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Abstract

We identify fiscal impulses in the EU New Member States using four different methods and apply econometric panel data techniques to determine what is the response of the output and its components to those impulses. We also directly test the effects of fiscal impulses on labour costs and housholds' expectations. The results confirm that the composition of impulses matters for output and its components' response. Notably, we find evidence that investment and export growth accelerates after fiscal adjustment and decelerates after fiscal stimulus when the impulses are expenditure-based. In turn, private consumption seems not to respond to fiscal impulses regardless of their size. The analysis confirms that expenditure-based fiscal adjustments enhance wage moderation and thereby competitiveness of domestic enterprises, while expenditure-based fiscal stimuli weaken it. By contrast, we do not find evidence that fiscal impulses have an effect on households' confidence.

JEL classification: C23, D22, D81, E23, E32, E44, E62

Keywords: fiscal consolidation, non-Keynesian effects, New Member States, panel data

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1 Introduction

Since the seminal paper by Giavazzi and Pagano (1990) there has been an ongoing argument in the economic profession about the consequences of fiscal impulses.[1] Not only the strength but also the sign of the short-term response of output to fiscal impulses are subjects of debate. An important controversy concerns the issue of whether and by which conditions the so-called 'non-Keynesian' effects of fiscal policy emerge. The outburst of the global financial crisis and subsequent fiscal crises in some advanced economies have intensified that debate.

This article contributes to the discussion by analyzing the macroeconomic consequences of fiscal impulses using panel data for the EU New Member States (NMS) from 1995-2011. The main research question concerns the preconditions for expansionary fiscal adjustments and contracionary fiscal stimuli which we call non-standard effects of fiscal impulses.[2] We do resign from calling those effects 'non-Keynesian' because we consider the conventional division of the effects of fiscal impulses into Keynesian and non-Keynesian to be rather imprecise. Even according to the simplest textbook Keynesian model (that is, the Samuelson model), fiscal adjustment may boost aggregate demand and fiscal stimulus may dampen it when provided with the appropriate impulse composition.

Our motivation to focus on the NMS was twofold. Firstly, the European Union membership and the perspective of joining the euro-area imposed more discipline on fiscal policy in those countries. Most of them have also made large efforts to consolidate their public finances after the outburst of the global financial crisis. Hence, the period we study provides us with a sufficient number of fiscal impulse cases of various composition and size. However, there is still relatively little research on the effects of fiscal impulses in those countries. Secondly, despite large fiscal adjustments undertaken after the outburst of global financial crises, in most NMS fiscal the deficits are still higher than in the pre-crisis period. Thus, the question of which fiscal adjustments may be least detrimental to the economic performance in the short term is of great practical importance.

This study makes several contributions to the existing literature.

The first is the approach to solve the problem of endogeneity between growth and fiscal impulses, which is a key point of any empirical work on the topic analyzed in this article. It is clear that, while changes in fiscal balance may affect GDP growth, economic conditions are also important determinants of both government spending and revenues. Having that in mind, one should look for a proxy for a fiscal stance that is exogenous to GDP growth. We have counted more than six different approaches widely used in the literature to cope with this problem. The results often differ substantially depending on the particular method.[3] As opposed to the majority of existing studies we do not use a single method to identify fiscal impulses but apply four different methods so as to test the robustness of the obtained results. Moreover, to our best knowledge this is the first article on the macroeconomic effects of fiscal impulses which use the underlying fiscal balance (UB) as one of the methods. This is also the first attempt to apply the 'action-based' method proposed by the IMF (2012) to the NMS.

Second, we do study the effects of fiscal impulses while other studies usually focus either on fis-

[1] We define fiscal impulse as a discretionary change in the fiscal balance. Fiscal adjustment is a discretionary improvement of that balance, while fiscal stimulus consists of its discretionary deterioration.

[2] Fiscal adjustment is expansionary if it causes an increase in aggregate demand and output already in the short term. Fiscal stimulus is contractionary if it leads to a fall in aggregate demand and output in such a horizon.

[3] Yet researchers come up with different and often contradictory results even when using the same methods for identification of fiscal impulses. In searching for an explanation of those differences, one may indicate different datasets studied, different methods of analysis applied (descriptive statistics versus econometric studies or DSGE models) or, in the case of econometric studies, a different set of control variables.

cal adjustments (most often) or on fiscal stimuli (less frequently). Analyzing both types of fiscal impulses simultaneously raises the number of episodes studied and thereby improves the accuracy of the estimates obtained. At the same time such an approach allows one to draw more general conclusions about the role of the so-called ' fiscal space' to stabilize the economy.
Third, the response of the output to fiscal impulses is only a starting point in our analysis. Next, we analyse the response of various output components. Most studies do not undertake that step, which we consider helpful in evaluating various channels indicated as leading to a possible output expansion after fiscal adjustment or to an output contraction after fiscal stimulus. Yet, as distinct from almost all other studies, we go one step further and directly investigate the cost channel (i.e. the effect of fiscal impulses on the labor costs share in GDP) and the expectations channel (i.e. the reaction of consumer expectations to the fiscal impulses).
Fourth, we analyze the NMS whose experience is still under-researched whereas most of the existing papers focus on advanced economies.
The main conclusion from the analysis is that the composition of fiscal impulses is crucial for their effects. We find that expenditure-based adjustments (stimuli) are rather neutral to GDP growth but they tend to be associated with investment and export growth acceleration (deceleration), even in the short term. On the contrary, tax-based adjustments (stimuli) seem to hamper (boost) GDP growth. We do not find evidence that fiscal policy affects the behaviour of private consumption. We directly investigate the cost channel and expectations channel and find that the former is of main importance. Adjustments (stimuli) involving expenditure cuts lead to the improvement (deterioration) of country cost competetiveness, which is in line with the discussed results for investment and export reaction to fiscal policy. By contrast we do not find evidence for the expectations channel. The results presented above should be treated with caution because of the estimation problems typical for panel data models, notably in the case of the limited number of available observations. Nevertheless, they constitute further, even if only partial, support for the claim that non-standard effects of fiscal impulses are possible.
The rest of the article is organized accordingly. In the second section, theoretical explanations of expansionary fiscal adjustments and contractionary fiscal stimuli are systematized. In the third section, we review the empirical research on the topic. In the fourth section we discuss the methodological aspects of the research and describe the results of the panel data analysis. Section five summarizes the main conclusions.

2 Complementary theories

Models explaining the non-standard effects of fiscal impulses can be divided into two groups (see, e.g. Alesina, 2010).[4] The first group attributes the source of such effects to the concerns of private agents about the government's solvency. According to the models of the second group, these effects may be caused by supply shocks induced by fiscal impulses.
According to the first type of explanation, both the strength and signs of output reaction to fiscal impulses depend on the households' expectations. In the aftermath of fiscal adjustment, households may reach the conclusion that they have had overly-pessimistic expectations as to the course of public expenditure and cumulative tax burdens. In that case, changes in expectations may result in an increase in private expenditures that more than offset the direct negative impact of fiscal adjustment on output. Output will grow, if, in the opinion of households, the adjustment considerably

[4]One may find a more detailed survey of the theory of the effects of fiscal impulses in Briotti (2005).

raises the cumulative flow of disposable income in their horizon of utility maximization relative to their previous expectations.

Hence, fiscal adjustment is more likely to be expansionary when public debt is high and growing. In such circumstances households expect to be soon burdened with the repayment of accumulated debt (see, e.g. Sutherland, 1995). Besides, when public debt is high and growing, a rise in taxation to a level causing serious distortions is more likely (see, e.g. Blanchard, 1990). A sufficiently large fiscal adjustment would dispel both of these concerns. Conversely, an increase in fiscal deficit hastens the moment when fiscal policy must be changed by accelerating the pace at which public debt grows and thus strengthening the pessimistic expectations of households.

The influence of fiscal policy on aggregate demand may also depend on the level of public expenditure to output ratio. If that ratio is low, then the increase in public expenditure is - to a considerable degree - offset by the decrease of private consumption. Households are aware that the government is unlikely to cut public expenditure until its financing becomes a problem; thus, they consider the increase to be permanent. Each subsequent increase in government spending leads to an ever weaker decrease of private consumption and, in effect, a stronger increase in aggregate demand. This is due to the fact that the higher the level of current expenditure, the greater the proportion of households considering the increase of public expenditure as temporary. If public expenditure exceeds a certain threshold - and despite this is not reduced - households cease to believe in the temporary nature of its previous increase. As the value of the cumulative tax burden expected by households goes up sharply, households considerably reduce their consumption. In effect, the increase of public expenditure is associated with a decrease of aggregate demand (see, e.g. Bertola and Drazen, 1993). Thus, the failure to reduce the budget deficit may result in a sharp fall in private consumption, leading to a decrease in aggregate demand.

According to the first type of explanation, fiscal impulses may also exert a non-standard impact on output due to their influence on interest rates and thus, on the interest rate-sensitive private expenditure - that influence being stronger than predicted in the standard Keynesian approach (with regard to the latter see, e.g. Hicks, 1937). With public debt, there is always a risk that the government will attempt to decrease its real value with higher inflation or that the government will become insolvent or illiquid. That risk is reflected in the interest rate premium. When the state of public finances raises households' concerns, fiscal adjustment by the substantial decrease of the previously high currency and country risk premium may crowd in private expenditure much more strongly than in 'normal' times (see, e.g. Miller, Skidelsky and Weller, 1990, or Costa Carvalho, 2009 who analyzes that channel in the DSGE framework). And the other way round, fiscal stimulus in such conditions may very strongly crowd private expenditure out by further fueling the risk premium.

Let us now turn to the second type of explanation. Fiscal impulses may cause supply shocks which lead to changes in output, in particular by the impact on real wages. That kind of supply shock spills over into the economy more quickly than other kinds of supply shock as it is more easily recognized by economic agents.

The sign of shock depends on the composition of fiscal impulse. The deficit can be reduced either by cuts in spending or through tax increases. Similarly, fiscal stimulus can consist in expenditure increases or in tax reduction. Curbing expenditures, particularly on wages and salaries, or reducing taxes ease the wage pressure in the economy while larger expenditures or higher taxes boost the pressure. Wage moderation increases the price competitiveness of businesses in the international market. The more open the economy, the more important the wage dynamics for the economic performance of the country in question. Strengthened wage discipline may also raise enterprises'

profits, which affect both their capacity and propensity to invest.[5] Wage hikes due to higher wages in the public sector or tax increases has precisely the opposite effect (see, e.g., Alesina et al, 1999 or Lane and Perotti, 2003).
To sum up: according to the first explanation, fiscal adjustment should be expansionary only if the government faces the spectre of fiscal crisis and the adjustment is strong enough to stop the growth of public debt. If, on the other hand, public debt growth is accelerated by fiscal stimulus, it may prove to be contractionary due to a fear of the fiscal crises that it increases. In the second explanation, the effects of fiscal impulse depend on its composition rather than its size or scale of initial fiscal imbalances. However, it should be pointed out that these explanations are not mutually exclusive - various mechanisms seem to be independent of each other. In that sense, contrary to what is sometimes stated in the literature (see, e.g. Giavazzi, Jappelli, and Pagano, 2000), different views are not competing, but rather complementary.

3 Previous empirical studies

The experience of Denmark in 1983-1986 and Ireland in 1987-1989 triggered numerous empirical research on the non-standard effects of fiscal impulses. The experience of these two countries was thoroughly analysed in the seminal paper by Giavazzi and Pagano (1990). Many more episodes of expansionary fiscal adjustment or contractionary fiscal stimulus have since been identified and discussed. As the next step, an analysis of the experiences of a wide group of countries has been undertaken. At first, this analysis came down to quoting descriptive models which focused on the issue of the persistence of fiscal adjustments (see, e.g. McDermott and Wescott, 1996). Gradually, as more emphasis was put on estimating private consumption or investment equations, the researchers were able to evaluate various channels that make fiscal adjustments expansionary or fiscal stimuli contractionary. That evaluation started with estimations of single equations, constructed on an ad hoc basis (see, e.g. Giavazzi, Jappelli and Pagano, 1999). Then the multi-equation approach, in the form of the structural VAR framework, also began to be applied (among others in Perotti, 2002). The global financial crisis and subsequent fiscal crises in some advanced economies triggered a new wave of research on the effects of fiscal impulses. Notably, a DSGE framework has been extensively used to show that fiscal multipliers exceeding one are possible when the central bank is constrained by the zero lower bound (see, e.g. Christiano, Eichenbaum and Rebelo, 2011; Eggertsson, 2009 or 2011, or Woodford, 2011). Yet even with the zero bound on interest rates, fiscal adjustment may be expansionary and fiscal stimulus contractionary; if the fiscal impulse is sufficiently persistent (see, e.g. Woodford, 2011, in particular Figure 3, or Cwik and Wieland, 2011), long-term interest rates depend on the public debt level (see Costa Carvalho, 2009) or the liquidity trap is not caused by a fundamental shock but by households' pessimism (see, e.g. Mertens and Ravn, 2010).
One can draw the following conclusions from empirical studies on the non-standard effects of fiscal impulses:

1. Fiscal adjustments are quite often followed by an acceleration in output growth. Giudice, Turrini and in 't Veld (2003) report that in Europe about half of the adjustments had this feature. This acceleration is driven by both private consumption and investment. The growth rate of the latter increases much more than that of the former (see, e.g. Alesina, Perotti

[5] A fall in real wage dynamics raises (ceteris paribus) capital remuneration but has no impact on the depreciation of capital. Thus, the increase in capital remuneration is tantamount to a rise of the rate of return from an investment.

and Tavares, 1998 or Broadbent and Daly, 2010). The acceleration of investment growth is preceded by an increase in the share of capital remuneration in the output (see e.g. Alesina and Ardagna, 1998).

2. There is evidence suggesting that the change in interest rates is an important factor leading to expansionary fiscal adjustments or contractionary fiscal stimuli. Alesina and Ardagna (2012) show that central banks do lower interest rates in response to those fiscal adjustments which are based on expenditure cuts. In turn, Baldacci and Kumar (2010) confirm that long-term bond yields are to a significant extent determined by changes in the fiscal policy stance. The relation is robust, nonlinear and dependent on the initial conditions (such as the public debt level) or global factors (such as investors' risk aversion or global bond supply). These results are generally consistent with previous works (see, e.g. Engen and Hubbard, 2004 or Laubach, 2009).

3. Not only changes in interest rates matter for the effects of fiscal impulses. There is evidence that supply-side polices, aimed at improving country cost competitiveness, can help mitigate or even eliminate the output fall in response to fiscal adjustments (see, e.g. Perotti, 2011 or Alesina and Ardagna, 2012).

4. Fiscal adjustments are more likely to be expansionary and fiscal stimuli - contractionary in open economies rather than in closed ones, or at least fiscal multipliers are lower in the former than in the latter economies (see, e.g. Hemming, Mahfouz and Schimmelpfennig, 2002 or Ilzetzki, Mendoza, and Végh, 2011).

5. Adjustments are expansionary mainly when the external economic conditions are favorable (see, e.g. McDermott and Wescott, 1996). That does not mean that expansionary fiscal adjustments are epiphenomena (it may suggest, with the two previous conclusions, the importance of the export channel) but calls for a careful control of those conditions. By contrast, an unfavorable domestic economic situation in the period preceding fiscal adjustment does not present an obstacle to the expansionary effect of adjustment (see, e.g. Alesina and Perotti, 1996) and may even favour it (see, e.g. Segura-Ubiergo, Simone and Gupta, 2006). That stands in sharp contrast to the claim, now quite popular (see, e.g. DeLong and Summers, 2012), that when capacity utilization is low, fiscal adjustment has to be strongly contractionary and fiscal stimulus very expansionary. Adjustments started under bleak domestic and external circumstances are more often based on expenditure reduction and more persistent than adjustments occurring in favorable conditions (see, e.g. von Hagen and Strauch, 2001).

6. It follows from most studies that fiscal adjustments are more often expansionary when they are lasting (see, e.g. Alesina and Perotti, 1996) and large (see, e.g. Giavazzi and Pagano, 1996). Some of those studies point out that the non-standard effects of fiscal impulses are more frequent when public debt is high (see, e.g. Bhattacharya, 1999 or Ilzetzki, Mendoza, and Végh, 2011) or fast growing (see, e.g. Giavazzi, Jappelli and Pagano, 2000), rather than low and slowly growing.

7. Fiscal adjustments are more lasting and more often expansionary if they are based on the curtailment of expenditures rather than on tax increases (see, e.g. Alesina, Perotti and Tavares, 1998 or Tsibouris et al., 2006). The difference in the effects of adjustments based on expenditure cuts and tax hikes respectively cannot be explained by different monetary

policies during the two types of fiscal adjustments, although those adjustments are followed by different central bank's reactions (see, e.g. Alesina and Ardagna, 2012 or Alesina, Favero, and Giavazzi, 2012). Some works find evidence in favor of tax increases, but they mainly concern the response of private consumption to adjustment (see, e.g. Giavazzi, Jappelli and Pagano, 1999) or stipulate that this conclusion refers to cases where large adjustments are needed (see, e.g. Baldacci, Gupta, and Mulas-Granados, 2010).

8. The composition of fiscal adjustment is of far greater importance in terms of its consequences than the size of the adjustment. Expansionary adjustments are usually focused on cuts in wages, subsidies or transfers to households (see, e.g. Alesina and Perotti, 1996; von Hagen, Hughes Hallett, and Strauch, 2002 or Alesina and Ardagana, 1998 or 2010). However, as far as only consumption (and thus the expectations channel) is concerned, the size of the adjustment plays a crucial role (see, e.g. Giavazzi et al., 2005).

9. Most empirical studies analyse advanced economies. However, countries in transition seem to be especially prone to experience the non-standard effects of fiscal impulses, in particular because of the high level of uncertainty about their future fiscal position (see, e.g. Mulas-Granados et al. 2002). The countries of this group often experienced a substantial duress at debt levels that would be perceived easily manageable in advanced economies (see, e.g. Reinhart, Rogoff and Savastano, 2003). Several descriptive analyses of fiscal policy in Central European countries confirm that both the composition (see, e.g. Rzońca and Ciżkowicz, 2005 or Horváth et al., 2006) and the size of adjustments (see, e.g. Segura-Ubiergo, Simone and Gupta, 2006 or Neicheva, 2007) matter for output growth. Moreover, expenditure-based adjustments proved to be more successful in debt reduction in those countries than tax-based adjustments (see, e.g. Purfield, 2003) and than in advanced economies (see, e.g. Afonso, Nickel and Rother, 2005).

In closing this section it should be emphasized that none of the aforementioned studies consider the non-standard effects of fiscal impulses to be certain. In the literature, the view still prevails that in response to fiscal adjustment output contraction is more plausible while output expansion is more likely in response to fiscal stimulus. But then that response to fiscal impulses is mostly of a modest scale. Most empirical studies on the effects of fiscal impulses indicate that the tax multiplier hardly exceeds one-half and that of public expenditure hardly exceeds one (see, e.g., Blanchard and Perotti, 2002; Hall, 2009; Barro and Redlick, 2009; Ramey, 2011 or Gechert and Will, 2012).

4 Econometric analysis

In this section we use panel data estimation to verify if fiscal impulses in the NMS from 1995-2010 caused non-standard effects. First, we briefly describe the methods we use to identify fiscal impulses. Next, we present the data, the specification of the equations and estimation techniques used. Lastly, we provide results of the estimation.

4.1 Fiscal impulses

To isolate fiscal impulse changes in the budget balance has to be corrected for effects of cyclical fluctuations in macroeconomic variables. There are several ways of achieving this.

The most popular is the cyclically-adjusted primary balance (CAPB). The CAPB is used as the main indicator of the fiscal policy stance by international institutions such as the OECD or the European Commission. In this article we apply the CAPB with the output gap calculated using the production function approach as it is better anchored in economic theory than an approach based on filters (like Hodrick-Prescott). Nevertheless, this choice reduces the number of observations as output gap data, according to the production function method, are not always available.
The CAPB method, although conceptually simple and giving comparable results across countries, should be used with caution, as noticed by the IMF (2010) and, a few years before, e.g. by Girouard and André (2005). Thus, in this article we also use the underlying fiscal balance (UB), whose concept was developed in Joumard et al. (2008). It is the CAPB corrected for changes in net capital transfers that stands for a proxy of government one-off transfers. Such a correction is easy to apply and ensures consistency in the identification of one-offs across time and countries.[6]
The third method we use in this article is a method based on a simplified growth accounting proposed by von Hagen (2002). This approach (HAGEN) does not require estimates of government spending or tax elasticities and potential GDP. This feature is very important if one analyzes countries that have undergone economic transition and have not completed enough business cycles to provide reliable estimates of those elasticities. However, one has to stress that this method may be oversimplified as it assumes that aggregate government expenditures and revenues react to business cycle fluctuations in the same way across countries.
We also attempt to use a fourth, 'action-based' (AB) method proposed by the IMF (2010).[7] It concentrates on actions (legislation changes) implemented in order to change the fiscal balance regardless of recorded changes in balance. That allows for identifying fiscal impulses ex ante, not ex post, as in the case of other methods. However, the method has at least three serious drawbacks. First, it implicitly assumes that economic agents make decisions based on the government's plans rather than on the observed effects of the actions, although governments tend to withdraw or modify their plans along the budget year. These modifications may be caused not only by the unpredicted economic development (which would lead to bias when using ex post impulse measures) but also by social pressure or erroneus preliminary estimates of the reform's effects. Second, it also ignores that some channels, making the effects of fiscal impulses non-standard, work due to actual rather than announced changes: e.g. labor supply is likely to increase after a reduction in transfers to households rather than after the anouncement of such a reduction. Third, it raises a lot of discretion as it is rare that detailed and coherent data on the planned effects of fiscal actions and policy-makers' intentions behind them are reported on an annual basis. That problem is particularly severe in the case of emerging economies. Due to the absence of appropriate data we are not able to strictly follow the methodology proposed by the IMF. However, in order to account for the IMF critique of standard measures of fiscal impulses, we propose a 'reduced' version of the action-based approach. Instead of identifying the exact size of planned deficit changes related to actions taken by governments we create a variable that takes values in a set $-1; 0; 1$, where -1 stands for fiscal stimulus, 0 means that

[6] Another step to improve CAPB reliability would be to adjust it to balance changes driven by asset prices movements: the effect not considered in CAPB estimates provided by the OECD or the EC (see, e.g. Tagkalakis, 2009). The problem seems to be on the researchers' agenda (see, e.g. Morris and Schuknecht, 2007), and the IMF recently started publishing data on structural fiscal balance, i.e. CAPB adjusted for the impact of asset price movement. Unfortunately, the data for NMS countries is still too scarce to apply the concept of structural fiscal balance in this paper. It is worth noting that even if corrected for one-offs and asset prices changes, the CAPB may fail to provide accurate estimate of fiscal stance in the periods in which values of certain taxes or expenditure elasticities differ from these estimated for 'normal' times.

[7] See also Devries et al. (2011).

no notable action was taken, and 1 accounts for adjustments.[8] In the next step, we compare our reduced AB impulses with the recorded changes in UB to find the episodes in which both methods give the same qualitatative result. Finally, in regression analysis we test if there is a difference in the reaction of macroeconomic variables to changes in the fiscal stance measured by UB depending on their consistency with our reduced AB impulses.[9] If such a difference was found, it would support the claim of the IMF that using an AB approach may lead to different conclusions about the effects of fiscal policy when compared to standard 'mechanical' approaches.

4.2 Data

We use panel data recorded on an annual basis for the EU New Member States (i.e. Bulgaria, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia and Slovenia) from 1995-2011. Relevant data is obtained from a variety of sources. Most of the data, especially national accounts, unemployment rates and fiscal data (including CAPB estimates) are taken from the European Commission's AMECO database. To calculate UB impulses according to the method proposed by Joumard et al. (2008) AMECO data on capital transfers is used. Data concerning consumper prices, labour productivity and share of labour compensation in GDP originate from the Eurostat database. In case of labour share and consumer prices several missing observations were filled with corresponding OECD and WB data. Information on households condifdence indicators were extracted from consumer surveys published by European Commission. A detailed description of each variable used can be found in the appendix. The data do not cover the whole period for all countries, hence the estimated models are based on an unbalanced panel.
In using annual data we follow the example given by Corsetti, Meier and Müller (2012). They argue that fiscal policy response to changes in economic conditions on a quarterly basis is quite rare and even then restricted to tax measures. Indeed, as shown by Born and Müller (2012), the hypothesis that government expenditure does not react to changes in other variables within a year cannot be rejected. However, the main reason why we do not base regressions on quarterly data is the scarcity of such data and its questionable quality for analyzed countries: namely, quarterly estimates of CAPB and UB are not available for them.

4.3 Specification of Equations

In order to validate the theoretical possibility of the occurrence of expansionary fiscal adjustments and contractionary fiscal stimuli we, at first, estimate the effect of fiscal impulses on GDP growth. In our regression specification we include both current and lagged fiscal impulse as suggested by Alesina and Ardagna (2012). Rational for such a lag structure is the focus on the short, rather than the long-term impact of fiscal impulses on output growth.[10] Then we introduce lagged real

[8] In cases where we were able to obtain estimates of the planned budgetary effect of an action, we coded our impulse variable in the following way: 1 (-1) if the adjustment (stimulus) accounted for no less than 0.5% GDP, and 0 in the remaining cases. To arrive with data on the reduced AB impulses we used the information from the OECD, IMF, EC surveys and other available country reports.

[9] In fact our approach to AB impulses allows us to avoid the possible truncation bias present in regressions using original IMF estimates which result from coding all cases of fiscal adjustments and stimuli as 0 (problem noted in Perotti, 2012).

[10] However, one has to stress that the possible output contraction in response to fiscal adjustment on impact and after a 1 period delay should be followed by its expansion, if fiscal deficit is indeed costly in terms of output level (or even its growth) in the steady state (see, e.g. Fischer, 1993; Elmendorf and Mankiw, 1998, or Friedman, 2005). A

GDP growth in order to capture the conventional persistence of this variable caused by the business cycle.[11] We also control the effects of changes in external conditions reflected in the growth rate of the total real GDP in EU27 countries.[12] Lastly, we add the artificial variable *art_exp* distinguishing between impulses relying on tax and government spending changes. The variable *art_exp* is equal to the *impulse* variable if the contribution of government expenditure reduction (increase) to fiscal adjustment (stimulus) is greater than 50 percent and 0 otherwise. Additionally, for models with an impulse identified as changes in UB we added the variable *art_ab_ub* taking the value of the *impulse* when indications of UB and AB impulses are consistent and 0 in the opposite case.[13]
Hence, we estimate the following equation:[14]

$$gdp_{i,t} = \mu + \delta_1\ gdp_{i,t-1} + \rho_1\ gdp\_eu27_{i,t} + \sum_{k=0}^{k=1} \beta_k\ impulse_{i,t-k} + \sum_{k=0}^{k=1} \gamma_k\ art\_exp_{i,t-k} + \alpha_i + \epsilon_{i,t}$$
$$with\ additional\ term\ on\ RHS\ when\ UB\ impulses\ are\ used: \ + \sum_{k=0}^{k=1} \phi_k\ art\_ab\_ub_{i,t-k} \qquad (1)$$

where μ is intercept, *gdp* - real GDP growth, *gdp_eu27* - real total GDP growth in EU27 countries, *impulse* - fiscal impulse (positive values for adjustments, negative for stimuli), *art_exp* - artificial variable that controls for composition of the impulse (spending versus tax based), *art_ab_ub* - artificial variable that accounts for possible differences between UB and AB impulses; variable α represents a time-invariant, country-specific disturbance (individual effect) and ϵ is a random noise. Variables subscripts i and t mean - country number (from 1 to 10) and year (from 1 to 17) respectively. If fiscal adjustments are expansionary and fiscal stimuli contractionary, then in equation 1 at least one of the estimated coefficients β_k should be positive and statistically significant. However, the output response may also depend on the composition of the impulse. This effect should manifest

complete impulse response analysis would have to be carried out to answer the question of when the possible costs of fiscal adjustments are outweighed by the long-term benefits. That question, although very fundamental, is beyond the scope of our article which is restricted to the short term.

[11] Another reason is that lagged variables reduce the potential consequences of spurious regression outcomes as suggested by Hamilton (1994).

[12] In general, one may want also a control for the stance of monetary policy by including a variable corresponding to interest rate changes. However, the presented theory suggests that interest rates changes are one of the potential channels for the occurrence of non-standard effects, so controlling them would not be appropriate here. Still, as a robustness check we estimated our equations explaining the dynamics of GDP and its components with a real short-term (3-month) interest rate added as a regressor. This does not change our basic results, which means that the interest rate channel is not the main force behind the occurrence of expansionary fiscal adjustments and contractionary fiscal stimuli.

[13] To be specific, we assume that AB and UB are mutually consistent in episodes where firstly, both impulses record the fiscal actions of the same sign and the absolute value of UB impulse exceeds 0.5% GDP or secondly, according to the AB approach no fiscal action was taken, while the absolute value of UB impulse is lower or equal to 0.5% GDP.

[14] We realize that the models presented in this subsection may seem oversimplified. However, the short timeframe of the analyzed panel prevents us from using more sophisticated methods such as, for example, panel VAR models or from including a greater range of explanatory variables. Even resorting to quarterly data (that is available for most variables we consider from 1999) would not solve the problem. This would require deseasonalizing the fiscal data which is clearly a difficult task as government revenues q-o-q changes depend not only on economic performance but also on the tax collection legislation. Thus, changes in the share of certain taxes in total revenues, or changes in legislated timing of tax collection, would affect seasonality patterns. These changes have been more frequent in the NMS than in developed countries. Therefore, standard "mechanical" deseasonalizing in the case of the NMS could lead to unsatisfactory results. Existing VAR models estimated on quarterly data for single NMS countries are plagued by a poor quality of estimates (manifesting itself in wide confidence intervals for IRF function) which do not allow one to draw any strong conclusions (see, e.g. Franta, 2012 or Mirdala, 2009).

itself by the sign (and significance) of γ_k parameters. To present the overall two-period impact of an expenditure based impulse, we test linear restriction where $\beta_0 + \beta_1 + \gamma_0 + \gamma_1 = 0$. If the null hypothesis is rejected and the obtained statistic proves positive, the result will be consistent with the theory of expansionary fiscal adjustments and contractionary fiscal stimuli, described in Section 2. Finally, the negative values of ϕ_k would support the claim made by the IMF (2010) that mechanical methods of identyfing impulses (in our case the UB approach) may be biased toward detecting cases of expansionary fiscal adjustments when it is not justified. However, positive estimates of ϕ_k would support the hypothesis that announced adjustments or stimuli are more likely to generate a GDP response in line with the theory of the non-standard effects of fiscal impuses.

As the next step of the analysis we investigate the effect of fiscal impulses on various GDP components. In that part of the analysis we follow the example given by Alesina and Ardagna (2012). Most studies on expansionary fiscal adjustments do not undertake that step, although it is helpful in evaluating various channels which may cause non-standard effects of fiscal impulses. If those studies go beyond the analysis of output response to fiscal impulses, they merely describe the contribution of various GDP components to its growth during adjustment episodes (see, e.g. Giudice, Turrini and in 't Veld, 2003) or focus on explaining the changes of a single component, that is of consumption (see, e.g. Giavazzi, Jappelli and Pagano, 2000 or Bhattacharya and Mukherjee, 2013), investments (see e.g. Alesina et al., 1999) or exports (see, e.g. Devries et al., 2011).

Firstly, we check the existence of the export channel since it gets the strongest support in previous empirical studies, as surveyed in Section 3. If it really does operate, the reduction in fiscal deficit through cuts in expenditures should boost exports more than a reduction obtained by tax increases. The estimated equation has the following form:

$$export_{i,t} = \mu + \lambda_1\ export_{i,t-1} + \delta_1\ gdp_{i,t-1} + \rho_1\ imp\_eu27_{i,t} + \sum_{k=0}^{k=1} \beta_k\ impulse_{i,t-k}$$
$$+ \sum_{k=0}^{k=1} \gamma_k\ art\_exp_{i,t-k} + \alpha_i + \epsilon_{i,t}$$
$$with\ additional\ term\ on\ RHS\ when\ UB\ impulses\ are\ used: + \sum_{k=0}^{k=1} \phi_k\ art\_ab\_ub_{i,t-k} \quad (2)$$

The set of control variables is similar as in GDP growth regressions; however here instead of the GDP growth rate we use the growth rate of imports in EU27 to capture the changes in external economic conditions.[15] If an export channel exists, the sum of *impulse* and *art_exp* parameters (both current and lagged) should be significantly larger than zero.

Secondly, to examine the existence of the private investment channel, we estimate the following

[15]We do not use current GDP growth as a control variable as it could lead to biased estimates because of reverse causality - export is a component of GDP, so acceleration of its growth may translate into the acceleration of GDP growth. For the same reason only lagged GDP growth is used in regressions explaining investment and consumption growth. Moreover, as non-standard effects could operate through the exchange rate channel, we do not control for this variable in our basic setting. Nevertheless, as an exercise we ran regressions of the equation 2 including real exchange rate as a control variable and the obtained results remained in line with the ones presented in the paper.

equation:

$$pinv_{i,t} = \mu + \lambda_1\ pinv_{i,t-1} + \delta_1\ gdp_{i,t-1} + \rho_1\ gdp\_eu27_{i,t} + \sum_{k=0}^{k=1} \beta_k\ impulse_{i,t-k}$$
$$+ \sum_{k=0}^{k=1} \gamma_k\ art\_exp_{i,t-k} + \alpha_i + \epsilon_{i,t}$$
$$with\ additional\ term\ on\ RHS\ when\ UB\ impulses\ are\ used: + \sum_{k=0}^{k=1} \phi_k\ art\_ab\_ub_{i,t-k} \quad (3)$$

where *pinv* stands for real growth of private investment. As in previous regressions we look not only at parameters β_k and γ_k but also test their joint significance assuming a null hypothesis of linear restriction $\beta_0 + \beta_1 + \gamma_0 + \gamma_1 = 0$.
Thirdly, we explore the response of private consumption to fiscal impulses. To validate the hypothesis according to which fiscal impulses should be lasting and large to accelerate rather than hamper consumption growth, we include a new artificial variable in the regression - *art_high*. It takes the value of the fiscal impulse variable if the latter is among the 5% highest adjustments or 5% highest stimuli in the sample, otherwise the variable is equal to zero.[16] Hence, the regression specification is as follows:

$$pcons_{i,t} = \mu + \lambda_1\ pcons_{i,t-1} + \delta_1\ gdp_{i,t-1} + \rho_1\ gdp\_eu27_{i,t} + \sum_{k=0}^{k=1} \beta_k\ impulse_{i,t-k}$$
$$+ \sum_{k=0}^{k=1} \gamma_k\ art\_high_{i,t-k} + \alpha_i + \epsilon_{i,t}$$
$$with\ additional\ term\ on\ RHS\ when\ UB\ impulses\ are\ used: + \sum_{k=0}^{k=1} \phi_k\ art\_ab\_ub_{i,t-k} \quad (4)$$

where *pcons* is a real growth rate of private consumption and the control variables are as in the previous equation. Once again we examine the overall two-period impact of the impulse by testing the validity of the restriction $\beta_0 + \beta_1 + \gamma_0 + \gamma_1 = 0$.
The last step in our analysis is the direct investigation of the cost channel and expectations channel.[17] As explained in Section 2, the former stands behind the export channel and contributes to the investment channel, and the latter largely determines the reaction of consumption to fiscal impulses. In the former case we draw from Alesina and Ardagna (2012), while in the latter from Alesina, Favero and Giavazzi (2012). Surprisingly, almost all other studies on the effects of fiscal impulses do not undertake that step.

[16] In existing literature it is popular to use fixed thresholds for the size of the impulse to recognize it as "high". Typically, thresholds are set to 1.5% of the GDP (see, e.g. Alesina and Ardagna, 2010 or the IMF, 2010). However, applying this approach to our data sample leads to a problem of collinearity between *impulse* and *art_high variables*. Applying thresholds based on 0.05 and 0.95 data quantiles solves the problem.

[17] We are grateful to an anonymous referee for the suggestion to extend our analysis of this element.

To verify the cost channel we estimate the following equation:

$$lab\_share_{i,t} = \mu + \lambda_1\ lab\_share_{i,t-1} + \delta_1\ lab\_prod_{i,t-1} + \rho_1\ gdp\_eu27_{i,t} + \varphi\ unemp_{i,t} + \sum_{k=0}^{k=1} \beta_k\ impulse_{i,t-k} + \sum_{k=0}^{k=1} \gamma_k\ art\_exp_{i,t-k} + \alpha_i + \epsilon_{i,t}$$

$$with\ additional\ term\ on\ RHS\ when\ UB\ impulses\ are\ used: + \sum_{k=0}^{k=1} \phi_k\ art\_ab\_ub_{i,t-k} \quad (5)$$

where *lab_share* is employee compensation as a share in the GDP. The growth rate of labour productivity (*lab_prod*) measured as GDP per person employed and the rate of unemployment (*unemp*) are included to control for cyclical determinants of the dependent variable. In this specification, we are especially interested in the impact of expenditure-based impulses (*art_exp*) which, according to the theories discussed in Section 2, are the driving force of the cost channel. If this channel works then the sum $\beta_0 + \beta_1 + \gamma_0 + \gamma_1 = 0$ should be significantly larger than 0.
To analyze the expectations channel we estimate the following equation:

$$con\_exp_{i,t} = \mu + \lambda_1\ con\_exp_{i,t-1} + \delta_1\ gdp_{i,t-1} + \rho_1\ hicp_{i,t} + \varphi\ unemp_{i,t} + \sum_{k=0}^{k=1} \beta_k\ impulse_{i,t-k} + \sum_{k=0}^{k=1} \gamma_k\ art\_high_{i,t-k} + \alpha_i + \epsilon_{i,t}$$

$$with\ additional\ term\ on\ RHS\ when\ UB\ impulses\ are\ used: + \sum_{k=0}^{k=1} \phi_k\ art\_ab\_ub_{i,t-k} \quad (6)$$

where *con_exp* is a balance of the consumer confidence indicator at the end of the given year.[18] In this regression we include the real GDP growth rate, the HICP inflation rate (*hicp*) and the rate of unemployment in order to control for variables which are perceived by the households as common indicators of the current economic situation and hence used as the basis for the formation of expectations. As in previous regressions we include the artificial variable *art_ab_ub* to verify if the discrepancies between impulses measured by the UB and AB approach could bias the results. According to the first of the explanations presented in Section 2, fiscal impulses have to be sufficiently large in order to influence household expectations. Therefore, as in the case of the consumption channel, not only do we include in the regression a fiscal impulse variable but also an artifical variable identifying impulses of a large scale. As in the case of the consumption channel we examine the overall two-period impact of the impulse by testing the validity of the restriction $\beta_0 + \beta_1 + \gamma_0 + \gamma_1 = 0$.

4.4 Methodological issues

Estimation of the equations described in the previous subsection may pose several methodological problems. Firstly, the equations are dynamic in nature so the standard panel data estimators like fixed effects (FE) and random effects (RE) are biased. One way to tackle the problem is to apply

[18] We use indicators from European Commission surveys. Balance is, roughly speaking, the difference between a percentage of respondents being optimistic about the economy and a percentage of respondents being pessimistic.

an instrumental variables estimator - one proposed by Arellano and Bond (1991) - the so-called *difference estimator*, or the estimator proposed in Arellano and Bover (1995) - the so-called *system estimator*. These estimators are asymptotically consistent, yet their properties may be unsatisfactory in the case of short samples as our. As Kiviet (1995) pointed out, it is possible to correct the bias of standard estimators without affecting their efficiency. In the article we apply a corrected least square dummy variables estimator (LSDVC) following the procedure proposed by Bun and Kiviet (2002) and then modified for the analysis of unbalanced panels by Bruno (2005). Secondly, the reggresors used in the equations 1 - 6 may be exposed to an endogeneity problem. It is controlled to some extent by using fiscal impulses rather than changes in the level of the general government deficit; however, it may be insufficient to fully eliminate the endogeneity bias. Once more, a possible solution is to apply the instrumental variables estimator. Again, the severe bias of this estimator when applied to short samples prevent us from using it in this research. Thirdly, the abscence of a sufficient number of observations makes it impossible to allow for the heterogeneity of structural parameters. If the estimated parameters varied across countries, the standard approach would be to separately estimate the model for each country with the OLS and average the parameters obtained in such a way.[19] In our case, each of the country-separate regressions would be based on - at most - 17 observations, making the estimates clearly unreliable. The fourth problem that could affect the results is possible cross-sectional dependence (or spatial correlation) of error terms. In the model analyzed, this is equivalent to the assumption that there are unobserved time-varying omitted common variables which impact individual states. If these unobservable common factors are uncorrelated with the independent variables, the coefficient estimates based on OLS or FE regression are consistent[20] but standard error estimates are biased. Therefore, we use the Driscoll and Kraay (1998) nonparametric covariance matrix estimator (DK) which corrects for the error structure spatial dependence as well as heteroscedasticity and autocorrelation.
Taking into account all of the abovementioned restrictions, we use four types of panel data estimators: fixed effects (FE), random effects (RE), Driscoll-Kraay with corrected standard errors (DK) and a biased-corrected least square dummy variable (LSDVC). Each of the equations presented in the previous subsection is estimated in 12 different versions: namely for each of the three main methods of impulse identification we apply four different estimators. At the same time, we do realize that the obtained results could be affected by some of the abovementioned problems and that the conclusions drawn on their basis should be taken with caution.

4.5 Estimation results

According to the approach presented in Subsection 4.3, we first estimate the impact of fiscal impulses on GDP growth. Table 1 presents a range of estimates varying by the type of the applied estimator and the method used to identify fiscal impulses. Regardless of the estimator, in the case of impulses identified by the CAPB and the UB, the obtained GDP growth response to tax-based fiscal impulses has a rather Keynesian flavor - the parameter related to the *impulse* variable is negative and significant. However, the situation changes if one considers expenditure-based impulses - in the case of all three, the main impulse identification methods coefficient of *art_exp* is significantly higher than 0 (with the weakest effect in the case of HAGEN and the strongest for UB,

[19] This approach, called the 'Mean Group Estimator', was first proposed by Pesaran and Smith (1995).

[20] If this is not the case, i.e. unobserved common-factors are correlated with independent variables, coefficient estimates are inconsistent. One of the possible solutions is the Common Correlated Effects estimator proposed by Pesaran (2006). Unfortunately, similarly to the Mean Group estimator, it requires a separate estimation of the model for each country in the sample.

where the coefficient is higher than 1 regardless of the estimator). Having in mind the potential problems with the estimation and identification of the fiscal policy stance outlined in the previous subsection, we argue that most of the attention should be paid to the DK and LSDVC estimates with fiscal impulses calculated by the UB method. The estimated coefficients indicate that fiscal adjustment (stimulus) by 1 percent of GDP, caused mainly by expenditure reduction (expenditure increase), raises (lower) the output growth by about 0.55 p.p. in the same period. Still, this effect is not statistically different from 0.

Meanwhile, the calculated total two-period impact of curbing (increasing) government expenditure on GDP growth is positive for all estimators and impulses but in most cases not significantly different from 0. Thus, we find evidence that although the expansionary effects of adjustment are unlikely to outweigh the contractionary ones, the total effect is much less negative in the case of expenditure-based adjustments. The same logic may be applied to fiscal stimuli - the ones based on tax cuts are much more effective in stimulating GDP growth than the ones involving mainly increases of expenditures.

Apart from fiscal impulses, GDP growth is also affected by the changes in external conditions proxied by the variable *gdp_EU27*. Moreover, the dependent variable shows high inertia which may be explained by the fact that including a lagged value of regressor allows one to account for factors that are not changing rapidly in time (in the case of the GDP one may think of a regulatory environment, or generally - institutions). Lastly, we do not find the evidence that an AB approach to impulse identification should lead to results different from the ones with impulses identified by UB changes. We elaborate on this later as this result is shared by most of the subsequent regressions.

Next, we focus on the effects of fiscal impulses on various GDP components. Firstly, we use equation 2 in order to examine the export channel. The main result we obtain (see Table 2) shows that the composition of impulses has a significant impact on the growth of exports - the coefficient on *art_exp* is significantly larger than zero, regardless of the estimator used, when the impulse is identified by CAPB or UB. Conversely, the coefficients on the *impulse* are mostly negative but the result is less robust than for *art_exp* - they are statistically significant only for CAPB impulses (at a 5% significance level). This suggests that fiscal adjustments based on tax reforms have a negative or, at most, a neutral impact on export performance. The overall two-period effect of expenditure-based fiscal adjustment (stimulus) on export growth seems to be expansionary (contractionary) if one looks at UB impulse estimates - the statistics of a linear restriction test are positive and significant on a 5 percent level for three out of the four estimators.

Secondly, using the empirical specification given by equation 3, we examine the investment channel. The results of the estimation (see Table 3) indicate that composition of fiscal impulses also matter in this case. Tax-based fiscal adjustments (stimuli) have mostly negative (positive) but not statistically significant effects on private investment growth (for CAPB and UB impulses). At the same time, adjustments (stimuli) involving expenditure curtailment (expansion) are associated with more (less) favourable outcomes in terms of investment growth when compared to tax-based reforms. As in the export channel, the non-standard effects outweight the Keynesian ones if one looks at the two-period impact of the impulses measured by UB - a fiscal adjustment (stimulus) equal to 1 percent of the GDP contributes to an acceleration (deceleration) of private investment growth over a period of 2 years by a cumulative 3.3-5.5 p.p., depending on the estimator used.

Thirdly, we estimate equation 4 in order to find evidence of a consumption channel (Table 4). The obtained estimates indicate that there is no straightforward and significant relation between private consumption growth and fiscal impulses. This manifests itself in coefficients on the current *impulse* variable - they are positive but not significant. A similar result is seen for lagged *impulse*

- the parameters are insignificant regardless of the estimator and impulse. The situation does not change much if we consider only substantial adjustments/stimuli or the ones when both AB and UB identification methods indicate the same pattern of fiscal stance changes. Lastly, the lack of a significant relation between fiscal policy and the growth of consumption is confirmed for two-period overall effects - the sum of the coefficients for *impulse, art_high* and their lags is not statistically different from 0 in all regressions.

So far we have established that the effects of fiscal impulses depend on their composition. Expenditure-based adjustments (stimuli) are less likely to be associated with hampered (accelerated) GDP growth rates than revenue-based ones. Behind that, the response of private investment and export seems to be the most important for the result. Next ,we directly investigate the cost channel and expectations channel.

Firstly, we estimate equation 5 to verify if there is any significant relation between labor cost (measured as labor share in the GDP) and fiscal impulses. We find that while tax-based impulses are neutral to the behaviour of labor costs, expenditure-based adjustments (stimuli) lead to a decline (rise) in the labor share in GDP (Table 5). The variable *art_exp* is negative and significant in most of the regressions. The result also holds for an overall two-period impact as the value of the tested linear restriction is negative and statistically significant in most cases. Fiscal adjustment that amounts to 1 percent of the GDP and involves mainly expenditure curtailment is associated with an overall two-period reduction of labor share in the GDP by 0.19 - 0.47 p.p.

Secondly, we estimate equation 6 to validate the existence of the expectations channel, i.e. the possibility that fiscal adjustments by their impact on future debt and taxation prospects improves household confidence (Table 6). This channel should be crucial for the reaction of private consumption to fiscal impulses as the cost channel is likely to operate mostly through investment and exports performance. However, our result does not support the logic behind the expectations channel. Most parameters of the variables *impulse* and *art_high* (and their lags) are not significantly different from 0. What is still worth noting is that, unlike in previous regressions, there is a discrepancy between the results for impulses measured by UB and AB. The parameters of *ab_ub_imp* are negative and significant, which means that fiscal adjustments (stimuli) recorded by both UB and AB are more contractionary (expansionary) than adjustments (stimuli) recorded by only one of the methods.[21] This may be explained in two ways - either the UB is biased toward detecting adjustments (stimuli) with a less negative (positive) impact on household confidence than AB, or agents believe that fiscal adjustments (stimuli) are likely to be followed by a worsened (improved) economy's performance and form more pessimistic (optimistic) expecations after adjustments (stimuli) that were widely announced.[22]

The results of the regressions discussed above share two common features worth noting. Firstly, the effects of impulse composition are more visible when fiscal impulse is identified by UB instead of CAPB. Expenditure-based impulses tend to have more likely non-standard effects in the case of UB impulses than in the case of CAPB impulses. This suggests that previous analyses that applied CAPB could be biased toward detecting larger fiscal multipliers than is actually the case. Secondly, with the exception of the expectations channel, we do not find evidence that UB leads to under-estimating fiscal multipliers when compared to the 'reduced' AB approach. This is at odds with the widely discussed results in the IMF (2010), where it was claimed that the CAPB method is biased and should be replaced by AB approach to properly investigate the effects of fiscal impulses

[21] And the second method pointing to the occurrence of fiscal stimuli (adjustments) or no policy change at all.

[22] As a reminder, only announced adjustments are detected by AB while UB detects all actions that ended with substantial changes in structural deficit.

on GDP growth.[23]
To sum up, we confirm the results already established in the literature that the output response to fiscal impulses depends on the composition of the latter. Although the expansionary effects of adjustment on GDP growth are unlikely to outweigh contractionary ones, the total effect is much less negative in the case of expenditure-based adjustments. Fiscal adjustments driven by government expenditure cuts tend to be accompanied by private investment and exports growth acceleration and fiscal stimuli - by private investment and export growth deceleration. We also find that the likely reason for these effects to occur is the cost channel - expenditure cuts improves a country's cost competitiveness, thereby contributing to the acceleration of export and investment growth, while expenditure increases undermine that competitiveness. We do not find evidence in favor of the existence of the expectations channel.
The conclusions from the analysis are broadly in line with the existing empirical research covering the NMS. The literature often points to the importance of the impulse composition (e.g. Purfield, 2003, Afonso, Nickel and Rother, 2005 or Rzońca and Ciżkowicz, 2005). In this paper, we present a more detailed picture - the total output response to fiscal policy is shaped mainly by the reaction of investment and export which in turn depends on the composition of impulse. To our best knowledge, this is so far the second paper (after Rzońca and Ciżkowicz, 2005) which investigates GDP components response to fiscal impulses in the NMS.[24] Moreover, we are the first to use new measures of fiscal impulses (i.e. UB and 'reduced' AB impulses respectively) for the NMS. It allows us to check the robustness of the results to the changes in the method applied for fiscal impulse identification, a topic that is receiving a lot of attention in many recent studies for developed economies. Lastly, our research involves one of the first attempts to directly validate the existence of the cost and expectations channels mentioned in the theory of non-standard effects of fiscal impulses.

4.6 Conclusions

In this article we have analyzed the effects of fiscal impulses in 10 NMS from 1995-2011. The main conclusions from the analysis are as follows:

1. The most robust result is that the composition of the fiscal impulses is crucial for their effects. We find that expenditure-based adjustments (stimuli) are rather neutral to GDP growth but they tend to be associated with investment and export growth acceleration (deceleration). On the contrary, tax based adjustments (stimuli) seem to hamper (boost) GDP growth.

2. We do not find evidence that fiscal impulses affect the behavior of private consumption, regardless of their size.

3. It follows from the direct investigation of the cost and expectations channels that the former is of main importance. Adjustments (stimuli) involving expenditure cuts lead to improvement (deterioration) of country cost competitiveness, which is in line with the discussed results for investment and export reaction to fiscal policy. By contrast we do not find any evidence for the 'expectation' channel which leaves a lack of clear consumption's response to the fiscal impulses unexplained.

[23] Although we compare UB not CAPB to AB, one should note that a majority of the IMF's theoretical arguments against CAPB should also be valid for UB.
[24] Compared to that work we use longer data series and a broader robustness check (with respect to the methods used to identify fiscal impulses and estimators applied).

4. We test the robustness of the results by comparing the relevant regression coefficients when different methods to identify fiscal impulses are applied. We find that most of the results remain qualitatively unchanged regardless of the impulse identification method used. The effects of impulse composition are most visible when the concept of underlying fiscal balance is used - the method we find the most reliable.

5. We take preliminary measures to apply an action-based approach to impulse identification as proposed in the IMF (2010). We do not find evidence supporting the IMF's claim that mechanical methods used to identify fiscal impulses tend to underestimate fiscal multipliers. Yet, one has to keep in mind that we use only a 'reduced' version of an action-based approach.

The results should be treated with caution because of the estimation problems typical for panel data models, notably in the case of the limited number of available observations. Nevertheless, they constitute further, even if only partial, support for the claim that expansionary fiscal adjustments and contractionary fiscal stimuli are possible.

5 Bibliography

- Alesina, A. (2010), 'Fiscal Adjustments: Lessons from Recent History', Paper prepared for the ECOFIN meeting, Madrid.
- Alesina, A. and Ardagna, S. (1998), 'Tales of fiscal adjustment', Economic Policy: A European Forum, Vol. 27, pp. 487-546.
- Alesina, A. and Ardagana, S. (2010), 'Large changes in fiscal policy: taxes versus spending', Tax Policy and the Economy, Vol. 24, pp. 35-68.
- Alesina, A., Ardagna, S., Perotti, R. and Schiantarelli, F. (1999), 'Fiscal Policy, Profits, and Investment', NBER Working Paper, No. 7207, National Bureau of Economic Research, Cambridge, http://www.nber.org/papers/w7207.
- Alesina, A. and Perotti, R. (1996), 'Fiscal Adjustments in OECD Countries: Composition and Macroeconomic Effects', NBER Working Paper, No. 5730, National Bureau of Economic Research, Cambridge, www.nber.org/papers/w5730.pdf.
- Alesina, A., Perotti, R. and Tavares, J. (1998), 'The Political Economy of Fiscal Adjustments', Brookings Papers on Economic Activity, No. 1, pp. 197-266, http://ideas.repec.org/a/bin/bpeajo/v29y1998i1998-1p197-266.html.
- Alesina, A., Favero, C. and Giavazzi, F. (2012), 'The Output Effect of Fiscal Consolidations', NBER Working Paper No. 18336, http://ideas.repec.org/p/nbr/nberwo/18336.html.
- Alesina, A. and Ardagna, S. (2012), 'The design of fiscal adjustments', NBER Working Paper No. 18423, http://ideas.repec.org/p/nbr/nberwo/18423.html.
- Afonso, A. , Nickel, C. and Rother, P. (2005), 'Fiscal consolidations in the Central and Eastern European countries', ECB Working Paper Series, No. 473, European Central Bank, Frankfurt, www.jstor.org/stable/40441098.
- Arellano, M. and Bond, S. (1991), 'Some Test of Specification for Panel Data: Monte Carlo Evidence and an Application to Employment Equations', Review of Economic Studies, Vol. 58, pp. 277-97.
- Arellano, M. and Bover O. (1995), 'Another Look at the Instrumental Variable Estimation of Error-Components Models', Journal of Econometrics, vol. 68, pp. 29-51.
- Baldacci, E. and Kumar, M. (2010), 'Fiscal Deficits, Public Debt, and Sovereign Bond Yields', IMF Working Paper, No. 10/184, International Monetary Fund, Washington D.C., http://www.imf.org/external/pubs/ft/wp/2010/wp10184.pdf.
- Baldacci E., Gupta S. and Mulas-Granados, C. (2010), 'Restoring Debt Sustainability After Crises: Implications for the Fiscal Mix', IMF Working Paper No. 10/232, http://www.imf.org/external/pubs/ft/wp/2010/wp10232.pdf.
- Barro, R. and Redlick, C. (2009), 'Macroeconomic Effects from Government Purchases and Taxes', NBER Working Papers , No. 15369, National Bureau of Economic Research, Cambridge , www.nber.org/papers/w15369.

- Bertola G.and Drazen, A. (1993), 'Trigger Points and Budget Cuts: Explaining the Effects of Fiscal Austerity', The American Economic Review, vol. 83, No. 1, pp. 11-26.
- Bhattacharya, R. (1999), 'Private Sector Consumption Behavior and Non-Keynesian Effects of Fiscal Policy', IMF Working Paper, No. 99/112, International Monetary Fund, Washington D.C., http://www.imf.org/external/pubs/ft/wp/1999/wp99112.pdf.
- Bhattacharya, R. and Mukherjee, S. (2013), 'Non-Keynesian effects of fiscal policy in OECD economies: an empirical study', Applied Economics, vol. 45(29), pp. 4122-4136.
- Blanchard, O. J. (1990 a), 'Comment on Giavazzi and Pagano', NBER Macroeconomics Annual 1990, National Bureau of Economic Research, Cambridge.
- Blanchard, O. J. and Perotti, R. (2002), 'An Empirical Characterization of the Dynamic Effects of Changes in Government Spending and Taxes on Output', Quarterly Journal of Economics, vol. 107, pp. 1329-68.
- Born, B., and Müller, G. (2012), 'Government Spending Shocks in Quarterly and Annual Time Series' Journal of Money, Credit and Banking, Blackwell Publishing, vol. 44, pp. 507-517 (03).
- Broadbent, B. and Daly, K. (2010), 'Limiting the Fall-Out from Fiscal Adjustment' Goldman Sachs Global Economics Paper No. 195, http://www.goldmansachs.com/korea/ideas/global-growth/limiting-the-fallout.html.
- Briotti, M. G. (2005), 'Economic Reactions to Public Finance: A Survey of the Literature', ECB Occasional Paper 38, http://www.ecb.int/pub/pdf/scpops/ecbocp38.pdf.
- Bun, M. and Kiviet, J. (2002),'On the Diminishing Returns of Higher-order Terms in Asymptotic Expansions of Bias;, Tinbergen Institute Discussion Papers 02-099/4, Tinbergen Institute, revised 24 Oct 2002, http://ideas.repec.org/p/dgr/uvatin/20020099.html.
- Christiano, L., Eichenbaum, M., Rebelo, S. (2011), 'When is the Government Spending Multiplier Large?', Journal of Political Economy, 119(1), pp. 78-121.
- Corsetti, G. , Meier, A. and Müller, G. (2012), 'Fiscal Stimulus with Spending Reversals', The Review of Economics and Statistics, MIT Press, vol. 94(4), pp. 878-895, November.Costa Carvalho, V.M. (2009), 'Non-Keynesian Effects of Fiscal Policy in a New-Keynesian General Equilibrium Model for the Euro Area', doctoral thesis at Universidade do Porto, http://repositorio-aberto.up.pt/bitstream/10216/20601/2/TESEVMCC.pdf.
- Cwik, T. and Wieland, V. (2011), 'Keynesian government spending multipliers and spillovers in the euro area', Economic Policy, 26(67), pp. 493-549.
- DeLong, J. B. and Summers, L. (2012), 'Fiscal Policy in a Depressed Economy', Brookings Papers on Economic Activity, 2012(1), pp. 233-274.
- Devries, P., Guajardo, J., Leigh, D. and Pescatori, A. (2011), 'A New Action-Based Dataset of Fiscal Consolidation', IMF Working Paper No. 11/128, http://ideas.repec.org/p/imf/imfwpa/11-128.html.

- Driscoll, J. C. and Kraay, A. (1998), 'Consistent Covariance Matrix Estimation With Spatially Dependent Panel Data', The Review of Economics and Statistics, MIT Press, vol. 80(4), pp. 549-560, November, http://ideas.repec.org/a/tpr/restat/v80y1998i4p549-560.html.
- Eggertsson, G. B. (2009), 'What Fiscal Policy is Effective at Zero Interest Rates?' Federal Reserve Bank of New York Staff Report. 402
- Eggertsson, G. B. (2011), 'What Fiscal Policy is Effective at Zero Interest Rates?', 2010 NBER Macroeconomic Annual 25, pp. 59-112.
- Elmendorf, D. W. and Mankiw G. N. (1998), 'Government debt', Paper prepared for Handbook of Macroeconomics.
- Engen, E. M. and Hubbard, R. G. (2004), 'Federal Government Debt and Interest Rates', NBER Macroeconomics Annual, vol. 19, pp. 83-138.
- Fischer S. (1993), 'The Role of Macroeconomic Factors in Growth', Journal of Monetary Economics, vol. 32, pp.485-512.
- Franta, M. (2012), 'Macroeconomic Effects of Fiscal Policy in the Czech Republic: Evidence Based on Various Identification Approaches in a VAR Framework', CNB Working Paper, No. 13, Czech National Bank, Prague, http://www.cnb.cz/en/research/research_publications/cnb_wp/2012/cnbwp_2012_13.html.
- Friedman, B. M. (2005), 'Deficits and Debt in the Short and Long Run', NBER Working Paper 11630, http://www.nber.org/papers/w11630.
- Gechert, S. and Will, H. H. (2012), 'Fiscal Multipliers: A Meta-Analysis of the Literature', mimeo
- Giavazzi, F., Jappelli, T. and Pagano, M. (1999), 'Searching for Non-Keynesian Effects of Fiscal Policy', CSEF Working Paper, No. 16, Centre for Studies in Economics and Finance, University of Naples, Naples, citeseer.ist.psu.edu/viewdoc/summary?doi=10.1.1.9.2997.
- Giavazzi, F., Jappelli, T. and Pagano, M. (2000), 'Searching for Non-Linear Effects of Fiscal Policy: Evidence from Industrial and Developing Countries', NBER Working Paper, No. 7460, National Bureau of Economic Research, Cambridge, www.nber.org/papers/w7460.
- Giavazzi, F. and Pagano M. (1990), 'Can Severe Fiscal Contractions Be Expansionary? Tales of Two Small European Countries', NBER Macroeconomics Annual 1990, National Bureau of Economic Research, Cambridge, www.nber.org/papers/w3372.
- Giavazzi, F. and Pagano M. (1996), 'Non-Keynesian Effects of Fiscal Policy Changes: International Evidence and the Swedish Experience', NBER Working Paper, No. 5332, National Bureau of Economic Research, Cambridge, www.nber.org/papers/w5332.
- Giavazzi, F., Jappelli, T., Pagano, M. and Benedetti M. (2005), 'Searching for Non-Monotonic Effects of Fiscal Policy: New Evidence', NBER Working Papers, No. 11593, National Bureau of Economic Research, Cambridge, www.nber.org/papers/w11593.

- Girouard, N. and André C. (2005), 'Measuring Cyclically-adjusted Budget Balances for OECD Countries', OECD Economics Department Working Papers, No. 434, Organization for Economic Cooperation and Development, Paris, http://www.oecd-ilibrary.org/economics/measuring-cyclically-adjusted-budget-balances-for-oecd-countries_787626008442.
- Giudice, G., Turrini, A. and in 't Veld, J. (2003), 'Can fiscal consolidations be expansionary in the EU? Ex-post evidence and ex-ante analysis', European Commission Directorate-General for Economic and Financial Affairs Economic Paper, 195.
- Hall, R. E. (2009), 'By How Much Does GDP Rise If the Government Buys More Output?', Brookings Papers on Economic Activity 2009:2, Fall, pp. 183-231.
- Hamilton, J. D. (1994), 'Time Series Analysis', Princenton University Press.
- Hemming, R., Mahfouz, S. and Schimmelpfennig, A. (2002), 'Fiscal Policy and Economic Activity During Recessions in Advanced Economies', IMF Working Paper, International Monetary Fund, Washington D.C., http://www.imf.org/external/pubs/ft/wp/2002/wp0287.pdf.
- Hicks, J. R. (1937), 'Mr. Keynes and the Classics; A Suggested Interpretation', Econometrica, vol. 5, April, pp. 147-59.
- Horváth, Á., P. Kiss, G., Jakab, M. Z. and Párkányi, B. (2006), 'Myths and Maths: Macroeconomic Effects of Fiscal Adjustments in Hungary', MNB Occasional Paper 2006/52, Hungarian National Bank, Budapest. http://www.mnb.hu/Root/Dokumentumtar/ENMNB/Kiadvanyok/mnben_muhelytanulmanyok/mnben_op52/op_52.pdf.
- Ilzetzki, E., Mendoza, E. G. and Végh, C. A. (2011), 'How Big (Small?) are Fiscal Multipliers?', IMF Working Paper No. 11/52, http://ideas.repec.org/p/imf/imfwpa/11-52.html.
- IMF (2010), 'Will It Hurt? Macroeconomic Effects of Fiscal Consolidation' in IMF, 'World Economic Outlook:Recovery, Risk, and Rebalancing', survey by the staff of the International Monetary Fund, Washington D.C.
- Joumard, I., Minegishi, M., André, C., Nicq, C. and Price, R. (2008), 'Accounting for One-off Operations when Assessing Underlying Fiscal Positions', OECD Economics Department Working Papers 642, Organization for Economic Cooperation and Development, Paris, http://www.oecd.org/officialdocuments/displaydocumentpdf?cote=eco/wkp.
- Kiviet, J. F. (1995), "On bias, inconsistency, and efficiency of various estimators in dynamic panel data models," Journal of Econometrics, Elsevier, vol. 68(1), pp 53-78, July.
- Lane, P. R., Perotti, R. (2003), 'The Importance of Composition of Fiscal Policy: Evidence from Different Exchange Rate Regimes', Journal of Public Economics, Vol. 87(9-10), pp. 2253-2279.
- Laubach, T. (2009), 'New Evidence on the Interest Rate Effects of Budget Deficits and Debt', Journal of the European Economic Association, vol. 7, No. 4, pp. 858-85.

- McDermott, J. C. and Wescott, R. F. (1996), 'An Empirical Analysis of Fiscal Adjustments', IMF Staff Papers, Vol. 43, No. 4, International Monetary Fund, Washington D.C., http://www.jstor.org/pss/3867367.
- Mertens, K. and Ravn, M. O. (2010), 'Fiscal Policy in an Expectations Driven Liquidity Trap', CEPR Discussion Paper. 7931.
- Miller, M., Skidelsky, R. and Weller, P. (1990), 'Fear of Deficit Financing: Is it Rational?' in: Dornbusch R., Draghi M. (eds.), 'Public Debt Management: Theory and History', Cambridge University Press, Cambridge.
- Mirdala, R. (2009), 'Effects of Fiscal Policy Shocks in the European Transition Economies", MPRA Paper No. 19481, University Library of Munich, http://mpra.ub.uni-muenchen.de/19481/.
- Morris, R. and Schuknecht, L. (2007), 'Structural Balances and Revenue Windfalls: the Role of Asset Prices Revisited', ECB Paper Series, No. 737, European Central Bank, Frankfurt, www.ecb.int/pub/pdf/scpwps/ecbwp737.pdf.
- Mulas-Granados, C., Baldacci, E., Clements, B. and Gupta S. (2002), 'Expenditure Composition, Fiscal Adjustment, and Growth in Low-Income Countries', IMF Working Papers, No. 02/77, International Monetary Fund, Washington D.C., www.imf.org/external/pubs/ft/wp/2002/wp0277.pdf.
- Neicheva, M. (2007), 'Non-Keynesian effects of Government Spending: Some implications for the Stability and Growth Pact', MPRA Paper, No. 5277, University Library of Munich, http://mpra.ub.uni-muenchen.de/5277/.
- Perotti, R. (2002), 'Estimating the Effects of Fiscal Policy in OECD Countries', ECB Working Paper, No. 168, European Central Bank, Frankfurt www.ecb.int/pub/pdf/scpwps/ecbwp168.pdf.
- Perotti, R. (2011), 'The Austerity Myth: Gain without Pain?', CEPR Discussion Paper, No. 8658, http://ideas.repec.org/h/nbr/nberch/12652.html.
- Perotti, R. (2012), 'Fiscal consolidations in Europe: What lessons for the Eurozone today?', written for the Federal Reserve Board Academic Consultants Meeting.
- Pesaran, M. H. and Smith, R. (1995), 'Estimation of Long-Run Relationships from Dynamic Heterogeneous Panels', Journal of Econometrics, vol. 68, pp. 79-114.
- Pesaran, M. H., (2006), 'Estimation and Inference in Large Heterogeneous Panels with a Multifactor Error Structure', Econometrica, Econometric Society, vol. 74(4), pp. 967-1012, 07, http://ideas.repec.org/a/ecm/emetrp/v74y2006i4p967-1012.html.
- Ramey, V.A. (2011), 'Identifying Government Spending Shocks: It's All in the Timing', The Quarterly Journal of Economics, vol. 126, pp.1-50.
- Purfield, C. (2003), 'Fiscal Adjustment in Transition Countries: Evidence from the 1990s', IMF Working Paper No. 03/36, http://www.imf.org/external/pubs/ft/wp/2003/wp0336.pdf.

- Reinhart, C. M., Rogoff, K. S. and Savastano, M. A. (2003), 'Debt Intolerance', NBER Working Paper, No. 9908, National Bureau of Economic Research, Cambridge, www.nber.org/papers/w9908.
- Rzońca, A. and Ciżkowicz, P. (2005), 'Portfolio crowding out and fiscal multipliers. Part I. Modified Silber model. Part II. Modified Friedman model', Bank i Kredyt, Vol. 36, No.1 (in Polish).
- Segura-Ubiergo, A., Simone, A. and Gupta, S. (2006), 'New Evidence on Fiscal Adjustment and Growth in Transition Economies', IMF Working Paper, No. 06/244, International Monetary Fund, Washington D.C., www.imf.org/external/pubs/ft/wp/2006/wp06244.pdf.
- Silber, W. L. (1970), 'Fiscal Policy in IS-LM Analysis: A Correction', Journal of Money, Credit and Banking, vol. 2, pp. 461-72.
- Sutherland, A. (1995), 'Fiscal Crises and Aggregate Demand: Can High Public Debt Reverse the Effects of Fiscal Policy', CEPR Discussion Paper, No. 1246, Centre for Economic Policy Research, London, http://www.cepr.org/pubs/new-dps/dplist.asp?dpno=1246.
- Tagkalakis, A. (2009), 'Fiscal adjustments and asset price movements', Working Papers 106, Bank of Greece, Athens, www.bankofgreece.gr/BogEkdoseis/Paper2009104.pdf.
- Tsibouris, G. C., Horton, M. A., Flanagan, M. J. and Maliszewski, W. S. (2006), 'Experience with Large Fiscal Adjustments', IMF Occasional Paper No. 246, International Monetary Fund, Washington D.C., www.imf.org/external/pubs/nft/op/246/op246.pdf.
- Von Hagen, J. (2002), 'More Growth for Stability - Reflections on Fiscal Policy in Euroland', ZEI University of Bonn, Bonn, www.zei.de/download/zei_emu/emu-9/vonhagen.pdf.
- Von Hagen, J. and Strauch R. (2001), 'Fiscal Consolidations: Quality, Economic Conditions, and Success' Public Choice, Vol. 109, No. 3-4, pp. 327-46.
- von Hagen, J., Hughes Hallett, A. and Strauch R. (2002), 'Budgetary Consolidation in Europe: Quality, Economic Conditions, and Persistence', Journal of the Japanese and International Economies, vol. 16(4), pp. 512-535.
- Woodford, M. (2011), 'Simple Analytics of the Government Expenditure Multiplier', American Economic Journal: Macroeconomics, American Economic Association, vol. 3(1), pp. 1-35.

6 Data appendix

Variables presented in order as they appear in equations presented in section 'Econometric analysis'.

Variable	Description	Source	Observations
gdp	Annual growth of real Gross Domestic Product.	AMECO	170
gdp_eu27	Annual growth of real Gross Domestic Product in 27 European Union Countries (weighted average of country growth rates with weights corresponding to share of country GDP in total EU27 GDP).	AMECO	170
impulse	Annual change of primary general government balance (as a share of GDP) adjusted for cyclical factors. Here, three different identification procedures were applied - method proposed by von Hagen (2002), CAPB (cyclically adjusred primary balance) and underlying fiscal balance (CAPB corrected for one-offs, abreviated as UB). Positive number of the variable means narrowing of the deficit, while negative - its deterioration.	For CAPB, own calculation based on AMECO data for von Hagen method and UB	Hagen – 165, CAPB – 146, UB – 144.
art_exp	Artifical variable that takes the value of the impulse variable (as defined above) if the government expenditure change accounts for at least 50% of the impulse, otherwise it is equal to 0.	Own calculation based on AMECO data	as for impulse variable.
art_ab_ub	Artificial variable that takes the value of the UB impulse variable if AB and UB methods identify impulse of the same sign, otherwise is 0. To be specific, art_ab_ub has non zero value in two cases. Firstly, if both AB and UB record fiscal actions of the same sign and the absolute value of UB impulse exceeds 0.5% GDP. Secondly, if according to the AB approach no fiscal action was taken and the absolute value of UB impulse is lower or equal to 0.5% GDP (thus identyfing cases where both methods point to no changes in fiscal stance).	Own calculations based on AMECO database, OECD, IMF, EC surveys and other available country reports	144
export	Annual growth rate of exports of goods and services at 2000 constant prices.	AMECO	167
imp_eu27	Annual growth of the total of imports of goods and services in 27 EU countries at 2000 constant prices.	AMECO	160
pinv	Annual growth rate of private investment at 2000 constant prices.	AMECO	166

pcons	Annual growth rate of private consumption at 2000 constant prices.	AMECO	167
art_high	Artifical variable that takes the value of the impulse variable if the latter is among the 5% highest adjustments or 5% highest stimuli in the sample, otherwise the variable is equal to zero.	Own calculation based on AMECO data	as for impulse variable.
lab_share	Compensation of employees as a percentage of GDP.	AMECO, with exeception of years 1995-1999 for Poland when data comes from OECD	152
lab_product	Anual growth rate of real labour productivity per person employed.	Eurostat	160
unemp	Unemployment rate.	AMECO	168
con_exp	A balance of consumers confidence indicator at the end of a year. The balance is calculated as an average of differences between optimistic and pessimistic answers for 4 questions concerning consumers expectations about the future (financial situation, general economic situation, unemployment and savings).	European Comission	137
hicp	Annual rate of change of Harmonised Index of Consumer Prices for years 1997-2011. For years 1995-1997, because of data scarcity, annual rate of change of Consumer Price Index (CPI).	Eurostat, World Bank	170

7 Tables

Table 1. The Effects of Fiscal Deficit Impulses on GDP Growth

	FE			RE			DK			LSDVC		
	Hagen	CAPB	UB/AB	Hagen	CAPB	UB/AB	Hagen	CAPB	UB/AB	Hagen	CAPB	UB/AB
gdp_1	0.379***	0.296***	0.333***	0.401***	0.309***	0.342***	0.379***	0.296***	0.333***	0.420***	0.341***	0.374***
	(6.954)	(4.889)	(5.499)	(7.619)	(5.301)	(5.846)	(6.017)	(6.222)	(6.485)	(6.805)	(5.094)	(6.191)
gdp_eu27	1.467***	1.572***	1.515***	1.471***	1.573***	1.518***	1.467***	1.572***	1.515***	1.449***	1.563***	1.501***
	(10.327)	(12.209)	(11.481)	(10.512)	(12.565)	(11.878)	(6.462)	(7.338)	(6.616)	(9.837)	(10.513)	(10.583)
impulse	-0.067	-0.728***	-0.702*	-0.087	-0.725***	-0.788**	-0.067	-0.728***	-0.702**	-0.04	-0.695***	-0.682**
	(-0.329)	(-3.641)	(-1.971)	(-0.446)	(-3.887)	(-2.392)	(-0.256)	(-8.960)	(-2.712)	(-0.195)	(-3.783)	(-1.981)
impulse_1	0.013	-0.055	0.125	-0.002	-0.037	0.067	0.013	-0.055	0.125	-0.004	0.006	0.162
	(0.057)	(-0.233)	(0.372)	(-0.009)	(-0.167)	(0.212)	(0.090)	(-0.410)	(0.630)	(-0.014)	(0.025)	(0.459)
art_exp	0.452**	0.989***	1.208***	0.475**	0.981***	1.203***	0.452	0.989***	1.208***	0.439*	0.972***	1.237***
	(1.989)	(3.981)	(3.844)	(2.175)	(4.256)	(4.138)	(1.011)	(8.243)	(8.633)	(1.777)	(4.424)	(3.349)
art_exp_1	-0.036	0.097	0.122	-0.051	0.068	0.088	-0.036	0.097	0.122	-0.035	0.032	0.064
	(-0.145)	(0.341)	(0.381)	(-0.211)	(0.255)	(0.294)	(-0.383)	(0.967)	(0.929)	(-0.130)	(0.097)	(0.198)
art_ab_ub			-0.281			-0.188			-0.281			-0.292
			(-0.751)			(-0.552)			(-1.216)			(-0.858)
art_ab_ub_1			0.01			0.095			0.01			0.017
			(0.029)			(0.292)			(0.077)			(0.045)
constant	-0.416	-0.072	-0.109	-0.509	-0.126	-0.176	-0.416	-0.072	-0.109			
	(-1.015)	(-0.181)	(-0.269)	(-1.266)	(-0.329)	(-0.451)	(-1.397)	(-0.367)	(-0.505)			
N	153	136	134	153	136	134	153	136	134	153	136	134
R^2	0.68	0.67	0.68	0.61	0.67	0.68	0.61	0.67	0.68	0.61	0.67	0.68
F test p-value	0	0	0	0	0	0	0	0	0			
Linear restr:												
value	0.362	0.303	0.753	0.335	0.287	0.57	0.362	0.303	0.753	0.36	0.315	0.781
p-value	0.0418	0.1954	0.1834	0.0513	0.1968	0.2215	0.2753	0.2691	0.0001	0.0334	0.189	0.1302

Note. The dependent variable is the annual real growth rate of GDP. Explanatory variables definitions are reported in the Appendix. The first row of the table lists estimators used in the subsequent regressions, while the second row describes methods used to calculate fiscal impulses. Fiscal impulses used in regressions are obtained in line with three different approaches: Underlying Balance (column UB), von Hagen decomposition (column H) and Cyclically Adjusted Primary Balance (column CAPB). The linear restriction on parameters being tested is impulse + impulse_1 + art_exp + art_exp_1 = 0, field value corresponds to value of the restriction LHS.
T-statistics are reported in parenthesis. Stars denote estimates significance at 1 (***), 5 (**) and 10 (*) percent levels.

Table 2. The Export Channel - the effects of fiscal impulses on export growth

	FE			RE			DK			LSDVC		
	Hagen	CAPB	UB/AB	Hagen	CAPB	UB/AB	Hagen	CAPB	UB/AB	Hagen	CAPB	UB/AB
export_1	-0.125	-0.05	-0.147*	-0.097	-0.017	-0.085	-0.125*	-0.05	-0.147*	-0.079	-0.002	-0.105
	(-1.589)	(-0.643)	(-1.779)	(-1.275)	(-0.221)	(-1.060)	(-1.893)	(-0.538)	(-2.167)	(-1.099)	(-0.024)	(-1.346)
gdp_1	0.084	-0.22	0.012	0.039	-0.267	-0.093	0.084	-0.22	0.012	0.047	-0.278	-0.035
	(0.516)	(-1.212)	(0.065)	(0.252)	(-1.519)	(-0.528)	(0.698)	(-1.056)	(0.084)	(0.316)	(-1.584)	(-0.210)
import_eu27	0.937***	1.112***	1.029***	0.928***	1.108***	1.048***	0.937***	1.112***	1.029***	0.931***	1.104***	1.025***
	(7.738)	(10.208)	(9.397)	(7.791)	(10.298)	(9.588)	(7.773)	(14.234)	(8.772)	(9.303)	(9.145)	(9.266)
impulse	0.421	-1.112**	-1.158	0.53	-0.981**	-1.491*	0.421	-1.112**	-1.158*	0.39	-1.142**	-1.17
	(0.794)	(-2.204)	(-1.322)	(1.044)	(-2.046)	(-1.787)	(1.635)	(-2.789)	(-2.152)	(0.791)	(-2.438)	(-1.376)
impulse_1	-0.618	-1.132*	-0.876	-0.628	-1.050*	-1.152	-0.618	-1.132**	-0.876*	-0.695	-1.132*	-0.841
	(-1.013)	(-1.910)	(-1.065)	(-1.066)	(-1.831)	(-1.449)	(-1.451)	(-2.749)	(-1.971)	(-1.267)	(-1.826)	(-1.030)
art_exp	0.213	1.646***	2.774***	0.12	1.474**	2.278***	0.213	1.646***	2.774**	0.242	1.665***	2.735***
	(0.355)	(2.637)	(3.578)	(0.210)	(2.501)	(3.088)	(0.401)	(6.411)	(3.149)	(0.343)	(3.114)	(3.084)
art_exp_1	0.848	1.204*	2.401***	0.868	1.079	1.889**	0.848*	1.204**	2.401***	0.894	1.171	2.262***
	(1.276)	(1.684)	(2.937)	(1.353)	(1.577)	(2.423)	(2.124)	(3.097)	(5.945)	(1.505)	(1.445)	(2.814)
art_ab_ub			-0.036			0.539			-0.036			-0.035
			(-0.039)			(0.627)			(-0.109)			(-0.042)
art_ab_ub_1			-0.592			0.065			-0.592*			-0.587
			(-0.666)			(0.079)			(-2.109)			(-0.650)
constant	4.443***	4.722***	5.169***	4.426***	4.634***	4.780***	4.443***	4.722***	5.169***			
	(3.777)	(4.433)	(4.785)	(3.836)	(4.423)	(4.470)	(7.129)	(8.415)	(7.958)			
N	152	136	134	152	136	134	152	136	134	152	136	134
R^2	0.4	0.5	0.52	0.4	0.5	0.53	0.4	0.5	0.52	0.4	0.5	0.52
F test p-value	0	0	0	0	0	0	0	0	0			
Linear restr:												
value	0.864	0.607	3.141	0.89	0.526	1.524	0.864	0.607	3.1406	0.831	0.562	2.986
p-value	0.062	0.302	0.0293	0.0464	0.3574	0.2029	0.1184	0.4163	0.0006	0.0912	0.3391	0.022

Note. The dependent variable is the annual real growth rate of goods and services export. Explanatory variables definitions are reported in the Appendix. The first row of the table lists estimators used in the subsequent regressions, while the second row describes methods used to calculate fiscal impulses. Fiscal impulses used in regressions are obtained in line with three different approaches: Underlying Balance (column UB), von Hagen decomposition (column H) and Cyclically Adjusted Primary Balance (column CAPB). The linear restriction on parameters being tested is impulse + impulse_1 + art_exp + art_exp_1 = 0, field value corresponds to value of the restriction LHS.
T-statistics are reported in parenthesis. Stars denote estimates significance at 1 (***), 5 (**) and 10 (*) percent levels.

Table 3. The effects of fiscal impulses on private investment growth

	FE			RE			DK			LSDVC		
	Hagen	CAPB	UB/AB	Hagen	CAPB	UB/AB	Hagen	CAPB	UB/AB	Hagen	CAPB	UB/AB
pinv_1	0.03	0.035	-0.028	0.087	0.086	0.038	0.03	0.035	-0.028	0.160**	0.179**	0.087
	(0.263)	(0.303)	(-0.234)	(0.789)	(0.770)	(0.328)	(0.284)	(0.270)	(-0.245)	(2.207)	(2.192)	(0.972)
gdp_1	1.130***	1.102***	1.310***	1.006***	1.000***	1.149***	1.130**	1.102**	1.310***	0.973***	0.854**	1.129***
	(3.221)	(2.877)	(3.415)	(2.982)	(2.697)	(3.056)	(2.338)	(2.540)	(3.347)	(3.796)	(2.474)	(3.528)
gdp_eu27	3.676***	3.947***	3.606***	3.705***	3.922***	3.691***	3.676***	3.947***	3.606***	3.579***	3.905***	3.519***
	(6.598)	(7.451)	(6.718)	(6.658)	(7.532)	(6.923)	(8.433)	(8.945)	(6.985)	(6.591)	(5.539)	(5.231)
impulse	1.212	-0.824	-1.093	0.992	-0.872	-1.723	1.212	-0.824***	-1.093	1.444*	-0.571	-0.771
	(1.450)	(-0.987)	(-0.735)	(1.215)	(-1.107)	(-1.211)	(1.513)	(-3.519)	(-1.441)	(1.720)	(-0.659)	(-0.464)
impulse_1	1.978**	1.415	2.01	1.554*	1.385	1.398	1.978**	1.415***	2.01	1.521	1.393	1.948
	(2.215)	(1.456)	(1.471)	(1.778)	(1.480)	(1.066)	(2.318)	(3.836)	(1.117)	(1.599)	(1.146)	(1.212)
art_exp	-0.072	2.206**	3.913***	0.12	2.221**	3.485***	-0.072	2.206***	3.913***	-0.27	2.003*	3.961**
	(-0.079)	(2.156)	(3.065)	(0.135)	(2.317)	(2.880)	(-0.045)	(3.194)	(3.556)	(-0.223)	(1.909)	(2.287)
art_exp_1	-2.143**	-1.33	0.691	-1.812*	-1.397	0.129	-2.143***	-1.330*	0.691	-1.781*	-1.507	0.382
	(-2.186)	(-1.136)	(0.529)	(-1.888)	(-1.252)	(0.103)	(-3.915)	(-2.047)	(0.783)	(-1.723)	(-0.962)	(0.251)
art_ab_ub			-0.123			0.736			-0.123			-0.373
			(-0.079)			(0.504)			(-0.098)			(-0.233)
art_ab_ub_1			-2.027			-1.033			-2.027			-1.891
			(-1.373)			(-0.763)			(-1.723)			(-1.061)
constant	-5.026***	-6.021***	-5.891***	-5.049***	-5.890***	-6.046***	-5.026***	-6.021***	-5.891***			
	(-2.978)	(-3.522)	(-3.383)	(-3.023)	(-3.526)	(-3.502)	(-4.556)	(-6.069)	(-7.347)			
N	152	136	134	152	136	134	152	136	134	152	136	134
R^2	0.45	0.46	0.46	0.45	0.46	0.47	0.45	0.46	0.46	0.45	0.46	0.47
F test p-value	0	0	0	0	0	0	0	0	0			
Linear restr:												
value	0.975	1.467	5.52	0.854	1.337	3.29	0.975	1.466	5.52	0.914	1.318	5.52
p-value	0.1542	0.1288	0.018	0.2046	0.1491	0.0946	0.4968	0.3257	0.0001	0.3068	0.2382	0.0247

Note. The dependent variable is the annual real growth rate of private investment. Explanatory variables definitions are reported in the Appendix. The first row of the table lists estimators used in the subsequent regressions, while the second row describes methods used to calculate fiscal impulses. Fiscal impulses used in regressions are obtained in line with three different approaches: Underlying Balance (column UB), von Hagen decomposition (column H) and Cyclically Adjusted Primary Balance (column CAPB). The linear restriction on parameters being tested is impulse + impulse_1 + art_exp + art_exp_1 = 0, field value corresponds to value of the restriction LHS.
T-statistics are reported in parenthesis. Stars denote estimates significance at 1 (***), 5 (**) and 10 (*) percent levels.

Table 4. The effects of fiscal impulses on private consumption growth

	FE			RE			DK			LSDVC		
	Hagen	CAPB	UB/AB	Hagen	CAPB	UB/AB	Hagen	CAPB	UB/AB	Hagen	CAPB	UB/AB
pcons_1	0.137	0.299**	0.196	0.201*	0.368***	0.291**	0.137	0.299***	0.196***	0.138	0.299***	0.196**
	(1.101)	(2.134)	(1.459)	(1.718)	(2.768)	(2.346)	(1.344)	(4.039)	(3.850)	(1.569)	(3.480)	(2.241)
gdp_1	0.429***	0.198	0.328**	0.377***	0.134	0.232	0.429**	0.198**	0.328***	0.432***	0.198	0.330**
	(2.783)	(1.162)	(2.010)	(2.615)	(0.826)	(1.529)	(2.871)	(2.879)	(6.395)	(4.568)	(1.384)	(2.319)
gdp_eu27	1.513***	1.583***	1.571***	1.504***	1.575***	1.572***	1.513***	1.583***	1.571***	1.522***	1.583***	1.574***
	(7.544)	(8.450)	(8.479)	(7.637)	(8.565)	(8.629)	(7.524)	(6.686)	(7.544)	(4.624)	(4.652)	(5.333)
impulse	0.077	0.21	0.854	0.101	0.231	0.637	0.077	0.21	0.854***	0.074	0.21	0.853
	(0.344)	(0.696)	(1.621)	(0.465)	(0.781)	(1.292)	(0.324)	(0.943)	(4.825)	(0.237)	(0.433)	(1.211)
impulse_1	-0.038	0.121	0.186	-0.028	0.114	0.008	-0.038	0.121	0.186	-0.043	0.121	0.182
	(-0.175)	(0.392)	(0.384)	(-0.133)	(0.383)	(0.018)	(-0.146)	(0.455)	(0.234)	(-0.137)	(0.232)	(0.229)
art_high	0.087	-0.481	-0.71	0.046	-0.532	-0.657	0.087	-0.481*	-0.710***	0.091	-0.481	-0.708
	(0.312)	(-1.242)	(-1.592)	(0.169)	(-1.413)	(-1.585)	(0.203)	(-2.065)	(-3.989)	(0.219)	(-0.688)	(-1.073)
art_high_1	-0.074	-0.093	-0.154	-0.127	-0.119	-0.149	-0.074	-0.093	-0.154	-0.064	-0.094	-0.152
	(-0.280)	(-0.248)	(-0.347)	(-0.492)	(-0.326)	(-0.357)	(-0.287)	(-0.425)	(-0.313)	(-0.178)	(-0.128)	(-0.208)
art_ab_ub			-0.783			-0.537			-0.783***			-0.786
			(-1.449)			(-1.085)			(-3.537)			(-1.073)
art_ab_ub_1			0.007			0.214			0.007			0.008
			(0.012)			(0.448)			(0.018)			(0.010)
constant	-1.121*	-0.746	-0.749	-1.174**	-0.758	-0.848	-1.121***	-0.746**	-0.749***			
	(-1.927)	(-1.296)	(-1.306)	(-2.069)	(-1.349)	(-1.511)	(-3.804)	(-2.484)	(-3.222)			
N	154	126	134	154	126	134	154	126	134	154	126	134
R^2	0.51	0.56	0.56	0.51	0.56	0.56	0.51	0.56	0.56	0.51	0.56	0.56
F test p-value	0	0	0	0	0	0	0	0	0			

Note. The dependent variable is the annual real growth rate of private consumption. Explanatory variables definitions are reported in the Appendix. The first row of the table lists estimators used in the subsequent regressions, while the second row describes methods used to calculate fiscal impulses. Fiscal impulses used in regressions are obtained in line with three different approaches: Underlying Balance (column UB), von Hagen decomposition (column H) and Cyclically Adjusted Primary Balance (column CAPB). The linear restriction on parameters being tested is impulse + impulse_1 + art_high + art_high_1 = 0, field value corresponds to value of the restriction LHS. T-statistics are reported in parenthesis. Stars denote estimates significance at 1 (***), 5 (**) and 10 (*) percent levels.

Table 5. The Cost Channel - the effects of fiscal impulses on labour share in GDP

	FE			RE			DK			LSDVC		
	Hagen	CAPB	UB/AB	Hagen	CAPB	UB/AB	Hagen	CAPB	UB/AB	Hagen	CAPB	UB/AB
lab_share_1	0.750***	0.854***	0.864***	0.895***	0.922***	0.925***	0.750***	0.854***	0.864***	0.836***	0.872***	0.937***
	(13.432)	(17.569)	(17.583)	(36.235)	(42.595)	(42.698)	(11.652)	(42.056)	(41.684)	(15.330)	(13.144)	(18.920)
lab_product	-0.056	-0.083***	-0.079**	0.002	-0.037	-0.039	-0.056	-0.083***	-0.079***	-0.06	-0.084**	-0.072**
	(-1.463)	(-2.724)	(-2.579)	(0.050)	(-1.236)	(-1.288)	(-1.603)	(-3.642)	(-3.396)	(-1.369)	(-2.097)	(-2.398)
unemp	-0.181***	-0.222***	-0.223***	-0.170***	-0.166***	-0.156***	-0.181***	-0.222***	-0.223***	-0.208***	-0.231***	-0.246***
	(-4.940)	(-6.850)	(-6.610)	(-5.964)	(-6.708)	(-6.186)	(-4.277)	(-7.018)	(-10.966)	(-4.789)	(-5.234)	(-7.011)
impulse	0.006	0.06	-0.033	0.023	0.003	0.039	0.006	0.06	-0.033	0.02	0.07	-0.004
	(0.073)	(0.793)	(-0.231)	(0.264)	(0.039)	(0.263)	(0.303)	(0.592)	(-0.224)	(0.244)	(0.625)	(-0.020)
impulse_1	0.01	-0.01	-0.101	0.087	-0.058	0.038	0.01	-0.01	-0.101	0.018	-0.003	-0.083
	(0.107)	(-0.122)	(-0.783)	(0.863)	(-0.694)	(0.281)	(0.266)	(-0.341)	(-1.631)	(0.165)	(-0.028)	(-0.532)
art_exp	-0.157	-0.234**	-0.282**	-0.216**	-0.251**	-0.323**	-0.157***	-0.234	-0.282*	-0.151	-0.242	-0.306**
	(-1.503)	(-2.205)	(-2.251)	(-1.991)	(-2.271)	(-2.465)	(-4.551)	(-1.662)	(-2.276)	(-1.388)	(-1.482)	(-2.109)
art_exp_1	-0.091	-0.074	-0.052	-0.167	-0.056	-0.026	-0.091	-0.074*	-0.052	-0.08	-0.074	-0.05
	(-0.828)	(-0.717)	(-0.465)	(-1.468)	(-0.508)	(-0.216)	(-1.142)	(-2.027)	(-1.468)	(-0.637)	(-0.530)	(-0.378)
art_ab_ub			0.114			-0.033			0.114			0.094
			(0.801)			(-0.225)			(1.165)			(0.570)
art_ab_ub_1			0.109			-0.125			0.109*			0.106
			(0.778)			(-0.922)			(1.899)			(0.747)
constant	12.592***	8.677***	8.222***	6.084***	5.008***	4.807***	12.592***	8.677***	8.222***			
	(5.503)	(4.327)	(4.055)	(5.124)	(4.853)	(4.640)	(5.055)	(9.315)	(8.910)			
N	136	121	121	136	121	121	136	121	121	136	121	121
R^2	0.92	0.95	0.95	0.93	0.95	0.95	0.92	0.95	0.95	0.93	0.95	0.95
F test p-value	0	0	0	0	0	0	0	0	0			
Linear restr:												
value	-0.231	-0.257	-0.468	-0.273	-0.362	-0.272	-0.231	-0.257	-0.468	-0.194	-0.248	-0.442
p-value	0.0095	0.0163	0.0245	0.0021	0.0009	0.1618	0.0021	0.0016	0	0.0398	0.0972	0.0554

Note. The dependent variable is the share of employee compensation in GDP. Explanatory variables definitions are reported in the Appendix. The first row of the table lists estimators used in the subsequent regressions, while the second row describes methods used to calculate fiscal impulses. Fiscal impulses used in regressions are obtained in line with three different approaches: Underlying Balance (column UB), von Hagen decomposition (column H) and Cyclically Adjusted Primary Balance (column CAPB). The linear restriction on parameters being tested is impulse + impulse_1 + art_exp + art_exp_1 = 0, field value corresponds to value of the restriction LHS.
T-statistics are reported in parenthesis. Stars denote estimates significance at 1 (***), 5 (**) and 10 (*) percent levels.

Table 6. The Expectations Channel - the effects of fiscal impulses on households confidence

	FE			RE			DK			LSDVC		
	Hagen	CAPB	UB/AB	Hagen	CAPB	UB/AB	Hagen	CAPB	UB/AB	Hagen	CAPB	UB/AB
con_exp_1	0.265**	0.229	0.292**	0.448***	0.453***	0.407***	0.265***	0.229**	0.292**	0.348***	0.311***	0.352***
	(2.267)	(1.652)	(2.311)	(4.824)	(4.314)	(3.955)	(3.358)	(2.590)	(2.791)	(3.665)	(2.659)	(3.704)
hicp	-0.567**	-0.961***	-0.970***	-0.654***	-1.052***	-1.038***	-0.567	-0.961	-0.970*	-0.515*	-0.924**	-0.944***
	(-2.246)	(-2.767)	(-3.004)	(-2.700)	(-3.382)	(-3.611)	(-1.592)	(-1.753)	(-1.927)	(-1.666)	(-2.346)	(-2.645)
unemp	0.275	-0.03	0.156	0.155	0.085	0.066	0.275	-0.03	0.156	0.312	0.043	0.213
	(0.698)	(-0.062)	(0.358)	(0.598)	(0.283)	(0.238)	(0.818)	(-0.091)	(0.822)	(0.655)	(0.074)	(0.435)
gdp	1.445***	1.232***	1.058***	1.055***	0.919***	0.904***	1.445***	1.232***	1.058***	1.408***	1.178***	1.017***
	(5.181)	(4.389)	(4.262)	(3.910)	(3.423)	(3.760)	(5.837)	(6.690)	(5.865)	(4.514)	(4.563)	(3.216)
impulse	-0.781	-0.935	1.007	-0.355	-0.594	1.519	-0.781	-0.935	1.007	-0.766	-0.942	1.093
	(-1.260)	(-1.117)	(0.711)	(-0.563)	(-0.715)	(1.104)	(-1.116)	(-1.210)	(1.716)	(-1.058)	(-0.948)	(0.598)
impulse_1	0.18	-0.309	2.209	0.228	-0.104	2.772**	0.18	-0.309	2.209	0.154	-0.312	2.206
	(0.295)	(-0.345)	(1.611)	(0.366)	(-0.116)	(2.098)	(0.414)	(-0.384)	(1.395)	(0.197)	(-0.329)	(1.231)
art_high	-0.569	0.864	1.842	-0.567	0.538	1.957*	-0.569	0.864	1.842***	-0.645	0.834	1.798
	(-0.711)	(0.809)	(1.495)	(-0.698)	(0.504)	(1.704)	(-1.197)	(1.814)	(4.753)	(-0.652)	(0.638)	(0.967)
art_high_1	-1.29	0.208	-1.986*	-0.993	0.331	-1.734	-1.290***	0.208	-1.986*	-1.339	0.236	-2.036
	(-1.619)	(0.181)	(-1.664)	(-1.240)	(0.286)	(-1.525)	(-3.730)	(0.235)	(-2.192)	(-1.317)	(0.151)	(-1.293)
art_ab_ub			-3.204**			-3.594***			-3.204***			-3.271
			(-2.240)			(-2.622)			(-5.959)			(-1.551)
art_ab_ub_1			-0.433			-1.15			-0.433			-0.38
			(-0.299)			(-0.834)			(-0.443)			(-0.196)
constant	-22.965***	-18.269***	-17.032***	-15.511***	-12.598***	-12.382***	-22.965***	-18.269***	-17.032***			
	(-5.706)	(-3.648)	(-3.732)	(-4.774)	(-3.327)	(-3.611)	(-6.835)	(-4.902)	(-6.584)			
N	123	110	115	123	110	115	123	110	115	123	110	115
R^2	0.48	0.48	0.56	0.5	0.5	0.55	0.48	0.48	0.55	0.49	0.55	0.55
F test p-value	0	0	0	0	0	0	0	0	0			
Linear restr:												
value	-2.46	-0.171	3.071	-1.686	0.171	4.515	-2.57	-0.171	3.072	-0.171	-0.183	3.061
p-value	0.0037	0.874	0.1417	0.033	0.874	0.0121	0.0444	0.7918	0.018	0.8763	0.8931	0.2558

Note. The dependent variable is the balance of consumers confidence indicatort the end of a year. Explanatory variables definitions are reported in the Appendix. The first row of the table lists estimators used in the subsequent regressions, while the second row describes methods used to calculate fiscal impulses. Fiscal impulses used in regressions are obtained in line with three different approaches: Underlying Balance (column UB), von Hagen decomposition (column H) and Cyclically Adjusted Primary Balance (column CAPB). The linear restriction on parameters being tested is impulse + impulse_1 + art_high + art_high_1 = 0, field value corresponds to value of the restriction LHS.
T-statistics are reported in parenthesis. Stars denote estimates significance at 1 (***), 5 (**) and 10 (*) percent levels.