



# GREECE

## PRELIMINARY DRAFT DEBT SUSTAINABILITY ANALYSIS

June 26, 2015

The following document has been released:

- A Preliminary Draft **Debt Sustainability Analysis** (DSA) prepared by the staff of the IMF. Elements of this DSA are included in the "Preliminary Debt Sustainability Analysis for Greece" as referred to by the Greek government on its official website.

This preliminary draft DSA was prepared by Fund staff in the course of the policy discussions with the Greek authorities in recent weeks. It has not been agreed with the other parties in the policy discussions, and it has been circulated to, but neither discussed with nor approved by the IMF's Executive Board. Since it was prepared, the Greek authorities have closed the banking sector, imposed capital controls, and incurred arrears to the Fund. These developments are likely to have a significant adverse economic and financial impact that has not yet been reflected in this draft DSA.

Note that the financing for the coming months assumed European support before the second European program expired. Note also that the amount of IMF disbursements going forward will be decided by the IMF Executive Board. Greece is precluded from purchasing these resources unless it clears all arrears to the Fund in full.

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# Greece: Debt Sustainability Analysis

## Preliminary Draft

*At the last review in May 2014, Greece's public debt was assessed to be getting back on a path toward sustainability, though it remained highly vulnerable to shocks. By late summer 2014, with interest rates having declined further, it appeared that no further debt relief would have been needed under the November 2012 framework, if the program were to have been implemented as agreed. But significant changes in policies since then—not least, lower primary surpluses and a weak reform effort that will weigh on growth and privatization—are leading to substantial new financing needs. Coming on top of the very high existing debt, these new financing needs render the debt dynamics unsustainable. This conclusion holds whether one examines the stock of debt under the November 2012 framework or switches the focus to debt servicing or gross financing needs. To ensure that debt is sustainable with high probability, Greek policies will need to come back on track but also, at a minimum, the maturities of existing European loans will need to be extended significantly while new European financing to meet financing needs over the coming years will need to be provided on similar concessional terms. But if the package of reforms under consideration is weakened further—in particular, through a further lowering of primary surplus targets and even weaker structural reforms—haircuts on debt will become necessary.*

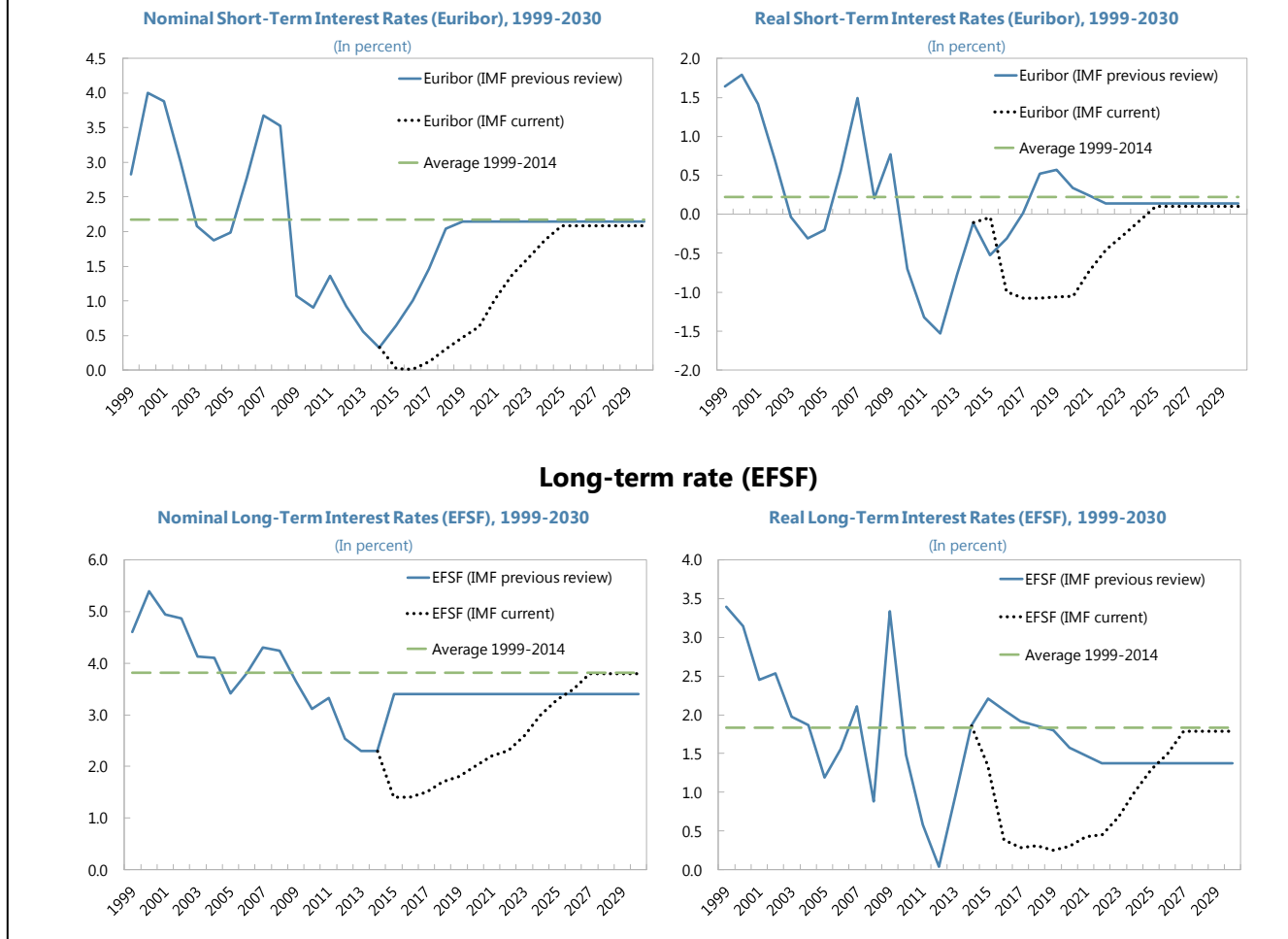
### Public Sector DSA

#### A. Background

1. **At the time of the last review in May 2014 (the IMF's Fifth Review under the extended arrangement), public debt dynamics were considered to be sustainable but highly vulnerable.** Debt/GDP was projected to fall from 175 percent of GDP at end-2013 to about 128 percent of GDP in 2020 and further to 117 percent of GDP in 2022. These were above the thresholds agreed to in November 2012, of debt coming down to 124 percent of GDP in 2020 and to "substantially below" 110 percent of GDP in 2022. It assumed policy implementation as planned under the program—medium-term primary surpluses of 4+ percent of GDP and steadfast and timely implementation of structural and financial sector reforms to underpin the high growth rate and privatization projections. However, debt sustainability risks were very significant, vulnerable in particular to shocks to growth and the primary surplus, and debt could not be considered sustainable with high probability.
2. **If the program had been implemented as assumed, no further debt relief would have been needed under the agreed November 2012 framework.** Declining interest rates helped to improve the debt dynamics. Other factors such as the return of the HFSF bank recapitalization buffer to the EFSF as part of the extension of the EU program at end-February 2015 also improved the debt dynamics, while historical revisions of data marginally worsened the debt dynamics.
  - a. **Lower interest rates.** Relative to the last review, for the 2015–22 period, the projected 3-month Euribor declined on average 122 basis points and the projected EFSF interest rate declined on average 161 basis points. The medium-term implied interest rate (accrual basis) fell from 3.3 percent to 2.3 percent. As a result, Greece's projected interest charges

during 2014-2022 dropped by nearly 30 percent on an accrual basis.<sup>1</sup> Lower interest rates have contributed to a reduction in Greece's projected debt of €23.5 billion (9.1 percent of GDP) by end-2022, relative to the projections at the last review (Figure 1).

**Figure 1. Revisions to Projected Interest Rates on Greece's Official Borrowing**  
Short-term rate (3-month Euribor)

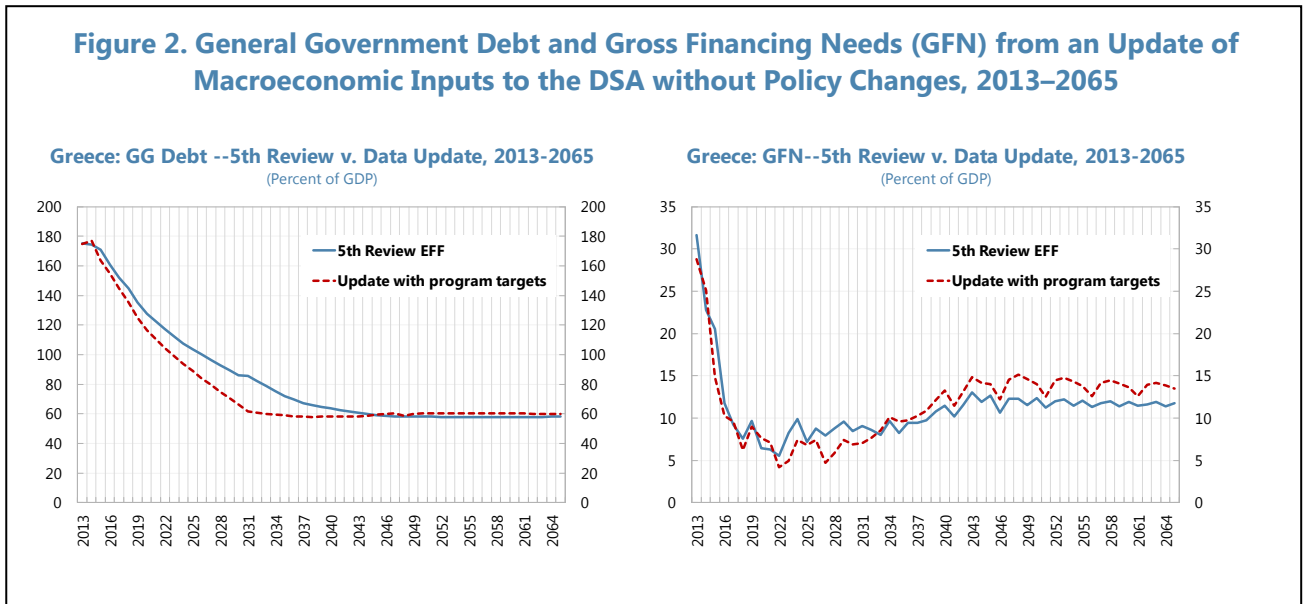


- b. **Other factors.** The debt outstanding was lowered when the HFSF bank recapitalization buffer of €10.9 billion was returned to the EFSF at the time of the extension of Greece's EU program in end-February 2015. It also meant interest savings (accrual basis) up to €1.1 billion over 7 years. Thus, the projected debt stock in 2022 improved by as much as 4.9 percent of GDP. On the other hand, weaker GDP performance and downward statistical revisions to historical GDP contributed to an increase by 4 percentage points in the 2022 debt-to-GDP ratio. Moreover, to meet liquidity needs in recent months

<sup>1</sup> On a cash basis, the impact is smaller as we take into consideration the interest deferral on some EFSF loans.

following the loss of market access that had begun to be gained in mid-2014,<sup>2</sup> Greece has been resorting to short-term borrowing from intra-government entities (two-week repo operations paying up to 3 percent of interest). The State has been able to tap about €11 billion from local governments, social security funds, and other entities since the last review. These operations have replaced external borrowing and, thus, reduced debt as defined in the Maastricht criteria. Rolling over indefinitely about 2/3 of this short-term borrowing (by making them part of the Treasury Single Account operations and repaying the rest) would lead to a fall in the 2022 debt-to-GDP ratio by approximately 5 percentage points of GDP.

- c. **Implications.** Taking into account all these background factors, if the key program targets had remained achievable, Greece’s medium-term debt profile would have improved by up to 13 percent of GDP. Greece’s debt-to-GDP ratio—projected at 127.7 percent in 2020 and 117.2 percent in 2022 during the last review—would have declined to 116.5 percent in 2020 and 104.4 percent in 2022 (see Figure 2, which shows projections of the stock of debt and of gross financing needs). No further relief would, therefore, have been needed under the November 2012 framework.



### B. Baseline scenario—Financing needs and debt projections

3. **However, very significant changes in policies and in the outlook since early this year have resulted in a substantial increase in financing needs.** Altogether, under the package proposed by the institutions to the Greek authorities, these needs are projected to reach about

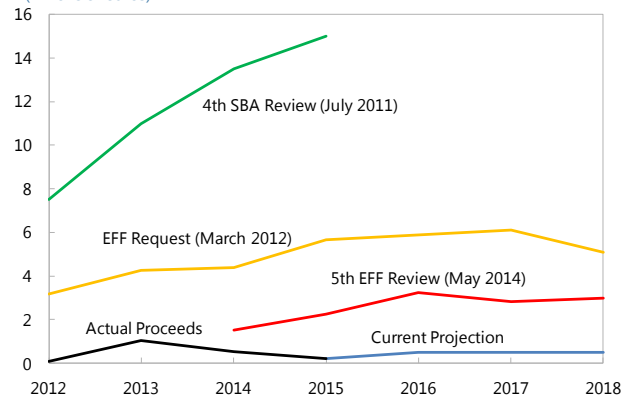
<sup>2</sup> In 2014, Greece was able to issue a 5-year bullet bond with a coupon of 4.75 percent in April (€3 billion), and a 3-year bullet bond paying a coupon of 3.50 percent in July (€1.5 billion). Later that year, the country swapped T-bills held by domestic banks for additional €1.6 billion in 3-year and 5-year bonds with these coupons.

€50 billion from October 2015 to end 2018, requiring new European money of at least €36 billion over the three-year period (Figure 3 and Table 1).

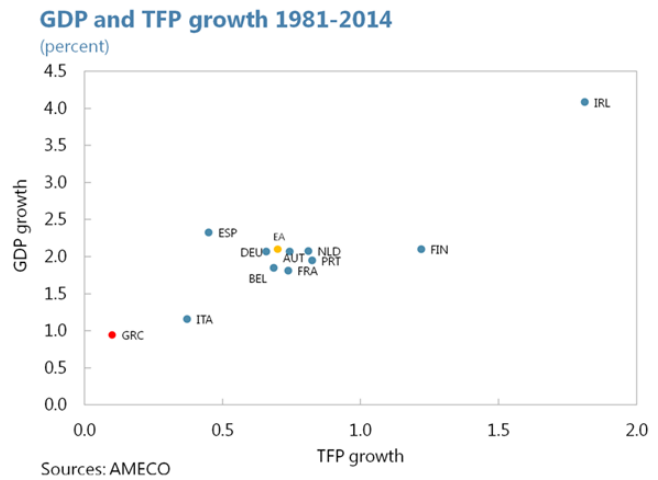
- Lower fiscal targets.** The 2014 primary fiscal balance fell short of the program target by 1.5 percent of GDP. Moreover, the proposed reduction in the primary surplus targets from 3 percent of GDP in 2015 and 4.5 percent of GDP in 2016 and beyond to 1 percent of GDP in 2015, 2 percent in 2016, 3 percent in 2017, and 3.5 percent in 2018 onwards would add cumulatively about 7 percentage points of GDP to financing needs during 2015–18. *Over the next three years, needs will be €13 billion more from this factor relative to the last review.*
- Lower privatization proceeds.** The projected privatization proceeds under the program were €23 billion over the 2014–22 period. Half of these proceeds were to come from privatizing state holdings of the banking sector. However, given the very high and rising levels of nonperforming loans in the banking system that in turn will require setting aside the bank recapitalization buffer as a potential backstop, it is highly unlikely that these proceeds will materialize. Of the remainder, the authorities have provided only vague commitments and have stated their opposition to further privatization of key assets. Against this background and given the very poor performance to date of cumulative privatization proceeds of only about €3 billion over the last 5 years, it is prudent and timely to take a more realistic view of how much privatization proceeds can materialize (Box 1 and text figure). With the politically less sensitive privatizations completed, and clear signs of decline in proceeds, staff assumes annual proceeds of about €500 million over the next few years. *This adds about €9 billion to financing needs during 2015–18 relative to the last review.* To the extent that privatization receipts exceed the levels assumed in the DSA, any excess should be used to pay down debt, which would bolster debt sustainability and investor confidence.

**Projected Annual Privatization Proceeds**

(Billions of euros)



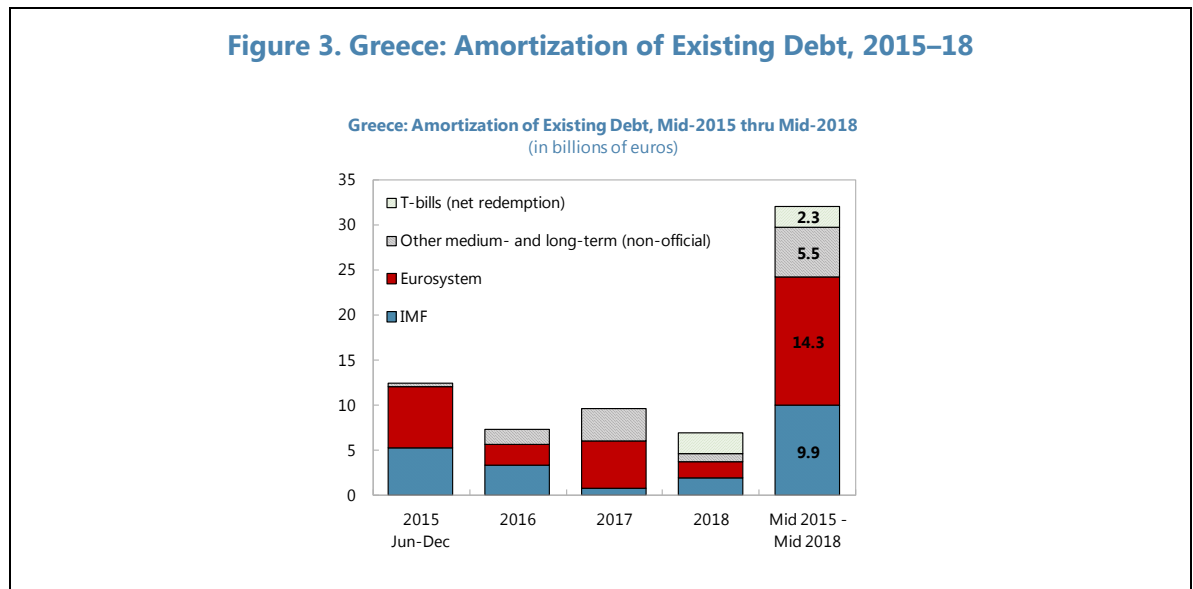
- Lower economic growth.** There is a substantial weakening in the delivery of structural reforms and in the reform commitments. This has made untenable the assumption until the last review that Greece would go from having the lowest average TFP growth in the euro area since it joined the EU in 1981 to having among the highest TFP growth, and that it would go to the highest labor force participation rates and to German employment rates (Box 2). Thus, relative to the last review, staff has downgraded the real long-term growth rate by 50 basis points to 1½ percent. (Growth in the 2-3 percent range is assumed over the next few years, as confidence returns and the output gap is gradually closed.) Clearly, growth risks remain to the downside, which is examined in the robustness scenarios below to ensure debt can be deemed sustainable with high probability.



- Clearing arrears.** Against the backdrop of tight financing conditions, the government has been accumulating arrears, including unprocessed pension and tax refund claims. The estimated stock stands at over €7 billion and will need to be cleared. *This would add about €5 billion to financing needs during 2015–18 relative to the last review.* Cross-country experience suggests that unreported arrears may be significant under tight financing conditions because agencies may not report all invoices received in such a constrained budgetary situation. This would impart an upside risk to the estimate.
- Rebuilding buffers and paying down short-term borrowing.** Also as part of managing the tight liquidity conditions, state deposits in commercial banks and at the Bank of Greece declined to less than €1 billion at end-May 2015. This is against targeted levels under the program of €5 billion in 2015 and €8 billion over the medium term built into the last DSA. These targeted levels—at up to 8-month forward financing needs—are below what Ireland and Portugal had when they exited their programs, which allowed for covering 12-month forward financing needs, but nevertheless provide a cushion for meeting payments. Moreover, staff assumes replenishment of Greece’s SDR holdings, amounting to €0.7 billion, which were consumed in May 2015 to repay debt due to the IMF. As regards short-term borrowing from general government entities to recycle cash surpluses, as noted above, about €6 billion of the €10.7 billion ought to be consolidated into the Treasury Single Account, based on IMF technical assistance and discussions with the authorities. The rest of the amounts would need to be repaid. *These would add €6½ billion to financing needs during 2015–18 relative to the last review. Note that this assumes that the HFSF bank recapitalization buffer remains set aside, pending a comprehensive assessment of bank balance sheets by the Single Supervisory Mechanism and the Fund.*

- Interest rates.** Borrowing costs related to the Greek loan facility (Euribor) and the EFSF are shown in Figure 1—current forecasts are taken till the end of the decade, after which it is assumed that the rates rise to historical averages. Borrowing from the market is assumed at an average maturity of 5 years and average nominal interest rate of 6¼ percent for the next several decades. This is calibrated as follows: the market cost of Greek debt prior to the crisis—when there was limited differentiation of risk and spreads were compressed—was about 5 percent, to which an additional modest spread is considered.<sup>3</sup>

**Figure 3. Greece: Amortization of Existing Debt, 2015–18**



<sup>3</sup> Alternatively, a similar result is derived by taking the euro area risk free rate of 3½-4 percent (WEO, average of France and Germany long-term nominal interest rates during 1999-2014), with the remaining difference being the Greece-specific risk premium, as estimated using the approach of Laubach (2009). This approach consists of an increase in the risk premium of 4 bps for every percentage point increase in debt-to-GDP ratio above 60 percent. For instance, with debt of 120 percent of GDP, the premium would be about 2½ percentage points, for a nominal rate of 6-6½ percent. For further details, see Laubach, Thomas, "New Evidence on the Interest Rate Effects of Budget Deficits and Debt." *Journal of the European Economic Association*, June 2009.

**Table 1. Greece: State Government Financing Requirements and Sources, Oct 2015–Dec 2018**

IMF	Financing assurances	Financing needs over the medium term
	12-month financing (Oct 15 - Sep 16)	Oct 15 - Dec 18
<b>A. Gross financing needs</b>	<b>23.4</b>	<b>50.2</b>
Amortisation	9.6	29.8
Interest payments	4.9	17.2
Arrears	7.0	7.0
Cash buffer for deposit build-up	4.0	7.7
Privatisation (-)	0.5	2.0
Primary surplus (-)	1.7	9.4
<b>B. Potential financing sources from Europe</b>	<b>-5.9</b>	<b>-1.7</b>
SMP/ANFA profits		4.2
Replenishing HFSF buffer	-5.9	-5.9
<b>C. Net financing needs (A-B) <sup>1</sup></b>	<b>29.3</b>	<b>51.9</b>

<sup>1</sup> The amount of IMF disbursements will be decided by the IMF Executive Board. There are €16 billion available in total under the current arrangement.



### Box 1. Privatization Proceeds

Privatization projections have been scaled back to €500 million per year. This amount is based on a realistic assessment of privatization results to date and future prospects. Over the course of the SBA and the EFF arrangement, receipts have consistently fallen short of program projections by huge margins. The fourth SBA review in July 2011 projected €50 billion to materialize through end-2015. Actual receipts through the first quarter of 2015 were €3.2 billion, about 94 percent below the target. These were based on asset sales that were the easiest to sell (least socially and politically sensitive and with fewer legal obstacles), whereas none of the more sensitive infrastructure assets (airports, ports, rail, utilities) that dominate the remaining privatization portfolio were sold. Even the lowered projections of the 1<sup>st</sup> and 2<sup>nd</sup> EFF review in January 2013 have since been disappointed. In the 5<sup>th</sup> EFF review, projected receipts from 2014 to 2022 were scaled back further to €23 billion, of which half was expected to come from sale of the state's share in banks and about a quarter each from corporate assets and real estate. In the one year that has passed since the 5<sup>th</sup> review, €400 million has materialized, three-quarters of which came from the auction of mobile phone frequencies.

Greece: Privatization Proceeds (€ billions)

	1-year forward		3-year forward	
	Projected	Actual	Projected	Actual
At the 1st and 2nd Review (Jan 2013)	2.5	0.9	6.4	1.6
Revised projection 1/	0.5	0.2	2.0	...

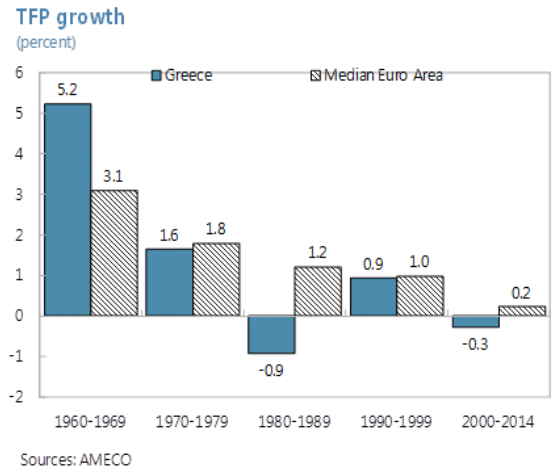
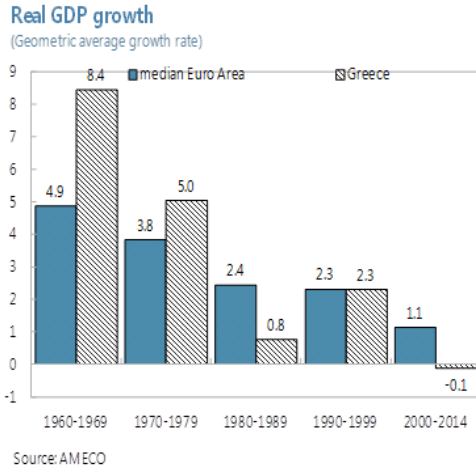
1/ Actual for 2015 (1-year forward) refers to outcomes for January-May 2015.

The privatization projections in the new DSA assume no sales of bank shares or of major corporate assets, and modest real estate sales. Banks' strained balance sheets and acute liquidity shortfalls point to a very high risk of capital injections and dilution of existing equity. Under these circumstances, it is not reasonable to assume revenues from bank sales. Remaining corporate assets will be more difficult to sell than those that have been sold to date—all the more so in light of the government's announced intention to add new conditions to future sales, including retention of a significant government stake and further safeguards for labor, environment, and local community benefits. Finally, the sale of real estate assets faces well-known obstacles including lack of a good database, disputed property rights, and problems securing needed permits for land development (such as environmental, forestry, coastline, and spatial planning), indicating that real estate privatization will be a protracted process with limited annual receipts.

Experience has shown that there is deep-seated political resistance to privatization in Greece. Against this background, it is critical for a realistic and robust DSA to assume reduced privatization revenues, which will derive from small annual concession payments, occasional extraordinary dividends, and gradual real estate sales – totaling about €500 million per year. Privatization should still be pursued, principally to improve governance and the investment climate rather than for fiscal reasons. To the extent that privatization receipts exceed the levels assumed in the DSA, any excess should be used to pay down debt, which would bolster debt sustainability and investor confidence.

## Box 2. Growth Projections

Medium- to long-term growth projections in the program have been premised on full and decisive implementation of structural reforms that raises potential growth to 2 percent. Such growth rates stand in marked contrast to the historical record: real GDP growth since Greece joined the EU in 1981 has averaged 0.9 percent per year through multiple and full boom-bust cycles and TFP growth has averaged a mere 0.1 percent per year. To achieve TFP growth that is similar to what has been achieved in other euro area countries, implementation of structural reforms is therefore critical.



What would real GDP growth look like if TFP growth were to remain at the historical average rates since Greece joined the EU? Given the shrinking working-age population (as projected by Eurostat) and maintaining investment at its projected ratio of 19 percent of GDP from 2019 onwards (up from 11 percent currently), real GDP growth would be expected to average  $-0.6$  percent per year in steady state. If labor force participation increased to the highest in the euro area, unemployment fell to German levels, and TFP growth reached the average in the euro area since 1980, real GDP growth would average 0.8 percent of GDP. Only if TFP growth were to reach Irish levels, that is, the best performer in the euro area, would real GDP growth average about 2 percent in steady state. With a weakening of the reform effort, it is implausible to argue for maintaining steady state growth of 2 percent. A slightly more modest, yet still ambitious, TFP growth assumption, with strong assumptions of employment growth, would argue for steady state growth of  $1\frac{1}{2}$  percent per year.

4. **Financing needs add up to over €50 billion over the three-year period from October 2015 to end-2018.** It is assumed that it could take until September for the Greek authorities to complete the prior actions and for the necessary assurances on financing and debt sustainability to be in place. Financing needs until then could be met from already committed European funds, including the temporary use of about €6 billion of the HFSF buffer. The 12-month forward financing requirements from October 2015 onward amount to about €29 billion. This includes the need to reconstitute the bank recapitalization buffer, pending a comprehensive assessment of capital needs, in view of the high non-performing loans in the banking sector. The 3-year financing need from October 2015 to December 2018 amounts to about €52 billion. The

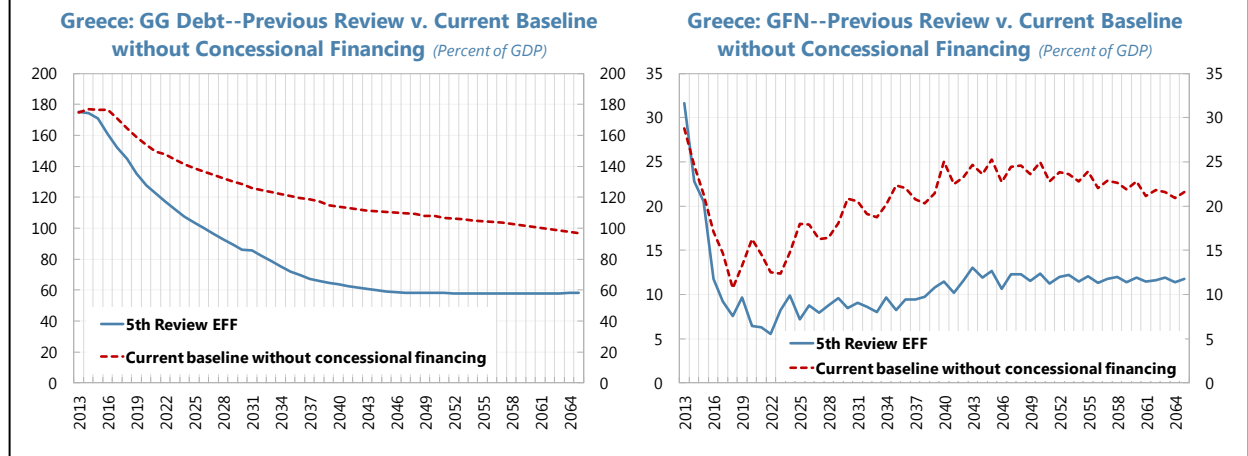
amount and tranching of Fund disbursements will be determined by the IMF’s Executive Board. However, it is assumed, in line with the practice in euro zone programs, that the European partners will cover at least 2/3 of the financing needs.

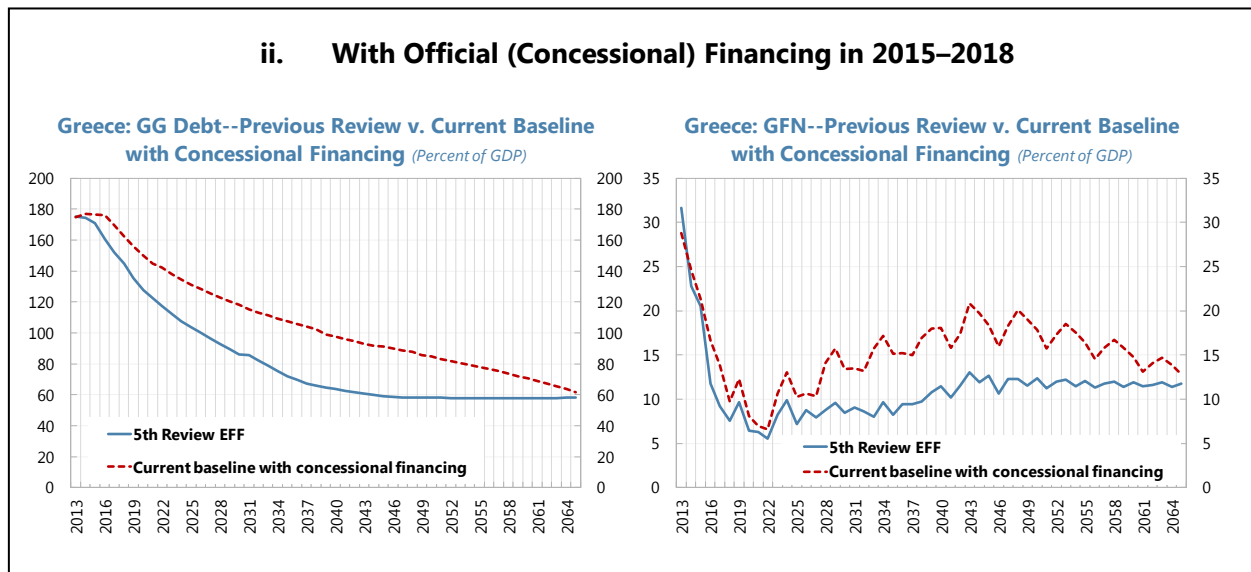
5. **It is unlikely that Greece will be able to close its financing gaps from the markets on terms consistent with debt sustainability.** The central issue is that public debt cannot migrate back onto the balance sheet of the private sector at rates consistent with debt sustainability, until debt-to-GDP is much lower with correspondingly lower risk premia (see Figure 4i). Therefore, it is imperative for debt sustainability that the euro area member states provide additional resources of at least €36 billion on highly *concessional* terms (AAA interest rates, long maturities, and grace period) to fully cover the financing needs through end–2018, in the context of a third EU program (see also paragraph 10).

6. **Even with concessional financing through 2018, debt would remain very high for decades and highly vulnerable to shocks.** Assuming official (concessional) financing through end–2018, the debt-to-GDP ratio is projected at about 150 percent in 2020, and close to 140 percent in 2022 (see Figure 4ii). Using the thresholds agreed in November 2012, a haircut that yields a reduction in debt of over 30 percent of GDP would be required to meet the November 2012 debt targets. With debt remaining very high, any further deterioration in growth rates or in the medium-term primary surplus relative to the revised baseline scenario discussed here would result in significant increases in debt and gross financing needs (see robustness tests in the next section below). This points to the high vulnerability of the debt dynamics.

**Figure 4. Baseline Scenario for the DSA, 2013–2065**

**i. Without Official (Concessional) Financing**



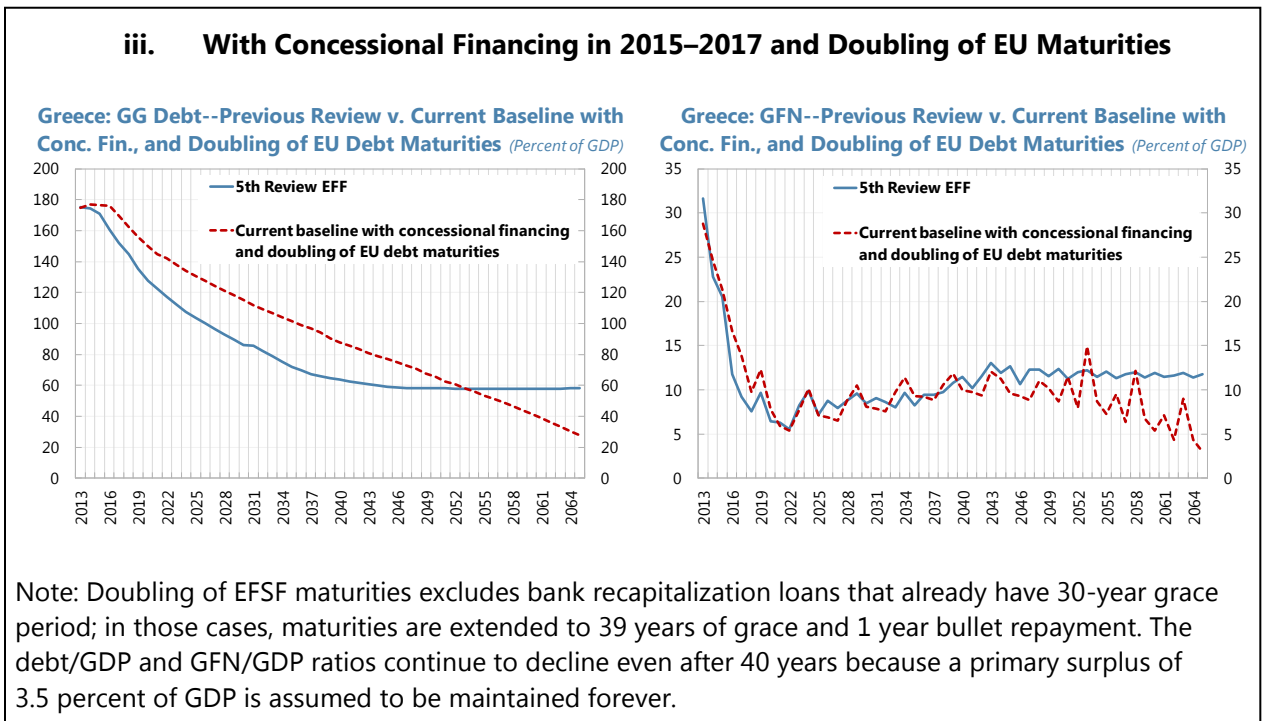


### C. Switching from a Stock to a Gross Financing Needs Basis to Assess Debt Sustainability

7. **Given the extraordinarily concessional terms that now apply to the bulk of Greece's debt, the debt/GDP ratio is not a very meaningful proxy for the forward-looking debt burden.** For the same reason, it has become increasingly problematic to compare the debt stock to the applicable benchmarks in the MAC DSA framework, which are derived from a historical sample of crisis episodes in which debt stocks would have been mostly, if not entirely, on market terms. It therefore makes sense to focus directly on the future path of gross financing needs (GFN), and use the MAC DSA benchmarks of 15–20 percent of GDP for that ratio to define a sustainable path. Given Greece's weak policy framework and easy loss of market access, the lower threshold is clearly the relevant one.
8. **If the program were implemented as specified at the last review, debt servicing would have been within the recommended threshold of 15 percent of GDP on average during 2016–45** (see Figure 2). This would require primary surpluses of 4+ percent of GDP per year and decisive and full implementation of structural reforms that delivers steady state growth of 2 percent per year (with the best productivity growth in the euro area) and privatization.
9. **However, the debt dynamics would still be very vulnerable** to changes in the assumptions, and staff could not affirm that debt is sustainable with high probability as required under the exceptional access policy. In particular, if primary surpluses or growth were lowered as per the new policy package—primary surpluses of 3.5 percent of GDP, real GDP growth of 1½ percent in steady state, and more realistic privatization proceeds of about €½ billion annually—debt servicing would rise and debt/GDP would plateau at very high levels (see Figure 4i). For still lower primary surpluses or growth, debt servicing and debt/GDP rises unsustainably. The debt dynamics are unsustainable because as mentioned above, over time, costly market financing is replacing highly subsidized official sector financing, and the primary surpluses are insufficient to offset the

difference.<sup>4</sup> In other words, it is simply not reasonable to expect the large official sector held debt to migrate back onto the balance sheets of the private sector at rates consistent with debt sustainability.

10. **Given the fragile debt dynamics, further concessions are necessary to restore debt sustainability.** As an illustration, one option for recovering sustainability would be to extend the grace period to 20 years and the amortization period to 40 years on existing EU loans and to provide new official sector loans to cover financing needs falling due on similar terms at least through 2018. The scenario below considers this doubling of the grace and maturity periods of EU loans (except those for bank recap funds, which already have very long grace periods). In this scenario (see charts below), while the November 2012 debt/GDP targets would not be achievable, the gross financing needs would average 10 percent of GDP during 2015–2045, the level targeted at the time of the last review.



#### D. Robustness Tests—Assessing Debt as Sustainable with High Probability

11. **Under the Fund’s exceptional access criteria, debt sustainability needs to be assessed with high probability.**

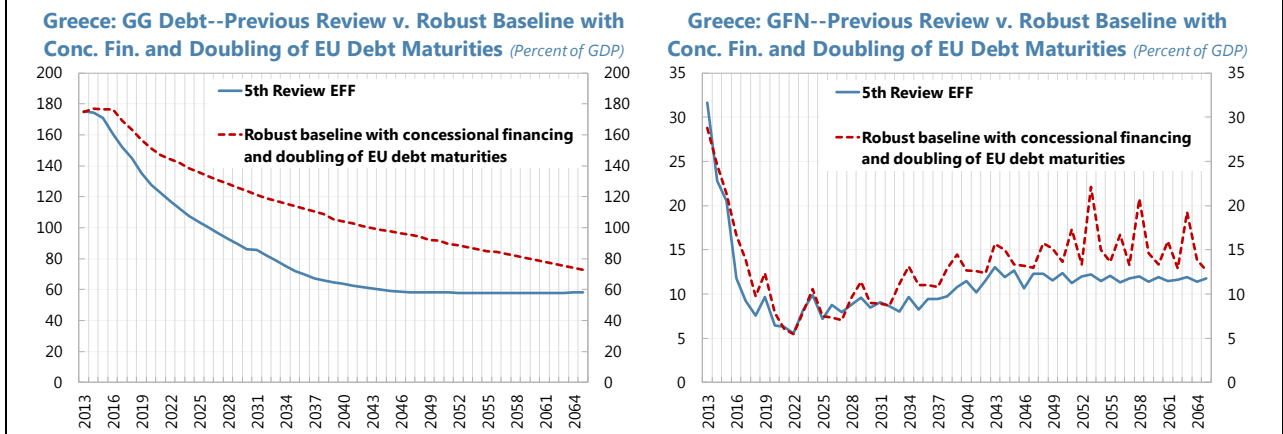
<sup>4</sup> Put technically, the debt-stabilizing primary balance can be defined simply as  $(r - g)$  times the debt/GDP ratio, where  $r$  and  $g$  are the nominal interest rate and nominal GDP growth rates, respectively. For plausible  $(r - g)$  of about 2½ percent and for debt/GDP ratio of 100 percent, a primary surplus of 2½ percent of GDP would be required, simply to stabilize debt. For higher debt/GDP ratios, the primary surpluses need to be higher to stabilize debt and even higher to bring debt down to safer levels.

- While the systemic exception was applied in the past, there is no rationale for continuing to invoke it when debt relief is needed now on official sector (rather than private) claims. A debt operation on official claims will not generate adverse market spillovers. On the contrary, by allowing debt to be assessed as sustainable with high probability, such action will have a catalyzing effect in restoring full market access.
- If grace periods and maturities on existing European loans are doubled and if new financing is provided for the next few years on similar concessional terms, debt can be deemed to be sustainable with high probability. Underpinning this assessment is the following: (i) more plausible assumptions—given persistent underperformance—than in the past reviews for the primary surplus targets, growth rates, privatization proceeds, and interest rates, all of which reduce the downside risk embedded in previous analyses. This still leads to gross financing needs under the baseline not only below 15 percent of GDP but at the same levels as at the last review; and (ii) delivery of debt relief that to date have been promises but are assumed to materialize in this analysis.

**12. The analysis is robust to somewhat lower growth and primary surplus targets.**

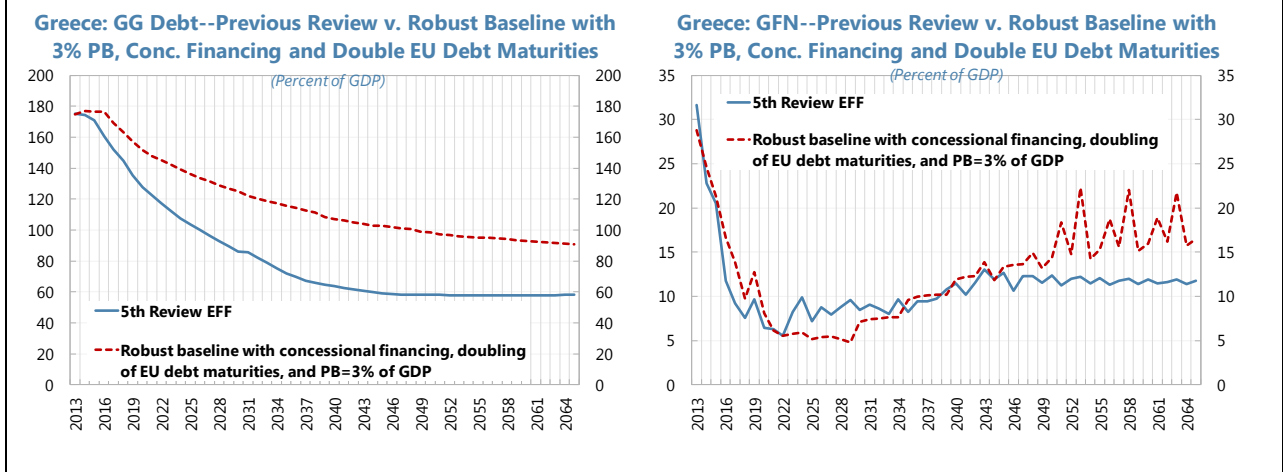
- **What if growth were lower—closer to the historical pattern of about 1 percent per year?** As noted in Box 2, real GDP growth of about 1 percent would still require strong assumptions about labor market dynamics and structural reforms that yield TFP growth at the average of euro area countries. In such a scenario, Greece's debt would remain above 100 percent of GDP for the next three decades. Doubling the maturity and grace on existing EU loans and offering similar concessional terms on new borrowing, as specified above, would be vital to preserve gross financing needs within a safe range—the average GFN during 2015-2045 would be 11¼ percent of GDP (Figure 5).

**Figure 5. Scenario with Lower Growth and Primary Surplus of 3½ percent of GDP, 2013–2065**



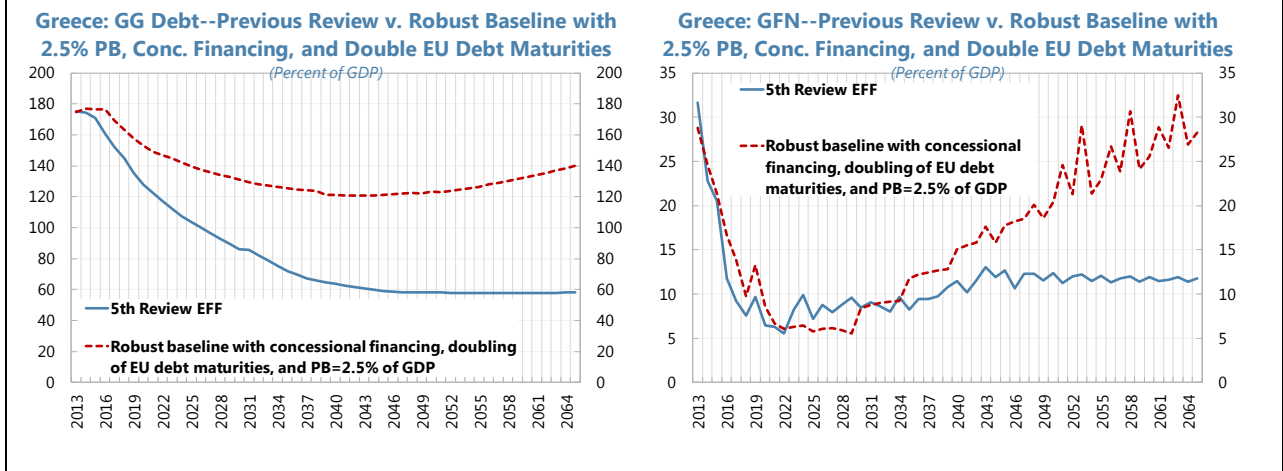
- **What if primary surplus targets could not exceed 3 percent of GDP over the medium term?** In that case, the provision of concessional financing for a prolonged period (10 years) would keep the GFN stable and below the 15-percent threshold over the next three decades. The decline in the debt-to-GDP ratio, nevertheless, would be very gradual (Figure 6).

**Figure 6. Scenario with Lower Growth and Primary Surplus of 3 percent of GDP, 2013–2065**



- **However, lowering the primary surplus target even further in this lower growth environment would imply unsustainable debt dynamics.** If the medium-term primary surplus target were to be reduced to 2½ percent of GDP, say because this is all that the Greek authorities could credibly commit to, then the debt-to-GDP trajectory would be unsustainable even with the 10-year concessional financing assumed in the previous scenario. Gross financing needs and debt-to-GDP would surge owing to the need to pay for the fiscal relaxation of 1 percent of GDP per year with new borrowing at market terms. Thus, any substantial deviation from the package of reforms under consideration—in the form of lower primary surpluses and weaker reforms—would require substantially more financing and debt relief (Figure 7).

**Figure 7. Scenario with Lower Growth and Primary Balance of 2½ percent of GDP, 2013–2065**



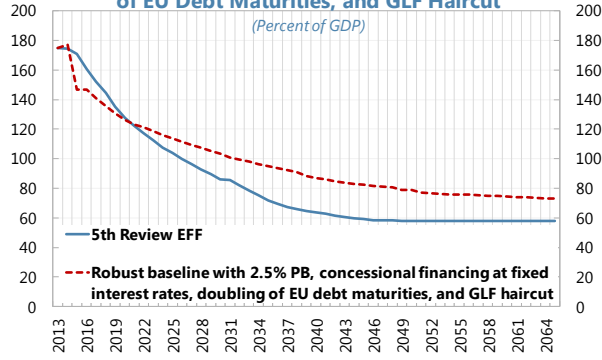
- In such a case, a haircut would be needed, along with extended concessional financing with fixed interest rates locked at current levels.** A lower medium-term primary surplus of 2½ percent of GDP and lower real GDP growth of 1 percent per year would require not only concessional financing with fixed interest rates through 2020 to cover gaps as well as doubling of grace and maturities on existing debt but also a significant haircut of debt, for instance, full write-off of the stock outstanding in the GLF facility (€53.1 billion) or any other similar operation. The debt-to-GDP ratio would decline immediately, but “flattens” afterwards amid low economic growth and reduced primary surpluses. The stock and flow treatment, nevertheless, are able to bring the GFN-to-GDP trajectory back to safe ranges for the next three decades (Figure 8).<sup>5</sup>

<sup>5</sup> Concessional loans with fixed interest rates locked at current low levels also offer a critical improvement to Greece’s gross financing needs, especially in the outer years of the projection period. In a low growth, low primary surplus scenario, even small interest rate shocks can tilt the GFN-to-GDP ratio upwards. These operations could be implemented for a limited period through the issuance of long-term bonds with fixed coupons by the ESM. Alternatively, fixed-for-floating swap contracts could be offered by European creditors to Greece, also in the context of a new financial program.

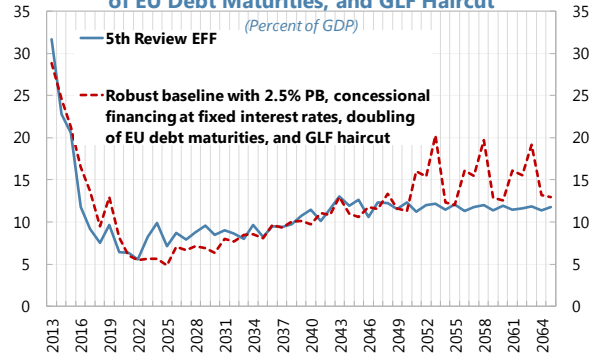


**Figure 8. Scenario with GLF Haircut and Concessional Financing, 2013–2065**

**Greece: GG Debt--Previous Review v. Robust Baseline with 2.5% PB, Conc. Financing at Fixed Interest Rates, Doubling of EU Debt Maturities, and GLF Haircut**



**Greece: GFN--Previous Review v. Robust Baseline with 2.5% PB, Conc. Financing at Fixed Interest Rates, Doubling of EU Debt Maturities, and GLF Haircut**



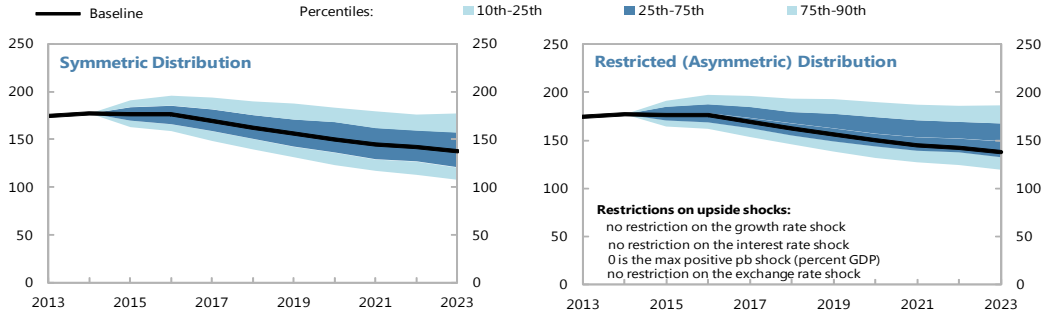
## Greece Public DSA Risk Assessment

### Heat Map

Debt level 1/	Real GDP Growth Shock	Primary Balance Shock	Real Interest Rate Shock	Exchange Rate Shock	Contingent Liability Shock
Gross financing needs 2/	Real GDP Growth Shock	Primary Balance Shock	Real Interest Rate Shock	Exchange Rate Shock	Contingent Liability Shock
Debt profile 3/	Market Perception	External Financing Requirements	Change in the Share of Short-Term Debt	Public Debt Held by Non-Residents	Foreign Currency Debt

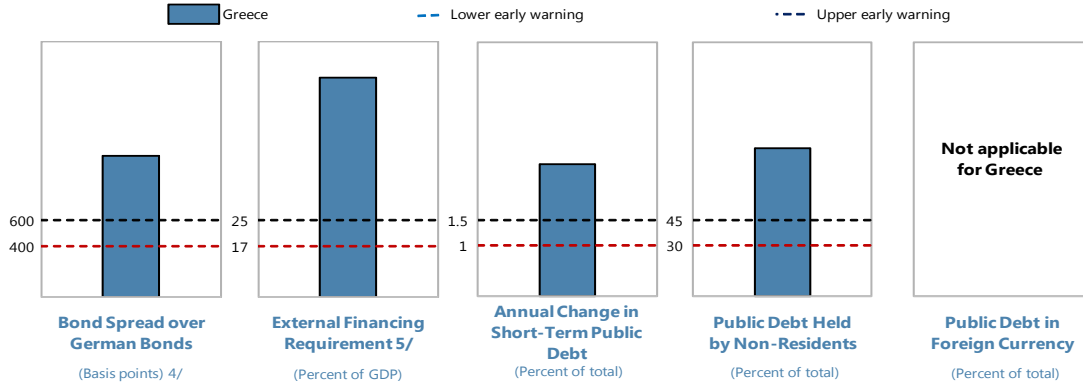
### Evolution of Predictive Densities of Gross Nominal Public Debt

(Percent of GDP)



### Debt Profile Vulnerabilities

(Indicators vis-à-vis risk assessment benchmarks)



Source: IMF staff.

1/ The cell is highlighted in green if debt burden benchmark of 85% is not exceeded under the specific shock or baseline, yellow if exceeded under specific shock but not baseline, red if benchmark is exceeded under baseline, white if stress test is not relevant.

2/ The cell is highlighted in green if gross financing needs benchmark of 20% is not exceeded under the specific shock or baseline, yellow if exceeded under specific shock but not baseline, red if benchmark is exceeded under baseline, white if stress test is not relevant.

3/ The cell is highlighted in green if country value is less than the lower risk-assessment benchmark, red if country value exceeds the upper risk-assessment benchmark, yellow if country value is between the lower and upper risk-assessment benchmarks. If data are unavailable or indicator is not relevant, cell is white.

Lower and upper risk-assessment benchmarks are:

400 and 600 basis points for bond spreads; 17 and 25 percent of GDP for external financing requirement; 1 and 1.5 percent for change in the share of short-term debt;

30 and 45 percent for the public debt held by non-residents.

4/ An average over the last 3 months, 17-Mar-15 through 15-Jun-15.

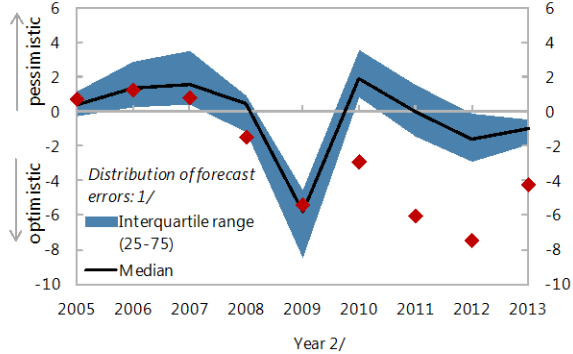
5/ Includes liabilities to the Eurosystem related to TARGET.

## Greece Public DSA - Realism of Baseline Assumptions

### Forecast Track Record, versus program countries

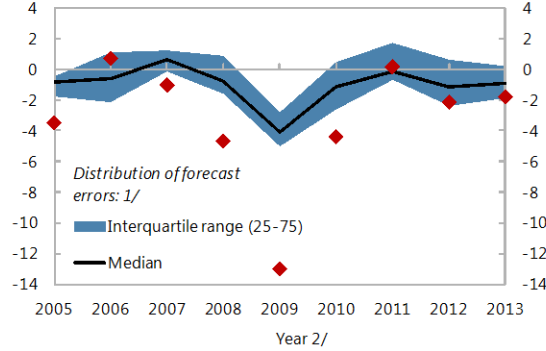
#### Real GDP Growth (Percent, actual-projection)

Greece median forecast error, 2005-2013: **-2.91**  
Has a percentile rank of: **1%**



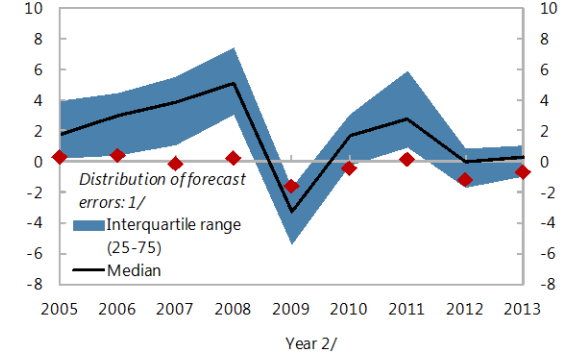
#### Primary Balance (Percent of GDP, actual-projection)

Greece median forecast error, 2005-2013: **-2.14**  
Has a percentile rank of: **13%**



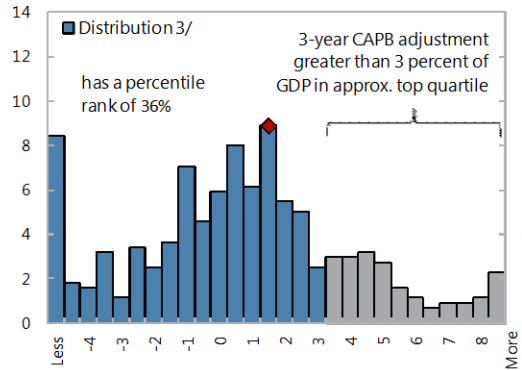
#### Inflation (Deflator) (Percent, actual-projection)

Greece median forecast error, 2005-2013: **-0.15**  
Has a percentile rank of: **19%**

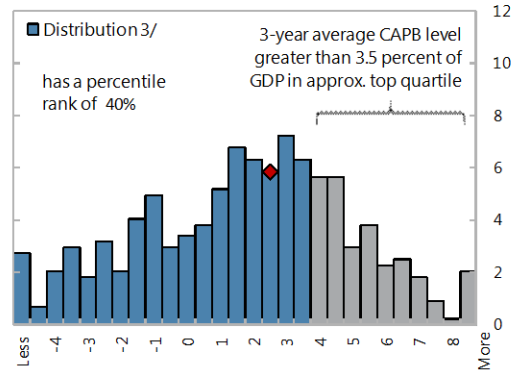


### Assessing the Realism of Projected Fiscal Adjustment

#### 3-Year Adjustment in Cyclically-Adjusted Primary Balance (CAPB) (Percent of GDP)



#### 3-Year Average Level of Cyclically-Adjusted Primary Balance (CAPB) (Percent of GDP)



Source : IMF Staff.

1/ Plotted distribution includes program countries, percentile rank refers to all countries.

2/ Projections made in the spring WEO vintage of the preceding year.

3/ Data cover annual observations from 1990 to 2011 for advanced and emerging economies with debt greater than 60 percent of GDP. Percent of sample on vertical axis.

Figure 1. Greece: Public Sector Debt Sustainability Analysis (DSA) - Baseline Scenario

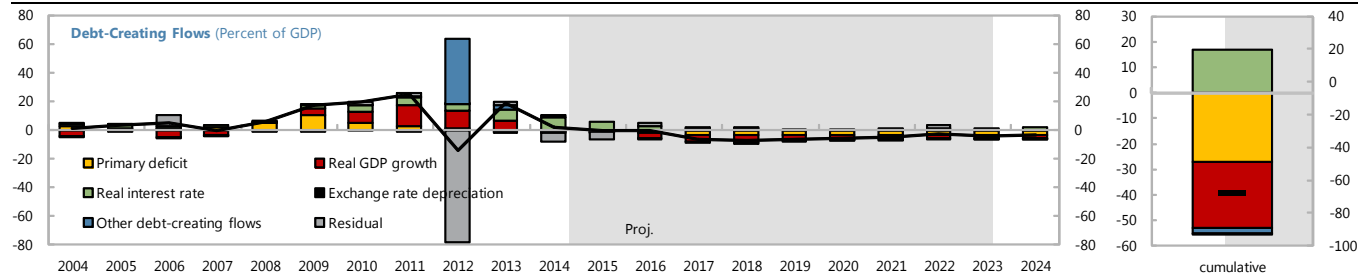
(Percent of GDP, unless otherwise indicated)

Debt, Economic and Market Indicators 1/

	Actual			Projections										As of June 15, 2015		
	2004–2012 2/	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	Sovereign Spreads		
Nominal gross public debt	123.0	175.0	177.1	176.7	176.2	169.7	162.3	155.8	149.9	144.8	142.2	138.0	134.2	Spread (bp) 3/		
Public gross financing needs	22.4	18.1	29.2	24.5	19.0	15.7	12.9	14.1	11.3	9.0	8.2	10.4	12.6	CDS (bp)		
Real GDP growth (percent)	-1.2	-3.9	0.8	0.0	2.0	3.0	3.0	2.0	1.7	1.7	1.5	1.5	1.5	Ratings	Foreign	Local
Inflation (GDP deflator, percent)	2.3	-2.3	-2.6	-1.2	0.7	1.4	1.5	1.8	1.9	2.0	2.0	2.0	2.0	Moody's	Caa2	Caa2
Nominal GDP growth (percent)	1.1	-6.1	-1.8	-1.2	2.8	4.4	4.5	3.9	3.7	3.7	3.5	3.5	3.5	S&Ps	CCC	CCC
Effective interest rate (percent) 4/	4.6	2.4	2.2	2.1	2.2	2.2	2.2	2.4	2.5	2.8	3.0	3.2	3.5	Fitch	CCC	CCC

Contribution to Changes in Public Debt

	Actual			Projections										Cumulative	Debt-stabilizing primary balance 9/
	2004–2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024		
Change in gross public sector debt	6.9	18.5	2.1	-0.4	-0.4	-6.5	-7.4	-6.6	-5.8	-5.1	-2.6	-4.2	-3.8	-42.9	-0.1
Identified debt-creating flows	14.2	15.9	8.6	5.3	-3.4	-7.1	-7.5	-6.1	-5.6	-5.1	-4.4	-4.0	-3.6	-41.6	
Primary deficit	3.6	-1.0	0.0	-1.0	-2.0	-3.0	-3.5	-3.5	-3.5	-3.5	-3.5	-3.5	-3.5	-30.5	
Primary (noninterest) revenue and grants	40.3	45.7	45.4	45.5	44.0	43.6	42.8	42.4	41.7	41.7	41.7	41.7	41.7	426.6	
Primary (noninterest) expenditure	43.8	44.7	45.4	44.5	42.0	40.6	39.3	38.9	38.2	38.2	38.2	38.2	38.2	396.1	
Automatic debt dynamics 5/	5.6	13.6	8.9	6.5	-1.1	-3.8	-3.8	-2.4	-1.9	-1.3	-0.7	-0.4	0.0	-8.9	
Interest rate/growth differential 6/	5.6	14.1	7.2	5.8	-1.0	-3.8	-3.7	-2.3	-1.8	-1.3	-0.7	-0.4	0.0	-9.3	
Of which: real interest rate	2.9	7.6	8.6	5.8	2.4	1.3	1.2	0.9	0.8	1.2	1.4	1.6	2.0	18.7	
Of which: real GDP growth	2.8	6.5	-1.4	0.0	-3.4	-5.1	-4.9	-3.1	-2.6	-2.5	-2.1	-2.1	-2.0	-27.9	
Exchange rate depreciation 7/	0.0	-0.5	1.7	...	...	...	...	...	...	...	...	...	...	...	
Other identified debt-creating flows	5.0	3.4	-0.3	-0.3	-0.3	-0.3	-0.3	-0.2	-0.2	-0.2	-0.2	-0.1	-0.1	-2.1	
Net privatization proceeds	-0.1	-0.6	-0.3	-0.3	-0.3	-0.3	-0.3	-0.2	-0.2	-0.2	-0.2	-0.1	-0.1	-2.1	
Contingent liabilities	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Other liabilities (bank recap. and PSI sweetner)	4.3	3.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Residual, including asset changes 8/	-7.2	2.6	-6.5	-4.9	2.9	0.5	0.1	-0.5	-0.3	0.0	1.8	-0.2	-0.2	-1.0	



Source: IMF staff projections.

1/ Public sector is defined as general government.

2/ Based on available data.

3/ Bond Spread over German Bonds.

4/ Defined as interest payments divided by debt stock at the end of previous year.

5/ Derived as  $[r - p(1+g) - g + ae(1+r)] / (1+g + p+gp)$  times previous period debt ratio, with  $r$  = interest rate;  $p$  = growth rate of GDP deflator;  $g$  = real GDP growth rate;  $a$  = share of foreign-currency denominated debt; and  $e$  = nominal exchange rate depreciation (measured by increase in local currency value of U.S. dollar).

6/ The real interest rate contribution is derived from the denominator in footnote 4 as  $r - \pi(1+g)$  and the real growth contribution as  $-g$ .

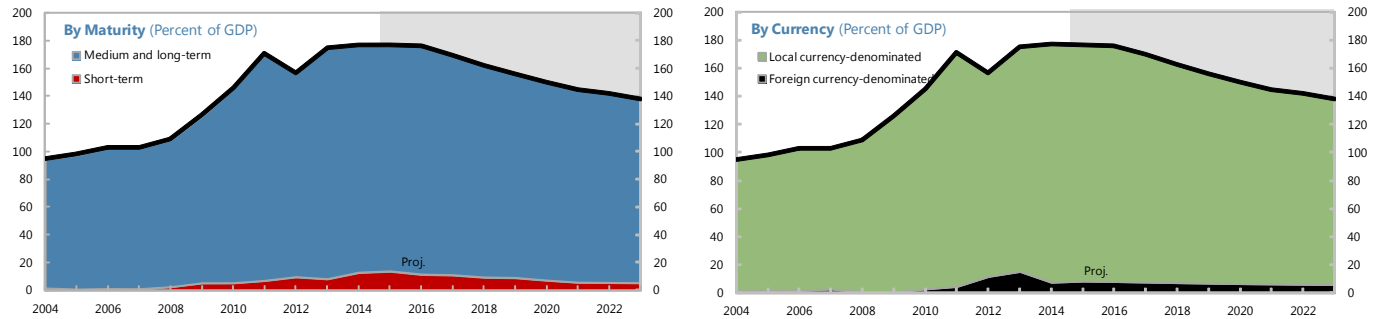
7/ The exchange rate contribution is derived from the numerator in footnote 2/ as  $ae(1+r)$ .

8/ For projections, this line includes exchange rate changes during the projection period. Also includes ESM capital contribution, arrears clearance, SMP and ANFA income, and the effect of deferred interest.

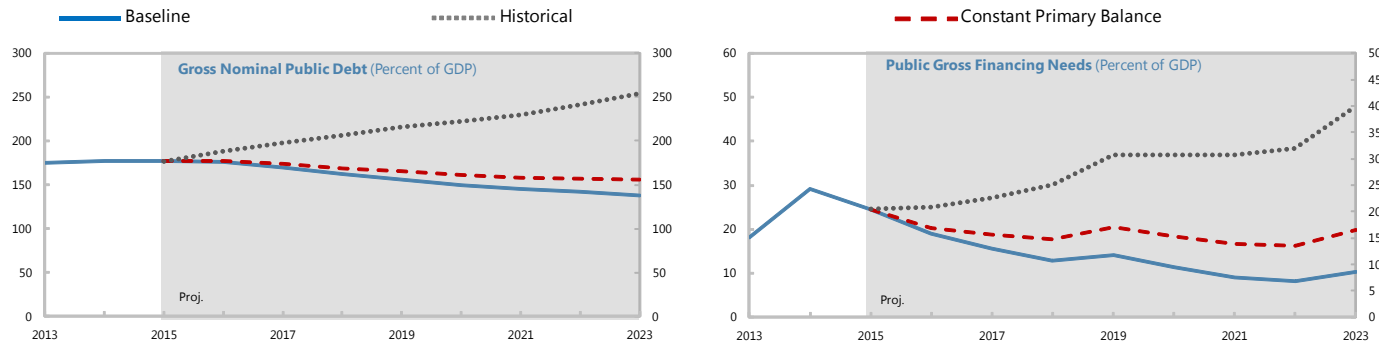
9/ Assumes that key variables (real GDP growth, real interest rate, and other identified debt-creating flows) remain at the level of the last projection year.

## Greece Public DSA - Composition of Public Debt and Alternative Scenarios

### Composition of Public Debt



### Alternative Scenarios



### Underlying Assumptions

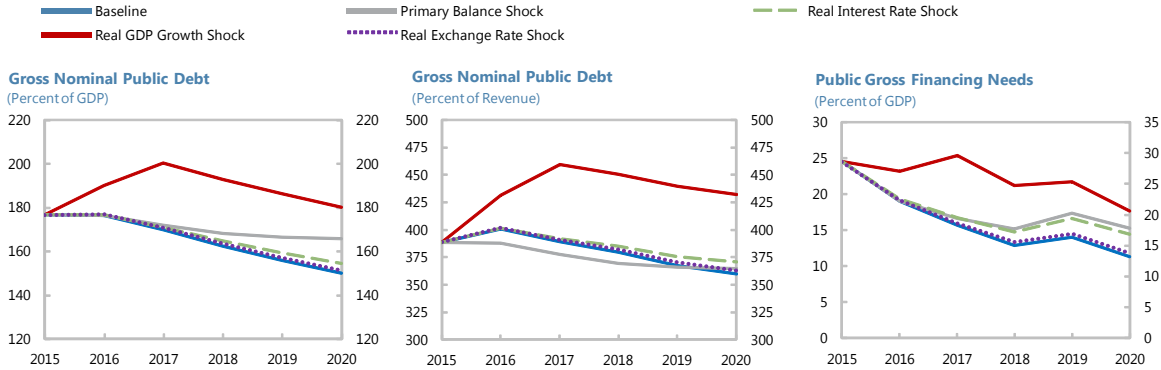
(Percent)

<b>Baseline scenario</b>	2015	2016	2017	2018	2019	2020	2021	2022	<b>Historical scenario</b>	2015	2016	2017	2018	2019	2020	2021	2022
Real GDP growth	0.0	2.0	3.0	3.0	2.0	1.7	1.7	1.5	Real GDP growth	0.0	-1.9	-1.9	-1.9	-1.9	-1.9	-1.9	-1.9
Inflation	-1.2	0.7	1.4	1.5	1.8	1.9	2.0	2.0	Inflation	-1.2	0.7	1.4	1.5	1.8	1.9	2.0	2.0
Primary balance	1.0	2.0	3.0	3.5	3.5	3.5	3.5	3.5	Primary balance	1.0	-2.9	-2.9	-2.9	-2.9	-2.9	-2.9	-2.9
Effective interest rate	2.1	2.2	2.2	2.2	2.4	2.5	2.8	3.0	Effective interest rate	2.1	2.3	2.5	2.7	3.0	3.4	3.7	4.0
<b>Constant primary balance scenario</b>																	
Real GDP growth	0.0	2.0	3.0	3.0	2.0	1.7	1.7	1.5									
Inflation	-1.2	0.7	1.4	1.5	1.8	1.9	2.0	2.0									
Primary balance	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0									
Effective interest rate	2.1	2.3	2.3	2.4	2.6	2.8	3.0	3.3									

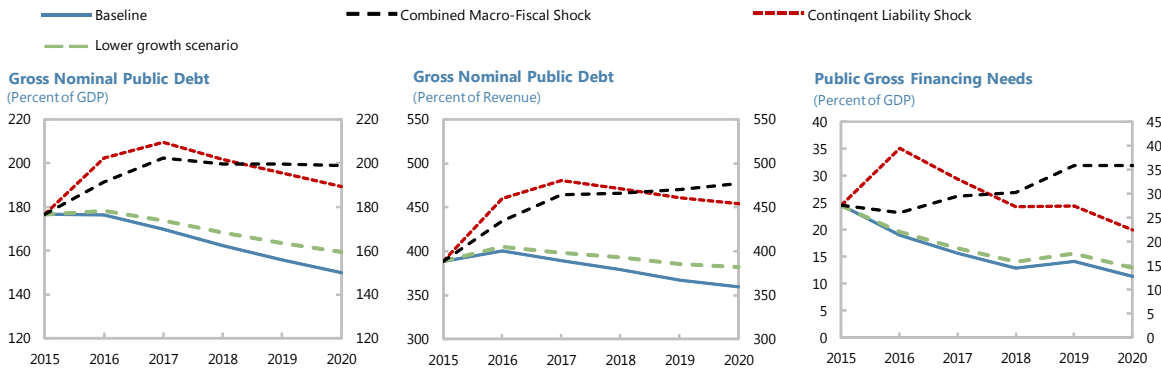
Source: IMF staff.

Greece Public DSA - Stress Tests

Macro-Fiscal Stress Tests



Additional Stress Tests



Underlying Assumptions

(Percent)

	2015	2016	2017	2018	2019	2020	2021	2022		2015	2016	2017	2018	2019	2020	2021	2022
<b>Primary Balance Shock</b>									<b>Real GDP Growth Shock</b>								
Real GDP growth	0.0	2.0	3.0	3.0	2.0	1.7	1.7	1.5	Real GDP growth	0.0	-2.7	-1.7	3.0	2.0	1.7	1.7	1.5
Inflation	-1.2	0.7	1.4	1.5	1.8	1.9	2.0	2.0	Inflation	-1.2	-0.4	0.2	1.5	1.8	1.9	2.0	2.0
Primary balance	1.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	Primary balance	1.0	-0.6	-2.1	3.5	3.5	3.5	3.5	3.5
Effective interest rate	2.1	2.2	2.2	2.2	2.5	2.6	2.9	3.2	Effective interest rate	2.1	2.3	2.4	2.6	2.7	2.8	3.1	3.3
<b>Real Interest Rate Shock</b>									<b>Real Exchange Rate Shock</b>								
Real GDP growth	0.0	2.0	3.0	3.0	2.0	1.7	1.7	1.5	Real GDP growth	0.0	2.0	3.0	3.0	2.0	1.7	1.7	1.5
Inflation	-1.2	0.7	1.4	1.5	1.8	1.9	2.0	2.0	Inflation	-1.2	1.2	1.4	1.5	1.8	1.9	2.0	2.0
Primary balance	1.0	2.0	3.0	3.5	3.5	3.5	3.5	3.5	Primary balance	1.0	2.0	3.0	3.5	3.5	3.5	3.5	3.5
Effective interest rate	2.1	2.3	2.7	2.9	3.1	3.4	3.7	4.0	Effective interest rate	2.1	2.3	2.3	2.3	2.5	2.6	2.9	3.1
<b>Combined Shock</b>									<b>Contingent Liability Shock</b>								
Real GDP growth	0.0	-2.7	-1.7	3.0	2.0	1.7	1.7	1.5	Real GDP growth	0.0	-2.7	-1.7	3.0	2.0	1.7	1.7	1.5
Inflation	-1.2	-0.4	0.2	1.5	1.8	1.9	2.0	2.0	Inflation	-1.2	-0.4	0.2	1.5	1.8	1.9	2.0	2.0
Primary balance	1.0	-0.6	-2.1	-0.7	-1.1	-1.8	-1.8	-1.8	Primary balance	1.0	-12.4	3.0	3.5	3.5	3.5	3.5	3.5
Effective interest rate	2.1	2.3	2.8	3.0	3.4	3.9	4.3	4.7	Effective interest rate	2.1	2.4	3.0	2.6	2.8	3.0	3.2	3.4
<b>Lower Growth Scenario</b>																	
Real GDP growth	0.0	1.0	2.0	2.0	1.0	0.7	0.7	0.5									
Inflation	-1.2	0.7	1.4	1.5	1.8	1.9	2.0	2.0									
Primary balance	1.0	2.0	3.0	3.5	3.5	3.5	3.5	3.5									
Effective interest rate	2.1	2.3	2.3	2.4	2.6	2.7	3.0	3.2									

Source: IMF staff.

## Greece: Net External Debt Sustainability Framework, 2010–20

(Percent of GDP, unless otherwise indicated)

	Actual					Projections						Debt-stabilizing non-interest current account 7/
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	
<b>Baseline: external debt</b>	132.0	149.0	130.7	136.9	140.4	138.5	133.4	126.1	118.5	111.3	107.5	-4.5
Change in external debt	44.8	17.0	-18.3	6.2	3.5	-1.9	-5.1	-7.2	-7.6	-7.2	-3.8	
Identified external debt-creating flows (4+8+9)	12.1	19.6	11.0	4.8	0.8	-1.1	-5.4	-7.9	-8.1	-8.0	-7.8	
Current account deficit, excluding interest payments	4.8	3.7	-1.6	-4.1	-4.2	-5.1	-4.9	-5.1	-5.0	-5.3	-5.3	
Deficit in balance of goods and services	6.6	6.1	2.3	0.1	-1.0	-1.1	-2.5	-2.5	-2.6	-2.6	-2.5	
Exports	20.1	23.5	25.5	27.7	30.6	30.1	29.9	30.1	30.4	30.9	30.4	
Imports	26.8	29.6	27.8	27.8	29.5	29.1	27.4	27.6	27.9	28.3	27.8	
Net non-debt creating capital inflows (negative)	0.4	0.2	-0.4	-1.5	0.5	0.0	1.0	0.4	-0.1	-0.8	-1.0	
Automatic debt dynamics 1/	6.9	15.7	13.0	10.4	4.5	3.9	-1.6	-3.2	-3.0	-1.9	-1.6	
Contribution from nominal interest rate	2.6	3.9	2.6	2.0	1.9	2.3	2.2	2.4	2.5	2.5	2.4	
Contribution from real GDP growth	5.0	12.7	10.5	5.4	-1.1	0.0	-2.7	-3.8	-3.6	-2.3	-1.9	
Contribution from price and exchange rate changes 2/	-0.7	-1.0	-0.1	3.0	3.6	1.7	-1.0	-1.8	-1.8	-2.1	-2.1	
Residual, incl. change in gross foreign assets (2-3) 3/	32.7	-2.6	-29.3	1.4	2.6	-0.7	0.3	0.7	0.5	0.8	4.1	
External debt-to-exports ratio (in percent)	655.3	633.7	512.3	494.6	459.3	460.0	445.8	419.3	389.7	360.3	354.2	
<b>Gross external financing need (billions of euros) 4/</b>	200.6	216.5	203.7	176.8	134.6	116.4	77.7	74.9	92.1	93.9	108.6	
Percent of GDP	88.7	104.2	104.9	96.9	75.2	65.7	42.7	39.4	46.4	45.5	50.8	
<b>Scenario with key variables at their historical averages 5/</b>	...	...	...	...	...	...	149.6	160.0	170.7	182.3	198.5	8.5
<b>Key macroeconomic assumptions underlying baseline</b>												
Real GDP growth (percent)	-5.4	-8.9	-6.6	-3.9	0.8	0.0	2.0	3.0	3.0	2.0	1.7	
GDP deflator (change in percent)	0.8	0.8	0.1	-2.3	-2.6	-1.2	0.7	1.4	1.5	1.8	1.9	
Nominal external interest rate (percent) 6/	2.8	2.7	1.6	1.4	1.4	1.6	1.6	1.9	2.0	2.2	2.2	
Growth of exports (euro terms, percent)	7.7	7.2	1.4	1.9	8.4	-2.6	2.1	5.0	5.6	5.5	1.9	
Growth of imports (euro terms, percent)	0.3	1.4	-12.1	-6.1	4.3	-2.8	-3.0	4.9	5.6	5.5	2.0	
Current account balance	-9.9	-9.9	-2.4	0.6	0.9	1.2	1.2	1.0	0.8	0.9	0.9	
Net non-debt creating capital inflows	-0.4	-0.2	0.4	1.5	-0.5	0.0	-1.0	-0.4	0.1	0.8	1.0	

1/ Derived as  $[r - g - r(1+g) + ea(1+r)] / (1+g+r+gr)$  times previous period debt stock, with  $r$  = nominal effective interest rate on external debt;  $r$  = change in domestic GDP deflator in euro terms,  $g$  = real GDP growth,  $e$  = nominal appreciation (increase in dollar value of domestic currency), and  $a$  = share of domestic-currency denominated debt in total external debt.

2/ The contribution from price and exchange rate changes is defined as  $[-r(1+g) + ea(1+r)] / (1+g+r+gr)$  times previous period debt stock.  $r$  increases with an appreciating domestic currency ( $e > 0$ ) and rising inflation (based on GDP deflator).

3/ For projection, line includes the impact of price and exchange rate changes.

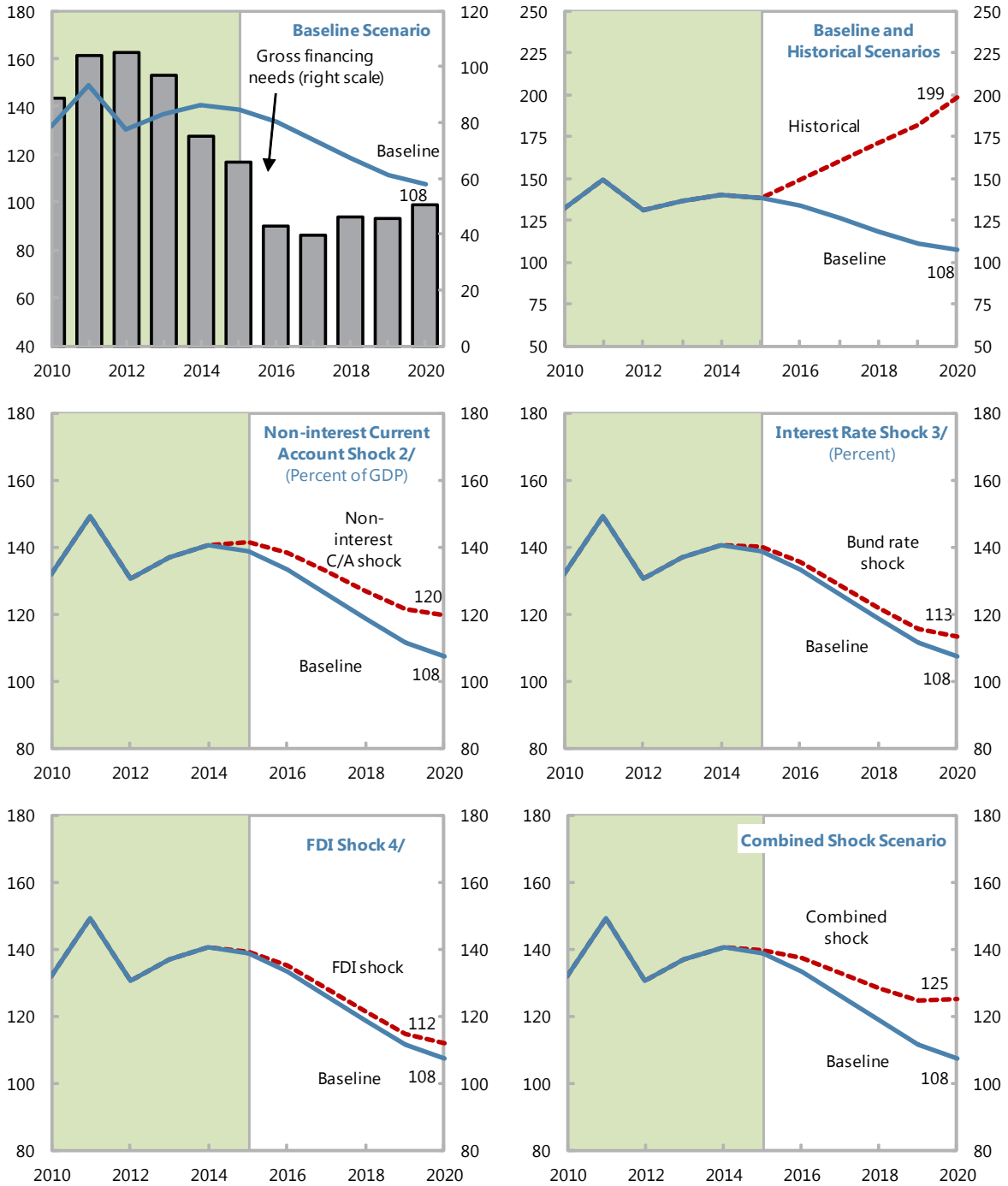
4/ Defined as current account deficit, plus amortization on medium- and long-term debt, plus short-term debt at end of previous period.

5/ The key variables include real GDP growth; nominal interest rate; dollar deflator growth; and both non-interest current account and non-debt inflows in percent of GDP.

6/ The external DSA is based on net external debt while the interest rates in the public sector DSA are based on gross debt. Nevertheless, average interest rates generally follow a rising trend, and are more closely correlated at the end of the projection period, as more new debt is contracted at higher interest rates.

7/ Long-run, constant balance that stabilizes the debt ratio assuming that key variables (real GDP growth, nominal interest rate, dollar deflator growth, and non-debt inflows in percent of GDP) remain at their levels of the last projection year.

**Greece: External Debt Sustainability: Bound Tests, 2010–20 1/**  
(Net external debt in percent of GDP)



Sources: Greek authorities; and IMF staff estimates.

1/ Shaded areas represent actual/preliminary data. Figures in the boxes represent average projections for the respective variables in the baseline and scenario being presented. Ten-year (pre-crisis) historical average for the variable is also shown.

2/ Current account balance lower by 1.5 percent of GDP due to delayed program implementation and terms-of-trade shock.

3/ Impact of 100bps shock to Bund rates on Greece's official interest rates and income balance.

4/ Decline in FDI due to reduced privatization receipts.