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DOI:10.2298/EKA0879145K

## **GOVERNMENT REVENUE-EXPENDITURE NEXUS: EVIDENCE FROM SEVERAL TRANSITIONAL ECONOMIES**

**ABSTRACT:** *Budget deficits and the debate on the sources of deficit finance have been on the agenda of public economics ever since the 1980s. However recently in the post-communist countries fiscal imbalances appear to be an important problem due to prolonged periods of growing poverty resulting from the transition process. Poverty alleviation policies considerably affect the revenue and expenditure decisions of governments, which are subject to hard budget constraints in an open transitional economy and do not have room for departing from sound fiscal policies. The public finance literature provides a vast number of studies analyzing the relationship between public revenues and expenditures. These studies are mostly characterized by efforts to reveal the attitude of the fiscal authority towards maintaining the budget balance. In this respect, budgetary dynamics in which past government revenues have predictive power on the current level of government expenditures are accepted as evidence of the so-called tax-and-*

*spend hypothesis. On the other hand, the revenue-expenditure nexus running from expenditures to revenues is known in the literature as the spend-and-tax hypothesis. The objective of this study is to analyze empirically the relationship between government revenues and expenditures in four of the transitional economies, i.e. Belarus, Kazakhstan, the Kyrgyz Republic and the Russian Federation. The empirical findings of this study, which are based on Granger causality tests, indicate evidence supporting the tax-and-spend hypothesis in Belarus and the Russian Federation and fiscal synchronization in Kazakhstan and the Kyrgyz Republic. The empirical support for the tax-and-spend hypothesis in these economies implies that increasing government revenues may not end up with lower budget deficits due to their stimulating effect on the demand for public goods and services.*

**KEYWORDS:** *Tax and Spend, Government Expenditures and Revenues, Granger Causality, Transitional Economies*

**JEL CLASSIFICATION:** E62, H61

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## Introduction

Budget deficits have been one of the main economic problems in many countries since the 1980s. According to supply side economists, the increasing size of government and persistent high budget deficits are the outcome of increased government spending led by higher taxes. In this sense, tax finance is not an appropriate tool for improving budget balances in the case of high budget deficits. However, there are views asserting that raising tax revenues need not stimulate government spending when budgetary dynamics are characterized by tax revenues adjusted with respect to the government's ad hoc spending decisions. A vast empirical literature of public finance has been accumulated concerning the causality between government spending and revenues in this case.

In the empirical public finance literature the causality between public revenues and spending is revealed and then exploited in order to understand the dynamics behind the formation of budget deficits. Within this context there are four main hypotheses formulated in the literature that help to illustrate the relationship between public revenues and spending. The first one is the *tax-and-spend* hypothesis led by Friedman (1978), which asserts that raising taxes will lead to more government spending and hence to fiscal imbalances. Also in the same context, Buchanan and Wagner (1977) state that when government spending is financed by other means than direct taxation, the ultimate outcome is higher budget deficits due to the fiscal illusion resulting from the incorrectly low perception of the price of government spending that is followed by increased demand for public goods and services. The second hypothesis regarding the public revenue-spending nexus is called the *spend-and-tax* hypothesis. It is originated by Peacock and Wiseman (1979), who argue that temporary increases in government spending as a result of economic and political crises lead to permanent increases in government revenues. This hypothesis is also consistent with Barro's (1978) view that today's deficit-financed spending means increased tax liabilities in the future in the context of the Ricardian equivalence proposition, which, in fact, rules out the fiscal illusion. The third hypothesis, which is led by Musgrave (1966) and Meltzer and Richard (1981), is called the *fiscal synchronization* hypothesis. According to this hypothesis, government's decision on the optimal levels of spending and taxation is determined concurrently and depends on the voters' welfare maximizing demand for public services and on voters' attitude towards the redistribution function of the government, based on the comparison of their marginal benefits and cost of public services. The fourth one is the institutional separation hypothesis introduced by Baghestani and McNown (1994), in which government revenues and spending are argued to be independent from each

other due to the independent functions of the executive and legislative branches of the government.

In order to see whether or not socio-cultural and political characteristics of economies influence the political economy of budget decision-making, findings in the empirical literature are presented through a classification made with respect to the geographical proximity of the developing countries, as follows. Of nine Asian countries, Narayan (2005) provides support for the tax-and-spend hypothesis in Indonesia, Singapore, Sri Lanka and Nepal, and for the institutional separation hypothesis in India, Malaysia, Pakistan, Thailand and Philippines. The tax-and-spend hypothesis is also supported in another two Asian countries i.e., Taiwan and South Korea, in Chang et al. (2002) and further confirmed for Taiwan in both Chang and Ho (2002a) and Fuess et al. (2003). However, empirical findings on China (Li, 2001; Chang and Ho, 2002b) show evidence of fiscal synchronization. When studies concerning the Latin American countries (Ewing and Payne, 1998; Cheng, 1999) are examined, the fiscal synchronization hypothesis is supported in Brazil, Chile, Panama, Peru and Paraguay while the tax-and-spend hypothesis is supported in Colombia, the Dominican Republic, Ecuador, Guatemala and Honduras. Additionally, the empirical evidence obtained by Tjerina-Guajardo and Pagan (2003) for Mexico verifies the tax-and-spend hypothesis. The only study carried out for Arab countries found in the literature (Fasano and Wang, 2002) provides evidence in favour of the tax-and-spend hypothesis for six Arab countries i.e., Bahrain, Kuwait, Oman, Qatar, Saudi Arabia and United Arab Emirates. According to these findings it is difficult to claim that economies with similar socio-cultural and political characteristics exhibit similarity in budget decision-making, except for in the Arab countries. However, what is common for all these developing economies is that in none of them the spend-and-tax hypothesis is supported.

When empirical findings on the revenue-spending nexus are examined for some developed economies conclusions are mixed. There are several studies carried out for European countries, which do not exhibit unanimous conclusions about the hypotheses in question. For example, for the three largest economies in Europe i.e., the UK, Germany and France, the empirical findings of Joulfaïn Mookerjee (1991), Owoye (1995) and Koren and Stiassny (1998) exhibit conflicting results. In Joulfaïn and Mookerjee (1991) the spend-and-tax hypothesis is found supported whereas in Owoye (1995) it is the fiscal synchronization hypothesis which is supported. On the other hand, Koren and Stiassny (1998) finds evidence for the tax-and-spend hypothesis for the UK and Germany and the spend-and-tax-hypothesis for France. Additionally, for the UK, Chang et al. (2002) finds

causality running from revenues to expenditures indicating a tax-and-spend type relationship whereas Hasan and Lincoln (1997) finds a bi-directional causality.

Empirical investigations carried out for the USA, Canada and Japan also display mixed results. Estimations of Ahiakpor and Amirkhalkhali (1989), Joulfaian Mookerjee (1991) and Payne (1997) reveal findings supporting the tax-and-spend hypothesis in Canada while Chang et al. (2002) and Owoye (1995) achieve results in favour of fiscal synchronization in Canada and tax-and-spend in Japan. However, findings of Joulfaian and Mookerjee (1991) for Japan describe dynamics consistent with the spend-and-tax hypothesis. In studies carried out for the USA, estimations of Bohn (1991), Korren and Stiassny (1988), Chang et al (2002) provide evidence for the tax-and-spend hypothesis while the estimations carried out by Anderson et al (1986), von Furstenberg et al (1986), Ram(1988), Jones and Joulfaian (1991), Joulfaian and Mookerjee (1991) and Islam (2001) support the spend-and-tax hypothesis. On the other hand, Miller and Russek (1990) and Owoye (1995) find evidence for fiscal synchronization while Ewing et al (2006) confirm the institutional separation hypothesis of Baghestani and McNown (1994) for the US economy. Further one can find studies based on local government data of the U.S. economy such as Holtz-Eakin et al (1987). As can be assessed from this empirical evidence, there is no unique budget decision-making rule that can be considered as characteristic of the fiscal policy choices in developing and developed economies. The absence of unanimity in empirical inferences may be due to differences in the estimation methodologies and in the sample periods of the studies in addition to differences in the political traditions of the economies in question.

The only study that is found in the literature about revenue-expenditure relationships in transition economies is the one carried out for Croatia by Payne et al (2002). This empirical investigation reveals findings supporting the tax and spend hypothesis.

After the collapse of Communism in the Soviet Union the transformation of the new independent states into free market democracies began. Since then the term “transition economies” has appeared in economic literature. Fundamentally, the transition economies are trying to get rid of their underdeveloped status and to become developed. While some of the economies have completed the transition period successfully, others are still experiencing the growing pains of transition. The main economic objectives of the transition period can be summarized as follows: to liberalize economic transactions and commodity prices, to privatize publicly owned firms, to protect property rights institutionally and legally, and

to pursue an efficient fiscal policy. It is also important to have a disciplined fiscal budget (fiscal austerity) and to find new revenue sources. Unfortunately some of the transition economies are faced with the vicious circle of increasing debt and budget deficits. This vicious circle has many reasons originating in the nature of these countries. The relatively larger share of the government sector, the lack of an institutional and legal framework, the endemic nature of corruption and the poor framework of revenue collection are some of these reasons. In this study, we try to examine one of many reasons for the budget deficits. We try to find an answer to the question of whether or not there is a triggering relationship between government expenditure and revenues in four transition economies (Belarus, the Russian Federation, Kazakhstan, and the Kyrgyz Republic).

### 1. Sample Countries at a Glance

Before presenting the data and estimation methodology, it is important to present some selected indicators of the sample countries. In this way we will annotate the consistency of the estimation results and the data of the sample countries. In Table 1 some selected indicators of the sample countries are presented. All countries have a similar level of debt. The level of government expenditure and revenue as a percentage of

**Table 1** Selected Economic Indicators of Sample Countries

	Population (million)	GNI per capita	Government Expenditure % of GDP	Government Revenue % of GDP	Government Deficit (-) or Surplus (+) of GDP	Total Debt / Exports of Goods and Services (%)	Debt Services / Exports of Goods and Services (%)
	2007	1999-2007 (Averages)	1999-2007 (Averages)	1999-2007 (Averages)	1999-2006 (Averages)	1999-2006 (Averages)	1999-2006 (Averages)
Belarus	9,700	2187	46,38*	45,06*	-1,34*	253	287
Kazakhstan	15,566	2378	23,27	22,67	-0,97	216	333
Kyrgyz R.	5,316	381	20,62	18,67	0,49	220	362
Russian F.	142,350	3464	15,93	19,65	3,45	370	344

\* 1999-2003 Data taken from Belarus: Strengthening Public Resources Management, World Bank Report, June 2003.

Source: The data compiled from World Development Indicators and Data Stream Database by the authors.

GDP is highest in Belarus and lowest in the Russian Federation. The government deficit is highest in Belarus and surplus highest in the Russian Federation.

## 2. Data and the Estimation Methodology

In this study the empirical investigation into the linkage between public revenues and spending is based on a bivariate econometric relationship in which the spending and revenue series are used in real terms. Accordingly, nominal figures on government expenditure and revenue are deflated with a consumer price index, of which the monthly data series are all obtained from the DataStream statistical database and used in natural logarithms. The starting date of the sample period is decided so that the outlier effect of the Russian crisis is excluded from the sample while the ending dates are determined with respect to data availability: The Russian Federation (1999:1 - 2006:10), Belarus (1999:1 - 2002:12), the Kyrgyz Republic (1999:1 - 2006:12) and Kazakhstan (1999:1 - 2007:4).

As the preliminary step in the estimations, univariate tests are computed to learn about the seasonality and integration characteristics of the series in question. A seasonality test is carried out within the framework of the *X-12-ARIMA* seasonal adjustment method. The test statistic has  $F(k-1, T-k)$  distribution with  $k=12$  for monthly data and  $T$  denoting the number of observations. In order to prevent the null hypothesis of ‘no seasonality’, the series are seasonally adjusted. Next, the series are tested to explore their orders of integration. For this purpose three different tests are used in this study, i.e., Augmented Dickey-Fuller (1979) (ADF), Phillips-Perron (1998) (PP) and Kwiatkowski et al. (1992) (KPSS). However, it must be noted that it is the ‘unit root’ or the ‘non-stationarity’ hypothesis that is being tested in the ADF and PP tests while it is the ‘stationarity’ hypothesis in the KPSS test.

The relationship between the public revenues and spending is investigated through estimating the following bivariate vector autoregression (VAR) equations by the least squares method,

$$S_t = \mu + \sum_{i=1}^p \alpha_i S_{t-i} + \sum_{i=1}^p \beta_i R_{t-i} + \varepsilon_{1t} \quad (1)$$

$$R_t = \delta + \sum_{i=1}^p \phi_i S_{t-i} + \sum_{i=1}^p \gamma_i R_{t-i} + \varepsilon_{2t} \quad (2)$$

where  $S_t$  and  $R_t$  denote the stationary series of real public spending and revenues respectively. The maximum lag of the bivariate VAR model represented by  $p$  is selected with respect to the Akaike Information Criterion (AIC). The *Granger causality* test is performed at the selected lag through testing the restrictions  $\beta_1=\beta_2=\dots=\beta_p=0$  in equation (1) and  $\phi_1=\phi_2=\dots=\phi_p=0$  in equation (2). The rejection of the former (latter) means the rejection of the null hypothesis that  $R_t$  ( $S_t$ ) *does not Granger-cause*  $S_t$  ( $R_t$ ), which is accepted as evidence for the tax-and-spend (spend-and-tax) hypothesis in the literature. However, rejecting both (none) of the restrictions implies a support for the fiscal synchronization (institutional separation) hypothesis.

### 3. Estimation Results

When the analysis on the univariate characteristics of the data series in question are done based on the computations given in Table 2, one can argue that all series exhibit strong seasonality and should be seasonally adjusted. ADF, PP and KPSS tests that

**Table 2.** Univariate Tests

Country	Series	Seasonality	ADF	PP	KPSS
RUSSIAN FED.	$S_t$	18.829**	-8.03**(0)	-8.01**(4)	0.28**(7)
	$R_t$	6.561**	-4.55**(2)	-4.55**(11)	0.15 (10)
BELARUS	$S_t$	8.965**	-7.77**(0)	-7.65**(6)	0.14 (1)
	$R_t$	4.822**	-3.50 (0)	-3.87* (7)	0.07 (8)
KYRGYZ REP.	$S_t$	26.216**	-14.31**(0)	-14.50**(3)	0.09 (4)
	$R_t$	17.074**	-9.81**(0)	-9.82**(7)	0.10 (7)
KAZAKHSTAN	$S_t$	30.790**	-7.22**(0)	-7.38**(7)	0.12 (9)
	$R_t$	3.171*	-3.01 (2)	-7.81**(11)	0.08 (12)

Asterisks \* and \*\* denote 5 % and 1 % levels of statistical significance respectively. Figures in parentheses show the selected lag in ADF test and the bandwidth in PP and KPSS tests.

are computed for the seasonally-adjusted series show that  $S_t$  and  $R_t$  series are stationary.<sup>1</sup> Although there are two cases where the ADF test statistics fail to reject the unit root hypothesis, KPSS statistics confirm the stationarity hypothesis.

<sup>1</sup> All econometric computations in this part of the study are performed with the Eviews 5.1 software.

In order to select the appropriate lag length of the VAR( $p$ ) model for the Granger causality tests, maximum lag-length of eight ( $p=8$ ) is reduced sequentially to one-lag ( $p=1$ ) in equations (1) and (2), keeping the sample size fixed. The appropriate lag-length in each case is selected with respect to the minimum value of the Akaike Information Criterion (AIC), where they are shown in Table 3. In this respect, the Granger causality restrictions are tested in VAR(4) representation for the Russian Federation and Kazakhstan, and in VAR(3) representation for Belarus and the Kyrgyz Republic.

**Table 3.** Lag-length Selection with AIC

Country	Lags							
	8	7	6	5	4	3	2	1
RUSSIAN FED.	-3.16	-3.18	-3.21	-3.17	<b>-3.24</b>	-3.23	-3.23	-2.85
BELARUS	-2.55	-2.59	-2.59	-2.65	-2.82	<b>-2.90</b>	-2.86	-2.88
KYRGYZ REP.	-2.71	-2.70	-2.72	-2.80	-2.82	<b>-2.84</b>	-2.53	-2.46
KAZAKHSTAN	-1.55	-1.63	-1.63	-1.71	<b>-1.75</b>	-1.74	-1.74	-1.57

Bold figures indicate the minimum AIC values.

The corresponding  $\chi^2$ -statistics used to test the relevant Granger causality restrictions at the selected lags are presented in Table 4. Computed results indicate that regression coefficients of lagged- $R_t$  in  $S_t$  equations are statistically significant at a 1 % level for Belarus, the Kyrgyz Republic and Kazakhstan and at a 5 % level for the Russian Federation, while regression coefficients of lagged- $S_t$  in  $R_t$  equations appear insignificant for the Russian Federation and Belarus at all levels but significant for the Kyrgyz Republic and Kazakhstan at a 5 % significance level. These findings provide evidence for the tax-and-spend hypothesis in the budgetary dynamics of the

**Table 4.** Granger Causality Test

Country	Granger Causality Test		Granger Causality	Conclusion
	Equations	$\chi^2$ -test (prob)		
RUSSIAN FED.	$S_t$	11.02 (0.026)	Yes	tax-and-spend
	$R_t$	4.03 (0.402)	No	
BELARUS	$S_t$	12.78 (0.005)	Yes	tax-and-spend
	$R_t$	4.84 (0.184)	No	
KYRGYZ REP.	$S_t$	18.20 (0.000)	Yes	fiscal synchr.
	$R_t$	10.93 (0.012)	Yes	
KAZAKHSTAN	$S_t$	22.74 (0.000)	Yes	fiscal synchr.
	$R_t$	9.70 (0.046)	Yes	

Asterisks \* and \*\* denote 5 % and 1 % levels of statistical significance respectively. Figures in parentheses show the maximum lag-length of the equation selected by AIC.

Russian Federation and Belarus based on the uni-directional Granger causality running from public revenues to public spending. However, the bi-directional causality found for the Kyrgyz Republic and Kazakhstan indicates evidence supporting the fiscal synchronization hypothesis in this economy.

#### 4. Conclusion

The empirical findings of this study, which are based on the Granger causality testing procedure, indicate evidence supporting the tax-and-spend hypothesis in Belarus and the Russian Federation, and fiscal synchronization in Kazakhstan and the Kyrgyz Republic. According to the theoretical propositions, in the former increasing the resources available to the government may not end up with lower budget deficits since higher revenues are associated with higher government spending in the context of the tax-and-spend hypothesis. Fiscal indicators show that the policy implications of the tax-and-spend finding for Belarus is more crucial than it is for the Russian Federation, because the Russian economy has been experiencing fiscal surpluses since 2000. However, the Belarus government, whose expenditure exceeds its revenues, should control or cut spending to prevent deterioration of its budget balance following any increase in revenues. On the other hand, the empirical evidence of the fiscal synchronization obtained

for Kazakhstan and the Kyrgyz Republic implies that the government in each of these countries makes simultaneous revenue-expenditure decisions while designing its budget.

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