the tax burden level. Further, they calculated Laffer points of the first and second kind for the sub-models of the fiscal policy. The obtained Laffer points were used in comparing a factual tax burden of each sub-model of the fiscal policy and determining the efficiency of the fiscal policy of the corresponding economic cycle.

In the process of the research, a methodology of the evaluation of a fiscal policy was elaborated and an efficiency evaluation of Russia's fiscal policy in the period of 1990-2013 was carried out with regard to such macroeconomic indices as levels of the gross domestic product, tax inflows and tax burdens.

As a result of the evaluation, they established an absence of the interrelation between a stage of an economic cycle and the efficiency of the fiscal policy in a given phase. Such a lack of interrelationship, which repeats itself from one sub-model of the fiscal policy to another, proves to be nonrandom.

Keywords: fiscal policy, efficiency of fiscal policy, methodology of the evaluation of a fiscal policy, taxes, tax revenues, public expenditures.

2. Introduction

The modern economy of Russia is characterized by some transformation processes. It is under these conditions that the problem of the efficiency of Russian national economy is becoming urgent. One of the major factors of the efficiency of

the national economy is the effectiveness of the on-going fiscal policy. Currently, the problem of the implementation of an effective fiscal policy remains to be debatable in economical publications. Studying the problems of fiscal policy and its effectiveness engaged scientists from different methodological trends.

A. Smith, as a representative of the classical school, hold views about state interference in the economy and interpreted fiscal policy through taxes, which are the source of budget replenishment, serving for the implementation of state functions (Smith, 1998).

D. Ricardo, exploring fiscal policy, believed that taxes should be used solely for fiscal purposes, and treated the tax as a source of inevitable evil preventing the irreversible process of capital formation and accumulation. D. Ricardo attempted to substantiate the interrelation of prices and tax revenues, according to which the tax on any product tends to lower the rate of return for its production (Ricardo, 1908).

J.M. Keynes considered fiscal policy as an instrument of state regulation aimed at smoothing fluctuations in business activity, and the impact on economic growth. He gives primary role to the principle of progressive taxation, higher tax rates, arguing that the lower rates are accompanied by reduction of budget revenues and instability of the state economy. According to the concept of J.M. Keynes, during the economy recovery it is necessary to increase taxes, and during a recession, on the contrary, to reduce. Tax reduce is to increase tax incentives for enterprises and monopolies of such industries that are most promising for the implementation of a new rise. Income tax is an automatic stabilizer during the rise capable to ensure the removal budget a greater share of rising incomes into the state, thus limiting demand, and while recovery to consider the reduction of income (Keynes, 2008).

A.Laffer, in contrast to the views of Keynesian representatives, focuses on the role of total supply, which have an impact on the tax rate. According to economic theory of offer excessively high level of taxation has a negative effect on the activity of economic entities, reduces aggregate supply, leads to inflation and slowing of economic growth. Thus, under the fiscal policy A. Laffer understands government policy aimed at income generation through the establishment of the state budget according to the maximum amount of tax revenue from the optimal tax rates (Laffer, 2004; Laffer, 2008; Laffer, 2009).

E.V. Balatsky actualizes questions of assessing the fiscal policy effectiveness and the ways of its optimization through the use of quantitative methods aimed at optimizing the fiscal mechanism by defining rational tax rates (Balatsky, 2000).

Taking into account that there is already a sufficient number of publications reflecting the substantive aspects of this subject (Belova, 2013; Barkhatov, 2006; Bevan, 2010; Callan, Keane, Savage and Walsh, 2012; Cournède and others, 2013; Diamond, 1998), the field for research has still not exhausted itself. In particular, as one of the unsolved scientific problems acts absence of universally accepted methodology for assessing the fiscal policy effectiveness, tailored to the characteristics of the Russian economy.

The purpose of this study is to develop a methodology to assess the fiscal policy effectiveness and evaluate effectiveness of fiscal policy implementation in Russia in the period from 1990-2013.

3. Methodology and Data

The efficiency evaluation of the Russian fiscal policy was carried out based on its impact on the economic growth. In this respect, the development stages of the fiscal policy in the period of 1990-2013 were singled out into six sub-models. Each sub-model of the fiscal policy corresponds to specific phases of an economic cycle. Thus, the main indicator of the identification phase of the economic cycle is the GDP growth rate, expressed as a percentage and reflecting the rate of economic growth. When the economy is in the rise and recovery phases, GDP growth rate value is positive, in phases of crisis and depression they are negative.

Fiscal policy sub-models and the economic cycle are shown in Table 1.

Table 1

Fiscal policy sub-models and phases of economic cycle

Fiscal policy sub-models	Economic cycle	Phases of economic cycle	
I	Economic cycle I (1988-1993)	1988	Rise
		1988-1992	Crisis
		1992-1993	Recovery
II	Economic cycle II (1993-1997)	1993	Rise
		1993-1994	Crisis
		1994-1997	Recovery
III	Economic cycle (1997-2000)	1997	Rise
		1997-1998	Crisis
		1998-2000	Recovery
IV	Economic cycle IV (2000-2003)	2000	Rise
		2000-2001	Crisis
		2001-2002	Depression
		2002-2003	Recovery
V	Economic cycle V (2003-2007)	2003	Rise
		2003-2005	Crisis
		2005-2007	Recovery
VI	Economic cycle VI (2007-2013)	2007	Rise
		2007-2009	Crisis
		2009-2013	Recovery

Source: compiled by the author.

Under fiscal policy sub-model we understand the fiscal policy model in a certain period of time, having specific features and qualities typical of this phase of the economic cycle.

Methods of assessing the fiscal policy effectiveness is based on the construction of a regression model for each sub-model. Regression model reflects the nonlinear dependence of GDP (Y) and tax revenue (T) of the tax burden of the national economy (N). The tax burden is the ratio of tax revenues to the consolidated state budget to total GDP. At the same time GDP (Y) acts as the dependent variable, and independent variable is the tax load (N).

Proposed method of fiscal policy effectiveness assessment is formed by approximating the growth process by polynomial of 2 degree including 3 parameters, for each sub-model of fiscal policy and has the following form:

$$Y = a_0 + a_1 N + a_2 N^2 \textbf{ (1),}$$

where a_0, a_1, a_2 are parameters to be determined empirically by constructing a functional dependence of Y = Y (N) for the corresponding sub-model of fiscal policy; N is the tax burden.

Regression model parameters a_0, a_1, a_2, obtained empirically, let calculate Laffer point of the 1st and 2nd kind with the use of Laffer curve and existing formulas for each sub-model of fiscal policy.

Laffer point of the 1st kind N* determines the limit of the state tax in which the production system does not go into recession, and is calculated by the formula:

$$N^* = -\frac{1}{2}\frac{a_1}{a_2} \textbf{ (2)}$$

Laffer point of the 2nd kind N** characterizes the state tax burden, beyond the boundaries of which the increase in tax revenues becomes unworkable, and is calculated by the formula:

$$N^{**} = \frac{-a_1 \pm \sqrt{3a_0 a_2 - a_1^2}}{3a_2} \textbf{ (3)}$$

After identifying the two points found by the formula (3), only one is selected, which is the maximum point. It's impossible to determine in advance which of the two points will be the maximum point, due to which two potential Laffer point of the 2nd kind appear in this formula.

Criterion of fiscal policy effectiveness is the level of the national economy tax burden which is below the Laffer points of the 1st and 2nd kind.

The procedure for determining the fiscal policy effectiveness reflecting the author's approach is presented in Table 2.

Table 2

The procedure for determining the effectiveness of state fiscal policy

Comparison of Laffer points found with the actual tax burden	Determination of the fiscal policy effectiveness	Fiscal policy characteristics
$\begin{cases} N<N^* \\ N < N^{**} \end{cases}$	Effective	• sets the prerequisites for economic growth; • stimulates economic growth;
$\begin{cases} N>N^* \\ N > N^{**} \end{cases}$	Non-effective	• stimulates the decline in production; • is accompanied by a reduction in tax revenues;
$N^*<N<N^{**}$	Ineffective	• does not contribute to economic growth; • set tax burden stimulates production decline.

		• is dominated by fiscal interests - state budget replenishment; • need to decrease the actual tax burden lower than N*;
N**<N<N*	Ineffective	• predominant fiscal component of macroeconomic policy; • tax burden is set outside the allowable level and causes the decline in economic activity of economic entities and move from the legal sphere to the shadow economy;

Source: compiled by the author.

4. Results

The proposed methodology was tested in the process of testing hypotheses of fiscal policy effectiveness.

Let's test the first hypothesis: The fiscal policy effectiveness does not depend on the nature of the economic cycle phases.

Hypothesis testing is accomplished by constructing a regression model for each stage of the fiscal policy development - fiscal policy sub-models . At the same time the level of the tax burden of each sub-model of fiscal policy act as the argument. Parameters a_0, a_1, a_2 were determined empirically and allowed us to calculate Laffer point of the 1st and 2nd kind. Received Laffer point are to be compared with the actual tax burden of each sub-model of fiscal policy and determine the fiscal policy effectiveness of the economic cycle. The build regression models are shown in Table 3.

Table 3

Results of regression model construction for each sub-model of fiscal policy, definition of Laffer points and fiscal policy effectiveness

Fiscal policy sub-models		Phases of economic cycle	Regression model	Actual tax burden	Laffer point values	Fiscal policy effectiveness
1	1988	Rise	Y=2081,7-143,82N+2,4478N^2	33,07	N*=29,5 N**=29,6	Non-effective
	1988	Crisis		33,07		Non-effective till 1991, 1991-1992 - effective
	1989			32,41		
	1990			33,57		
	1991			27,49		
	1992			23,21		
	1992	Recovery		23,21		Effective
	1993			20,82		Effective
2	1993	Rise	Y=10788-1261,4N+37,738N^2	20,82	N*=16,7 N**=16,4	Non-effective
	1993	Crisis		20,82		Non-effective
	1994			19,01		
	1994	Recovery		19,01		Non-effective
	1995			23,65		
	1996			22,04		
	1997			23,97		

3	1997	Rise	Y=124109N-2784,6N^2	23,97	N*=22,3 N**=39,1	Ineffective
	1997	Crisis		23,97		1997- ineffective in 1998 - effective
	1998			20,60		
	1998	Recovery		20,60		In 1998-1999 – effective, in 2000 - ineffective
	1999			20,89		
	2000			23,37		
4	2000	Rise	Y=-29427+2127,5N-24,095N^2	23,37	N*=44,2 N**=50,9	Effective
	2000	Crisis		23,37		Effective
	2001			26,22		
	2001	Depression		26,22		Effective
	2002			28,96		
	2002	Recovery		28,96		Effective
	2003			28,21		
5	2003	Rise	Y=-690526N+12076N^2	28,21	N*=28,6 N**=38,1	Effective
	2003	Crisis		28,21		Ineffective
	2004			29,50		
	2005			28,96		
	2005	Recovery		28,96		In 2005, 2007 – ineffective, in 2006 - effective
	2006			27,72		
	2007			29,50		
6	2007	Rise	Y= -193947 + 21650N-470,44N^2	29,50	N*=23,1 N**=25,2	Non-effective
	2007	Crisis		29,50		Non-effective
	2008			27,14		Non-effective
	2009			24,39		Ineffective
	2009	Recovery		24,39		In 2009, 2010, 2013 – effective; in 2011-2012 – non-effective
	2010			25,25		
	2011			26,26		
	2012			26,75		
	2013			23,57		

Source: compiled by the author.

The resulting calculations showed that fiscal policy in the same phases of the economic cycle can be effective, ineffective and non-effective. Thus, we can conclude that the fiscal policy effectiveness does not depend on the nature of the economic cycle phases.

Graphical representation of the obtained Laffer points of the 1st and 2nd kind, the actual tax burden between 1988 and 2013 are shown in Figure 1.

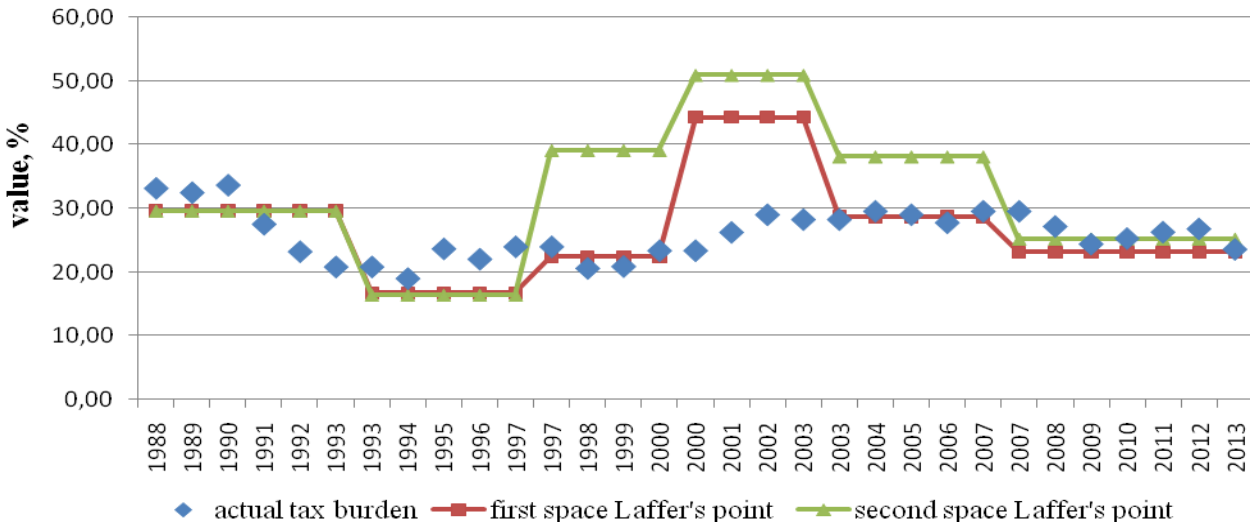

Figure 1. Graphic illustration of the 1st and 2nd kind Laffer points, the actual tax burden between 1988 and 2013

Let's test the second hypothesis: Fiscal policy within sectors of the national economy can manifest with varying degrees of effectiveness.

Starting point for the study of Russian corporations was the leading national economy sectors included in the ranking of the 400 largest companies by sales volume, compiled by the rating agency Expert RA. Russian corporations participating in the study are presented in Table 4.

Table 4

Russian corporations of the leading national economy sectors

Oil and gas industry	**Metallurgy**
OJSC "Gazprom"	OJSC "Severstal"
OJSC "Lukoil"	OJSC "Evraz Companies"
OJSC "NK" Rosneft "	OJSC "MMC" Norilsk Nickel"
OJSC "Tatneft"	OJSC "Mechel"
OJSC NGK "Slavneft"	OJSC "NLMK"
OJSC "NOVATEK"	OJSC "MMK"
Power industry	**Transport and communications**
OJSC "Rosseti"	OJSC "MegaFon"
OJSC "RusHydro"	OJSC "Rostelecom"
OJSC FGC UES	OJSC RZD
OJSC "Inter RAO UES"	OJSC "AK" Transneft "
OJSC "Bashkirenergo"	OJSC "Aeroflot"
OJSC "OGK-1"	OJSC " UTair "Airline"
Wholesale and retail trade	
X5 Retail Group	
Groupe Auchan	
"M. Video" company	
OJSC "Magnit"	
"Protek" group of companies	
OJSC "Tekhsnabeksport"	

Hypothesis testing was based on the construction of a regression model for each sub-model of fiscal policy in the sectors of the national economy in the period

from 2000 to 2011.

The build of regression models for each sector of the national economy are presented in Table 5.

Table 5

The build of regression model for each sub-model of fiscal policy in the sectors of national economy, the definition of Laffer points and fiscal policy effectiveness

Branch	Fiscal policy sub-models	Regression model	Average values of actual tax burden	Laffer points value	Fiscal policy effectiveness
Oil and gas industry	2000-2003	$Y=131479N-1668,3N^2$	39,1	N*=39,4 N**=52,5	effective
	2003-2007	$Y=89450N-876N^2$	46,2	N*=51,1 N**=69,9	effective
	2007-2011	$Y=219940-470,1N+29,05N^2$	43,9	N*=44,4 N**=55,3	effective
Metallurgy	2000-2003	$Y=317491-40535N+1274,8N^2$	14,3	N*=15,9 N**=16,1	effective
	2003-2007	$Y=-180377+57446N-3301,3N^2$	11,4	N*=8,7 N**=9,7	non-effective
	2007-2011	$Y=118530-28050N+2875,8N^2$	6,9	N*=4,9 N**=5,0	non-effective
Power industry	2000-2003	$Y=640,2N-136N^2$	5,9	N*=12,4 N**=12,7	effective
	2003-2007	$Y=-3935,9+2153,2N-72,91N^2$	7,6	N*=14,8 N**=18,7	effective
	2007-2011	$Y=69129-5317,5N+80,498N^2$	8,9	N*=15,1 N**=18,8	effective
Transport and communications	2000-2003	$Y=224227-54629N+3318,4N^2$	7,8	N*=8,2 N**=8,2	effective
	2003-2007	$Y=58997-12886N+1256,3N^2$	6,9	N*=5,1 N**=5,4	non-effective
	2007-2011	$Y=-85462+41608N-2723,6N^2$	8,7	N*=7,6 N**=9,0	ineffective
Wholesale and retail trade	2000-2003	$Y=1368,3N-393,5N^2$	1,5	N*=1,7 N**=2,3	effective
	2003-2007	$Y=924,58-771,18N+181,07N^2$	2,9	N*=2,1 N**=2,0	non-effective
	2007-2011	$Y=6416,3-3799,4N+624,16N^2$	2,9	N*=3,0 N**=2,9	ineffective

Source: compiled by the author based on data from the financial statements of the entities listed in Table 4.

Thus, the calculations showed that fiscal policy is effective in all sectors of the national economy in sub-model in 2000-2003. In sub-model in 2003-2007, it is effective in the oil and gas industry and power industry, is ineffective in metallurgical industry, transport and communications sector, wholesale and retail trade. In sub-model in 2007-2011, fiscal policy is effective in the oil and gas industry and power industry, ineffective in the transport and communications sectors, wholesale and retail trade, and non-effective in metallurgy.

Let's test the third hypothesis: Tax revenues growth to Russia's budget is due to their dependent nature of the economic cycle phases.

Testing the hypothesis 3 is accomplished by calculating the linear correlation coefficient and determination of the type of connection between the tax revenues growth and GDP growth in the period from 1990 to 2013.

Initial data for calculating the tax revenues growth rate to the consolidated budget and GDP growth in the period from 1990 to 2013 are presented in Table 6.

Table 6

The growth rate of tax revenues to the consolidated budget and the GDP growth rate from 1990 to 2013

Year	Tax revenue, bln. rubles (up to 1998 - trillion rubles)	Tax revenue growth, %	GDP, bln. rubles (up to 1998 - trillion rubles)	GDP growth rates,%
1	2	3	4	5
1989	0,31	-	0,94	-
1990	0,10	32,26	1,00	106,38
1991	0,21	210,00	1,40	140,00
1992	4,41	2100,00	19,01	1357,85
1993	35,70	809,52	171,51	902,21
1994	116,10	325,21	610,75	356,10
1995	364,30	313,78	1428,52	233,89
1996	473,00	129,84	2007,83	140,55
1997	594,10	125,60	2342,51	116,69
1998	564,60	95,03	2629,62	112,26
1999	1007,50	178,44	4823,23	183,42
2000	1707,60	169,49	7305,65	151,47
2001	2345,00	137,33	8943,58	122,42
2002	3136,80	133,77	10830,54	121,10
2003	3735,30	119,08	13208,23	121,95
2004	4942,10	132,31	17027,19	128,91
2005	6257,20	126,61	21609,77	126,91
2006	7461,00	119,24	26917,20	124,56
2007	9806,60	131,44	33247,51	123,52
2008	11202,50	114,23	41276,85	124,15
2009	9459,70	84,44	38807,21	94,01
2010	11345,10	119,93	46308,54	119,33
2011	14699,00	129,56	55967,23	120,86
2012	16645,30	113,24	62218,38	111,17
2013	15734,35	94,52	66755,30	107,29

Source: compiled by the author based on data from the Federal State Statistics Service (www.gks.ru)

The resulting linear correlation coefficient R^2 = 0,9386 characterizes direct and close interrelation.

Illustration of direct and close interrelation between the studied variables is presented in Figure 2.

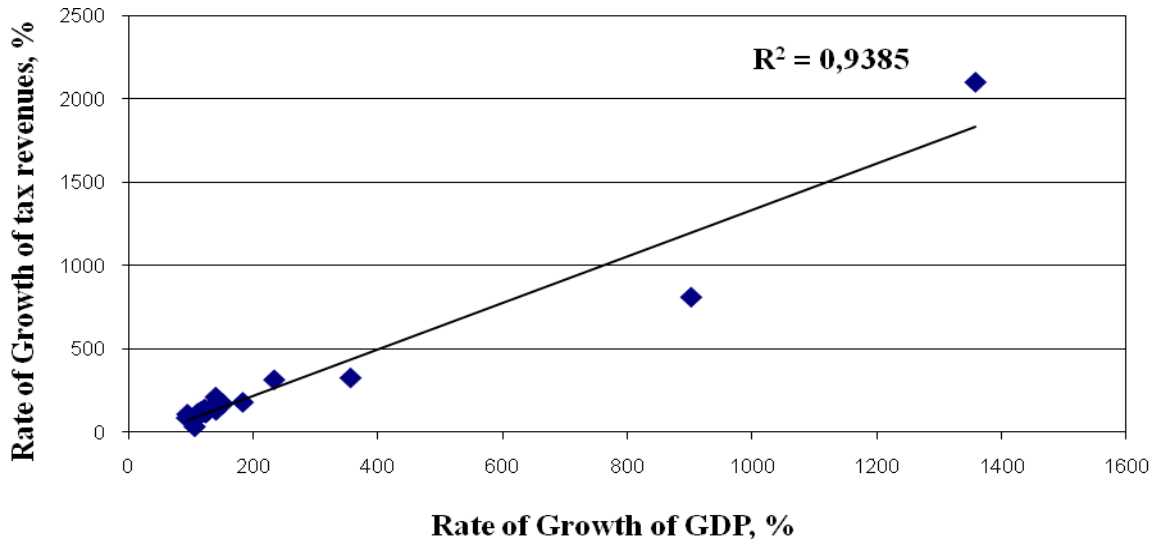

Figure 2. Interrelation of tax revenues growth and GDP growth from 1990 to 2013

Thus, the close interrelation between the tax revenues growth of the Russia's consolidated budget and GDP growth rates indicate the presence of tax revenues dependence on the nature of the economic cycle phases, i.e. tax revenues increase in the rise and recovery phases, and decrease in the phases of depression and crisis.

The study has developed a methodology assessing the fiscal policy effectiveness, assessed the fiscal policy effectiveness in Russia in the period from 1990-2013, taking into account macroeconomic indicators such as GDP, the tax revenue level, the tax burden.

5. Conclusions

As a result of the developed technique application and hypotheses tested the following conclusions about the fiscal policy effectiveness in Russia during the Soviet and post-Soviet periods can be drawn:

Firstly, in six analyzed fiscal policy sub-models, each of which corresponds to its economic cycle, there is no interrelation between the economic cycle phase and the fiscal policy effectiveness in this phase. In the same phases of relevant economic cycles fiscal policy can be effective, ineffective and non-effective, and this lack of correlation, repeated from one sub-model of fiscal policy to another, can be called natural.

Secondly, the tendencies of fiscal policy exercised influence on the domestic industry were determined. Fiscal policy is effective in all sectors of the national economy studied only with sub-models from 2000-2003. In 2003-2007 and 2007 - 2011 sub-models fiscal policy implemented in the analyzed sectors is effective ineffective and non-effective. Thus, revealed lack of interrelation between the

national economy and the of fiscal policy effectiveness repeated in the period of 2003-2007 and 2007-2011 gets regular.

Thirdly, we revealed a strong correlation between the tax revenues growth of the Russia's consolidated budget and GDP growth. This interrelation indicates dependence of tax revenue phases on the nature of the economic cycle. Tax revenues increase in phases of rise and recovery, and decrease in the phases of depression and crisis, and this dependence is logical.

References

- Balatsky, Ye., 2000, "Effektivnost' fiskal'noy politiki gosudarstva" [Fiscal policy Efficiency], Problems of Forecasting, Vol. 5, pp. 32–43
- Barkhatov, V., 2006, "Problemy makroekonomicheskogo regulirovaniya v sovremennoy rossiyskoy ekonomike" [Problems of macroeconomic management in modern Russian economy], Bulletin of the Chelyabinsk State University. Series «Economy»,Vol. 1 (74), pp. 29-43.
- Belova, I., 2013, "Model' effektivnoy fiskal'noy politiki gosudarstva" [Model of effective fiscal policy], Bulletin of the Chelyabinsk State University. Series «Economy»,Vol. 15 (306), pp. 109-115.
- Bevan, D., 2010, "Fiscal Implications of the Global Economic and Financial Crisis for Low-Income Countries," Department of Economics paper prepared for the U.K. Department for International Development (Oxford: Oxford University). Available at: http://www.dfid.gov.uk/r4d/PDF/Outputs/EcoDev_misc/60740-Fiscal-Implications-Bevan-03-10.pdf
- Callan, T., C. Keane, M. Savage, and J. R. Walsh, 2012, "Distributional Impact of Tax, Welfare and Public Sector pay Policies: 2009–2012," ESRI Working Paper (Dublin: The Economic and Social Research Institute).
- Cournède, B., and others, 2013, "Choosing Fiscal Consolidation Instruments Compatible with Growth and Equity," OECD Economic Policy Paper, No. 7, July (Paris: Organisation for Economic Cooperation and Development)
- Diamond, P.A., 1998, "Optimal Income Taxation: an Example with a U-shaped Pattern of Optimal Marginal Tax Rates," The American Economic Review, Vol. 88, No.1, pp. 83–95.
- Keynes, J.M., 2008, "The General Theory of Employment, Interest and Money", BN Publishing.
- Laffer, A., 2004, "The Laffer Curve: Past, Present, and Future", Heritage Foundation Backgrounder #1765, June 1.
- Laffer, A., 2009, "Taxes, Depression, and Our Current Troubles", Wall Street Journal, September 22.
- Laffer, A., 2008, "The Tax Threat to Prosperity", Wall Street Journal, January 25.
- Ricardo, D., 1908, "Principles of Political Economy and Taxation, George Bell and sons", London.

- Smith, A., 1998, “An Inquiry into the Nature and Causes of the Wealth of Nations: A Selected Edition”, OUP General, Oxford World`s Classics.