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Non-Keynesian effects of Government Spending: Some implications for the Stability and Growth Pact

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September 2007

NON-KEYNESIAN EFFECTS OF GOVERNMENT SPENDING: SOME IMPLICATIONS FOR THE STABILITY AND GROWTH PACT

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Abstract: The paper focuses on the non-Keynesian effects of fiscal policy, specifically government expenditure on output in Bulgaria. The main finding of the study is that the size of the fiscal impulse is the most important determinant of the non-Keynesian outcome. Also, the results imply that the "balanced-budget rule" does not automatically assure growth; the regulations regarding the budgetary categories themselves should also be considered.

Keywords: fiscal policy, non-Keynesian effects, balanced-budget rule, Stability and Growth Pact

JEL: E62

Introduction

A large part of recent empirical studies in the area of public finance has been exploring the short-run expansionary influence of fiscal consolidations on macroeconomic aggregates, mainly private consumption and output. In the economic

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literature these effects have been called "non-Keynesian effects of fiscal policy". The papers discuss mainly the experience of developed European economies; few studies investigate the post-communist countries.

This study focuses on the Bulgarian experience between 1998 and 2004, a few years prior to the EU accession. It tries to illuminate the macroeconomic impact of the discretionary fiscal interventions. The analysis shows a presence of non-Keynesian influence of government outlays on output and looks at factors that determine it. The tax policy affects short-run real growth in the typical Keynesian manner. The non-linearity in the effects of budgetary categories implies that the balanced-budget policy accompanied by growing government's size could decelerate the short-run real growth. So, it is not enough to focus on the budgetary result; the regulations regarding the budgetary categories themselves should also be considered.

Section 1 of the paper presents the theoretical background as well as empirical research on non-Keynesian effects of government expenditure on output. Section 2 outlines the method for cyclical adjustment of fiscal categories. Section 3 describes the empirical model (Logit) and its results. The main findings of the study and its practical implications are presented in Section 4.

Non-Keynesian effects of government expenditure: theoretical background and empirical results

In contrast with the traditional Keynesian view, the studies on non-Keynesian effects indicate that tight fiscal policy can stimulate economic activity in the short run. Besides the expansionary role of fiscal restrictions (so called "expansionary fiscal consolidations"), the relevant studies consider the role of the budget adjustments in reducing the debt-to-GDP ratio or the fiscal deficits-to-GDP ratio several years after the adjustment. Such consolidation efforts are defined as "successful fiscal adjustments" (see, for example, Afonso 2001).

Most papers point out that non-Keynesian response of output is more likely in the case of a spending cut than a tax increase. This section outlines the theoretical foundation as well as the empirical findings about non-Keynesian effects, focusing specifically on the impact of budgetary spending on output.

Several <u>theoretical explanations</u> of the non-Keynesian effects of government expenditure can be found in the literature (see, for example, Alesina and Ardagna 1998, Alesina and Perotti 1996, Ardagna 2004, Giavazzi and Pagano 1995, Perotti 1999, Sutherland 1997).

Fiscal policy affects output either through demand-side channel or through supply-side channel. One of the explanations of the non-Keynesian effects on the demand-side is based on the *wealth effect on consumption*. Restrictive fiscal policy triggers expectations for a future tax cut and a higher present value of household income, which stimulates private consumption and thus output. Oppose to the traditional view, the wealth effect entails an increase in consumption as a result of an expenditure cut. This explanation represents the "expectation view of the fiscal policy".

The effect is stronger when the fiscal policy changes are perceived as permanent. As well, the presence of the positive wealth effect might depend on the debt-to-GDP ratio. Economic agents expect that when this ratio reaches a certain high level, an upward jump in taxation will occur. If a fiscal restriction is undertaken before this expected level of debt-to-GDP ratio, the probability for a tax increase is lower. These positive expectations generate, in turn, a positive wealth effect on the household consumption.

Blanchard (1990) points out that a tax increase can also have an expansionary effect on output if it generates expectations of less dramatic tax increases tomorrow. It may also reduce precautionary savings by lowering the uncertainty about the course of future fiscal policy.

Additionally, the wealth effect could arise from the fall in interest rates, following the fiscal consolidation. In this case, the market value of the households' wealth increases which can lead to higher consumption spending and, in turn, output.

The second source of expansionary fiscal contractions is the *credibility effect on interest rates*. This effect works when the ratio debt/GDP is high, that is during periods of fiscal stress. At high levels of public debt, investors may face an interest rate premium due to the default risks or inflation. The fiscal consolidation can bring a downward pressure on the interest rates by reducing the risk premium, which will crowd in private investments.

In addition, there is a *supply-side channel* at work. According to the *labor market view,* cuts in government employment or transfer payments boost employment in the private sector and stimulate the economy. Also, higher/lower wages in the government sector put an upward/downward pressure on the business sector wages and

increase/decrease unit labor costs. This is equivalent to a negative/positive supply shock leading to a contraction/expansion of output. In open economies with a flexible exchange-rate regime, reduced labor costs, resulting from a fiscal restriction, increase the competitiveness of the companies and raise the net export.

The labor market channel operates in both competitive and unionized labor markets although in a different manner. An increase in the public employment or government wages in the competitive labor markets leads to a fall in private sector employment. As was noted earlier, this results in an increase of the real wage and a decline in profits, investments, and thus output, in the business sector.

With unionized labor markets, an increase of public employment, wages of public sector employees or unemployment benefits raises unions' wage claims in the private sector, boosts the wages and reduces profits and investments (Ardagna 2007). The final result is the same – a negative relationship between government spending, specifically its wage component, and short-run GDP growth.

The empirical studies confirm that the presence of non-Keynesian effects depends on a number of factors such as initial conditions and the fiscal impulse's characteristics[2]. The key findings of these studies are summarized bellow.

The *composition of the fiscal impulse* is one of the factors, which determine the outcome of the fiscal intervention. Restrictions on government wages and transfers are more successful in stimulating economic activity in the short-run than a tax increase or a

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[2] This study focuses on the non-Keynesian effects in post-communist economies. Extensive summaries of the relevant research on developed European countries could be found in Hemming et al (2002), Prammer (2004).

capital spending cut. This result is consistent with the abovementioned labor market view.

According to Perotti (1996), the adjustments of social expenditure and wage government consumption are more persistent and are associated with rising rates of growth and investments than the labor-tax increases or the capital spending cuts. The reason is that bigger and persistent fiscal adjustments point to the government's commitment to a longer lasting change of the fiscal regime and, in consequence, are more likely to expand private demand and output.

Bigger and persistent adjustments, inducing a permanent change in the fiscal regime, are more likely to expand private demand and thus output (Giavazzi and Pagano 1995, McDermott and Wescott 1996).

Perotti (1999) finds that the European economies in which fiscal adjustments occur have extremely high *debt-to-GDP levels* or rates of debt accumulation. In such periods, a negative shock to government purchases stimulates consumption and output. Conversely, when the fiscal situation in the country is sound, the traditional Keynesian effects dominate. The share of liquidity constrained consumers in the economy is also important: the higher the share, the lower the probability for a non-Keynesian outcome.

The effect of public outlays on consumption may depend on the initial *government consumption-to-output ratio* (Bertola and Drazen 1993). When that ratio approaches a "trigger" value, households expect a further expenditure cut, designed to ensure the sustainability of public finances. The present value of their net income, and hence consumption, grows. If the cut does not materialize, consumption falls significantly. When government spending continues to rise above the "trigger value",

agents anticipate a tax cut in the near future and boost their consumption. At the moment of fiscal stabilization, government expenditure falls significantly while private consumption is at a high level.

Alesina et al (2002) find a strong negative impact of government expenditure on profit and investments in the private sector. Government wages have the largest negative effect on profit, bigger than that of taxes. The study demonstrates the positive impact of government wage spending and labor taxes on labor costs. This evidence is consistent with the labor market view discussed above.

Also, the authors show that changes in business investments explain to a great extent the expansionary effect of large fiscal stabilizations in developed economies: prior to the expansionary fiscal adjustment, the growth rate of business investments is negative and contributes negatively to the GDP growth, the latter in this case being small. During and after the adjustment, the growth of private investments is positive and significantly contributes to the high GDP growth. This pattern cannot be observed when fiscal consolidations affect output in the Keynesian (negative) manner.

The studies underline the importance of *accompanying policies*. Monetary stabilizations, falls in the real interest rates and currency devaluations play a significant role for the expansionary fiscal consolidations in Denmark (1983-1986) and Ireland (1987-1989) (Giavazzi and Pagano 1990).

On the other hand, McDermott and Wescott (1996) consider the case of an unsuccessful fiscal adjustment in the UK. Despite the consolidation efforts the ratio of public debt to GDP increased by 7 percentage points between 1980 and 1984. This outcome reflected the domestic contractionary monetary policy, which resulted in a sharp

appreciation of the national currency. Also, the consolidation was attempted during a world economic recession and very high interest rates. Third, fiscal policy mix was not favorable: net capital outlays were reduced while social security benefits rose.

It should be noted that other authors express a different view about the role of monetary policy for the appearance of non-Keynesian effects. For example, Ardagna (2004) shows that successful and expansionary fiscal contractions are not the result of expansionary monetary policy or exchange rate devaluations. Hemming et al (2002) point out that alternative monetary regimes have relatively little effect on the size of short-term fiscal multipliers.

By contrast, few studies examine the non-Keynesian effects of fiscal policy in acceding countries (see Table 1).

Purfield (2003) explores large fiscal adjustments in a number of transition economies, including Bulgaria, between 1992 and 2000. The study analyzes the countries' overall primary balances, rather than the cyclically adjusted ones, as a measure of the fiscal stance. The large and expenditure-based fiscal adjustments are more successful in sustainable improvements in the primary balance within two years after the adjustment. The author does not find episodes of expansionary fiscal consolidations in transition economies. Bulgaria is given as an example of successful fiscal contraction in 1994.

Siwinska and Bujak (2003) focus on the consumption effects of fiscal policy for a panel of 14 transition countries between 1990 and 2001 (Bulgaria included). Not cyclically adjusted budget balances of consolidated central governments serve as a measure of the fiscal stance. The consumption reacts in a non-linear fashion to the

discretionary budgetary interventions. The households tend to behave in a Keynesian manner when the level of the fiscal deficit is small (within the limits of the mean value plus one standard deviation, calculated for the time period). In "bad times", fiscal expansions stimulate private consumption but on a much smaller degree than in "good times". In general, the non-Keynesian response of consumption during the periods of fiscal stress does not outweigh the Keynesian effects, observed during normal times. The authors explain this outcome by the bigger portion of liquidity-constrained and myopic consumers in transition countries.

Von Hagen (2004) surveys the fiscal episodes in the New Member States between 1999 and 2002 on the basis of the cyclically adjusted general government budget deficits. The author uses "the growth-accounting approach" to calculate the discretionary fiscal impulse. The budget deficit is corrected with the rate of real GDP growth in order to isolate the exogenous from endogenous changes in the fiscal stance. This method for cyclical adjustment is used by Afonso et al (2005) as well as Rzonca and Cizkowicz (2006). Large expenditure-based budgetary expansions dominate; only five large fiscal consolidations have been observed, all of them in the Baltic States.

Afonso et al (2005) study fiscal consolidations in the eight New Member States, Bulgaria and Romania over the period 1991-2003. They focus on the substantial improvements in the structural budget balances. A Logit model helps to assess the determinants of the successful fiscal adjustments. The results confirm that, similar to the advanced European economies, the expenditure-based adjustments tend to be more successful in reducing the general government budget deficits for two consecutive years than the revenue based ones. Three examples of successful fiscal contractions are given

for Bulgaria (1992, 1994 and 1997) and one example of an unsuccessful consolidation (1998). According to the authors, expenditure-based consolidations prevail due to the limited administrative capacity of post-communist countries to increase tax revenues and, in comparison with advanced EU economies, start out from higher overall deficit levels when fiscal stabilization seems "inevitable".

On the basis of data for the New Member States from CEE (NMS) between 1993 and 2002, Rzonca and Cizkowicz (2005) find evidence that fiscal adjustments accelerate short-run output growth. The study identifies only the export channel as a source of non-Keynesian effects. The descriptive analysis shows that an important determinant of these effects is the size of the fiscal impulse. Large fiscal consolidations are almost always accompanied by higher rates of output growth. In support of the relevant studies mentioned above, the study confirms that fiscal consolidations in the NMS are achieved mainly through expenditure cuts.

This study concentrates on factors, which determine the presence of non-Keynesian response of output to a discretionary fiscal shock in Bulgaria. It focuses on the effects of government expenditure specifically while the earlier studies did not differentiate the macroeconomic impact of the budgetary categories. Also, the discretionary expenditure changes isolated by the HP filter serve as a measure of the fiscal stance.

Table 1. Non-Keynesian effects of fiscal policy in post-communist economics: a review of empirical studies.

Author	Purpose of the study	Method of the study	Sample	Measure of fiscal stance(% GDP)	Main conclusions
Purfield (2003)	Determinants of successful fiscal consolidations	Probit model Descriptive analysis	Twenty-five transition economies, (1992-2000)	General government primary budget balance	Larger expenditure-based fiscal adjustments are more successful in budget deficit reduction in two years after the consolidation.
Siwinska and Bujak (2003)	Fiscal policy's impact on household consumption	Time series regression	Fifteen transition economies, (1990-2001)	Consolidated government budget balance	Non-linear behavior of household consumption; in times of fiscal stress (high levels of fiscal deficit) fiscal expansions stimulate private consumption but in a lower degree than in good fiscal times (low fiscal deficits); in general, Keynesian response prevails.
Von Hagen (2004)	Composition of fiscal interventions	Descriptive analysis	NMS from CEE, (1999-2002)	Cyclically adjusted budget balance (growth – accounting approach)	Fiscal expansions prevail over fiscal consolidations; in most cases large fiscal expansions were expenditure dominated; all "good quality" fiscal consolidations were in the Baltic states .
Afonso et all (2005)	Determinants of successful fiscal consolidations	Logit model Descriptive analysis	NMS, (1991-2003)	Cyclically adjusted primary budget balance (growth-accounting approach)	Fiscal consolidations based on expenditure cuts are more successful than revenue increases in reducing budget deficit within two years after the adjustment; fiscal adjustments based on reduction of budget spending prevail.
Rzonca, A., P. Cizkowicz (2006)	Fiscal policy's impact on GDP growth	Time-series regressions Descriptive analysis	NMS from CEE (1993-2002).	Cyclically adjusted primary budget balance (growth-accounting approach)	Discretionary fiscal adjustments accelerate real GDP growth in the short-run; in most cases, strong fiscal consolidations have an expansionary effect on output; fiscal consolidations are based primarily on the expenditure cuts, specifically cuts in wage outlays.

The methodology of the study: constructing the discretionary fiscal impulse

The HP filter[3] is used for the cyclical adjustment of budgetary categories - primary government expenditure and tax revenues. This method has been chosen among a number of alternatives[4] because of its popularity, transparency and suitability for international comparisons.

Quarterly data for the primary government spending and for the total tax revenue of the general government budget and for GDP over the period 1998-2004 form the basis of the analysis. The data are first deflated by the GDP deflator (1995=100) and seasonally adjusted. The primary government spending includes wages and social insurance payments, subsidies, expenditure on goods and services, social expenditure and capital outlays[5].

To isolate the endogenous changes from the exogenous (discretionary) movements of the budgetary categories the HP filter with λ=480[6] is applied to the

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[3] Hodrick and Prescott (1997).

[4] Another popular method for cyclical adjustment is the elasticity method, used by international organizations (Giorno et al 1995, Rőger and Ongena 1998). Blanchard (1993) proposes to estimate the discretionary shock as the difference between the actual policy and the policy that would prevail under the previous year's growth rate. See also, Alesina and Ardagna (1998), Alesina and Perotti (1996), Jonnson (2004).

[5] Source: Ministry of Finance, www.minfin.government.bg

[6] The coefficient λ=480 for quarterly data corresponds to a value λ=30 for annual data according to the formula $\lambda_{annual} = \lambda_{quarterly} * (0.25)^2$ (Ravn and Uhlig 2002). The value of 30 is used in the studies of the ECB (Bouthevillain et al 2001).The lower the value of the weighting parameter the better the discretionary policy shocks are captured.

seasonally adjusted quarterly series for the total primary government spending (G) and the total tax revenue (T). The structural (cyclically adjusted) series are expressed as a share of real GDP and denoted by g and t respectively.

The discretionary expenditure impulse GI_t is defined as the difference between the cyclically adjusted values of primary government outlays in a given period and in a previous period:

$$GI_t = g_t - g_{t-1}, = \Delta g \quad (1),$$

where g is defined as above. A positive/negative value of GI indicates an expansionary/contractionary fiscal impulse.

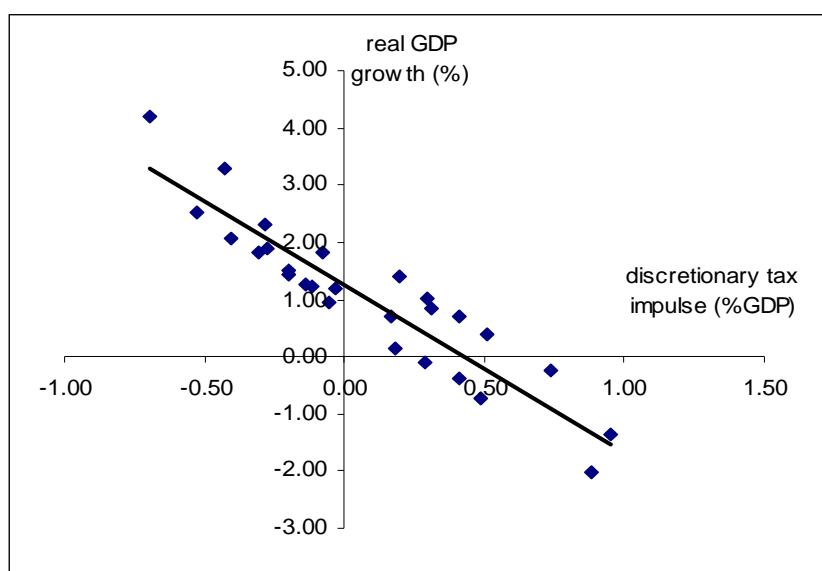*Figure 1. Discretionary expenditure policy and real GDP growth*
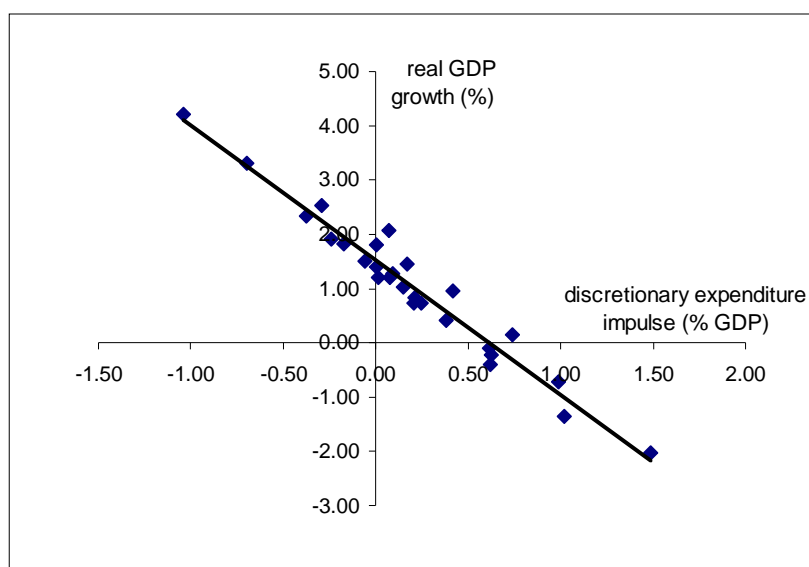
Source: author's calculations on the basis of data from Ministry of Finance and
National Statistical Institute.

Figure 1 gives evidence of a negative relationship between the discretionary expenditure changes and the real GDP growth on impact, which implies a presence of

non-Keynesian influence of government expenditure. In addition, the correlation between GI and real GDP growth is strong and negative (correlation coefficient of -0.91). As can be seen from the graph, the restrictive fiscal impulse is always accompanied by a positive rate of growth. Such a negative relationship is not valid for all cases of a positive spending shock, but it is clear that larger fiscal expansions are accompanied by negative rates of GDP growth.
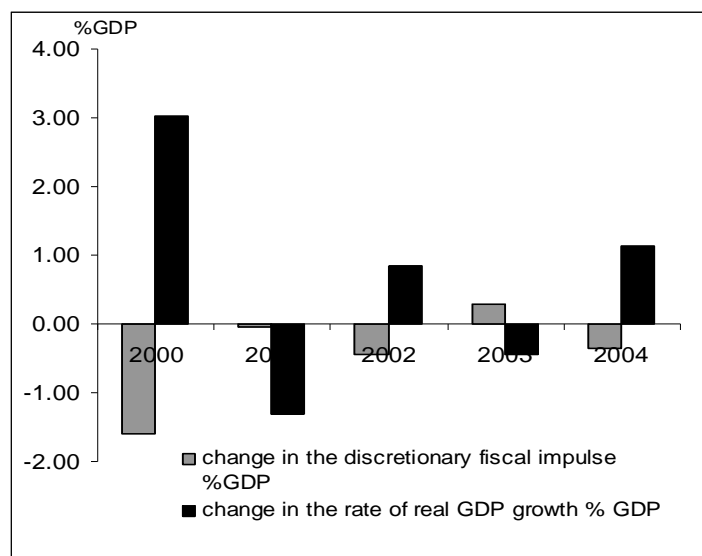
Figure 2. Discretionary tax policy and real GDP growth

Source: author's calculations on the basis of data from Ministry of Finance and National Statistical Institute.

The descriptive analysis also demonstrates a Keynesian behavior of tax policy (figure 2). The lower average tax burden in the economy leads to positive rates of output growth. So, the fiscal categories influence economic activity in a non-linear fashion: while a typical Keynesian result prevails for the tax payments, a non-Keynesian outcome has been observed for the government outlays.

Figure 3. Changes in the expenditure impulse and changes in the rate of real GDP growth

Source: author's calculations on the basis of data from Ministry of finance and National Statistical Institute.

The negative relationship between the annual changes in the discretionary fiscal impulse (changes in the rate of growth of cyclically adjusted public spending) and the changes in the rate of real year-to-year GDP growth confirms the existence of non-Keynesian effects in Bulgaria (fig. 3). When government spending was growing at slower pace, the short-run output growth accelerated. This pattern is clearly seen in 2000, 2002 and 2004. In 2003, the faster increase in government spending was accompanied by a lower rate of real GDP growth than in the previous year.

However, the descriptive analysis demonstrates that the non-Keynesian result has not been observed in all times; in several cases the discretionary expansions have been accompanied by a positive rate of GDP growth. Also, in 2001 the lower share of

government purchases in output did not lead to a faster real economic growth (fig. 3).
Next, the study should answer the question: What are the determinants of non-Keynesian
effects of government expenditure on aggregate output in Bulgaria?.

Determinants of non-Keynesian effects of government expenditure: a Logit model

An appropriate instrument for evaluating the determinants of non-Keynesian
effects is the Logit regression. The Logit model is of the following form:

$$P = E(y = 1|Z) = \frac{e^z}{1 + e^z}$$

y is a binary variable reflecting the influence of the discretionary expenditure
impulse on output. It takes the following values:

y = 1 in the case of a non-Keynesian influence of government expenditure on
output (the discretionary fiscal impulse (Δg) and the real GDP growth (y_{growth}) are
moving inversely): an economic downturn/upturn is observed when the cyclically
adjusted budgetary outlays increase/decrease;

y = 0 in the case of a traditional Keynesian impact of government spending on
short-run economic activity (Δg and y_{growth} are moving in the same direction): the positive
interventions on government spending are accompanied by a positive rate of real GDP
growth.

E (y=1 │Z) is the conditional probability for a presence of a non-Keynesian effect
of the discretionary fiscal impulse, given z, where

$$Z = a + b\,x + e$$

The choice of the factor variables (x) depends on the relevant theoretical and empirical findings as well as on the descriptive analysis above. According to the previous studies, the main determinants of the non-Keynesian effects are the size of the fiscal impulse and the level of ratio government debt/GDP. Also, as was pointed out, fiscal restrictions are more likely than fiscal expansions to demonstrate a non-Keynesian impact on output. Each of these factors is tested as a possible determinant of the non-Keynesian effects through a Logit model.

In light of this, the independent variables (x) are respectively:

▪ TYPEIMPU, denoting the type of the discretionary impulse

$$TYPEIMPU = \begin{cases} 1 \text{ for an expansionary fiscal impulse } (\Delta g > 0) \\ 0 \text{ for a restrictive fiscal impulse } (\Delta g < 0) \end{cases}$$

The inclusion of this variable in the model would show whether the non-Keynesian effects of government expenditure on output would prevail in the case of a tight expenditure policy or in the case of an accommodating expenditure policy. Most of the studies explore the output effects of fiscal consolidations.

▪ SIZEIMPU, presenting the size of the discretionary fiscal impulse (Δg)

$$SIZEIMPU = \begin{cases} 1 \text{ for significant expenditure impulses} \\ 0 \text{ for neutral (insignificant) expenditure impulses} \end{cases}$$

The fiscal intervention is defined as "significant" if the discretionary expenditure impulse (GI= Δg) in a given period lies outside the interval of the mean value (μ_g) plus/minus one half standard deviation (σ_g). Otherwise, the fiscal intervention is insignificant and is defined as "neutral".

Table 2 presents the values of the binary variable SIZEIMPU according to the size of the expenditure impulse (GI); the frequency distribution is displayed on figure 4.

Table 2. Values of SIZEIMPU

Size of the discretionary fiscal impulse	*Type of the discretionary fiscal impulse*	*Value of SIZEIMPU*
$-\infty < \Delta g < -0.07$ $-\infty < \Delta g < \mu_g - \frac{1}{2}\sigma_g$	Significant (Restrictive)	1
$-0.07 < \Delta g < 0$ $\mu_g - \frac{1}{2}\sigma_g < \Delta g < 0$	Neutral	0
$0 < \Delta g < 0.47$ $0 < \Delta g < \mu_g + \frac{1}{2}\sigma_g$	Neutral	0
$0.47 < \Delta g < \infty$ $\mu_g + \frac{1}{2}\sigma_g < \Delta g < \infty$	Significant (Expansionary)	1

μ_g is the sample average of FI (Δg), σ_g is the standard deviation. The discretionary expenditure impulse is regarded as neutral (SIZEIMPU=0) if its value is between ($\mu_g - \frac{1}{2}\sigma_g$) and ($\mu_g + \frac{1}{2}\sigma_g$). The fiscal impulse is defined as significant (SIZEIMPU=1) if it lies outside the interval ($\mu_g - \frac{1}{2}\sigma_g$; $\mu_g + \frac{1}{2}\sigma_g$).

Figure 4. Frequency distribution of the discretionary expenditure impulse (Δg)

Change in the cyclically adjusted government spending

(discretionary fiscal impulse % GDP)
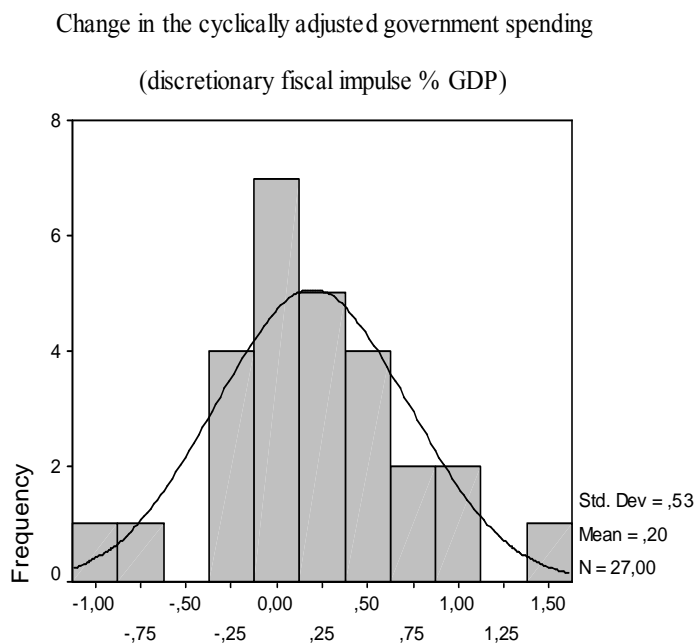
The discretionary expenditure impulse (GI) is defined as expansionary if its value is greater than 0.47% of GDP (0.47 = μ_g + ½ σ_g). The expenditure intervention is restrictive if GI is negative and smaller than -0.07% of GDP (0.07 = μ_g - ½ σ_g). If the value of the fiscal impulse is between -0.07 and 0.47, the fiscal stance is defined as neutral.

Respectively, SIZEIMPU is 0 when $-0.07 < \Delta g < 0.47$, i.e. when the primary government spending has changed between -0.07% and 0.5% of GDP. If the fiscal intervention is outside these limits, it is regarded as significant and SIZEIMPU equals 1. In this way the hypothesis that the size of the discretionary impulse is an important factor for the appearance of the non-Keynesian effects would be verified. The relevant literature concludes that the larger the fiscal impulse, the greater the probability for the non-Keynesian outcome.

▪   The GOVDEBT variable reflects the role of the initial conditions, specifically the level of government debt. According to the theoretical explanations, a non-Keynesian result is more probable when the debt-to-GDP ratio is high. In such times (times of "fiscal stress"), economic agents appreciate the authorities' efforts to improve the sustainability of the public finances through a fiscal consolidation, which stimulates private demand and output. GOVDEBT is a nominal variable equal to the government debt/GDP ratio.

▪   The next exogenous variable SIZET included in the model reflects the size of the discretionary tax changes. It is introduced in order to test the relationship between the tax policy and the non-Keynesian response of output to the expenditure policy. SIZET is a binary variable, similar in nature and definition to the variable SIZEIMPU. Its value is based on the value of the discretionary tax revenue impulse (TI_t) defined as the difference between the cyclically adjusted tax revenue in a given period and in a previous period (see, expression (1)).

$$TI_t = t_t - t_{t-1}, = \Delta t \qquad (2),$$

where t is the HP filtered tax revenue expressed as a share of GDP. SIZET is equal to 1 when Δt lies outside the interval of the mean value (μ_t) and one half standard deviation (σ_t).

$$SIZET = \begin{cases} 0, \text{ if } -0.14 < \Delta t < 0.30 \\ 1, \text{ otherwise} \end{cases}$$

A positive value for SIZET would mean that the non-Keynesian influence of government outlays on output is more probable in the case of higher discretionary tax changes.

The results of regression analysis are presented in Table 3.

Table 3. Determinants of non-Keynesian effects: econometric results

	SIZEIMPU	TYPEIMPU	SIZET	GOVDEBT
b	5.05	10.05	1.49	-0.03
	(1.47)*	(37.66)	(0.85)	(0.03)
Wald statistics	11.80	0.07	3.07	1.06
p-value for b	0.00	0.79	0.08	0.30
Exp.(b)	155.96	23156	4.44	0.96
pseudo R^2	0.768	0.51	0.16	0.05

* st. error of the estimate

As can be seen, two of the exogenous variables have statistically significant regression coefficients: SIZEIMPU and SIZET. The type of the discretionary impulse (TYPEIMPU) is not among factors influencing the appearance of the non-Keynesian effects, since the last are observed during both fiscal expansions and fiscal contractions. In addition, the level of government debt does not determine the non-Keynesian behavior of output. Such a conclusion is not unreasonable in the light of the fact that non-Keynesian effects in the Bulgarian economy appear as a result of budget consolidations as well as budgetary expansions.

The size of the fiscal interventions is a statistically significant determinant of the non-Keynesian effects. Similar to the results of the relevant studies the larger the changes in the cyclically adjusted expenditure, the higher the probability for non-Keynesian effects.

If the value of the discretionary expenditure impulse is outside the limits of the mean value plus/minus one half standard deviation, the probability for a non-Keynesian

outcome is approximately 0.9 (fig.5). By contrast, small changes in the expenditure policy result in traditional Keynesian behavior of aggregate activity in the short run. This implies that larger expenditure cuts could more successfully stimulate the aggregate activity in the Bulgarian economy.

The regression coefficient for the variable SIZET is also statistically significant. If the variable SIZET lies outside the interval $(\mu_t - \frac{1}{2}*\sigma_t; \mu_t + \frac{1}{2}*\sigma_t)$, the probability of a non-Keynesian response is near 0.6.

Figure 5. Probability for non-Keynesian effects of government expenditure
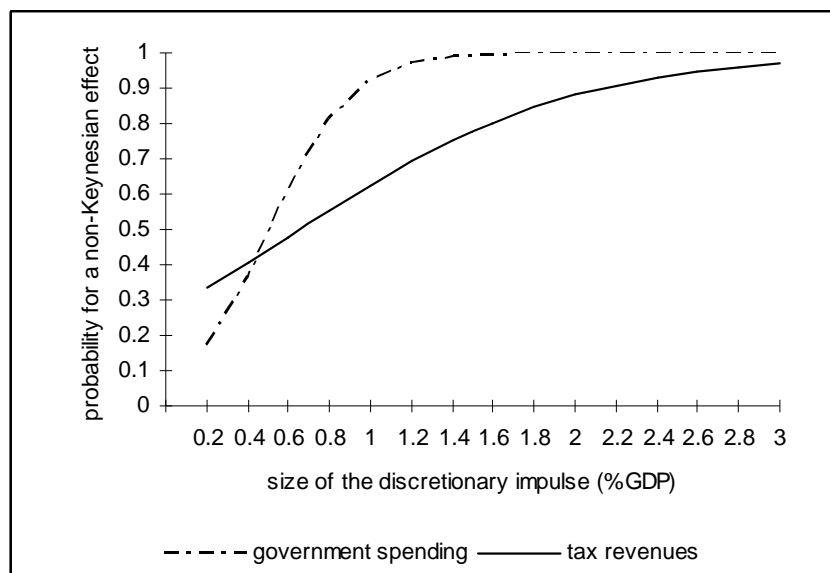
Figure 5 plots the probability for a non-Keynesian response of output to the discretionary expenditure shock as a function of the size of the expenditure impulse as well as of the size of the tax revenue impulse in the same period. It implies that the probability for a non-Keynesian result is higher when both the size of the expenditure intervention and the size of the tax intervention are higher.

Larger increases in the tax revenue-GDP ratios have been accompanied by non-Keynesian effects of budgetary purchases on output. This outcome is due to the fact that under the Currency Board Arrangement, introduced on 1st July 1997, the Bulgarian authorities keep a budget close to balance or in surplus. Both spending and taxes are moving in an upward direction: in order to keep the government's budget constraint, higher spending requires a higher tax burden.

The size of government in Bulgaria, expressed by the average of government spending-to-GDP ratio and revenue-to-GDP ratio, is continuously growing during the investigated period. In 2004, it is above the NMS8 average and equals to 41% of GDP, while NMS8 average is 40.2%[7]. In addition, only Slovenia and Hungary have a higher revenue-to-GDP ratio. At the same time, Bulgaria has the lowest GDP per capita, far below the NMS8 average (30.6 for Bulgaria and 56.5 for NMS8, EU25=100). The two countries with a similar monetary regime – Estonia and Lithuania – have a smaller government's size: 36.5% and 32.5% of GDP respectively. Between 1998 and 2005, primary government spending in Bulgaria has increased from 32.1% to 38.1% of GDP. Tax revenue accounted for 30.9% of GDP in 1998 and 34.5% of GDP in 2004, while for

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[7] Data are taken from the EUROSTAT database and the Bulgarian Ministry of Finance. NMS8 include Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Slovakia and Slovenia.

the same period total revenue was growing from 38% of GDP to 42.9% of GDP. These figures show that the positive budget balance in the Bulgarian economy under the Currency Board Arrangement is a result of a restrictive tax policy rather than of an expenditure consolidation.

The results imply that the balanced-budget policy in countries with a large public sector could have a negative impact on macroeconomic activity. So, the imposition of fiscal rules on the overall budget balance only is not enough with a view of accelerating growth prospects. According to the Stability and Growth Pact, the Eurozone countries should keep a budget balance-to-GDP ratio below 3% and a debt-to-GDP ratio below 60%. The Pact does not specify rules about the level of current government spending, public investment or tax burden. It is important to evaluate how the country meets the budget balance, by raising taxes and spending or by lowering both, because the expenditure expansion accompanied by tight tax policy is likely to impede the real short-run growth.

The study could not unambiguously identify the channels through which non-Keynesian effects of government purchases operate. The results show the importance of the net export channel. During the whole period under observation except 2002 both the share of government purchases in GDP and the share of import in GDP were growing. The correlation between changes in the cyclically adjusted government spending-GDP ratio and changes in the net export-GDP ratio is large and negative (-0.84). Due to the Currency Board Arrangement, the cumulative inflation in the medium run leads to a real exchange rate appreciation thus making imported goods relatively cheaper. In this case, it

is reasonable to expect that higher government purchases, especially government consumption spending, will stimulate import and will lead to a lower real GDP growth.

The descriptive analysis does not give evidence for the existence of either a consumption channel or an investment channel. Expenditure impulse is positively correlated with both changes in the private consumption-to-GDP ratio (0.7) and changes in the business investments-to-GDP ratio (0.4).

Conclusion

This study illuminates the macroeconomic effects of fiscal policy in Bulgaria during the pre-accession period. The descriptive analysis shows a negative relationship between the discretionary expenditure interventions and short-run output growth. The tax policy affects output in the traditional Keynesian manner.

The size of the discretionary impulse is the main determinant of the non-Keynesian effects of government outlays: the stronger fiscal expansions/contractions are more likely to decelerate/accelerate GDP growth. This result supports the conclusions of relevant research on both advanced and post-communist economies.

The study emphasizes on the relationship between the tax policy conducted by the authorities and the probability for the appearance of non-Keynesian effects of public spending. The episodes of stronger discretionary tax changes have been characterized by non-Keynesian effects of budgetary purchases on output. Thus, the balanced budget achieved by a growing share of government spending and revenue in GDP impedes the year-to-year real economic growth.

What are the practical implications of the above results for Bulgaria's fiscal policy once the country joins the EMU? According to the Stability and Growth Pact, the country has to keep the 3% deficit restriction and a budget "close to balance or in surplus" in the medium run. Due to the Currency Board Arrangement, introduced in 1997, Bulgaria completely satisfies the criteria for the general government budget deficit as well as the debt-to-GDP ratio, imposed by the SGP[8]. This is a good starting position few years before entering the EMU. However, the government's share in the economy is among the highest ones in CEEC. There is room for expenditure restrictions and a lower tax burden with a view to accelerating growth prospects. This should be accompanied by a reform in the public sector, specifically education, health care, public administration.

The study suggests that although the balanced budget ensures a sustainability of the public finances, it could not guarantee a stimulating effect on output - the government size itself is a very important factor for the economic growth as well. So, the imposition of restrictions on the overall budget balance and the level of government debt alone is not enough; there should be regulations on the budgetary categories themselves. The SGP does not specify such rules. It does not assess how the country meets the balanced-budget criteria – by raising taxes and spending or by lowering both.

The larger discretionary changes in the government spending/GDP ratios are more likely to lead to a non-Keynesian response of output. In light of this, following credible fiscal rules would be better than conducting discretionary policy actions in order to foster economic growth. One appropriate rule-based approach would be to keep the annual real

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[8] Since 2002 the government debt has been constrained below 60% of GDP while the budgetary result has remained within the 3% reference value.

growth of cyclically adjusted current spending under the rate of real GDP growth. This means that their share in GDP would remain relatively stable thus allowing the automatic stabilizers to operate freely as well as to counteract the negative shocks to the economy.

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