

# GREECE MACRO MONITOR

June 22, 2015

## The macroeconomic costs of fiscal adjustment in Greece

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This note demonstrates that the austerity programs implemented in Greece in the context of the two consecutive bailout programs can *fully* explain the ensuing contraction in Greek GDP. This is not to say that the country should not have implemented *any* adjustment in recent years, especially in view of the huge macroeconomic imbalances accumulated in the years leading to the 2007/2008 global financial crisis. Instead, the key message of the simulation exercise presented herein is that the risk that a draconian fiscal austerity program may turn out to be a "self-defeating" proposition increases dramatically when it is implemented in a deep recessionary environment like the one experienced in Greece in recent years.

### The macroeconomic costs of fiscal adjustment in Greece

Since the signing of its first bailout program in May 2010, Greece has undergone an unprecedented macroeconomic adjustment that resulted in the near elimination of sizeable (pre-crisis) twin deficits and restored wage competitiveness vis-a-vis main trading partners. On the fiscal side, the cumulative improvement in the country's general government primary balance has already exceeded 10.5ppts-of-GDP and amounted to around 20 ppts-of-GDP in cyclically-adjusted terms. This has been the most sizeable adjustment ever made by any developed economy in recent decades, as has repeatedly been emphasized by the IMF and other multinational organizations. In terms of the size of the entire fiscal austerity package that was implemented in the context of the two consecutive bailout programs, we estimate that this has been close to 30 ppts-of-GDP, with c. 45 percent of relevant measures falling on the revenue side (hikes in direct and indirect taxes as well as in social security contributions) and the rest on the expenditure side *i.e.*, mainly cuts in wages and pensions payments (see *Appendix I*).<sup>1</sup>

Regrettably, this sizeable (and heavily front loaded) fiscal contraction has inflicted dramatic macroeconomic costs in terms of output losses and labor shedding. In fact, this note demonstrates that the austerity programs implemented over the last 5 years can *fully* explain the ensuing contraction in Greek GDP. That is, compared to a theoretical (*counterfactual*) scenario, which assumes: a) no fiscal adjustment over the entire period 2010-2014 *i.e.*, annual change in the structural primary balance equal to 0 ppts-of-GDP; and b) continuation of external financing over the said period, so as to avert a sovereign default and prevent a more severe deleveraging of the domestic economy.

<sup>1</sup> These estimates are based on official data publicized in various instances in the past and our own calculations as we have been unable to locate any updated official data on the overall size and structure of the fiscal adjustment implemented over the entire period of interest in this report *i.e.*, 2010-2014.

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Of course, that is not to say that Greece should not have implemented *any* adjustment in recent years, especially in view of the huge macroeconomic imbalances accumulated in the years leading to the 2007/2008 global financial crisis. Instead, the key message of the simulation exercise presented herein is that the risk that a draconian fiscal austerity program may turn out to be a “self-defeating” proposition (i.e., in terms of initial output losses and deteriorating rather than improving debt-dynamics) increases dramatically when it is implemented in a deep recessionary trajectory like the one experienced in Greece in recent years.

By implication, a less front-loaded (and more countercyclical) fiscal adjustment program implemented mostly when the economy has already started to recover could eventually deliver the intended results (in terms of improving fiscal balances), without inflicting such severe costs to the domestic economy.

This result stems from the documented *regime-dependence* of fiscal multipliers in Greece and in many other countries *i.e.*, *much* higher fiscal multipliers in recessionary phases than in normal economic times. Its validity also increases with the existence of a credible bias by domestic authorities in favor of multi-year fiscal consolidation and, crucially, with the implementation of structural reforms, liquidity support programs and other strategies to counter the contractionary effects of fiscal adjustment and help re-engineer economic growth.

### Estimated output losses due to fiscal austerity in 2010-2014

In order to derive estimates about the macroeconomic impact of fiscal austerity measures, one needs to make a number of methodological & other assumptions regarding the *size*, *persistence*, and *regime-dependence* of fiscal multipliers. In that respect, an increasing number of recent studies demonstrate that fiscal multipliers tend to be significantly higher in deep economic downturns than in normal economic times. In addition, while fiscal multipliers vary significantly across different government spending and revenue categories, numerous recent empirical studies suggest that spending multipliers generally tend to be larger than tax multipliers. This result applies especially for wages and social transfers (i.e., pensions) and in lower macroeconomic regimes (i.e., deep recessionary periods), arguably because in such regimes the share of liquidity-constrained households increases significantly relative to normal economic times. Another important methodological issue in estimating fiscal multipliers is the identification of *purely exogenous* and fully discretionary fiscal shocks. A good working assumption to make herein is that the bulk of fiscal austerity measures implemented in Greece over the last 5 years have indeed been exogenous.

Table A shows the estimated macroeconomic effects of the fiscal austerity implemented in Greece in the context of the two consecutive bailout programs over the period 2010-2014. More specifically, it shows the impact of austerity measures on Greece’s nominal GDP in euro terms. The table assumes that fiscal multipliers follow the convex, autoregressive decay path analyzed in *Appendix II*.<sup>2</sup> The *impact* multipliers assumed herein are broadly in line with these estimated in a number of recent empirical studies for Greece.<sup>3</sup> Furthermore, the parameters  $\alpha$  (measure of “multiplier persistence”) and  $\beta$  (measure of “hysteresis” effects) take much milder values than these assumed in some relevant empirical papers (see *e.g.* European Commission, 2013)<sup>4</sup>, so as to ensure that our estimates err on the conservative side.

<sup>2</sup> The decay function assumed herein reproduces relatively well the shape of the impulse-response function by typical DSGE models for most of permanent fiscal shocks.

<sup>3</sup> See *e.g.* Monokroussos P. and D. Thomakos, “Fiscal multipliers in deep economic recessions and the case for a 2-year extension in Greece’s austerity programme”, Eurobank Research, Economy & Markets Vol. VIII |Issue 4 |October 2012

<http://www.eurobank.gr/Uploads/Reports/ECONOMY%20AND%20MARKETSfiscal%20multipliers.pdf>

See also, Monokroussos P. and D. Thomakos, “Greek fiscal multipliers revisited. Government spending cuts vs tax hikes and the role of public investment expenditure”, Eurobank Research, Economy & Markets Vol. VIII |Issue 3 |March 2013

<http://www.eurobank.gr/Uploads/Reports/Economy%20and%20Markets%20march%2020123.pdf>

<sup>4</sup> See “Effects of fiscal consolidation envisaged in the 2013 Stability and Convergence Programmes on public debt dynamics in EU Member States”, European Commission, Economic Papers 504 / September 2013

[http://ec.europa.eu/economy\\_finance/publications/economic\\_paper/2013/pdf/ecp504\\_en.pdf](http://ec.europa.eu/economy_finance/publications/economic_paper/2013/pdf/ecp504_en.pdf)

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Table A – Effect of austerity measures on domestic GDP in EURbn (2010-2015)

	2010	2011	2012	2013	2014	2010-2014
Wage bill, pensions & other social transfers	-9.5	-9.3	-5.5	-10.5	-3.4	-38.2
Other expenditure	-4.3	-3.9	-1.6	-1.0	-0.9	-11.7
Revenues (mainly from taxation)	-3.9	-5.0	-4.4	-1.6	-1.0	-15.9
<b>Total recessionary impact of measures</b>	<b>-17.6</b>	<b>-18.2</b>	<b>-11.5</b>	<b>-13.1</b>	<b>-5.4</b>	<b>-65.8</b>
<b>Realised (annual) change in nominal GDP (EURbn)</b>	<b>-11.2</b>	<b>-18.5</b>	<b>-13.5</b>	<b>-11.8</b>	<b>-3.4</b>	<b>-58.4</b>

Source: FinMin, EC, IMF, Eurobank Research

Notes on Table A

- Fiscal measures implemented as in *Appendix I*
- Assumed impact multiplier values (in absolute terms):
  - *Wage bill, pensions & other social transfers* impact multiplier 1.5
  - *Other expenditure* impact multiplier 0.8
  - *Revenue* impact multiplier 0.6
- “Multiplier persistence” parameter  $\alpha=0.15$  (*mild persistence*)
- “Hysteresis” parameter  $\beta = 0$  (*no hysteresis effects assumed*)

**Concluding remarks**

The analysis in the paper suggests that the implementation of the sizeable and heavily front-loaded fiscal austerity in Greece in the context of the two consecutive bailout programs can fully explain the ensuing contraction of GDP over the period 2010-2014. If this is so, then it should be no surprise that the country’s public debt to GDP ratio actually increased significantly over the said period despite the draconian fiscal austerity measures and the debt restructuring operations implemented in 2012 (PSI and Debt Buyback). In fact, our earlier calculations show that given the present level of the public debt ratio, a negative (i.e. contractionary) fiscal policy shock can lead to an initial (i.e., same year) increase in the debt-to-GDP ratio if the fiscal multiplier is higher than 0.45.<sup>5</sup>

As a note of caution, however, we emphasize that results presented herein should be treated with caution, especially considering the well-documented technical difficulties (e.g. shock identification) involved in deriving empirical multiplier estimates. Another potential objection to our simulation results is related to some recent empirical findings suggesting lower multiplier estimates when heightened sovereign solvency concerns exist. Yet, we have reasons to believe that our results err on the conservative side, especially in view of the severe domestic recession over the last 5 years and the fact that the bulk of Greek debt servicing costs is currently insensitive to market rate fluctuations.

<sup>5</sup> Monokroussos P., “The Challenge of Restoring Debt Sustainability in a Deep Economic Recession: The case of Greece”, LSE, Hellenic Observatory Papers on Greece and Southeast Europe, GreeSE Paper No.87 | October 2014  
<http://www.lse.ac.uk/europeanInstitute/research/hellenicObservatory/CMS%20pdf/Publications/GreeSE/GreeSE-No87.pdf>

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## Appendix I

## Fiscal measures implemented in Greece over the period 2010-2014 (ppts-of-GDP)

Empty cells represent lack of official data

	2010	2011	2012	2013	2014
<b>Expenditure measures</b>		4.5	2.1	4.1	1.2
<i>of which</i>					
I. Public sector wage bill		0.8	0.5	0.6	0.1
II. Pensions				2.57	0.2
III. Social benefits		1.1	0.7	0.1	0.0
IV. Health		0.6	0.1	0.2	0.3
V. Defence		0.0	0.0	0.2	0.1
VI. Education				0.0	0.0
VII. SOEs rationalization		0.0	0.1	0.1	0.1
VII. Local governments				0.0	0.1
IX. Public administration restructuring		2.0	0.5	0.2	0.2
<b>Revenue measures</b>		4.2	3.7	1.0	0.9
<i>of which</i>					
I. Income tax reform				0.2	0.8
II. Reduction of VAT refunds to farmers				0.1	0.0
III. Excises				0.2	0.0
IV. Taxation by tonnage of Greek owned merchant fleet				0.0	0.0
V. Taxes on lottery games and winner gains				0.2	0.0
VI. Equalization of social security contributions ceiling				0.3	0.0
<b>Total measures</b>	<b>8.6</b>	<b>8.8</b>	<b>5.8</b>	<b>5.1</b>	<b>2.1</b>

Source: Greek FinMin, EC, IMF, Eurobank research

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## Appendix II

## Impact multipliers, multiplier persistence &amp; hysteresis assumptions

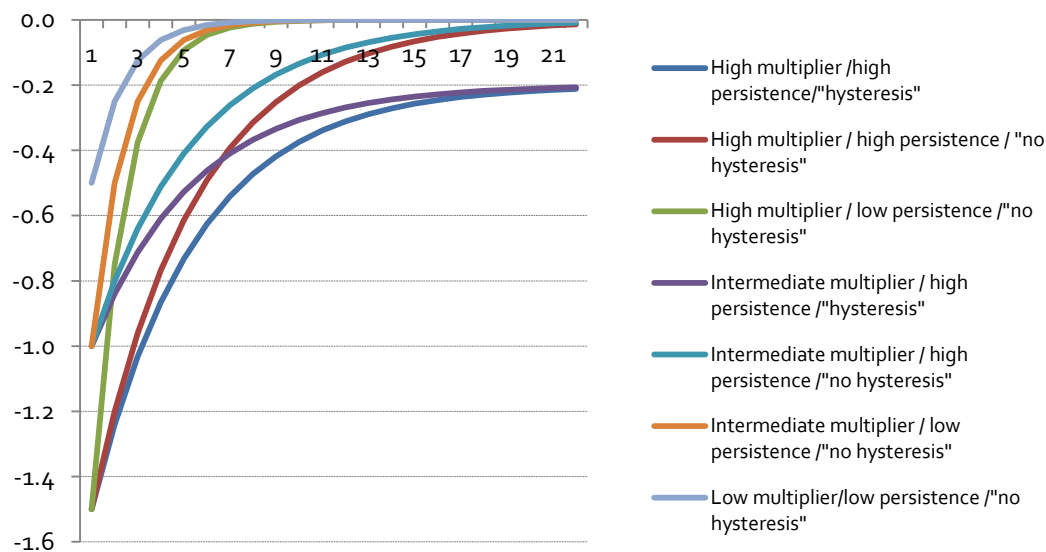
In order to incorporate multiplier persistence in our simulation exercise we follow Boussard et al. (2012) and European Commission (2013)<sup>6</sup> and assume that fiscal multipliers follow the following convex, autoregressive decay path:

$$m_{t,i} = (m_1 - \beta)\alpha^{i-t} + \beta$$

where,  $m_1$  is the impact (*i.e.*, first year) multiplier,  $m_{t,i}$  is the fiscal multiplier applying in year  $i$  following a permanent fiscal shock in year  $t$ ,  $0 < \alpha < 1$ ; and  $\beta$  is the long-run impulse response of GDP to fiscal consolidation. A negative value of  $\beta$  indicates that “hysteresis” effects are present (see *e.g.* de Long and Summers, 2012). A positive one represents a situation in which a consolidation today boosts long term growth by *e.g.* reducing the interest rate and by lessening the crowding out on private investment.

The following figure depicts the decaying path of the fiscal multiplier assumed in the simulation exercise presented in this study. In the figure below, the initial value of the (impact) multiplier is assumed to take one of the following three values: **-1.5** “high multiplier”; **-1.0** “intermediate multiplier” and **-0.5** “low multiplier”. Moreover, “high persistence” corresponds to the following parameter value:  $\alpha=0.8$  and “low persistence” corresponds to  $\alpha=0.5$ . Finally, for the presence of “hysteresis” effects we assume  $\beta=-0.2$ , while the case of  $\beta=0$  corresponds to “no hysteresis” effects.

Figure: Response of GDP to one-off cyclical adjustment



Source: EC (September 2013); Eurobank Global Markets Research

**Note:** Response of GDP in years  $t=1, \dots, 21$  per one unit cut in cyclically adjusted primary balance in year  $t=1$ . Assuming that the same logic applies, then a unit increase in the cyclically adjusted primary balance in year  $t=1$ , would lead to a GDP response that could be portrayed by inverting the above figure.

<sup>6</sup> See “Effects of fiscal consolidation envisaged in the 2013 Stability and Convergence Programmes on public debt dynamics in EU Member States”, European Commission, Economic Papers 504 / September 2013  
[http://ec.europa.eu/economy\\_finance/publications/economic\\_paper/2013/pdf/ecp504\\_en.pdf](http://ec.europa.eu/economy_finance/publications/economic_paper/2013/pdf/ecp504_en.pdf)

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