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CURRENT PROSPECTS FOR THE GREEK ECONOMY

INTERIM REPORT

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Summary

In this preliminary report, we discuss the evolution of major macroeconomic variables for the Greek economy, focusing in particular on the sources of growth before and after the euro era, the causes and consequences of the continuing recession, and the likely results of the policies currently being implemented. Some preliminary suggestions for alternative policies are included in our discussion. These alternatives will be tested in a more robust econometric framework in a subsequent report.

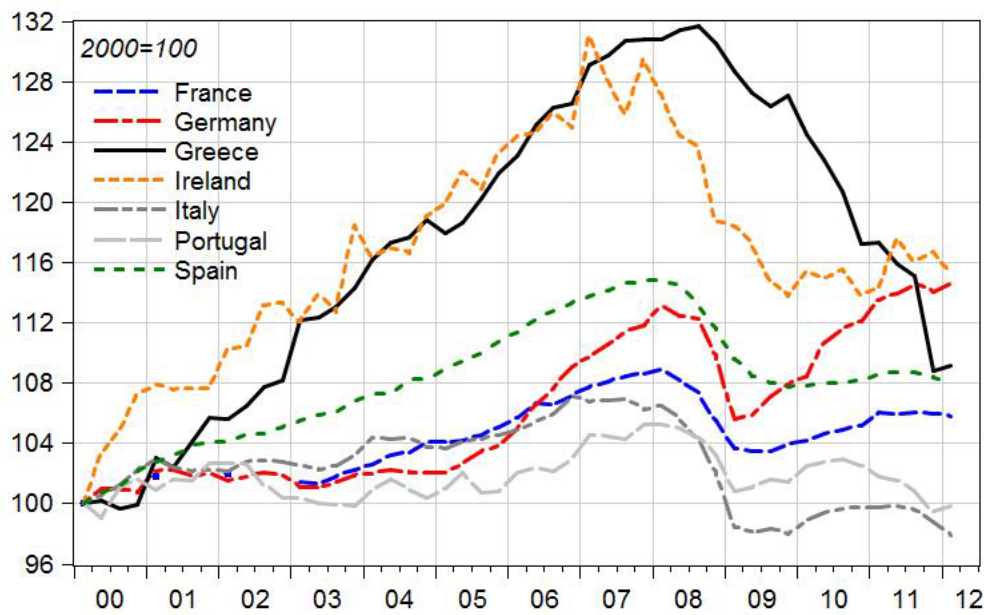
1. Growth and Decline in the Greek Economy

It is commonly accepted that the eurozone's crisis started with the difficulties faced by the Greek government in rolling over maturing debt in 2009, which produced contagion of other eurozone economies such as Portugal and then spread to Spain and, finally, to Italy. The Greek government sought assistance from the European Union (EU) and the International Monetary Fund (IMF) that resulted in rescue programs featuring significant financial support, but with the mandatory imposition of very severe austerity and structural-change measures. The combined EU, European Central Bank (ECB), and IMF rescues were based on the assumption that a dramatic reduction in government deficits was the solution. But this "solution" tends to slow growth, increase unemployment, reduce savings, and hence increase the burden of private sector debt. The idea is that this will reduce government debt and deficit ratios. However, as we will show from the evidence, this did not work due to impacts on the domestic private sector. The question that should be asked, then, is whether this imposed policy mix was wise.

As mounting evidence shows, the Greek economy is enduring the most severe recession in its postwar history. Greece has seen declines in per capita GDP of 5 percent or more for the last three years, a soaring unemployment rate, a large increase in poverty, and, most important, the threat of a collapse in government finances that would lead to further layoffs of public workers and a continuing deterioration of the economic conditions in the country. To understand why this is happening, and to place our analysis in its historical context, it is useful to analyze the available macroeconomic evidence, with the help of a consistent model, in order to explore the linkages and feedback between the evolution of income, expenditures, and savings, and the accumulation of wealth and debts.

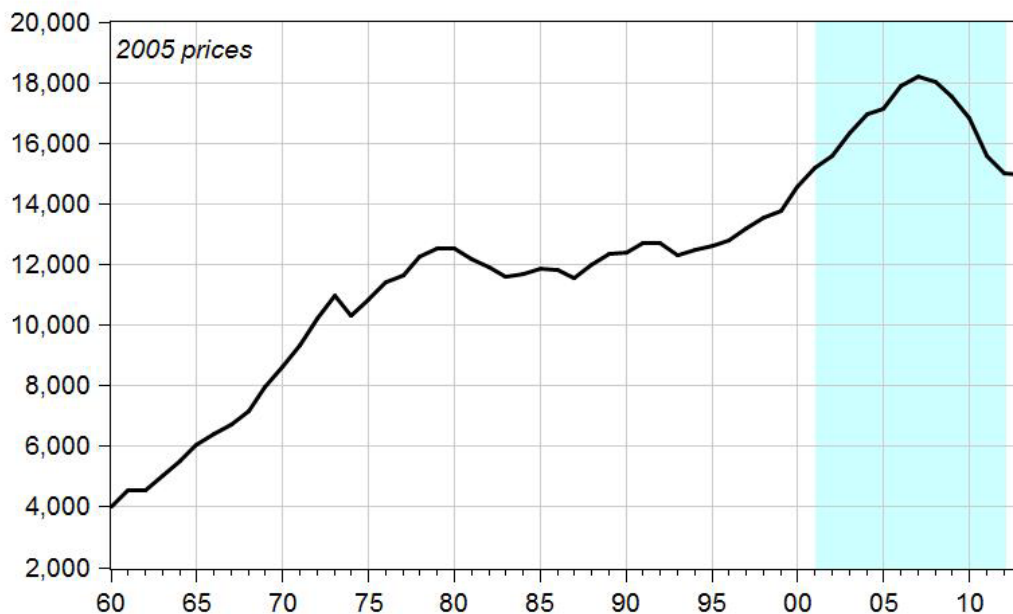
The data in Figure 1 show the recent evolution of real per capita GDP in Greece, compared to other selected countries in the euro area. The first striking observation is that Greece was the country that derived the largest benefit from the euro era—before the crisis hit in 2008—with an increase in its real GDP per capita of more than 30 percent from 2000 to 2008. This performance was matched only by the Irish economy, although for different reasons, while other countries experienced either a very modest increase in per capita income (Italy and Portugal), or a moderate increase (Germany and France). However, while income per capita in Ireland had risen considerably *above* Germany's, the position of Greece relative to Germany improved, from 58 percent of German real per capita GDP in 2000 to 68 percent by the end of 2007, and then fell back to 55 percent in the first quarter of 2012. It would seem that joining the euro allowed Greece, until 2008, to catch up and even surpass its richer eurozone partners, but these gains have been completely wiped out in the years since.

Figure 1. Eurozone. Real GDP per-capita



The other important finding from the data in Figure 1 is that, if we compare the latest available data to the corresponding figures before the crisis, only Germany has recovered. All of the other countries are still below the level they had reached in 2007, and in some cases the trend of real output is still declining.

Figure 2. Greece. Real national product per head



To put Greece's GDP growth in historical context, in Figure 2 we report the evolution of real GDP per capita since 1960. The figure shows that Greece experienced a very large increase in economic well-being during the 1960s and 1970s, when GDP per capita increased by 210 percent, or an average of 6.1 percent per year. Between 1980 and 1995, the same income measure increased by a meager 0.8 percent over the entire period. Growth resumed at a healthy pace in 1995, before the adoption of the euro in 2001, and then accelerated during the euro era, up to 2007. When the crisis hit in 2008, GDP started to fall. GDP is expected to be close to 20 percent lower at the end of 2012 than its peak in 2007.

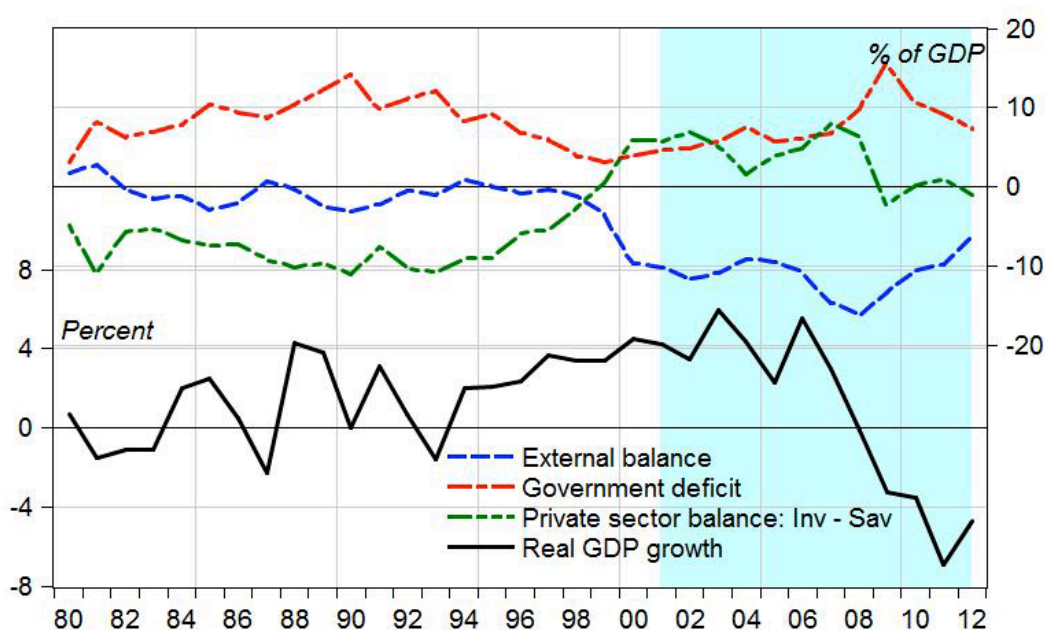
2. Financial Balances

The goal of this report is to assess the historical sources of growth and to evaluate Greece's prospects for growth in the future. We adopt the “financial balances approach” pioneered by Wynne Godley of Cambridge University and the Levy Economics Institute, which, starting from the components of aggregate demand (consumption, investment, government expenditure, and net exports), analyzes the implications in terms of the financial balances of the main sectors, which are given by

$$NAFA = GNB + BP$$

where *NAFA* is the net acquisition of financial assets of the private sector as a whole; *GNB* is the government deficit, including net capital transfers; and *BP* is the external balance, again including net capital transfers.

Figure 3. Greece. Financial balances and real GDP growth



Our estimates² for the financial balances of Greece are shown in Figure 3, along with real GDP growth. Balances are drawn so that an upward movement implies an increase in the contribution of that sector to aggregate demand.

The prolonged period of stagnation that ended in 1995 was accompanied by relatively stable ratios of balances as a percent of GDP; the excess of savings over investment in the private sector was roughly equal to net government borrowing. The increase in the government deficit in the 1980s was accompanied by a decline in the private sector balance, with a negligible impact on the external balance. The opposite trend can be observed in the 1990–94 period. In the second half of the 1990s, investment started to increase relative to private sector savings, and this implies, when the private sector balance turned positive in 1999, that the private sector became a net borrower against the rest of the world—that is, the increase in the private sector balance was mirrored by a decline in the external balance, which deteriorated in the period leading up to the crisis in 2008. Strong growth in real GDP was, therefore, based on private sector demand fueled by debt. We turn now to a more in-depth analysis of each of the three balances.

² Data for the government balance from AMECO has been estimated backward for the 1980–87 period using IMF sources. No consistent data seem to exist for government accounts for earlier periods. See the appendix for data sources.

3. The External Balance

The decomposition of the external balance for Greece is reported in Figure 4. The figure shows that there have always been underlying problems with the current account. These were not dramatic as long as the structural deficit in the trade balance was matched by a surplus in the balance from property income and net transfers (mostly remittances from abroad). The transfer balance started to decline in the 1990s, followed by a decline in net property income. Matters worsened further when Greece joined the euro and the trade balance deteriorated.

Figure 4. Greece. Balance of payments and its components

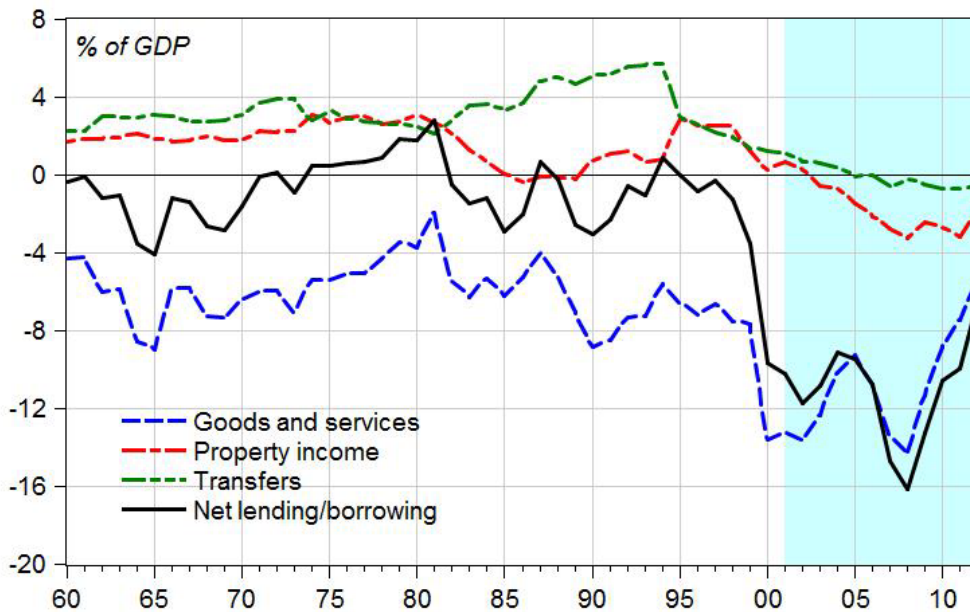
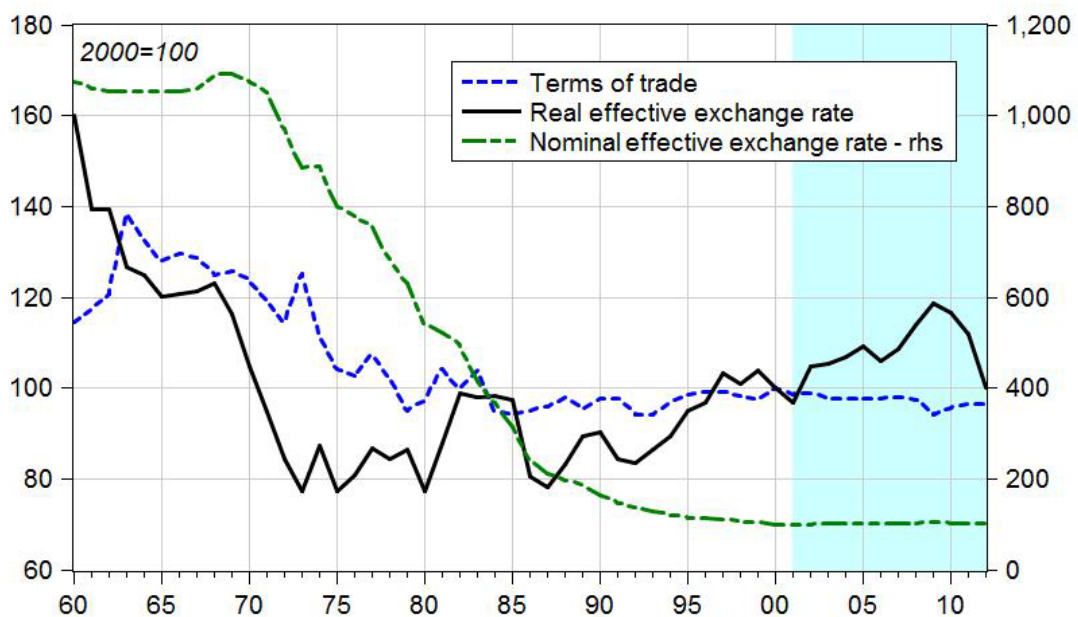


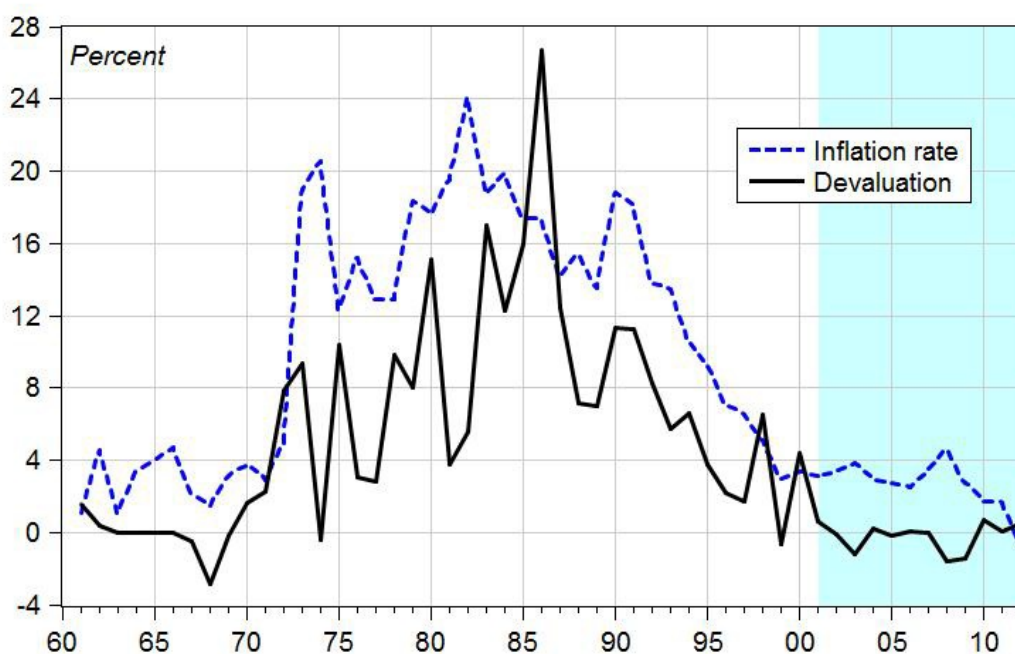
Figure 5. Greece. Nominal and real exchange rates



A major determinant of the trade balance is the price of domestic goods relative to that of competitors. In Figure 5, we report a measure of the nominal effective exchange rate,³ along with measures of relative prices given by the real effective exchange rate⁴ and the terms of trade, computed as the ratio of the exports deflator to the imports deflator. After the end of the Bretton Woods system, the drachma devalued considerably in nominal terms, with a much smaller impact on the real exchange rate (albeit the fact that the two measures are not strictly comparable). Comparing the dynamics of the exchange rate with the trade balance in Figure 4, we may conclude that the devaluation was sufficient to keep the trade balance from deteriorating even further.

This is confirmed by the data in Figure 6, which compares the percent change in the nominal exchange rate of Figure 5 (where an upward movement now measures devaluation) with a measure of inflation given by the rate of change in the GDP deflator. The correlation between the two series is high. Although a Granger-causality analysis shows that the variables feed back on each other (inflation implies devaluation in the next year, and devaluation helps explain inflation in the following year), the link from inflation to devaluation seems stronger. This implies that exchange rate movements were a consequence of inflation gaps.

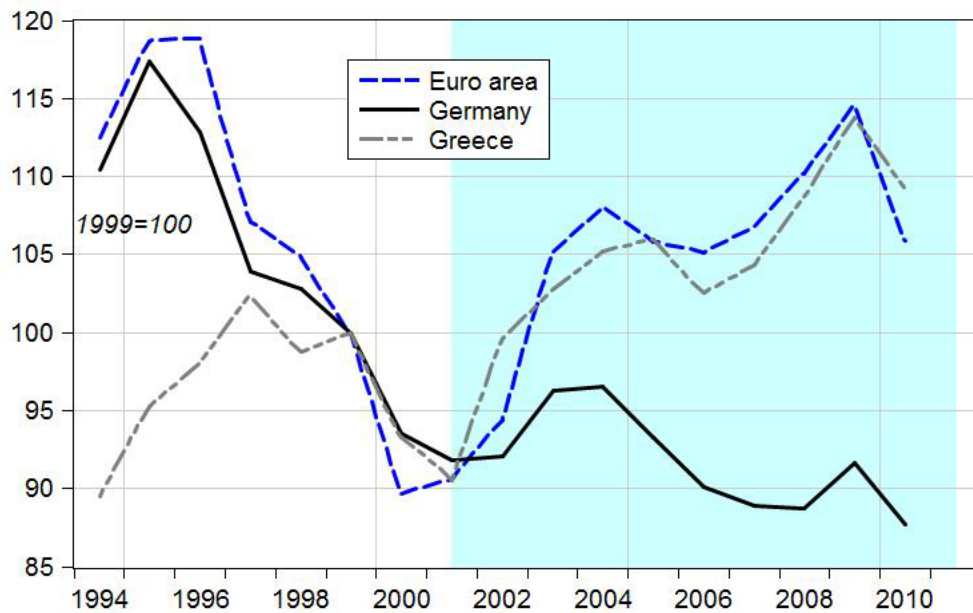
Figure 6. Greece. Inflation and devaluation



³ From the AMECO database. This index is computed against 34 industrial countries, with a double export weight that also takes into account the competitiveness with foreign countries in third markets.

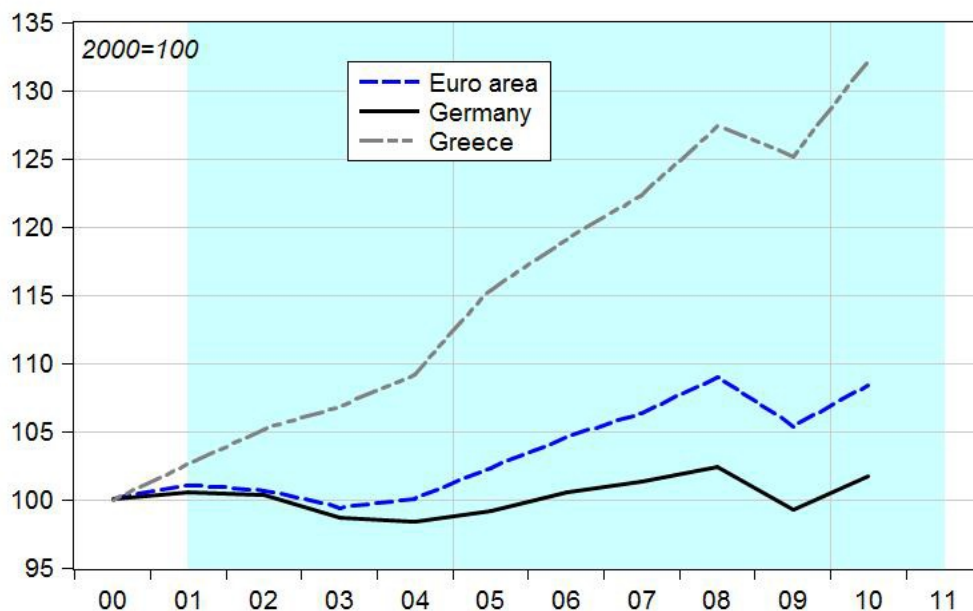
⁴ From the AMECO database. Computed against the EU15 with double export weights.

Figure 7. Real effective exchange rates



We can focus on more recent periods with the data reported in Figure 7. These data show recent movements in the real effective exchange rate.⁵ The Greek currency appreciated from 1994 to 1997 while Germany and the euro area depreciated. In the early years of the euro, there was a degree of convergence in the evolution of exchange rates. But, with the German policy of wage moderation after reunification, which accelerated in 2003, the differences became pronounced. The real appreciation was very close between Greece and the euro area, while in Germany the real exchange rate diverged dramatically.

Figure 8. Export price indexes



It is interesting to compare the data in Figure 8, which reports price export indexes, with the real exchange rate data in Figure 7. Despite a similar real appreciation, as shown in Figure 7, the index of

⁵ Calculated from Eurostat on 36 trading partners with unit labor cost deflators.

export prices shows that prices rose much faster in Greece than in the rest of the euro area. Greek firms have been unable or unwilling to absorb the euro appreciation by lowering their margins.

Figure 9. Greece. Structure of exports of goods

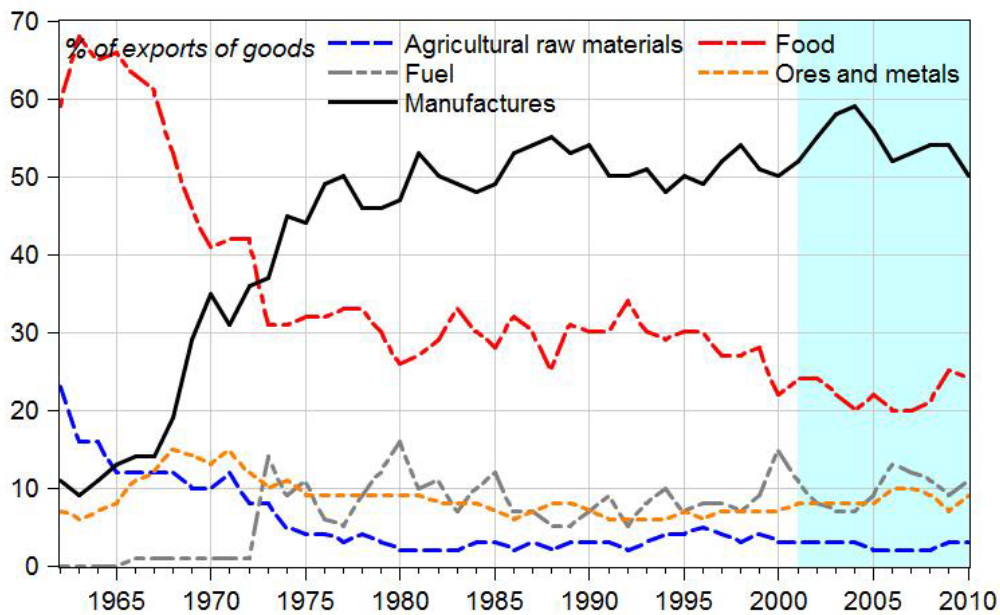
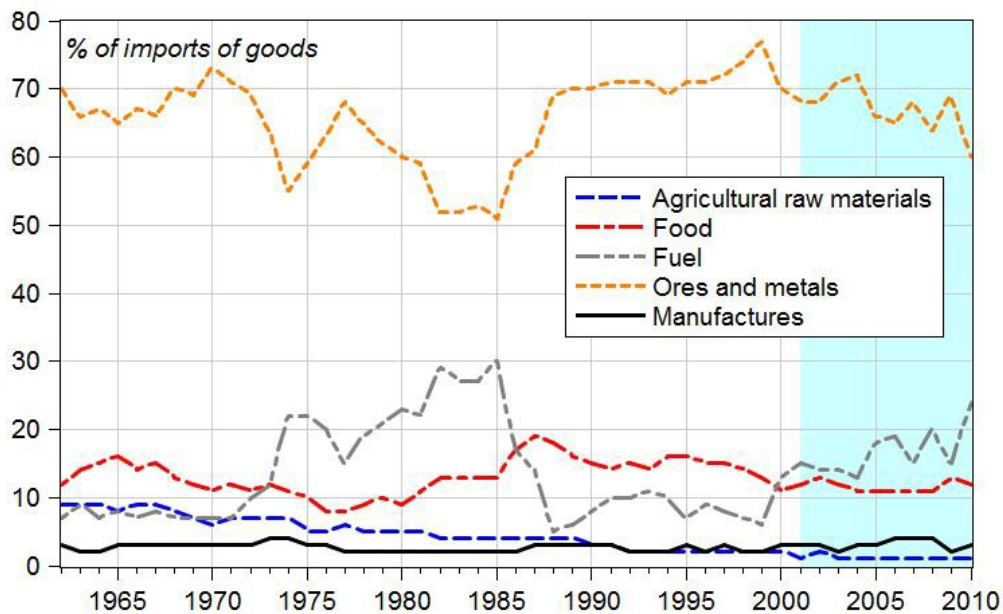


Figure 10. Greece. Structure of imports of goods



To assess the origin of the trade imbalance, it is also necessary to examine the composition of trade in more detail. In Figures 9 and 10, we document the composition of exports and imports, respectively.

The industrialization of the Greek economy is reflected in the structure of its exports. Between 1962 and the late 1970s, we observe in Figure 9 a fall in the share of food exports, as well as a decrease in exports of agricultural raw materials. During the same period, the share of manufacturing exports rose

sharply. In 2010, this share represented half of total exports of goods. Food exports were almost 25 percent, which is perhaps still a large percentage for a developed country.

Figure 10 describes the decomposition in imports of goods, of which manufactured goods have always been the major component. Between 1970 and 1985, the share of fuels increased (from 7 percent in 1970 to 30 percent in 1985), following the developments in oil prices. Between 1985 and 1988, this share fell sharply (to 5 percent in 1988), and stabilized until the end of the 1990s. In the 2000s, fuel imports started to increase again, reaching 25 percent of total exports by 2010.

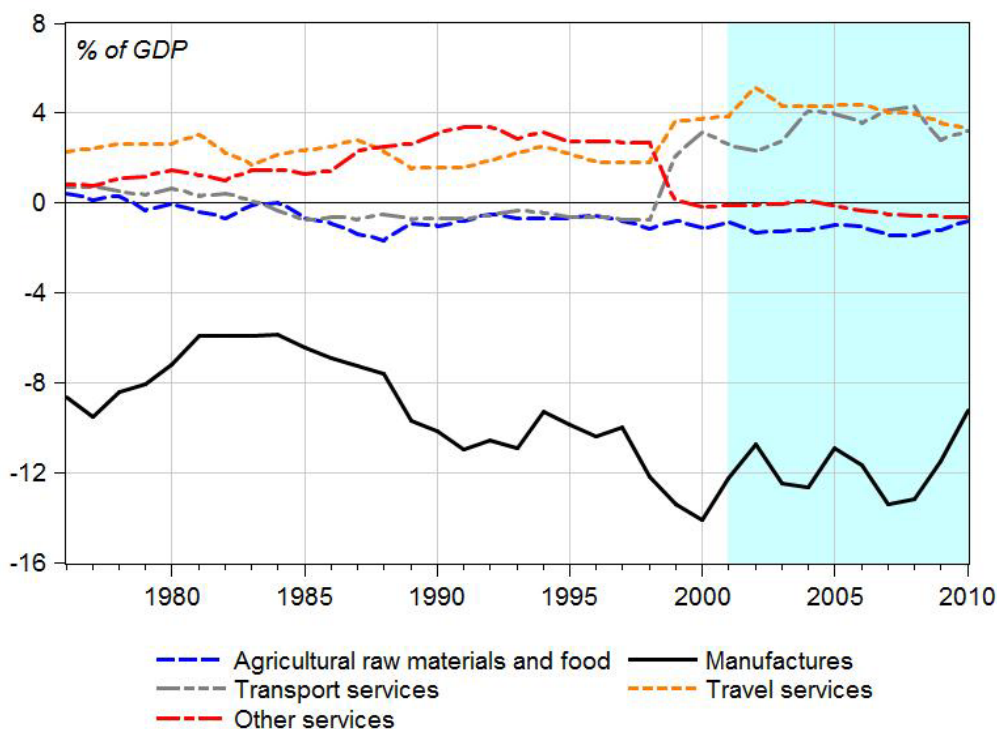
In Table 1 below, we report the bilateral trade balance for Greece's 10 largest trading partners, sorted according to the trade balance in the most recent period.

	1980–90	1991–2000	2001–10
Germany	-1.8	-1.8	-2.3
Italy	-1.2	-2.2	-2.3
Russia	0.0	-0.2	-1.3
France	-0.8	-1.3	-1.1
Netherlands	-0.8	-1.0	-1.0
Belgium-Luxembourg	-0.4	-0.6	-1.0
South Korea	-0.2	-0.4	-0.8
China	0.0	-0.2	-0.8
Spain	-0.2	-0.4	-0.6
Saudi Arabia	-0.8	-0.2	-0.6

Sources: Chelem; authors' calculations

From the table above some additional important results emerge; namely, that the trade balance has deteriorated the most against countries pursuing export-led growth (China and Germany) and against fuel-exporting countries (Russia, Saudi Arabia), but also against countries that have experienced lower growth rates in income (Germany again, along with Italy and France).

Figure 11. Greece. Decomposition of trade balance



In Figure 11, we report the dynamics of trade in services, for which data are available only for a shorter time period. Services associated with tourism have been an important and growing component of Greek trade, although they have not risen to levels sufficient to outweigh the deficit in trade of manufactures.

Another component of the recent deterioration in the current account balance is associated with net migration. In 2000, Greece was still benefiting from net inflows above 1 percent of GDP connected with remittances (Figure 12), but net migration into the country recently turned this into a net outflow.

Figure 12. Remittances and compensation of employees



Net property income from abroad, which includes interest payments, distributed income of corporations, and reinvested earnings on foreign direct investment, also deteriorated sharply, mainly as a consequence of servicing the Greek external debt, which has been increasing in size as a consequence of current account deficits. The data in Figure 13, calculated on the basis of the newly released sector account balances, show that net interest payments paid abroad are now at 4.8 percent of GDP, a figure that is bound to increase given the current size of the debt and the interest rate at which Greece is raising funds.

Figure 13. Greece. Net property income from abroad

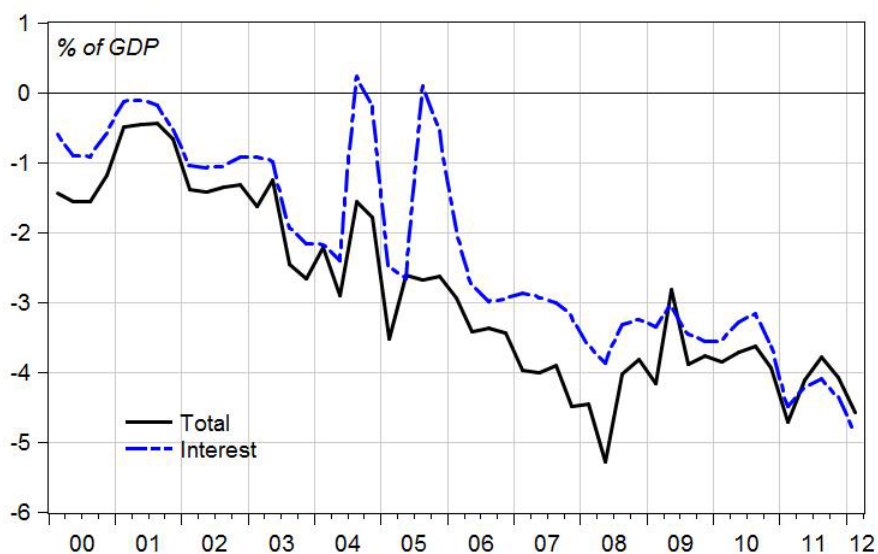
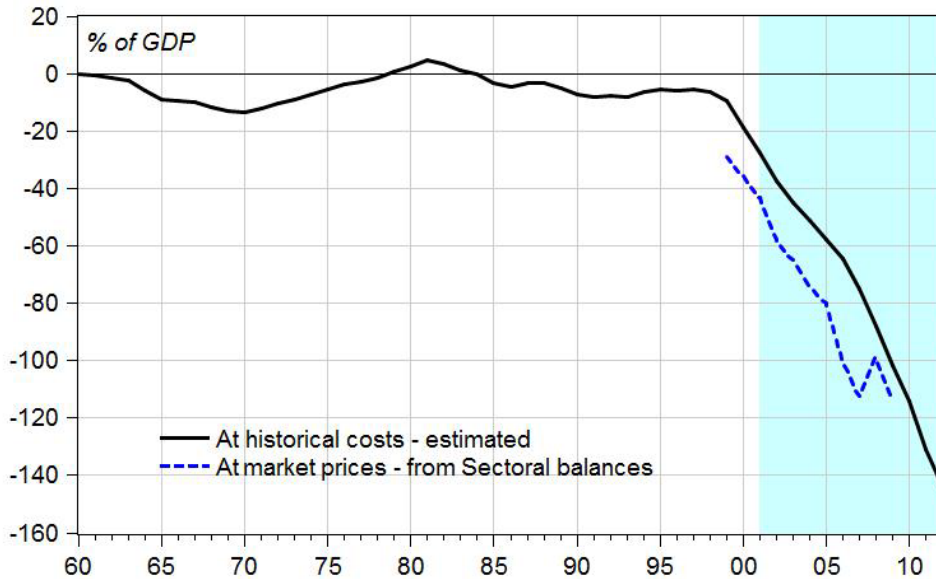


Figure 14. Greece. Net external assets

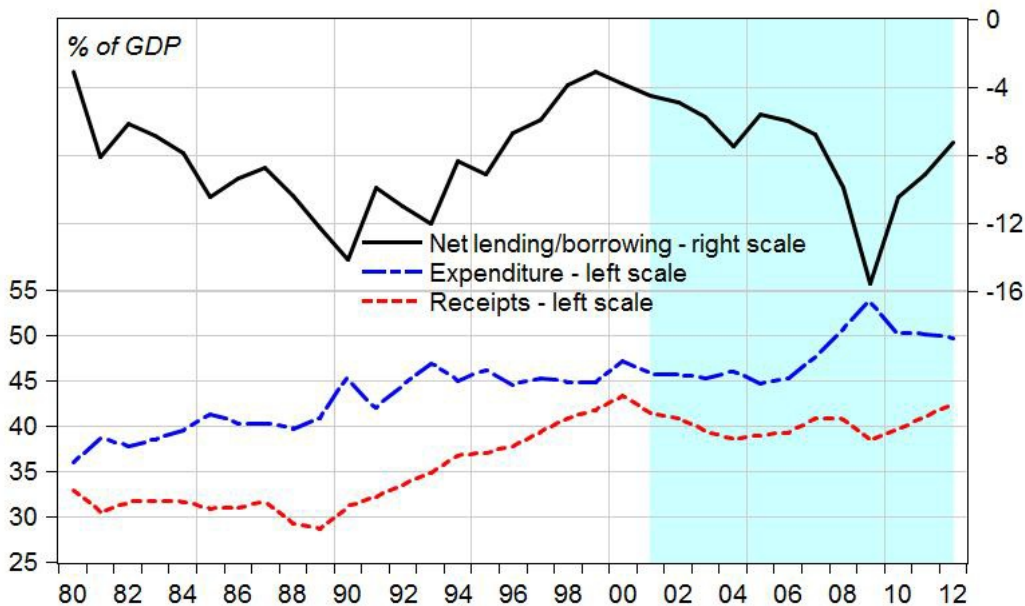


The large and growing current account deficit implies an explosive path for external debt. In Figure 14, we provide our estimate for external debt using historical costs, obtained by cumulating the net external balance. Our estimate is somewhat optimistic when compared to the available figures for external debt at market prices. Nonetheless, they show that the external debt began to explode with the widening of the external deficit that occurred when Greece became a member of the eurozone.

4. Government Accounts

The government of George Papandreou, newly elected in 2009, reported that the public sector deficit was larger than that provided by the previous government, appearing to confirm the notion that the sovereign crisis in Greece was a consequence of profligate government spending. But is this true? It is important to verify this notion from the available data.

Figure 15. Greece. Government accounts

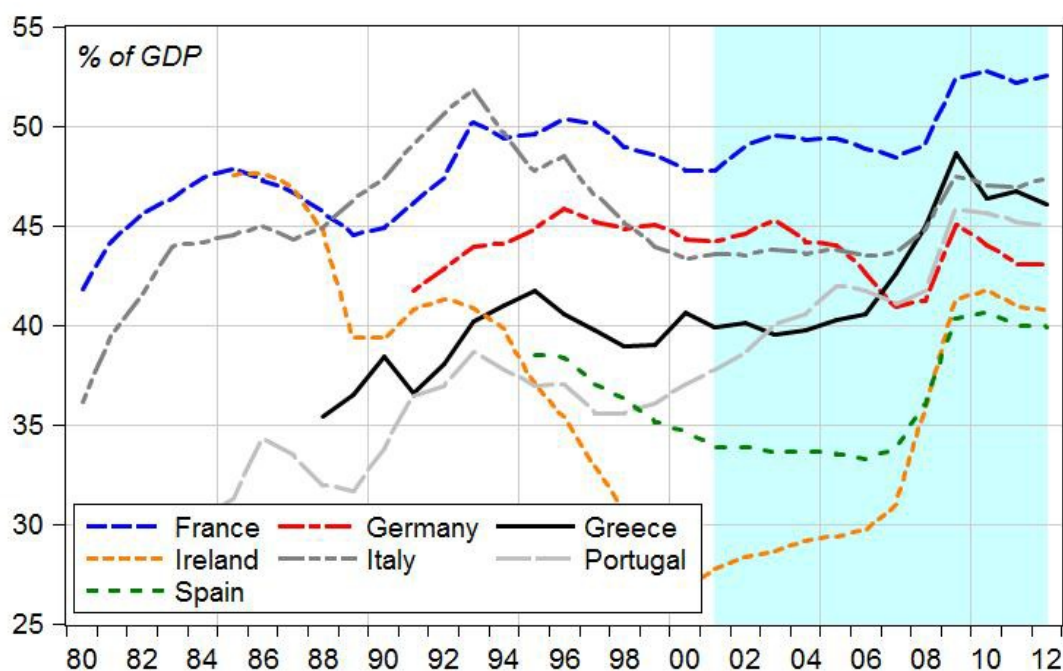


The historical path of the government deficit is shown in Figure 15,⁶ where the government deficit on the right axis is now represented with an inverted scale against the same data in Figure 3. Data for expenditures and revenues for the general government are represented on the left axis scale; they are both growing as a percentage of GDP, as in all other developed countries.

However, the figure shows that government expenditures stabilized at a share of 45 percent of GDP from around 1990–2006; increased to 47.6 in 2007, just before the crisis hit Greece; and then increased rapidly as a result of the recession that began in 2008, before the austerity adjustment programs started to play a role in 2010. Therefore, large government expenditures cannot be considered a major source of the problems in the country, unless we assume that the problems began in 1990 and were not addressed.

The reduction of the government deficit necessary to achieve the Maastricht criteria was mainly done through an increase in government revenues. Revenues increased steadily as a share of GDP, from a low of 28.6 percent in 1989 to 43 percent in 2000, just before Greece joined the euro, achieving an overall government deficit of 3.8 percent of GDP. In the succeeding years, government revenues declined again, contributing to a larger deficit.

Figure 16. Eurozone. Government current expenditure



A comparison of the Greek government’s overall expenditures with those of other European countries is presented in Figure 16. Before the crisis, the size of the government in Greece was well below those of France, Germany, or Italy. However, as interest payments on government debt increased, it is interesting to examine separately their impact on expenditures, as they are a sizable component for countries with large government debts.

⁶ It would be interesting to obtain estimates for the government deficit and its components before 1980, but they do not seem to be available.

Figure 17. Eurozone. Government expenditure on interest payments

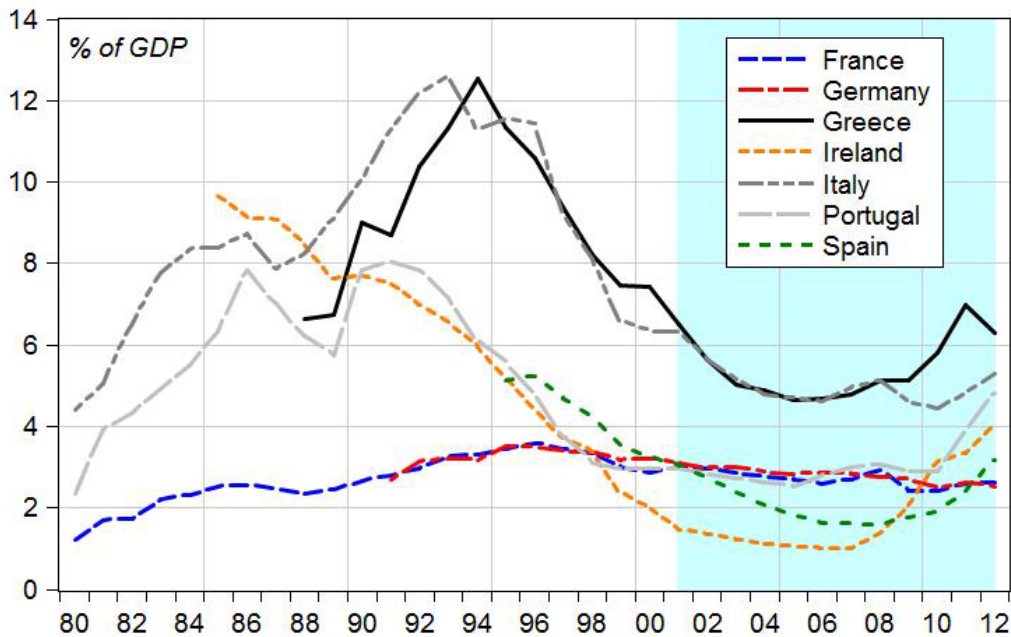
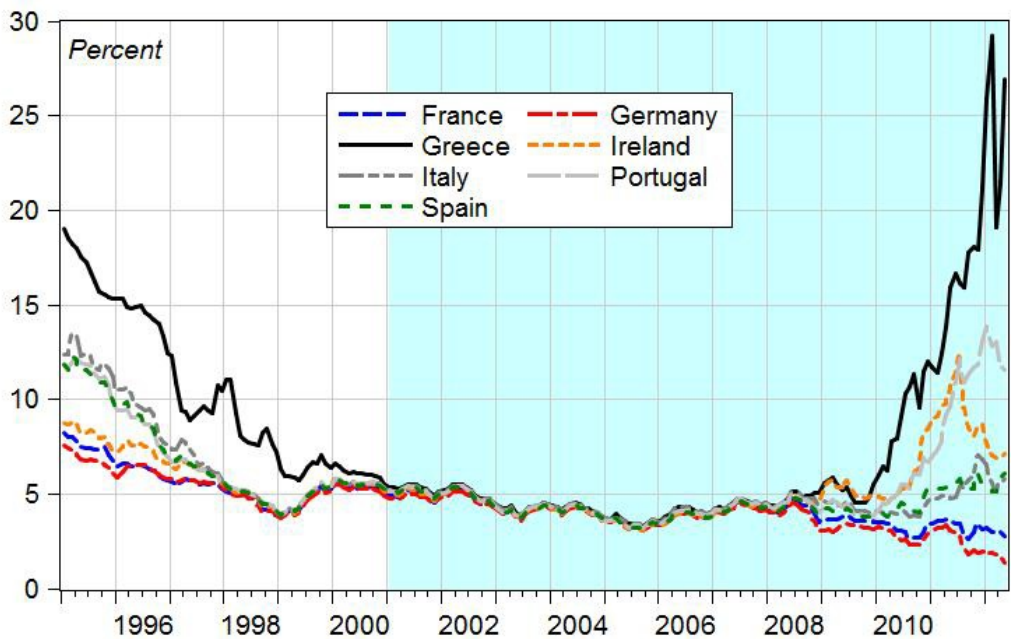


Figure 18. Eurozone. Interest rates on 5-year government bonds

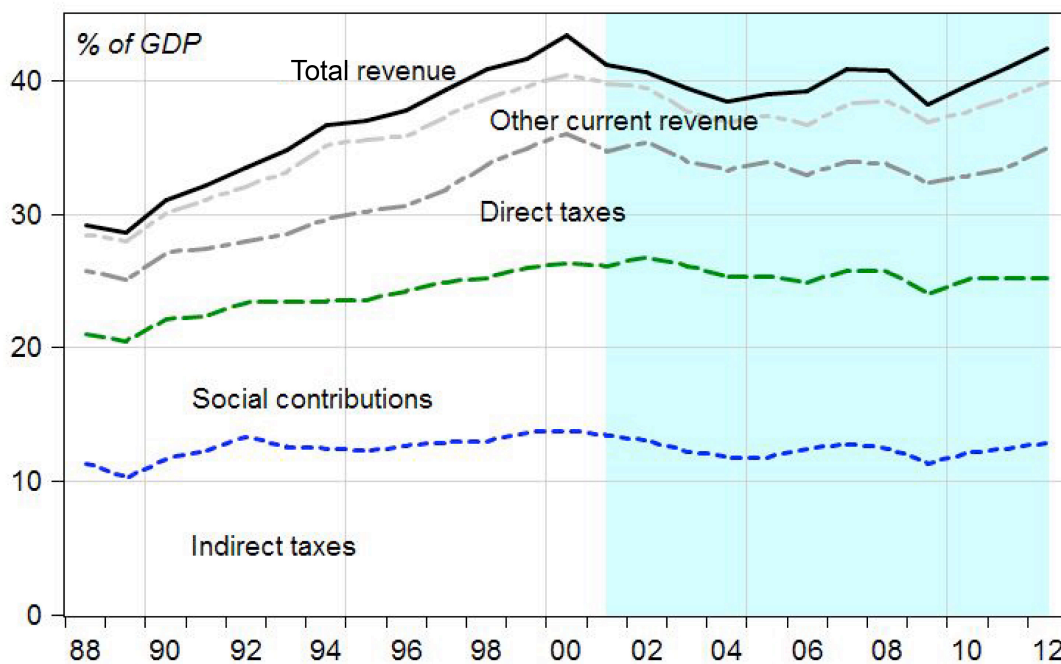


The data in Figure 17 show that Greece and Italy were the two countries that achieved the largest reduction in interest payments on government debt, which was higher than 12 percent of GDP in the 1990s and gradually declined in concert with lower interest rates at the end of the 1990s. There was a further decline with the adoption of the euro, but interest payments reversed course and increased again when the “debt crisis” unraveled. The decline in interest rates on government debt was the major benefit of joining the euro for countries like Greece and Italy. These countries were able to borrow at significantly lower rates, comparable to the robust economies (i.e., Germany and France), as the data in Figure 18 document.

Figure 17 shows that government interest payments are still below 10 percent of GDP, since the implicit interest rate on debt is an average of interest rates for liabilities with different maturities. However, if interest rates are kept at their current level, net government expenditures on interest payments alone could increase to unprecedented heights.

A comparison of the data in Figures 16 and 17 shows that the Greek government took advantage of the fall in its debt burden to increase other expenditures, rather than reducing its debt during the “good times” of high growth and low unemployment.

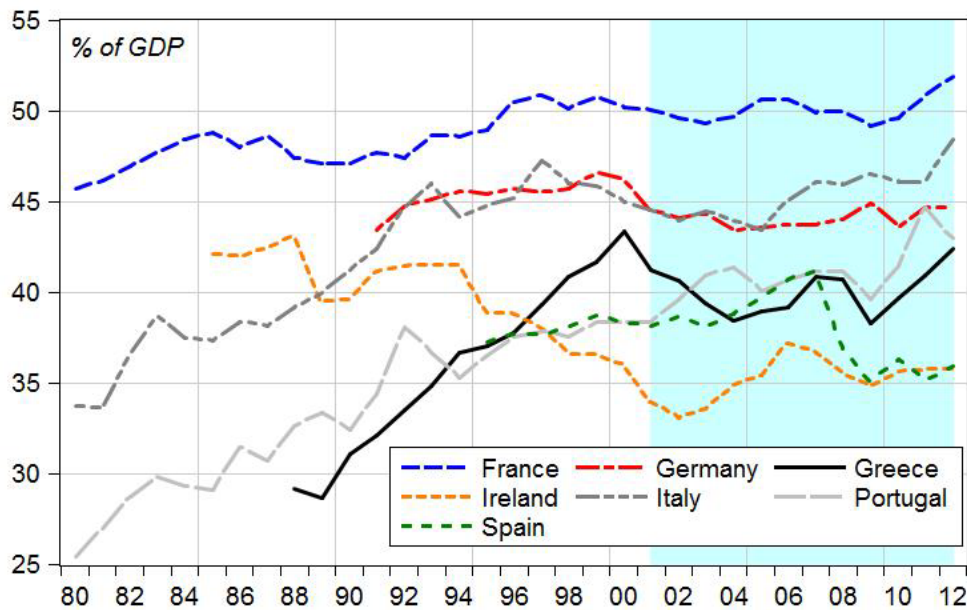
Figure 19. Greece. Composition of government revenue



Details of the different components of government revenues are reported in Figure 19. The figure shows that more than one-fourth of total revenue comes from taxes on production and imports, which have been relatively stable with respect to GDP and at a level similar to, or higher than, other European economies.

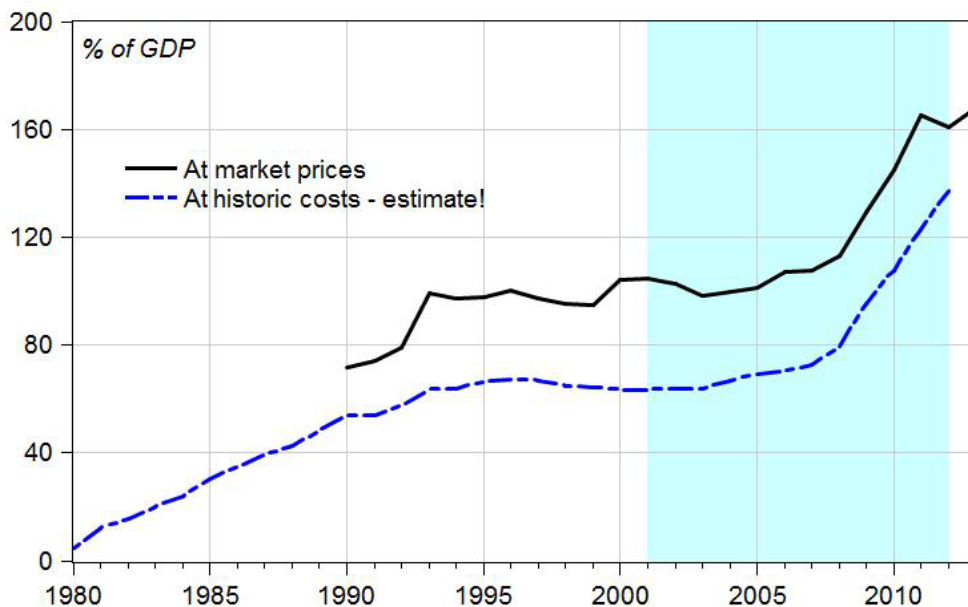
The increase in government revenue to achieve compliance with the Maastricht criteria was mainly obtained through an increase in social contributions, which grew from 9.8 percent in 1988 to a high of 13.5 percent in 2005, and then declined a bit and stabilized thereafter. Revenues from taxes on income and wealth were at a modest 4.7 percent of GDP in 1988 and 8.6 percent in 2005, a level still below that of other European countries. These lower revenues from income and wealth taxes can be attributed mostly to the tax evasion and avoidance that results from a sizable shadow economy.

Figure 20. Eurozone. Government current revenues



A comparison of government revenues in Greece with other eurozone countries is reported in Figure 20. This figure confirms our previous results: the size of the government is not exceedingly large, and Greece, at least before the euro, was lagging behind other European economies in its ability to raise a sufficient amount of funds through taxation.

Figure 21. Greece. Government gross debt



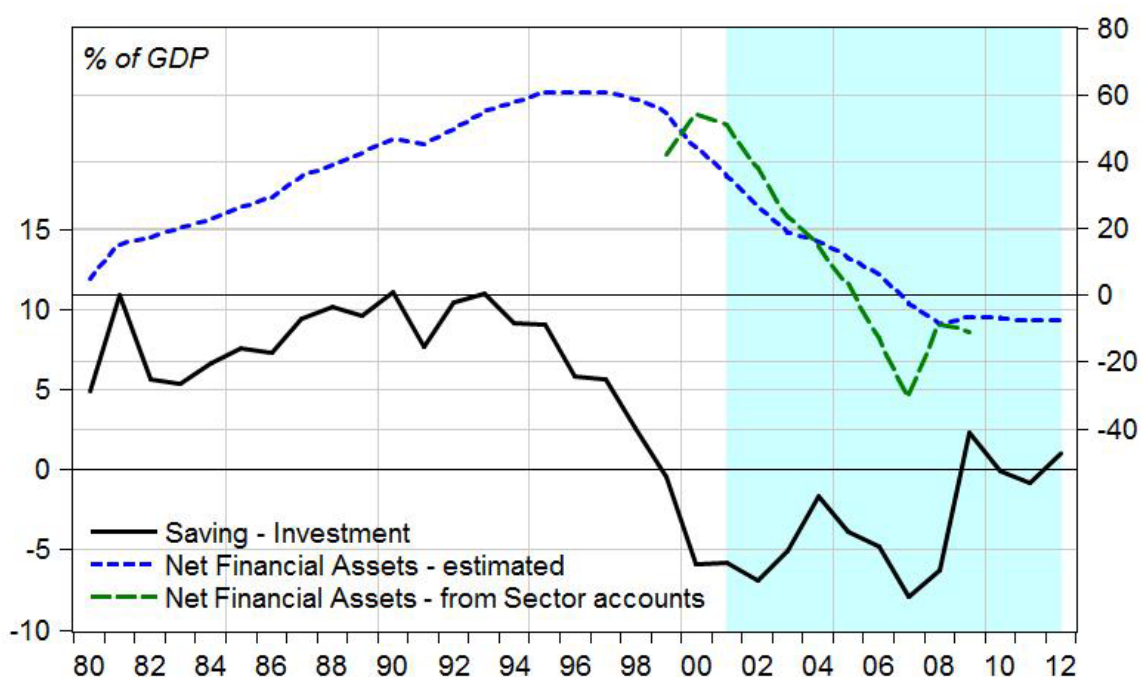
In Figure 21, we report the official measure for the general government gross debt outstanding. The figure also includes a preliminary estimate, which needs a better benchmark, obtained from summing government net borrowing over time. It is interesting to note that both measures are roughly stable at the beginning of the euro years, and both exploded only when the sovereign debt crisis surfaced. This confirms our view that the dramatic government debt increase has been the consequence of a badly managed affair rather than the primary cause of deficits.

We turn next to the analysis of the determinants of the private sector financial balance.

5. Savings, Profits, and Investment

We have shown in Figure 3 that the private sector balance (the difference between the private sector's aggregate investment and savings) was roughly stable relative to GDP up to 1995, and then started to grow. We replicate the same measure, with the sign reversed, in Figure 22, where now an excess of saving over investment implies that the private sector as a whole is accumulating financial claims on the other two sectors (the government and the rest of the world), while a deficit implies net borrowing.

Figure 22. Greece. Private sector balance and NFA

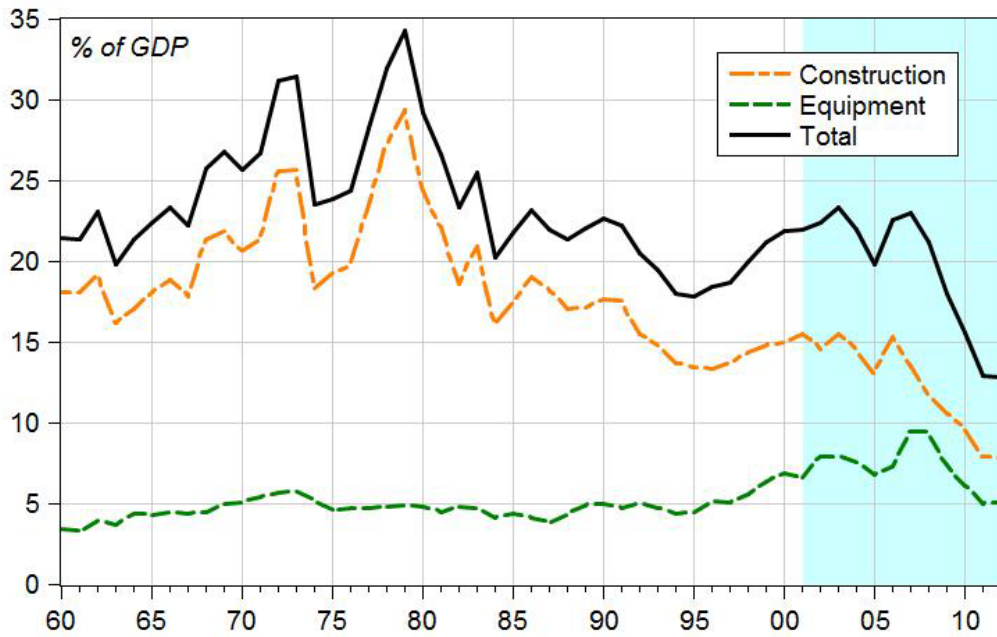


The financial balance turned negative in 1999, as noted above, and this has implied a decrease in net financial assets (NFA) that eventually turned negative in 2004⁷ and is still negative.

In our view, this is the major problem currently facing Greece. While other countries like Italy still have a net creditor position in the stock of financial assets of the private sector, so that, if necessary, a reduction in government net liabilities can be obtained through appropriation of private financial assets, this possibility is ruled out for Greece, where both the private and the public sector have a net debt against foreigners. As a result, any attempt to quickly reduce the stock of debt must imply a transfer of *real*, rather than financial, assets from Greece to foreigners.

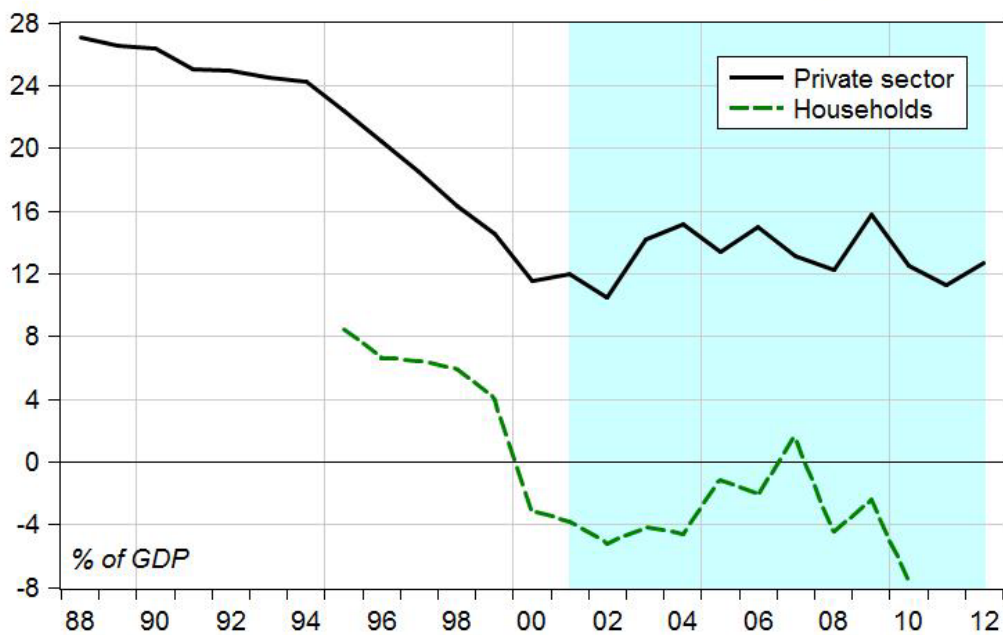
⁷ The estimated measure in Figure 22 is obtained by cumulating net flows, while the other measure is obtained from Eurostat as the sum of the net liabilities of the government and the rest of the world.

Figure 23. Greece. Gross fixed capital formation



We now turn to a quick examination of the determinants of the private sector financial balance, which, as shown in Figure 22, is the difference between aggregate savings and investment. In Figure 23, we report investment as a share of GDP. Greece had a high level of investment up to the 1990s. However, as the figure shows, this was mainly investment in construction. Investment in machinery and transportation equipment, which is much more important for creating productive capacity, was lower, relative to GDP, as compared with other countries like Germany. In the second half of the 1990s, investment in equipment started to rise, but it was not sustained and both categories of investment collapsed with the crisis to unprecedented lows.

Figure 24. Greece. Private sector saving



The fall in investment relative to GDP would imply an increase in the financial balance of the private sector, but as Figure 22 shows, this measure dropped in the second half of the 1990s. It must be the case, therefore, that savings declined even faster than investment during this period. This is confirmed by the data shown in Figure 24, which show that aggregate saving fell from 27 percent of GDP in 1988 to 10 percent in 2002, and stabilized, but household savings turned negative and remained so in the latest available data.

It must be the case, therefore, that growth in Greece during the 2000s—similar to the United States—was fueled by consumption financed by running down households' financial assets, and/or by net borrowing. It was this unsustainable process, rather than an excessive government deficit, that put Greece on an unsustainable path.

A more in-depth analysis of private sector consumption and its determinants will be available in a subsequent report.

6. The Impact of Bailouts and the Prospects for Greece According to the Troika

In a recently released document, the European Commission (EC) seems to expect the recession in Greece to be less severe this year, and then to be followed by an additional year of stagnation, and a return to growth in 2013. The details of this macroeconomic scenario are reported in Table 2.

	2009	2010	2011	2012	2013	2014
Real GDP (growth rate)	-3.2	-3.5	-6.9	-4.7	0.0	2.5
Final domestic demand contribution*	-3.6	-7.0	-10.0	-7.2	-1.4	1.5
Net trade contribution	3.1	3.1	2.8	2.3	1.4	1.2
Employment (growth rate)	-0.7	-1.9	-6.3	-4.8	-0.2	1.6
Unemployment rate (percent of labor force)	8.9	11.7	15.9	17.9	17.8	16.7
Compensation of employees, private sector, per head	0.6	-0.3	-3.2	-13.0	-3.8	-2.2
Unit labor cost (growth rate)	4.3	-1.6	-1.0	-7.8	-1.3	-1.9
HICP inflation	1.3	4.7	3.1	-0.5	-0.3	0.1
HICP inflation at constant taxes	1.1	1.4	1.2	-1.2	-0.8	0.1
Current account balance (percent of GDP)	-14.3	-12.3	-10.3	-6.9	-5.3	-4.6
Net borrowing vis-à-vis RoW (percent of GDP)	-13.3	-10.6	-8.3	-4.8	-3.1	-2.4
Net external liabilities (percent of GDP)	-112.9	-101.9	-116.0	-88.1	-90.0	-89.6
General government deficit (percent of GDP)	-15.8	-10.6	-9.3	-7.3	-4.6	-2.1
General government primary surplus (percent of GDP)	-10.6	-5.0	-2.4	-1.0	1.8	4.5
General Government debt (percent of GDP)	129.3	144.9	165.3	161.4	165.4	162.1

Source: European Commission (2012), p. 16

According to the EC, the recovery should come from a strong increase in investment (expected to rise by 6.7 percent in 2013 and 9.8 percent in 2014⁸) as well as exports (5.5 percent in 2013 and 7 percent in 2014), while imports would remain stable in 2013 and increase moderately by 2.4 percent in 2014. Government expenditures are expected to keep falling by 9.5 percent in 2013 and 4.7 percent in 2014.

⁸ See European Commission (2012), p. 85, Table A1.

These numbers are, of course, wishful thinking, since a large increase in exports may be obtained only if the ongoing slowdown in the rest of the world reverses its trend, and only if the rest of Europe abandons recessionary policies. It is not clear, otherwise, which country would be willing to increase its demand for Greek exports. An increase in the export of services may be more likely, if prices in Greece fall faster than those in other southern European countries; but so far, the level of exports in services has been insufficient to compensate for the projected fall in government expenditures.

Again, the decrease in labor costs and possible structural reforms may not be sufficient for a recovery in investment if domestic consumption remains weak—as is to be expected, given the projected path for wages—and net exports do not fill the gap in aggregate demand.

Is this scenario then plausible, in terms of our financial balances approach? We notice that net borrowing from the rest of the world is projected to drop from 4.8 percent in 2012 to 2.4 percent in 2014, reflecting the improvement in the trade balance. However, this financial balance will still be negative, because of the expected large flows of net property income.

The government deficit, which can be used as a proxy for government borrowing requirements, is expected to drop to 2.1 percent of GDP in 2014, from the 7.3 percent of GDP expected in 2012. Since the drop in the government component is larger than the improvement in the external balance, the EC projection implies that the private sector balance turns negative again, with a return to net borrowing from the private sector.

This view may be consistent with the projected strong increase in investment, but at present it is hard to imagine that the Greek private sector would be willing to increase its net debt in just two years, given the high level of unemployment and declining incomes, and without major events occurring in financial markets.

The EC projection is based on the idea that austerity, when coupled with external support, will work for Greece. We can attempt to assess the impact of the first financing program by comparing the amount of net inflows, reported in Table 3, with other key macroeconomic variables.

Table 3. Disbursement under the first financing program (EUR billions)

	Euro-area member-states		IMF		Total
1st tranche	May 18, 2010	14.5	May 12, 2010	5.5	20.0
2nd tranche	September 13, 2010	6.5	September 14, 2010	2.5	9.0
3rd tranche	January 19, 2011	6.5	December 21, 2010	2.5	9.0
4th tranche	March 16, 2011	10.9	March 16, 2011	4.1	15.0
5th tranche	July 15, 2011	8.7	July 13, 2011	3.3	12.0
6th tranche	December 14, 2011	5.8	December 7, 2011	2.2	8.0
Total disbursement		52.9		20.1	73.0

Source: European Commission (2012), p. 5

The first two financing tranches of the program consisted of 29 billion euros, or roughly 12.7 percent of GDP in 2010. The other four tranches amounted to 44 billion euros in 2011. However, with interest rates now above 20 percent and a debt-to-GDP ratio above 120 percent, a financing program of this size is insufficient to pay for the current debt burden, and will only result in an increase in net interest paid abroad, with little additional macroeconomic impact.

Furthermore, austerity measures will keep aggregate demand low, with GDP declining at a faster rate than the reduction in public sector debt.

7. Alternative Prospects for Recovery

A consistent analysis of alternative prospects for recovery will be presented in a subsequent report, which will provide detailed estimates of the key elasticities of the impact of wage deflation and other austerity measures on trade and consumption. Some initial results can, however, be outlined here.

Given the current situation of net debt for the private and public sectors in the economy, no solution is feasible if the cost of borrowing, for both the private and the public sector, remains above the growth rate in income, which is now negative. Moreover, since Greece's net debt is now entirely a credit held by foreigners, servicing the debt implies a net transfer of a large share of income out of the country, with obvious consequences for aggregate demand.

Nominal GDP growth needs to be restored before the "problem" of public and private debt is addressed. This inevitably requires additional borrowing from either the private or the public sector, or a strong increase in net exports. The latter does not seem to be easily achievable, as long as most other eurozone countries are either stagnating or in outright recession. Even Germany, which has recovered from the 2007 crisis, has allowed only a moderate increase in domestic demand, and therefore is refusing to play a role as a possible engine of growth for southern European countries, including Greece.

If we rule out the possibility of a sufficient increase in net exports, which is more likely to come from growth differentials rather than differences in inflation rates; and since aggregate demand from the private sector, be it for consumption or investment, itself depends on the economic conditions of the country; the only alternative is for a suspension of the austerity program and the implementation of job-creation policies from the public sector. Alternatively, a much larger influx of foreign assistance is required and must be directed toward stable job creation, while government debt should be rolled over at very low interest rates.

References

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Appendix

1. A Note on This Preliminary Report

The development of a model for the Greek economy has met with considerable problems related to data consistency that have been solved only up to a point, although a strategy to overcome all problems now seems feasible.

In more detail, the Hellenic Statistical Authority (ELSTAT) has revised national accounts twice during the last year, each time revising the series for GDP downward for the whole time series. The agency has not yet released seasonally adjusted data, and the time series is quite short for our purposes.

The other major source of information is given by the sectoral accounts for Greece, which are published by Eurostat on the basis of ELSTAT data. A first-time series was available from 2000 to 2009, including all the information required to build a social accounting matrix, a flow-of-funds matrix, and a balance sheet matrix for the Greek economy. Again, ELSTAT has revised these time series during the year, publishing a shorter set of information from 2005 to 2010 (2009 for stocks) that needs to be reconciled with both the previous release and national accounts. A new release for sector accounts was published on July 27, 2012, but this covers only flows, and therefore cannot be used for reconstructing the flow of funds or balance sheets.

An additional problem stemming from the analysis of sectoral data is a very large discrepancy between saving determined from national accounts, and net change in financial assets estimated from financial accounts. The latter series, for instance, shows that household saving is still positive, while national accounts report a negative value. Such discrepancies are common to all countries publishing these data, but discrepancies for Greece are particularly large, perhaps due to underreporting of income.

Since we need to compare our results to official data, we chose not to adjust any estimates affecting GDP and its components, but this decision may be revisited given the large size of the Greek shadow economy.

Our strategy to overcome the problems with ELSTAT data will be based on reconstruction of longer time series at annual frequency, available from the Organisation for Economic Co-operation and Development (OECD), AMECO, and IMF databases. For some key macroeconomic variables, data is available from 1960, or from 1980 for government accounts. The adoption of these time series has been crucial to analyze stock-flow and flow-flow ratios that are at the core of our approach to medium-term projections. The analysis of financial balances in Figure 3 of this preliminary report shows some stability in the private sector balance from 1980 to 1995, a finding that is the main result of Godley's approach, and that could not emerge from later data. This result is consistent with the analysis we performed for the UK economy and the US economy in the past, and will be crucial in estimating the behavioral relationship between aggregate demand and its determinants, including the role of wealth, debt, and capital gains on consumption and investment. The availability of longer time series will also be extremely helpful in identifying trade elasticities with a floating exchange rate, to build scenarios for a possible Greek exit from the euro system.

We are currently building on these premises to obtain a backward estimation of all model variables at quarterly frequency, to produce numerical simulation of scenarios for the next final report.

2. Data Sources

A) **ELSTAT** (<http://www.statistics.gr/>). Quarterly data for GDP and its components, as well as for the labor force, are obtained from the Hellenic Statistical Authority for 2000Q1 to the present. Data have been seasonally adjusted where needed.

B) **OECD** (<http://stats.oecd.org/>). Previous data at quarterly frequency are from the OECD. We used these time series for backward estimation.

C) **AMECO** (http://ec.europa.eu/economy_finance/ameco/). Annual data for previous years are also from AMECO. We have interpolated these series and used them for backward estimation.

D) **IMF** (<http://www.imf.org/>). Annual data from the IMF World Economic Outlook Database have been used for backward estimation and for projections.

3. Deriving the Links between Aggregate Demand and Financial Balances

Start from the GDP accounting identities

$$A1) \quad GDP = C + I + G + NX$$

$$A2) \quad GDP = W + F + IT$$

where C is consumption; I is gross capital formation, including the change in inventories; G is government expenditure; and NX is net exports. Equation (A2) gives the distribution of the value of production into wages W , profits F , and indirect taxes IT .

Equating the two identities and rearranging, we get

$$A3) \quad (W - C) + (F - I) = (G - IT) + NX$$

By subtracting from both sides net payments from the private sector to the government T , which can be split between net payments from households TH and from firms TF , and subtracting as well net payments from the private sector to the rest of the world NT , we get

$$A4) \quad (W - C - TH) + (F - TF - I) = (G - IT - T) + (NX - NT)$$

Adding and subtracting on the right-hand side net payments from the government to the rest of the world NG , we get

$$A5) \quad (W - C - TH) + (F - TF - I) = (G + NG - IT - T) + (NX - NT - NG)$$

Splitting investment I into residential investment made from the household sector IR and other investment IN , we can now define

$$A6) \quad SH = W - C - TH$$

$$A7) \quad SF = F - TF$$

$$A8) \quad GD = G + NG - IT - T$$

$$A9) \quad CA = NX - NT - NG$$

where SH is household saving, SF is aftertax profits, GD is the government current account deficit, and CA is the current account balance. Using (A6-A9) into (A5), we have

$$A10) \quad (SH - IR) + (SF - IN) = GD + CA$$

Finally, adding and subtracting net capital transfers among sectors, where KTH and KTB are net transfers from the government to households and firms, respectively, and KTW is net transfers from the rest of the world to the government, we get

$$A11) \quad (SH - IR + KTH) + (SF - IN + KTB) = (GD + KTH + KTB - KTW) + (CA + KTW)$$

We finally get

$$A12) \quad NAFAH + NAFAB = GNB + BP$$

where $NAFAH$ and $NAFAB$ are the net acquisition of financial assets by households and firms, respectively; GNB is government net borrowing; and BP is the net increase in financial assets against the rest of the world. If we consolidate the private sector, (A12) reduces to

$$A13) \quad NAFA = GNB + BP$$

showing that any increase in net financial assets for the private sector as a whole must correspond to a net increase in government liabilities and/or a net increase in the liabilities of the rest of the world.