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Now, more than ever, fiscal sustainability requires stabilization of domestic output dynamics

This technical note presents an updated analysis on Greece's debt dynamics and the evolution of the general government borrowing needs and sources of funding over the extended fiscal adjustment implementation horizon and beyond. In addition, an updated analysis is provided on a number of possibilities that are open, in theory, to official lenders ahead of the crucial November 20 Eurogroup, as regards: i) ways to finance the government borrowing gap ensuing from the 2-year extension in the country's fiscal consolidation programme (as well as past programme implementation slippages); and ii) the introduction of additional debt-reducing operations to help restore fiscal sustainability. Although we emphasize that the debt sustainability scenarios presented herein do not necessarily represent our view on the implementability - either from a technical, or a political perspective - of the different debt-reducing schemes under examination, a number of important conclusions can still be drawn as to the challenges lying in the way to providing a more credible response to Greece's sovereign liquidity and solvency problems.

Specifically,

— The recent ratification of the FY-2013 budget and the key omnibus bill by the Greek Parliament opens the door for a resumption of official financing under the present bailout programme and thus, it removes the risk of an imminent distortedly sovereign default that could seriously undermine the country's euro area membership status.

— In theory, a combination of strategies could be applied to bridge the overall government financing gap expected to arise in the period 2013-2016 (ca €32.7bn). Among others, these could include: i) the utilization of up to €5bn initially earmarked for the creation of a cash buffer in the period 2013-2014; ii) higher short-term government debt issuance vs. what was assumed in the troika's March 2012 DSA (*i.e.,* close to zero from 2014 onwards); and/or iii) other, more radical measures, such a deferral of maturities of Greek government bonds, currently held by the ECB and other euro area central banks.

— It should be noted that any new debt-reducing operations to be decided at the November 20, 2012 Eurogroup (*e.g.* further reduction of the interest rate charged on EU bilateral loans disbursed under the first programme and/or debt buybacks) could also assist to bridge the government's borrowing gap, thus lessening the need of implementing any of the measures described in the previous paragraph.

— The debt-reducing operations implemented earlier this year (privately-held debt exchange, better terms on EU/IMF loans and other measures) have already improved the projected profile of *net* government borrowing needs on a longer-term basis. According to our analysis, the *cumulative* government borrowing gap for the period 2017-2020 will drop below €30bn.

— The interest rates currently charged on EU/IMF loans to Greece are already at concessional levels and thus, a further reduction of these rates could probably not be adequate, by itself, to facilitate a drop of the public debt ratio to 120%-of-GDP, especially if FY-2020 is maintained as the terminal year of the DSA-relevant horizon. This implies, in turn, that additional debt-reducing operations may be needed to facilitate a more sustained improvement of debt dynamics.

— GDP growth remains the single most important determinant of debt dynamics. This is particularly relevant in view of the current depressionary trajectory of the Greek economy and the heavily front-loaded implementation profile of the new austerity package. In conclusion, there is an urgent need for strategies aiming to stabilize domestic output and facilitate a swifter return to positive growth rates, if sovereign sustainability perceptions are to improve on a more sustainable basis.

Part 1 - General government borrowing need and sources of funding (2012-2020)

In this section we present an updated analysis of Greece's general government borrowing need and sources of funding over the period 2012-2020 (*Table 1* & accompanying explanatory note).

Table 1 - Greece: General Government Financing Requirements & Sources

	2012	2013	2014	2015	2016	2017	2018	2019	2020
A. Gross borrowing need (A1+A2+A3)	**121.1**	**40.2**	**38.3**	**25.1**	**12.3**	**11.8**	**8.9**	**13.1**	**11.8**
A1. General government deficit (accrual) 1/	**13.4**	**9.7**	**8.0**	**7.7**	**4.3**	**3.1**	**2.7**	**2.2**	**1.7**
A2. Maturing debt (a2.1+a2.2+a2.3)	**24.6**	**25.0**	**25.8**	**17.4**	**8.0**	**8.7**	**6.2**	**10.9**	**10.1**
a2.1 Bonds & loans post-PSI 2/	12.8	10.8	18.0	8.4	4.4	6.9	3.3	6.9	2.4
a2.2 Short-term debt (reduction with official fun	11.8	12.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4
a2.3 Official creditors (a2.3.1+a2.3.2)	0.0	1.7	7.4	8.6	3.2	1.4	2.5	3.6	7.3
a2.3.1 IMF repayment	0.0	1.7	7.4	8.6	3.2	1.4	2.5	3.6	4.5
a2.3.2 EU repayment	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.8
A3. Other (a3.1+a3.2+a3.3+a3.4+a3.5)	**83.1**	**5.5**	**4.5**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
a3.1 Cost of PSI (sweeteners)	29.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
a3.2 Bank recap.	48.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
a3.3 Settlement of arrears 3/	4.0	4.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
a3.4 Cash buffer	0.0	1.0	4.0	0.0	0.0	0.0	0.0	0.0	0.0
a3.5 ESM capital	0.9	0.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0
B. Gross financing sources (B1+B2+B3)	**14.1**	**2.7**	**3.3**	**5.7**	**5.9**	**4.7**	**4.6**	**4.6**	**4.5**
B1. Privatization revenue 4/	**0.4**	**1.7**	**2.4**	**2.2**	**2.4**	**3.9**	**3.9**	**3.9**	**3.9**
B2. Market access (b2.1+b2.2)	**12.5**	**0.4**	**0.4**	**2.9**	**2.9**	**0.4**	**0.4**	**0.4**	**0.4**
b2.1 Medium & long-term debt/ other (still-unidentified) market financing 5/	0.0	0.0	0.0	2.5	2.5	0.0	0.0	0.0	0.0
b2.2 Short-term debt /6	12.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
B3. Additional OSI (GLF margin reduction & grants from ANFA profits)	**1.2**	**0.6**	**0.5**	**0.6**	**0.6**	**0.4**	**0.3**	**0.3**	**0.2**
C. Financing gap (A-B)	**107.0**	**37.5**	**35.0**	**19.4**	**6.4**	**7.2**	**4.3**	**8.5**	**7.3**
D. Oficial financing EU/IMF 7/	**107.0**	**29.3**	**28.3**	**6.6**	**1.6**	**0.0**	**0.0**	**0.0**	**0.0**
Total annual financing gap (C-D)	**0.0**	**8.2**	**6.7**	**12.8**	**4.8**	**7.2**	**4.3**	**8.5**	**7.3**
Cumulative gap	***0.0***	***8.2***	***14.9***	***27.7***	***32.5***	***39.6***	***43.9***	***52.5***	***59.8***

Source: EC, IMF, Eurobank Research

Explanatory note to Table 1

1/ General government deficit values for 2012-2016 are broadly in line with these projected in the European Commission's 1st draft review of the Second Economic Adjustment Programme for Greece (Nov. 2012). Respective values assume that additional adjustment of up to €4bn is implemented in 2015-2016 though new (still unidentified) austerity measures. Note that Greece's updated MTFS (2013-2016) forecasts a general government deficit (ESA95) of €13.54bn (7%-of-GDP) in FY-2012, while the Greek government's FY-2013 Budget expects the corresponding deficit to decline to ca €12.71bn (6.6%-of-GDP) this year, from €19.69bn (9.4%-of-GDP) in FY-2011. Assumed general government deficit values in 2017-2020 constitute author's estimates, derived as the sum of annual primary surpluses (4.5%-of-GDP) and projected interest payments.

2/ See European Commission *"The Second Adjustment Programme for Greece"*, March 2012.

3/ *Settlement of arrears* values constitute author's estimates. Under the new bailout programme agreed with official lenders earlier this year, a total of €7bn (€4bn in 2013 and €3bn in 2014) was earmarked for the clearance of outstanding State debts to third parties. According to the latest available data, general government accumulated arrears stood at €8.29bn at the end of September 2012.

4/ Author's estimate for FY-2012 & European Commission's 1st draft review of the Second Economic Adjustment Programme for Greece (Nov. 2012). For purely expositional purposes (and also to remain on the conservative side), *Table 1* assumes total privatization revenue in 2012-2020 of only €25bn vs. ca €45bn assumed in the EC/ECB/IMF March 2012 baseline DSA scenario.

5 / The baseline scenarios for the evolution of the general government borrowing need and sources of funding presented in the European Commission's and the IMF's March 2012 assessments of Greece's adjustment programme assumed additional cumulative market or other (still unidentified) financing of €10.3bn and €12.1bn, respectively in 2015-2016. According to the European Commission's March 2012 report, cumulative market financing of €22.1bn was projected in the period 2017-2020. For expositional purposes, *Table 1* assumes additional cumulative financing (from market or other sources) of ca €3.5bn in 2015-2006 and zero thereafter.

6/ Value for short-term debt issuance in 2012 constitutes author's estimate and it is calculated as the average of outstanding T-bill issuance in the corresponding year. Respective values for 2013 onwards are in line with the IMF's March 2012 baseline (IMF Country Report N. 12/57) and are reproduced here for expositional purposes.

7/ For expositional purposes (and also to remain on the conservative side), *Table 1* assumes disbursement of next EU-IMF loan tranche (€31.3bn) to occur by the end of this year. On the other hand, the loan tranches initially earmarked for September 2012 (€5.05bn) and December 2012 (€8.35bn) are assumed to be received by Greece sometime in early 2013. Yet, a clearly stated objective of the Greek government is to negotiate with official lenders a more front-loaded loan disbursement profile, which would effectively allow the country to receive all (or part) of the latter two installments concurrently with the €31.3bn tranche.

Part 2 - Why GDP growth is the single most important determinant of public debt dynamics

It is a well known proposition that output growth is the single most important determinant of public debt dynamics, allegedly as a result of the potential *endogeneity* of the fiscal primary balance. Nonetheless, we believe that it would be useful at this point to demonstrate with a simple example the validity of the above argument and take a closer look at the mechanisms underlying the evolution of the public debt to GDP ratio. In a special study we published in December 2010 we discussed in detail the theoretical aspects of sovereign solvency and provided an empirical assessment on the determinants of Greece's fiscal position with the use of a range of sustainability indicators (*Eurobank Research, "Assessing fiscal policy with the use of sustainability indicators: The case of Greece")*.[1]

[1] http://www.eurobank.gr/Uploads/Reports/December%202010_Economy%20and%20Markets%20Fiscal%20Sustainability%20Greece.pdf

In what follows, we utilize a reduced-form expression of the mathematical relationship (*i.e.,* the government inter-temporal budget constraint) governing the dynamics of public debt and demonstrate the primary importance of positive and sustained medium-term economic growth for restoring sovereign solvency. From the government *intertemporal budget constraint* (and after some simplifying assumptions) we get the following reduced-form expression describing the evolution of the budget debt ratio:

$$\Delta B_{t+1} = [r_t - g_t] * B_t + PD_{t+1} + SF_{t+1} \quad (1)$$

Where

- t is the time subscript;
- B_t denotes the public debt to GDP ratio at time (year) t;
- Δ is the first difference operator ($\Delta B_{t+1} = B_{t+1} - B_t$);
- r_t is the real interest rate on the overall debt stock;
- g_t denotes real GDP growth;
- PD_{t+1} denotes the general government primary deficit (% of GDP); and
- SF_{t+1} stands for stock-flow adjustments (% of GDP).

As it is clearly demonstrated by equation (1), the term in bracket, $r_t - g_t$, (known and as "snowball") needs to be negative (*i.e.,* GDP growth rate needs to be at least as high as the average interest rate on the overall debt stock) so as to prevent an *automatic* increase in the debt ratio, merely as a result of sub-par output growth. Note that after the latest debt-reducing operations decided at the February 21, 2012 Eurogroup, the nominal effective interest rate on Greece's public debt stock has declined considerably (to ca 3.5% on average in the period 2012-2022), which effectively means that the *snowball* effect can be neutralized (or even start providing an automatic reduction in the debt ratio) once *nominal* GDP growth (*i.e.,* real GDP growth + GDP deflator inflation) becomes at least as high as 3.5%. From equation (1) above (and also taking into account the potential endogeneity of the primary balance as a result of the effect of automatic fiscal stabilizers) it can also be demonstrated that GDP growth is the single most important determinant of the evolution of the debt ratio. This can be easier conceptualized by the following simple example:

Let us assume that:

- t = fiscal year 2012;
- B_t = 176.7%-of-GDP (*i.e.,* the new troika *preliminary* projection for Greece's debt ratio at the end of 2012);
- the output elasticity of the primary balance is, say, 0.4 (that means that, for every 1ppt higher/lower GDP growth vs. an assumed baseline scenario, the primary balance improves/deteriorates by 0.4ppts of GDP as a result of *e.g.* the impact of economic growth on tax revenue, unemployment benefits, taxable corporate profits and personal incomes).

If for some external reason real GDP growth, **g**, in year t+1 turns out to be higher (lower) by, say, 1ppt vs. the assumed baseline scenario, then from equation (1), the debt ratio declines (increases) by 1.767ppts + 0.4ppts = 2.17ppts-of-GDP. That is, assuming all other factors equal (*ceteris paribus* analysis).

In comparison, for every 1% change in the other right-side variables of equation (1), the corresponding declines in the debt ratio are as follows:

for every 1% decline in **r** ⇨ debt ratio declines 1.767ppts-of-GDP (and vice versa);

for every 1% improvement (decline) in **PD** ⇨ debt ratio declines by 1ppt-of-GDP (and vice versa);

for every 1% decline in **SF** (say, as a result of 1ppts of GDP higher privatization revenue) ⇨ debt ratio declines 1ppt-of-GDP (and vice versa).

Part 3- Debt sustainability analysis

In this section we present an updated sustainability analysis of Greek public debt and examine the projected impact of a range of debt-reducing operations speculated lately in the local and international press as providing potential solutions to the country's sovereign solvency problem (Table 2 & accompanying explanatory note).

Table 2 – Greek public debt DSA scenarios

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Scenario 0	170.6	176.7	189.2	190.1	184.7	175.7	167.1	158.6	150.5	142.8	135.5	128.7
Scenario 1 (higher GDP growth post-2016)	170.6	176.7	189.2	190.1	184.8	175.8	167.2	158.4	149.3	140.2	131.2	122.3
Scenario 2 (1ppt higher nominal GDP growth)	170.6	176.7	186.9	185.4	177.9	167.0	156.7	146.7	137.3	128.2	119.6	111.6
Scenario 3 (1ppt <u>lower</u> nominal GDP growth)	170.6	176.7	191.7	194.9	191.6	184.7	178.0	171.3	164.9	158.9	153.2	148.2
Scenario 4 (100bps reduction in the interest rate on EU bilateral loans - 1st adjustement programme)	170.6	176.4	188.7	189.2	183.5	174.3	165.5	156.8	148.5	140.6	133.1	126.1
Scenario 5 (€30bn debt buybacks)	170.6	176.7	178.4	178.7	173.1	163.9	155.2	146.6	138.4	130.6	123.1	116.0
Scenario 6 (€30bn debt buybacks & 100bps reduction in EU bilateral loans)	170.6	176.7	178.1	178.1	172.2	162.8	153.8	145.0	136.6	128.6	121.0	113.7
Scenario 7 (more optimistic growth assumptions post-2016; €30bn buyback & lower interest rates by 100bps on EU bilateral loans)	170.6	176.7	178.1	178.1	172.2	162.8	153.8	144.7	135.4	126.0	116.8	107.5

Source: EC, IMF, Eurobank Research

<u>Explanatory notes to Table 2</u>

<u>Scenario 0</u>

Scenario 0 purports to replicate the underlying DSA assumptions of the European Commission's first (draft) review of the second economic adjustment programme for Greece that was discussed at the November 12, 2012 Eurogroup. As it is demonstrated in *Table 2*, we have extended the forecasting horizon of the Commission's draft debt sustainability analysis to fiscal year 2022. The underlying assumptions we used to derive the evolution of the public debt-to-GDP ratio over the period 2017-2022 are rather conservative. Specifically, *Scenario 0* assumes:

— total privatization revenue of ca €30bn in the period 2012-2022 vs. ca €50bn assumed in the troika's March 2012 baseline DSA;
— a gradual slowdown in the pace of annual real GDP growth, from 3.5% in 2017 to 2.2% in 2022, broadly in line with the medium-term growth trajectory assumed in the troika's March 2012 baseline DSA;
— annual (GDP deflator) inflation that remains firmly below the ECB's price-stability threshold (2%) over the entire projection

horizon;

— a general government *primary* surplus of ca 4.5%-of-GDP/annum over the period 2017-2022.

Scenario 1 (higher GDP growth post-2016)

Scenario 1 adjusts the previous scenario so as to incorporate higher real GDP growth rates over the period 2017-2020. Specifically, annual *real* GDP growth of 3.5% is assumed throughout the aforementioned period, which effectively translates into an average (positive) *nominal* growth differential of ca 0.6ppts in 2017-2022 compared to *Scenario 0*. *Scenario 1* (as well as the rest of the scenarios presented below) assumes an output elasticity with respect to the general government primary balance of ca 0.4. The latter value is not far from what had been estimated for Greece in a number of past empirical studies (by the OECD and others).

Scenarios 2 & 3 (1ppt higher/lower nominal GDP growth)

Scenarios 2 & 3 adjust *Scenario 0* so as to incorporate higher (lower) *nominal* GDP growth by 1ppt/per annum over the period 2013-2022. Again, the aforementioned scenarios assume an output elasticity of the general government primary balance of ca 0.4 (in order to incorporate the interplay of automatic fiscal stabilizers).

Scenario 4 (100bps reduction in the interest rate on EU bilateral loans provided under the 1st adjustment programme)

Scenario 4 adjusts *Scenario O* to incorporate a 100bps hypothetical reduction in the interest rate Greece currently pays on EU bilateral loans (3month euribor + 150bps) provided under the 1st adjustment programme (€52.9bn). Note that, the the average interest rate on EFSF loans to Greece under the 2nd bailout programme is very close to the mechanism's funding cost (i.e., EFSF funding cost + 15bps).

Scenario 5 (€30bn debt buybacks)

Scenario 4 adjusts *Scenario O* to incorporate 30bn buybacks of privately-held Greek sovereign bonds in early 2013. For the purpose of our exercise, we assume required financing (up to €10bn) to conduct buybacks to be provided at current EFSF funding rates.

Scenario 6 (€30bn debt buybacks & 100bps reduction in EU bilateral loans)

Scenario 6 assumes a parallel implementation of the debt-reducing operations described in scenarios 4 & 5 above.

Scenario 7 (More optimistic growth assumptions post-2016 with €30bn buyback & lower interest rates by 100bps on EU bilateral loans)

Scenario 7 adjusts *Scenario 1* to incorporate the debt-reducing operations described in scenarios 4 & 5 above.

Scenario 8 (all future income accrued on the ECB's SMP portfolio of Greek government bonds is being passed on to Greece)

As it was stated in the February 21, 2012 Eurogroup statement "*The Eurogroup takes note that the Eurosystem (ECB and NCBs) holdings of Greek government bonds have been held for public policy purposes. The Eurogroup takes note that the income generated by the Eurosystem holdings of Greek Government bonds will contribute to the profit of the ECB and of the NCBs. The ECB's profit will be disbursed to the NCBs, in line with the ECB's statutory profit distribution rules. The NCBs' profits will be disbursed to euro area Member States in line with the NCBs' statutory profit distribution rules. Furthermore, governments of Member States where central banks currently hold Greek government bonds in their investment portfolio commit to pass on to Greece an amount equal to any future income accruing to their national central bank stemming from this portfolio until 2020. These income flows would be expected to help reducing the Greek debt ratio by 1.8pp by 2020 and are estimated to lower the financing needs over the programme period by approximately 1.8 bn euro.*"

Note that the coupon payments on the Greek government bond (GGB) investment portfolios of Eurosystem national central banks (NCBs) is currently being passed on to Greece. A significant cash flow release (in the form of reduced interest payments to the tune of ca €1.5bn/annum) would be provided to Greece, in case that a decision was made to also pass on to the country all coupon income accrued on the *SMP-related* ECB holding of GGBs.

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