

Gonzalo C. Capriolo and Marko Glažar

**Fiscal multipliers and policy mix during fiscal consolidation process:
minimizing the impact of fiscal adjustment on economic activity (GDP)**

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Abstract: To assess the impact of fiscal consolidation and the 2012 envisaged policy mix for the period 2012–2015 on economic activity in Slovenia this paper estimates the size of fiscal multipliers. Consistent with literature and estimation of multipliers under the zero lower bound on nominal interest rates the paper finds that in order of magnitude the less costly consolidation policy consist of an increase in VAT rate followed by the reduction on social benefits, government consumption and investment. The size of multipliers is larger when the share of liquidity constrained household increases magnifying the impact of fiscal policy on economic activity. This can be the case when economic conditions worsen or income becomes uncertain. The assessment of the impact of the 2012 envisaged consolidation policy, against a base line scenario in which consolidation does not take place and results in the worst outcome, suggests that lifting the VAT rate could contribute to mitigate the short-term negative effect of consolidation on economic activity.

Key words: fiscal multipliers, fiscal consolidation, policy mix

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Working paper: Fiscal multipliers and policy mix during fiscal consolidation process: minimizing the impact of fiscal adjustment on economic activity (GDP)

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LIST OF ABBREVIATIONS

EU	European Union
DSGEM	Dynamic stochastic general equilibrium model
GDP	Gross domestic product
LCH	Liquidity constrained households
OECD	The Organisation for Economic Co-operation and Development
VAT	Value added tax
SLC	Liquidity constrained factor
SP	Stability Program
SFW	Forward looking factor

Summary

In considering alternative fiscal consolidation policies it is important to have an assessment of the size of fiscal multipliers to evaluate their impact on economic activity. This is particularly the case under current conditions in which the economy is undergoing recession. Equally important is to appraise the consequences of no consolidation, which is in turn the appropriate counterfactual scenario for evaluating the cost of fiscal consolidation policy. The relevance of addressing the issue of alternative consolidation policy mix is not only due to the aim of mitigating its negative impact on economic activity in short run, at the time where overall conditions in euro area have worsened, but also because lower economic activity affects perception of creditworthiness of the sovereign as summarized in the debt-to-GDP ratio and the differential between the interest rate and GDP growth. It should be also stressed that the discussion of optimal policy mix is strongly constrained by government financing conditions. In the paper fiscal multipliers are estimated for various policy instruments and it is found that their impact on the economy ranked in order of magnitude seem to conform with those found in other studies for advanced economies. Under current conditions, the fiscal multiplier for government expenditure is likely to be relatively larger than under normal circumstances. Confidence considerations can also play an important role. Simulations indicate that the policy mix that minimizes the cost on economic activity seems to be one in which expenditure policy is always accompanied by an increase in VAT rate. Assessment of the envisaged fiscal consolidation policy in 2012 (Stability Program 2012) indicates that the major impact on economic activity is in the short run, but it is less adverse than in the case of no consolidation scenario. Nevertheless, it also seems to have effect on the economy over the medium to long run suggesting the importance of enacting policies aiming at offsetting the overall effect of consolidation.

Povzetek

Pri izbiranju možnih načinov fiskalne konsolidacije je pomembna informacija o fiskalnih multiplikatorjih posameznih ukrepov, ki kažejo oceno vpliva konsolidacije na ekonomsko aktivnost. To je še posebej pomembno v času, ko je ekonomija v recesiji. Prav tako je treba oceniti posledice odsotnosti konsolidacije javnih financ. To je namreč scenarij, ki ga moramo primerjati s scenarijem fiskalne konsolidacije. Ocenjevanje različnih načinov fiskalne konsolidacije ni pomembno samo zaradi minimiziranja kratkoročnih negativnih učinkov v času, ko so se razmere v evrskem območju poslabšale, ampak tudi zato, ker nižja ekonomska aktivnost vpliva na dojemanje kreditne sposobnosti države v smislu deleža dolga v BDP ter razlike med obrestno mero na dolg in rastjo BDP. Poudariti je treba, da je razprava o optimalnem svežnju različnih ukrepov na fiskalnem področju zaradi pogojev financiranja s katerimi se sooča država, zelo omejena. V delovnem zvezku so fiskalni multiplikatorji ocenjeni za različne inštrumente ekonomske politike. Ugotovila sva, da so rezultati, razvrščeni po velikosti, v skladu z rezultati drugih raziskav za razvita gospodarstva. V trenutnih razmerah so po najini oceni multiplikatorji za državno potrošnjo relativno večji, kot bi bili v normalnih razmerah. Pomembno vlogo lahko igra tudi faktor zaupanja. Simulacije kažejo, da naj bi fiskalna konsolidacija, ki minimizira negativne učinke na ekonomsko aktivnost, vedno vsebovala tudi ukrep zvišanja stopnje DDV. Ocena načrtovane politike fiskalne konsolidacije pa kaže, da je negativni učinek na ekonomsko aktivnost največji v kratkoročnem obdobju, vendar je ta manjši kot če do fiskalne konsolidacije sploh ne pride. Načrtovana fiskalna konsolidacija bo imela, glede na rezultate simulacij, negativne učinke na ekonomsko aktivnost tudi v srednjeročnem obdobju, kar kaže na pomembnost sprejemanja politik, ki spodbujajo gospodarsko rast.

INTRODUCTION

This paper estimates the size of fiscal multipliers to assess the impact of alternative consolidation policies on economic activity with the aim to get insight about the consequences of fiscal consolidation or no consolidation and the policies that deliver the minimum negative impact on economic activity. The emphasis on economic activity arises due to the fact that consolidation is/has taking place against a macroeconomic background characterized by weak external demand, the impact of undergoing deleveraging on domestic demand and macroeconomic activity and the effect of the EU sovereign debt crisis on risk aversion of investors. The paper also assesses the impact on economic activity of no consolidation and of the expenditure consolidation policy as foreseen in the Update of the Stability Program 2012 (SP 2012).

The estimation of the size of fiscal multipliers, the assessment of the impact of alternative consolidation policy options on economic activity and of the 2012 envisaged fiscal consolidation policy for the period 2012–2015 is made based on a dynamic stochastic general equilibrium model (DSGEM) Quest III calibrated for Slovenia. The paper is divided in two sections and conclusions. The first section presents the assumptions and approach followed in estimating the fiscal multipliers and fiscal policy simulations and the second section presents the results.

SECTION 1: APPROACH FOLLOWED IN ESTIMATING FISCAL MULTIPLIERS AND SIMULATIONS

1. To assess the effect of fiscal consolidation three types of simulations were performed using the DSGEM Quest III calibrated for Slovenia (Glažar 2012)¹. They include: Temporary (one-year) and permanent shifts in fiscal policy's instruments; alternative policy mixes that would result in lowering the government deficit by 1 % of GDP every year over the next four years and; assessment of the effect of fiscal consolidation as envisaged in the SP 2012.
2. Estimations were carried out under two assumptions concerning the central bank interest rate and government's fiscal target. The key interest rate of the central bank is kept at the so-called zero lower bound over the medium term. This has implications for the relative strength of tax and government expenditure consolidation measures as their positive effect on economic activity depend upon the accompanying degree of relaxation of monetary policy which under current conditions is not available (IMF 2011). Furthermore, the role of monetary policy via impact on interest rates, in new Keynesian models is the most important factor determining the size of multipliers (Woodford 2011).
3. It is also assumed that the government does not target any specific level of the deficit. The model has a feedback rule which adjust taxes in relation to the gap between actual and target deficits which is switched off in the simulations in the medium term (see Roger et al 2011 and OECD 2011). This assumption prevents automatic endogenous fiscal correction to shocks.
4. In line with other simulations (e.g. OECD 2012) on the impact of fiscal policy on economic activity, the fiscal multipliers are estimated for policy measures (tax increases or spending cuts) that ex-ante would improve the deficit by 1 % of GDP. Fiscal multipliers were estimated for indirect taxes, government consumption, government transfers and government investment. Fiscal multipliers

¹ For a more detailed description of the model see D'Auria et al (2009).

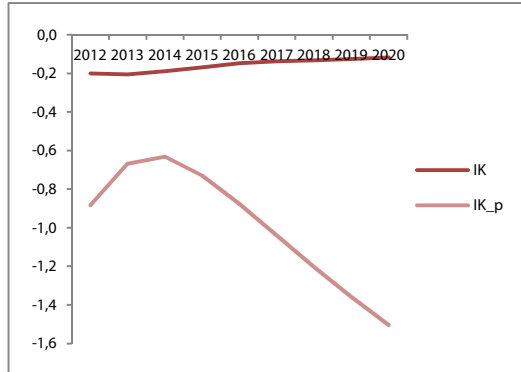
were not estimated for direct taxes (personal income and corporate income) and social security contributions as they result in more adverse impact on economic activity than in the case of an increase in indirect taxes.

5. In addition to fiscal multipliers the effect of exogenous increase of capital costs (temporary and permanent) on economic activity due to absence of fiscal consolidation (i.e. increase in government borrowing cost) was estimated. Exogenous reductions in the cost of capital are associated with the effects of financial integration (D' Auria et al 2009). However, the cost of capital in the current context is strongly influenced by sovereign risk premium and the dysfunction of euro area interbank market which in turn has led to erosion of gains on banking financing integration (ECB 2012). In particular, as a consequence of the Greek's debt crisis sovereign risk premium has increased in euro area and a strong correlation between borrowing cost of sovereigns and those of their respective banking sectors has emerged (IMF 2011). Furthermore, empirical research indicates that sovereign risk adversely affects borrowing conditions in the broader economy and that the correlation between public and private borrowing costs actually tends to become stronger during crises (Corsetti et al 2012 and IMF 2012). Nevertheless, under current circumstances facing Slovenia in which the sovereign's credit rating has been downgraded, among other reasons due to the potential adverse impact of worsening of state's partially owned banks on government balance sheet (Moody's 2011 and Fitch 2011), it can be said that the adverse result on cost of capital also arises from a two-way causation. The simulation aims at assessing the sovereign risk channel of fiscal policy (i.e. impact on interest rates) when sovereign risk is high. Such a simulation in turn could be considered as a counterfactual scenario for the case of no fiscal consolidation.

SECTION 2: RESULTS

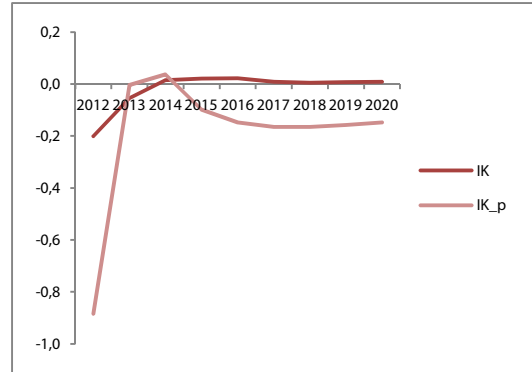
6. In assessing the cost of fiscal consolidation the key issue is to determine the appropriate benchmark for comparing the various fiscal consolidation measures. When government financing faces a fully elastic supply of funds and unrestrictive access to funding, then the cost of consolidation is relative high as policy measures dent economic activity. However, when financing is constrained or limited the cost of no consolidation is relatively high as maintaining large deficits becomes a no option resulting first in increases in borrowing costs and then in lack of access to funding. This is particularly the case under current conditions in which the euro area government debt market has become dysfunctional (Capriolo 2012). Among the recent changes to Slovenia's sovereign credit rating the argument of lack of credible fiscal consolidation was singled out as a reason for a downgrade (S&P 2011). Therefore, the appropriate benchmark scenario for assessing the impact of consolidation measures on economic activity seems to be one in which the cost of capital for the economy rises due to absence of fiscal consolidation; first affecting the government borrowing cost and then that of the economy at large.
7. Figures 1 and 2 show the effect of an increase in the borrowing cost of the government (100 bps.) which is entirely passed-through to private sector borrowing cost. Figures 1 and 2 indicate that temporary (one-year) and permanent increases in borrowing costs affect the level of GDP and its rate of growth. When the increase is permanent the adverse effect on GDP is larger and the effect on GDP growth rate permanent. The simulations point out to the implicit cost of no fiscal consolidation.

Figure 1: Impact of 1 p.p. increase in cost of capital on level of GDP, temporary (IK) and permanent increase (IK-p)



Source: Own calculations

Figure 2: Impact of 1 p.p. increase in cost of capital on GDP growth %, temporary (IK) and permanent increase (IK-p)



Source: Own calculations

8. The next step consists of estimating fiscal multipliers. Table 1 reports the estimates of the first year multipliers of temporary measures of fiscal consolidation (i.e. ex-ante reduction in government spending and increase in VAT revenue due to VAT rate increase (1 % of GDP)). It indicates that government spending multipliers (i.e. consumption, transfers and investment) are larger than that of indirect taxes (VAT). It also suggests that the size of the multiplier of government consumption is not very different from that of investment.

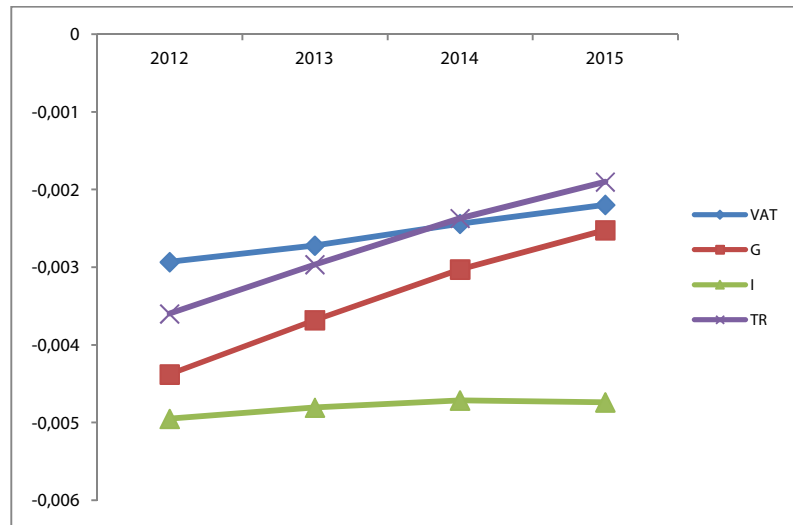
Table 1: First-year multipliers from 1 % of GDP temporary measure

Government spending			VAT
Consumption	Transfers	Investment	VAT
-0.44	-0.36	-0.50	-0.29

Source: Own calculations

9. Since the fiscal intervention (i.e. shock) is conceived temporary, then in the second year it is reversed in the same magnitude as in the first year with positive effect on GDP. Figure 3 shows the resulting dynamics on the level of GDP. After the two shocks (negative and positive) GDP recovers in all cases but the speed of recovery is very slow in the case of investment (I). GDP level recovers faster in the case of change in transfers (TR), followed by changes in VAT rate and government consumption (G). After three years following the temporary shocks (2015) the adverse effect of government consumption on economic activity is close to that of VAT which is consistent with empirical findings regarding the relative VAT's lower cost in terms of GDP in the short-term (IMF 2012).

Figure 3: Temporary shock (level effect)



Source: Own calculations

10. The first-year multipliers for temporary measures estimated in Table 1 were compared with similar estimates made by OECD for its members (excluding Slovenia) under similar assumptions used in the estimates of multipliers presented in this paper regarding interest rate and fiscal rule (Barrel et al 2012). The estimates of the OECD presented in Table 2 correspond to government consumption and benefits (transfers) and indirect taxes. They vary among countries but ranked in order of magnitude indicate that the largest multipliers across all countries correspond to government consumption followed by benefits and then indirect taxes. The estimated multipliers for Slovenia, also presented in Table 2 for comparison, indicate that those of government consumption and transfers are relatively lower than the OECD average while VAT multiplier is relatively larger. Notice however, that a straight comparison between the magnitude of the multipliers in both OECD and those estimated here for Slovenia is not possible given that are estimated with alternative models. What it is relevant in the comparison is that in all country cases of OECD and in Slovenia the multipliers for different fiscal instruments reflect similar ranking (Table 2 last two columns) i.e. the multiplier of government consumption is bigger than those of benefits (column 4) and indirect taxes (column 5).² With regard to multipliers estimated according to VAR methodology a review of the literature (EU Commission 2012) indicates that empirical estimates reveal that tax shocks entail lower cost in GDP than expenditure. Furthermore, according to the mentioned review the government consumption multiplier lies between 0.5 and 0.8 and larger value multipliers correspond to wages and investment (above 1) with smaller multipliers for VAT and labour tax (0 in normal times and 0.7 in time of crisis).

² Notice that other relevant model base multipliers provide similar order of magnitude among various fiscal instruments (Roger et al 2010 and Coenen 2010). This finding is further confirmed in Baunsgaard et al (2012) that surveyed 34 studies between 2002 and 2012 concerning the size of multipliers which were made based on DSGE and vector autoregressive models.

Table 2: First-year multipliers from 1 % of GDP temporary measure

	Consumption	Benefits	Indirect Taxes	Differences	
	1	2	3	4 = 1-2	5 = 1-3
Australia	-0.82	-0.27	-0.25	-0.55	-0.57
Austria	-0.53	-0.17	-0.09	-0.36	-0.44
Belgium	-0.17	-0.04	-0.05	-0.13	-0.12
Canada	-0.53	-0.16	-0.05	-0.37	-0.48
Denmark	-0.53	-0.1	-0.06	-0.43	-0.47
Finland	-0.64	-0.14	-0.09	-0.5	-0.55
France	-0.65	-0.32	-0.09	-0.33	-0.56
Germany	-0.48	-0.29	-0.09	-0.19	-0.39
Greece	-1.07	-0.44	-0.22	-0.63	-0.85
Ireland	-0.33	-0.09	-0.07	-0.24	-0.26
Italy	-0.62	-0.17	-0.07	-0.45	-0.55
Japan	-1.27	-0.65	-0.34	-0.62	-0.93
Netherlands	-0.53	-0.19	-0.07	-0.34	-0.46
Portugal	-0.68	-0.15	-0.08	-0.53	-0.6
Sweden	-0.39	-0.14	-0.06	-0.25	-0.33
Spain	-0.71	-0.15	-0.17	-0.56	-0.54
United Kingdom	-0.74	-0.22	-0.16	-0.52	-0.58
United States	-1.12	-0.35	-0.35	-0.77	-0.77
Slovenia	-0.44	-0.36	-0.29	-0.08	-0.15

Source: For OECD countries Barrell et al (2012); for Slovenia Table 1

11. Fiscal multipliers were also estimated for the case in which the cut in spending or increase in taxes is made permanent (i.e. permanent shocks). Table 3 presents the first-year multiplier from a 1 % of GDP permanent consolidation policy measures. The results indicate that the size of multipliers of permanent measures are similar to those of temporary nature (Table 1) in the cases of government consumption and transfers (slightly higher) and VAT (slightly lower) but not for investment which the negative impact increases significantly in the case of a permanent cut. This can be explained by the lagged impact of investment in economic activity. OECD estimates of multipliers of permanent measures for OECD countries reflect also similar ranking than in Table 3³.

Table 3: First-year multipliers from 1 % of GDP permanent consolidation

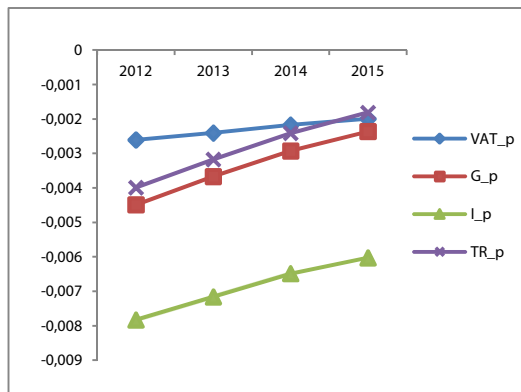
Government spending			VAT
Consumption	Transfers	Investment	
-0.45	-0.40	-0.78	-0.26

Source: Own calculations

³ According to Barrell et al (2012) permanent multipliers should be smaller than temporary ones, due to larger impact of fiscal contraction on longer rates. The fall in long rates will induce increase in asset prices and investment.

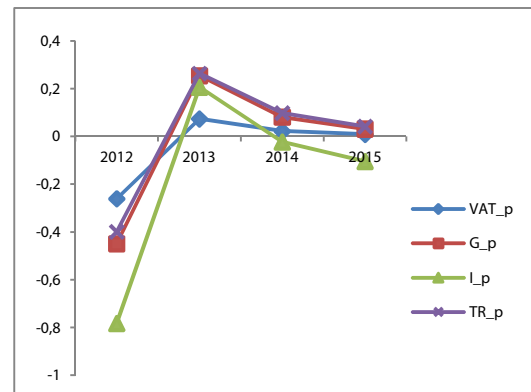
12. With regard to the GDP dynamics in the aftermath of the permanent fiscal intervention the simulations indicate that recovery in GDP level is slower than under a temporary fiscal intervention in the cases of cuts in consumption and transfers and particularly in the case of investment which never recovers (Figure 4). This is because the shock affects also the GDP growth rate (Figure 5). The order of magnitude of the adverse effect of consolidation measures on GDP is similar than that in the case of temporary fiscal measures. Yet, the speed of reduction of negative impact on GDP due to cut in transfers is slower and equals that of VAT only in the four year after the shock (Figure 4). Appendix 1 summarizes the response of macroeconomic variables to the various shocks.

Figure 4: Permanent shock (GDP level effect)



Source: Own calculations

Figure 5: Permanent shock (GDP growth rate)



Source: Own calculations

13. As discussed in Box 1 the results of the relative impact of permanent changes in various policy measures is robust to alternative calibration of two key parameters in the model influencing its dynamics and effects: The share of liquidity constrained households (LCH) in the economy and the share of work force that sets its wage based on a forward looking view of inflation. In particular, according to Lepper et al (2011) the share of LCH is the single most relevant variable influencing the size of multipliers. Furthermore, in the current juncture given the recession and stress in financial markets it is likely that multipliers are higher than in normal times (Auerbach and Gorodnichenko 2010; Baum et al 2012).

Box 1: Sensitivity of fiscal multipliers to different share of liquidity constraint households (LCH) and of individuals setting their wage based on forward looking view of inflation (SFW)

The two parameters affect the intensity and the dynamics of the response of economic activity to shocks as they result in frictions to real activity. The term liquidity constrained consumer refers to the consumer whose current consumption is determined by current income. On the other hand in the case of non-liquidity constrained, Ricardian, households their consumption decision is made on the basis of current and (expected) future income. A higher share of LCH tends to magnify the impact of a given shock as individuals cannot smooth out income fluctuations. The model is calibrated with a share of LCH of 40 % which is equivalent to two times the share of low skilled workers in the Slovenian workforce.

The other parameter, the share of individuals setting their wage with a forward looking view of

inflation, refers to the proportion of individuals in the labor force that set their wage based on expected inflation and not on past inflation. A higher share of individuals setting their wage in a forward looking way results in a faster adjustment of real activity to shocks. In the model the share of individual that adjust their wage in this manner is 90 %.

The sensitivity of fiscal multipliers of permanent shocks to alternative parameter specification was assessed by attributing alternative values to the underlying parameters. In particular the impact of permanent shocks due to cuts of government consumption, transfers, and Investment and the increase of VAT rate was assessed under different values of the shares of LCH and SFW.

The results indicate that a higher share of LCH magnifies the impact of a fiscal shock on GDP (Table 4). In the model the share of LCH is relative important in driving GDP's dynamics as private consumption offsets to a certain degree the negative impact of a government expenditure reduction on the economy. In the aftermath of negative government expenditure shock in the model, private consumption in general increases due to lowering of prices. However, it is the behavior on non liquidity constrained households whose relative share of consumption in the total consumption is the largest, that underpins the overall positive consumption response. In particular, even if share of LCH increases significantly (e.g. 60 % (Table 4)) private consumption still importantly offsets the negative impact of government consumption reduction on economic activity. Nevertheless, under the ongoing recession process affecting employment and wages, thus increasing the number of individuals constrained, it seems quite unlikely that a strong response of private consumption would ensue pointing out to the possibility of relatively larger government expenditure multiplier than that estimated in the baseline scenario (Table 3).

The share of the work force that set its wages with a forward looking view of inflation does not influence the impact of the shock (Table 4) but affects the adjustment dynamics. A higher share of SFW induces a less strong rebound in economic activity and fluctuation. This is because the labor market adjusts faster than for example in the case of higher share of individuals adjusting wages with past inflation.

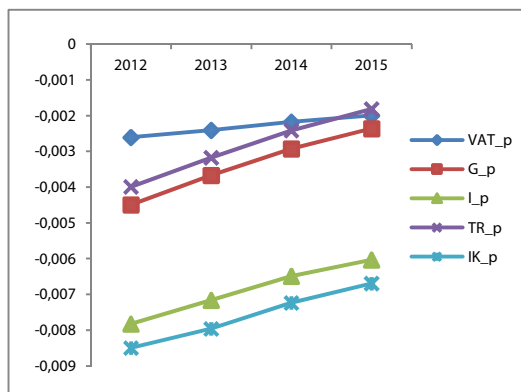
Table 4: Sensitivity analysis of multipliers

	Baseline (SLC=0.4, SFW=0.9)	Liquidity constraint factor			Forward looking factor	
		SLC= 0.3	SLC= 0.5	SLC= 0.6	SFW=0.6	SFW=0.3
VAT	-0.26	-0.18	-0.34	-0.43	-0.26	-0.26
Transfers	-0.40	-0.33	-0.48	-0.56	-0.39	-0.39
Government Consumption	-0.45	-0.36	-0.55	-0.65	-0.44	-0.44
Investments	-0.78	-0.70	-0.88	-0.98	-0.76	-0.77

Source: Own estimations

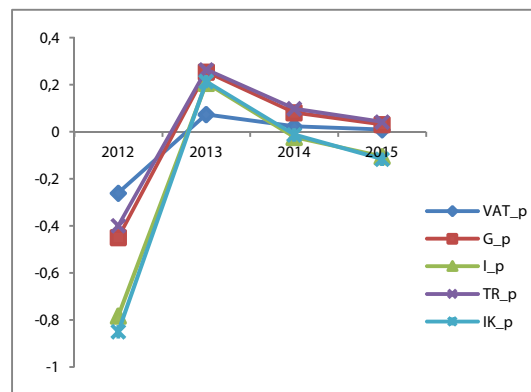
14. As mentioned above, a suitable assessment of the cost of fiscal consolidation on economic activity cannot be obtained from comparing the relative losses in economic activity resulting from alternative policy mixes but from comparing them with those arising from a scenario in which consolidation does not take place and as a result the borrowing cost of the government and the cost of capital for the economy increase. To this purpose the impact of fiscal multipliers of permanent consolidation measures on the economy is compared with that of a permanent increase in cost of capital by 100 bps set arbitrarily for illustration purposes⁴. As shown in Figure 6 the impact of the increase in the cost of capital (IK_p) on GDP level is the most adverse among the shocks. The effect is more negative than in the case of government's investment reduction. The effect of the increase in cost of capital on GDP is permanent as it also affects the growth rate of GDP (Figure 7). The comparison suggests that whatever the permanent fiscal consolidation measure implemented its cost on GDP is lower than the impact of the increase in the cost of capital (i.e. no consolidation). Figure 6 also indicates that the minimum cost in terms of economic activity over the medium term is achieved by increasing VAT rate followed by a cut in social transfers, government consumption and investment.

Figure 6: Permanent shock (GDP level effect)



Source: Own calculations

Figure 7: Permanent shock (GDP growth rate)



Source: Own calculations

15. The estimated multipliers of permanent changes in fiscal policy were used to assess alternative consolidation policies taking into account the fiscal position at the end of 2011 and the EU binding constraints regarding reduction of excessive deficit and pace of consolidation. The fiscal deficit at the end of 2011 was 6.4 % of GDP of which 1.3 % of GDP was due to one-off type expenditure nature⁵. This suggests that absent of one-off type of expenditures the fiscal gap to be closed is of about 5 % of GDP. This implies enacting permanent fiscal consolidation measures that could deliver on a given time frame the desired results. While in principle the pace of deficit reduction can be chosen, the fact that Slovenia is member of the EU imposes a minimum pace of fiscal consolidation: reduction of government deficit below 3 % of GDP by 2013 and then a minimum yearly speed of deficit reduction corresponding to 0.5 % of GDP structural deficit reduction. These minimum requirements broadly imply a deficit reduction of 1 % of GDP per year. Nevertheless, it is important to highlight that the ultimate constraint determining the pace of consolidation is the possibility of financing a given deficit.

⁴ The Government 10-year bond yield increase in 2011 from an average of 4.5 % during the first semester to almost 7 % in November and then declined again. This development is explained by various factors (Capriolo 2012).

⁵ By one-off type expenditure it is referred to non recurrent expenditure (e.g. capital injection in government owned enterprises).

CONSOLIDATION'S ALTERNATIVE POLICY MIXES

16. Consolidation can be achieved by means of different policy mixes (e.g. government expenditure reduction and revenue increases) and with different speed. If pursued alone by spending reduction this means a permanent expenditure reduction equivalent to 5 % of GDP whose implementation should be distributed over a given time frame with same or different intensity of the reduction of expenditure. In addition consolidation can also include tax rate increases which can contribute to mitigate the recursive use to expenditure reduction measures.
17. To assess different consolidation alternatives (i.e. policy mix) and possibilities to minimize the impact on GDP given ongoing deleveraging in the economy and low external demand the impact of various policy measures were simulated. These include: i) four-year consecutive permanent reduction of government consumption by 1 p.p. of GDP every year; ii) four-year consecutive permanent reduction of social transfers to liquidity constraint households by 1 p.p. of GDP every year⁶; iii) three-year consecutive permanent reduction of government investment by 1 p.p. of GDP every year and⁷; iv) one-time permanent increase in VAT rate by 2 p.p. equivalent to increase in government revenue by 1 p.p. of GDP. To assess the impact of consolidation versus no consolidation scenario a three-year consecutive increase in cost of capital by 100 bps was simulated.
18. Figures 8 and 9 highlight the issue that the no consolidation scenario (IK) is the worst option for the economy in terms of GDP dynamics. They also implicitly indicate the risk associated with change in borrowing conditions for the government and the economy at large. Notice that the combined effect of consolidation on GDP by adding the effects of cutting of government consumption and transfers and increase in VAT rate is less negative than the increase in cost of borrowing. This suggests the importance of frontloading the adjustment when risk of increase in government borrowing cost is imminent (e.g. change in the sovereign credit rating) or government funding conditions worsen. It also indicates that when that risk is high the choice of instrument for consolidation is not too relevant as the losses from changes in borrowing conditions are larger.
19. When looking at the issue of minimizing the cost of fiscal adjustment it is clear that a permanent increase in VAT has the smaller cost in GDP over the medium term. This is the case not only because its cost is the lowest in terms of accumulated GDP losses (Figure 10) but also because it reduces permanently the deficit gap and reduces the need to resort to successive cuts in expenditure which has larger GDP costs. However, resorting to VAT rate cannot be seen in isolation from other measures but as an accompanying policy measure as one time permanent increase in VAT rate while reducing permanently the deficit it cannot close the fiscal gap. For this purpose it is important to simultaneously reduce government expenditure (i.e. the consolidation has to be primarily led by expenditure cuts) and increase the VAT rate.
20. An issue concerning changes in VAT rate it is the likely impact on inflation, wages and economic activity in general. In the model the increase in VAT rate transmits almost entirely into prices

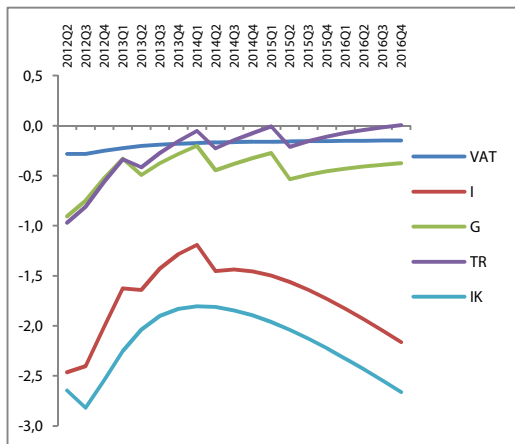
⁶ The size of social benefits in cash and kind as percentage of GDP will be reduced from 20.1% at the end of 2011 to 16.1 % of GDP which is close to the level in 2007.

⁷ The starting level of investment in GDP (2011) is 3.7 p.p. This implies that government investment cannot be reduced permanently beyond 3 years by 1 p.p. of GDP consecutively.

(90 %) which in turn reduces consumption and the labor market adjusts to the price shock via employment and wages. There is no automatic indexation of wages to the price shock as in fact changes of wages take place after negotiation between employers and employees taking into account overall inflation developments and underlying broad economic conditions. Wages in the model are affected by price developments via the proportion of individuals in labor force indexing their growth wage to inflation in the previous period. As indicated in Box 1 the share of individuals indexing their wage in a backward looking fashion is about 10 % in the baseline scenario. But increasing this share to 70 % does not result in a larger impact multiplier but mainly in a strong adjustment in the labor market (Box 1, Table 4).

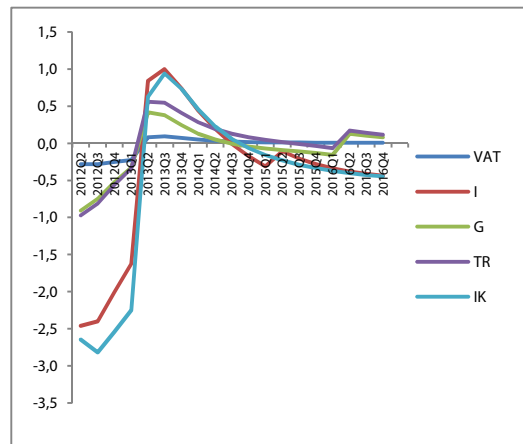
21. Among the expenditure measures the more adverse policy is a permanent cut in investment. This is not only because of its negative effect on GDP in the medium term which is about the combined size of other consolidation measures but because it is a permanent measure. This means that after 5 or 6 years when depreciation of buildings, hospitals, roads will take a toll there will not be possibilities to refurbishing them.
22. The adverse impact of cuts in government consumption and transfers on GDP is similar in the first two years (Figure 10). After that the negative effect of cuts in social transfers on GDP is gradually phased out while the negative effect of government consumption continues and by 2016 practically doubles the size of the cut in transfers (Figure 10).
23. When considering the minimization of the impact of the cost of consolidation on GDP the results indicate that in whatever chosen fiscal strategy (fast or slow consolidation) this is achieved optimally by relying both on expenditure and VAT rate increase. If the aim is to minimize the impact on GDP in the short term the policy mix should be biased to VAT increase (e.g. 50 % expenditure cuts and 50 VAT increase).
24. When considering the impact of fiscal policy on the economy and the pace of consolidation it is also important to take into account recent research (Baum et al 2012) that points out that the position in the business cycle affects the impact of fiscal policy: government spending and revenue multipliers tend to be larger in downturns than in expansions. Sensitivity analysis concerning the share of LCH also points out that a higher share affects more adversely economic activity in the short run and this is likely to be the case under current circumstances (Box 1, Table 4).

Figure 8: Permanent shock (GDP level effect)



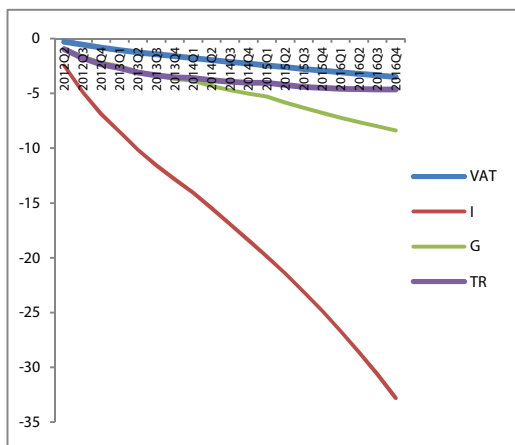
Source: Own calculations

Figure 9: Permanent shock (GDP growth rate)



Source: Own calculations

Figure 10: Accumulated loss in level of GDP, p.p.



Source: Own calculations

25. The impact of the expenditure consolidation policy on economic activity as described in the Update of the Stability Program 2012 (SP 2012) for the period 2012–2015 was also assessed. The overall impact of consolidation is also compared with the scenario in which there is no consolidation and as a result the cost of capital in the economy increases by 1 p.p. every year for three consecutive years and then the interest rate level remains permanently at a higher level (i.e. 3 p.p.)
26. Table 5 describes the fiscal consolidation policy mix envisaged in the SP 2012 for the period 2012–2015 concerning government’s consumption, transfers and gross fixed capital formation. Figures show the change of expenditure categories as percentage of GDP with respect to their levels in the year 2011. The expenditure reduction was modeled as permanent reduction in the mentioned expenditure categories.

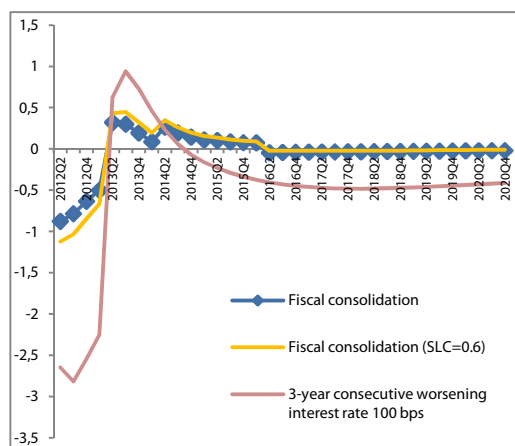
Table 5: Fiscal consolidation policy mix envisaged in the Stability Program 2012

	Difference with respect to 2011 (% GDP)			
	2012	2013	2014	2015
Government consumption	-0.9	-1.3	-1.1	-0.9
of which wages	-0.6	-0.9	-0.6	-0.4
of which intermediate consumption	-0.3	-0.4	-0.5	-0.6
Transfers	-0.3	-0.3	-0.1	0.2
Gross fixed capital formation	-0.2	-0.3	-0.3	-0.3
Total expenditure	-1.5	-1.9	-1.6	-1.1

Source: SP 2012

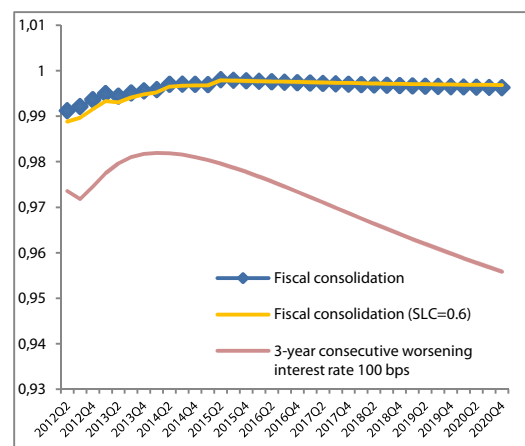
27. Figures 11 and 12 present the simulation of the impact of consolidation policy as envisaged in the SP 2012 on the growth rate and level of GDP. The figures include the baseline simulation, sensitivity of the consolidation to higher share of liquidity constrained households and the impact of three year successive increase in the interest rate (100 bps) on GDP resulting from no fiscal consolidation. The figures point out several important messages. The first one is that consolidation is less costly than the alternative of no consolidation. The second message is that fiscal consolidation is costly in terms of economic activity during the first years and this is particularly the case in the first year suggesting the importance of cost mitigation (e.g. increase in VAT rate). The third message is that the effect of consolidation could be more adverse depending on consumers response (SLC = 0.6) and, the last message is that the policy mix results on lower growth rate and level of GDP in the long term which is mainly attributed to the reduction of investment. This latter insight suggest the importance of devising supplementary policies to offset the effect of consolidation on economic activity such as improving the access to capital financing to Slovenian enterprises and foster the fast restructuring of leveraged but viable firms.

Figure 11: Consolidation policy (GDP growth rate)



Source: Own calculations

Figure 12: Consolidation policy (GDP level effect)



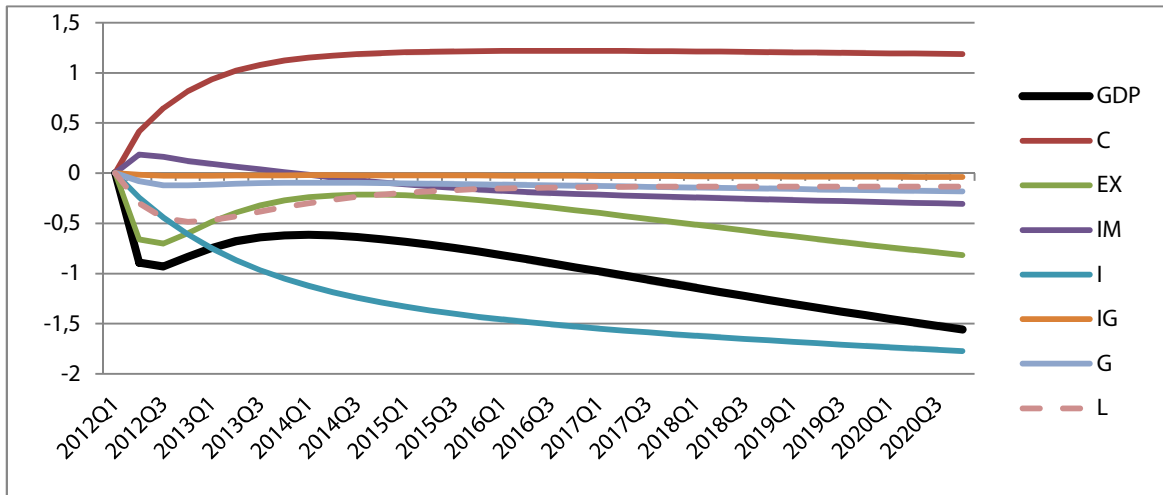
Source: Own calculations

CONCLUSIONS

28. In line with growing number of studies concerning the size of multipliers made based on DSGE and vector autoregressive models the simulations performed in this paper indicate that in order of magnitude the less costly consolidation policy in terms of economic activity corresponds to increase in VAT rate followed by reduction on social benefits, government consumption and investment. From this result it is inferred that a consolidation policy, aiming at reducing the deficit permanently should consider a policy mix including revenue (i.e. VAT rate) and expenditure measures to mitigate the adverse effect on economic activity. Notice however that given the magnitude of the deficit, consolidation cannot be based only on VAT increase but should rely primarily on expenditure measures. Nevertheless, a VAT rate increase can ease the burden of adjustment and contribute to its frontloading. The advantage of resorting to an increase in VAT rate seems to be greater at the starting of consolidation when expenditure measures have not dented on economic activity and where revenue collection can be larger. The increase in VAT rate can also contribute to frontloading adjustment when sovereign risk increases and funding conditions worsens as this is currently the case. In the model the impact of increase in VAT rate does not feed directly on wages as the labor market adjusts following the impact of the rate increase on private consumption and prices. This seems to correspond to observed effect of the change in VAT rate in 2002.
29. The comparison of the cost of different consolidation policy options contributes to design an optimum consolidation mix but the relative impact of consolidation should be assessed vis-à-vis a no consolidation scenario. In the analysis this was done by simulating an increase in the cost of funding of the government which is passed through to the economy. Comparing this scenario with whatever consolidation policy mix points out that the option of no consolidation is the most expensive one.
30. Sensitivity analysis concerning the share of liquidity constrained households on the size of impact multipliers indicates a positive relation between the two. This suggests that in an environment in which economic conditions worsen and income becomes more uncertain the size of the multipliers increase and as such the impact of fiscal policy on economic activity becomes more adverse.
31. While the no consolidation scenario results in the worst outcome in terms of economic activity, the assessment of the effect of the 2012 envisaged consolidation policy suggests to have stronger negative effect on economic activity in the short-term that could be minimized by a policy mix including an increase in VAT rate. Due to reduction of government's investment, simulations indicate that the 2012 envisaged consolidation may also affect the growth rate and the level of GDP over the medium-to-long term suggesting the need for policies to offset such an impact. To some extent the lowering of corporate income tax, whose effect was not simulated and which should be considered in light of the enterprises' balance sheet strength, could contribute to such an outcome. Other important policies could include enhancing directly the enterprises' balance sheets and maximizing the withdrawal of EU funds.

APPENDIX: IMPULSE RESPONSE TO PERMANENT SHOCKS

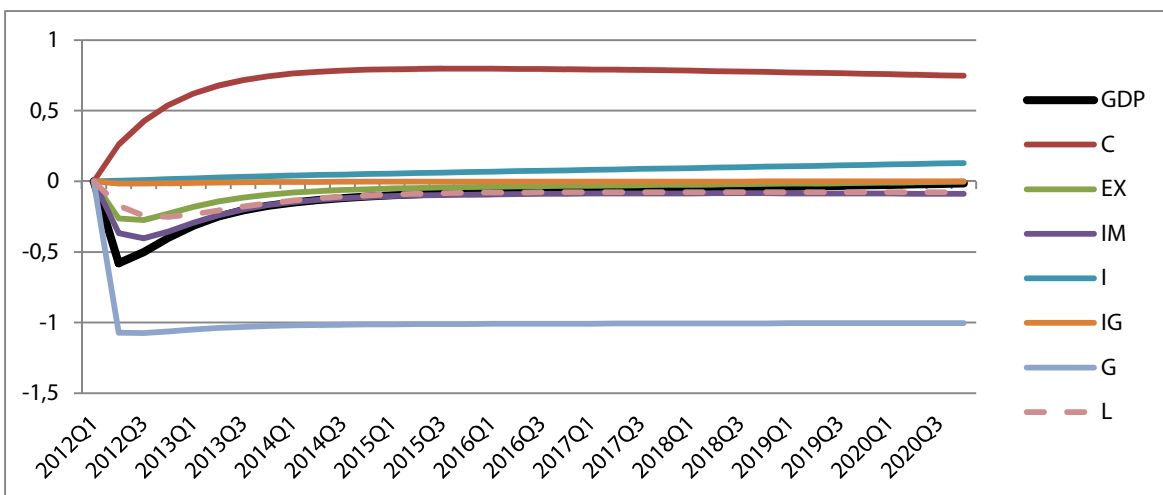
Figure A1: Response to 100 basis points increase in the cost of capital. Changes in private consumption (C), exports (EX), imports (IM), private investments in gross fixed capital (I), government investments (IG) and government consumption (G) are shown as % of baseline GDP; changes in labour (L) as % of baseline labour.



Source: Own calculations

The increase in the cost of capital reduces the demand for capital which in turn causes non-liquidity constrained households to reduce savings and increase consumption. The shock has large long term effects due to lowering of the investment activities of the firms. Raised costs of capital reduce entrance of new firms to the market thus affecting adversely innovation. The overall effect on GDP is negative on the short and long-term.

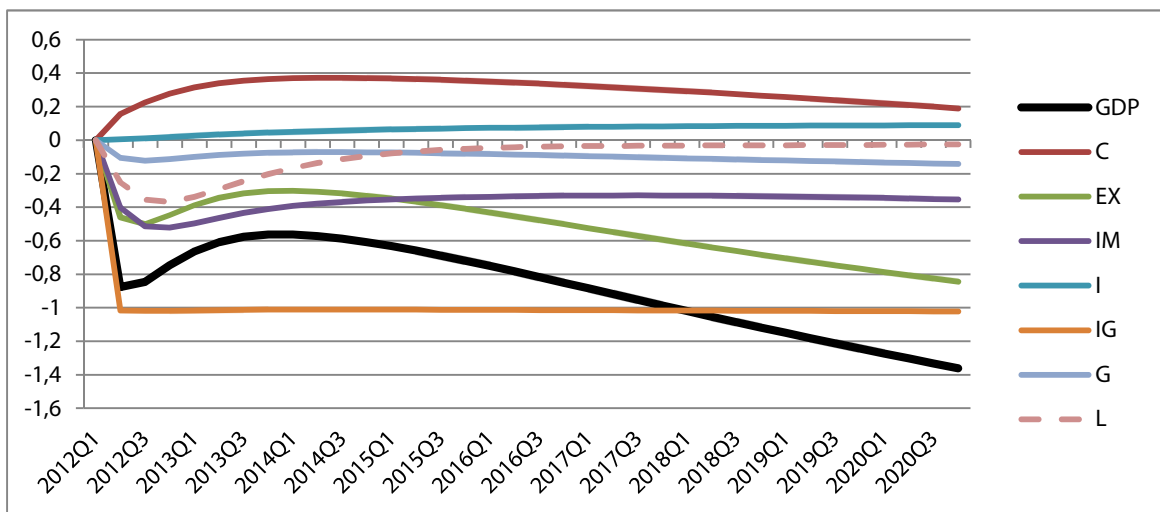
Figure A2: Response to 1 % of GDP reduction in government consumption. Changes in private consumption (C), exports (EX), imports (IM), private investments in gross fixed capital (I), government investments (IG) and government consumption (G) are shown as % of baseline GDP; changes in labour (L) as % of baseline labour.



Source: Own calculations

The decrease in the government consumption reduces aggregate demand which causes consumer prices to decline. Private consumption increases as a consequence; however, it does not fully substitute the decrease in public consumption. Firms offset lower income due to lower prices mainly by decreasing employment. Export is mainly unaffected but import decreases due to lower aggregate demand. Overall the effect on GDP is negative in short and medium term.

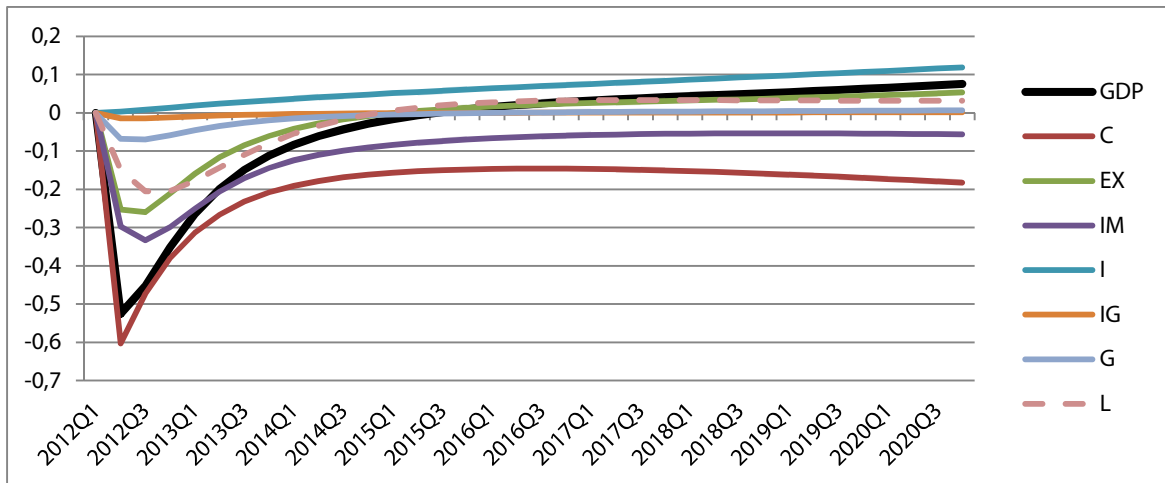
Figure A3: Response to 1 % of GDP reduction in government investments. Changes in private consumption (C), exports (EX), imports (IM), private investments in gross fixed capital (I), government investments (IG) and government consumption (G) are shown as % of baseline GDP; changes in labour (L) as % of baseline labour.



Source: Own calculations

The decrease in the government investments is only marginally offset by higher private investments. Private consumption has positive effect on the GDP, since it rises due to lower consumer prices. As in the previous simulation with government consumption, employment decreases as firms are confronted with lower profits. Due to decrease in investments the capital is lower than in the baseline scenario with no shocks and this has a permanent negative effect on GDP.

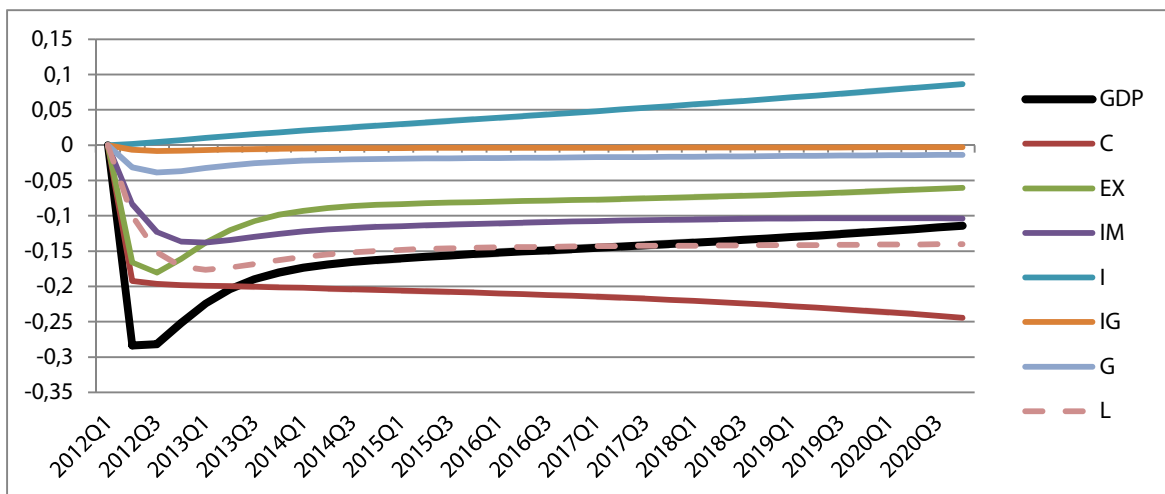
Figure A4: Response to 1 % of GDP reduction in transfers to liquidity constrained households. Changes in private consumption (C), exports (EX), imports (IM), private investments in gross fixed capital (I), government investments (IG) and government consumption (G) are shown as % of baseline GDP; changes in labour (L) as % of baseline labour.



Source: Own calculations

Since liquidity constrained households consume all their income, decreasing transfers to these households has a direct negative effect on private consumption. Ricardian households increase their consumption but this is not sufficient to balance the decrease in the liquidity constrained households' consumption. Consumer prices decrease due to lower aggregate demand and firms are faced with lower profits. Firms decrease employment in the short run. In the medium term reduced transfers to households increase incentive to work, lowering real wages and increasing employment. The increase in investments and positive net exports contribute to positive GDP effect.

Figure A5: Response to 1 % of GDP increase in VAT revenue (2 p.p. increase in the VAT rate). Changes in private consumption (C), exports (EX), imports (IM), private investments in gross fixed capital (I), government investments (IG) and government consumption (G) are shown as % of baseline GDP; changes in labour (L) as % of baseline labour.



Source: Own calculations

Increase in the VAT rate is to a large extent passed to consumer prices which decreases private consumption. A part of the price increase is absorbed by the firms which lower employment to preserve profits. Private investments increase and this has together with a rebound of exports a positive effect on GDP, however still below baseline level.

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