Levy Economics Institute of Bard College

Strategic Analysis

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CAN GREECE GROW FASTER?

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Summary

The Greek government has managed to exit the stability support program and achieve a higher-than-required primary surplus so as to avoid being required to impose further austerity measures that would depress domestic demand. At the same time, the economy has started to recover, mainly due to the performance of exports of goods and tourism and modest increases in investment.

In this report, we review recent developments in the determinants of aggregate demand, with a particular focus on net exports, and provide estimates of two scenarios: one that assumes business as usual; the other that simulates the medium-term impact of an acceleration in investment.

We conclude with a discussion of the sustainability of Greek government debt, showing that it is crucial that the cost of borrowing remain below the nominal growth of national income.

Introduction

The year 2017 marked a turning point in the Greek economy's changing fortunes, as it began registering steady GDP growth. As illustrated in Figure 1, that real GDP growth pattern has continued for at least six consecutive quarters (through the second quarter of 2018—the latest data available), and employment growth, begun in 2014, has been rising at a faster pace since 2015. Still, growth has been modest so far, viewed within the framework of an unprecedented fall in output the country experienced beginning with the Great Recession in 2007 and later during the austerity period from around 2010 to date.

The crisis entailed dramatic falls in both consumption and investment (Figure 2), which have been relatively flat in the last five years. Although real GDP is now about 3 percent higher than in 2013, the change in consumption is smaller (at only 1 percent higher), and investment, notwithstanding the significant increase in 2017, is still below its 2013 level. The behavior of private

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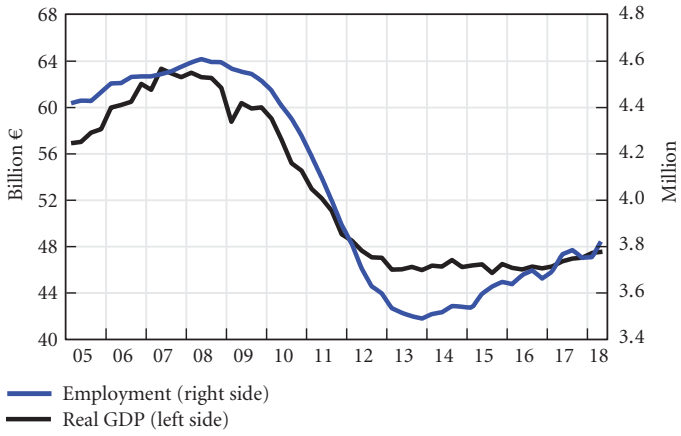
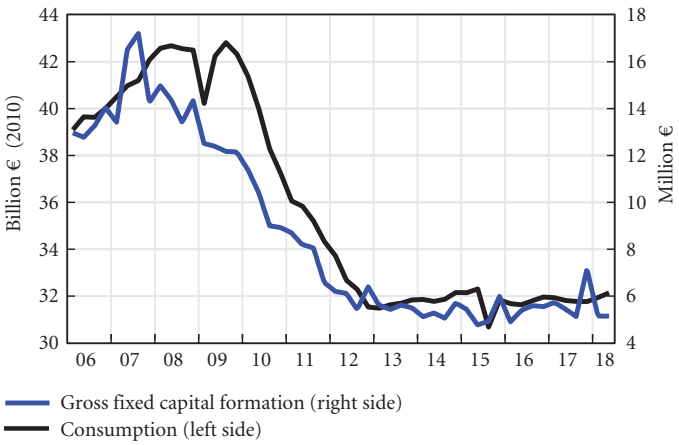
Figure 1 Greece: Real GDP and Employment



Source: ElStat

Figure 2 Greece: Consumption and Investment



Source: ElStat

sector demand has therefore been very much in line with the New Cambridge approach to macroeconomics, which assumes that both consumption and investment react to changes in the autonomous components of demand (government expenditure and exports), but are unable to lift the economy out of a crisis on their own (unless they can be financed by borrowing, which is not in the cards for Greece).

A prolonged fall in investment is not only harmful to the level of aggregate demand, but also destroys productive capacity, with consequences for the country's ability to grow in the longer run. Using figures from the nonfinancial sector accounts, we estimate that the net investment of the nonfinancial business sector[1] has been negative from the first quarter of 2009 to the present, at a cumulated amount of €39 billion, constituting a rough estimate of the amount of net investment needed to bring the stock of capital back to where it was in 2009. The spike in investment in 2017 may mark a turning point, although the aggregate figure for gross fixed capital formation includes an extraordinary increase in the purchase of private sector ships. In Figure 2, we also notice the large drop in consumption in the third quarter of 2015, which we attribute to capital controls.

Real GDP has been growing faster than domestic demand because of the robust performance of exports, as we will discuss below. The other remaining component of demand—government expenditure—has behaved procyclically during the crisis and is now about 10 percent lower than it was in 2013, thereby acting as a drag on the economic recovery.

Another interesting variable emerging from Figure 1 is the increase in employment, which reduced the unemployment rate from its highs of 27.7 percent and 26.5 percent (in 2013 and 2014, respectively) to 19 percent in the second quarter of 2018—still much higher than the trough of 7.6 percent in 2008, before the Greek crisis started.

In this report, we provide some evidence of the effects of the policies adopted in Greece in accordance with international lenders' Memoranda of Understanding (MoUs), and explore the possibilities for increasing the country's growth rate in the medium term.

The Financial Balances Approach

Our analysis of the US and the Greek economies is derived from the results of the Levy Institute's macroeconomic stock-flow consistent models that follow the New Cambridge tradition. Put forward by our late colleague Wynne Godley (among others), the model is centered on a key macroeconomic constraint dictated by the accounting identities between national income (GDP) and the components of demand:

$$GDP = Y = C + I + G + NX \qquad (1)$$

From this, it is easy[2] to obtain the relation between the financial balances of the private sector, the government, and the foreign sector:

$$NAFA = S - I = (G - T) + CA \qquad (2)$$

NAFA is the net acquisition of financial assets from the private sector equal to the excess of saving (S) over investment (I). When NAFA is positive, the private sector is accumulating claims on one or both of the other sectors. If NAFA is negative, the private sector is borrowing (or decreasing its stock of financial assets).

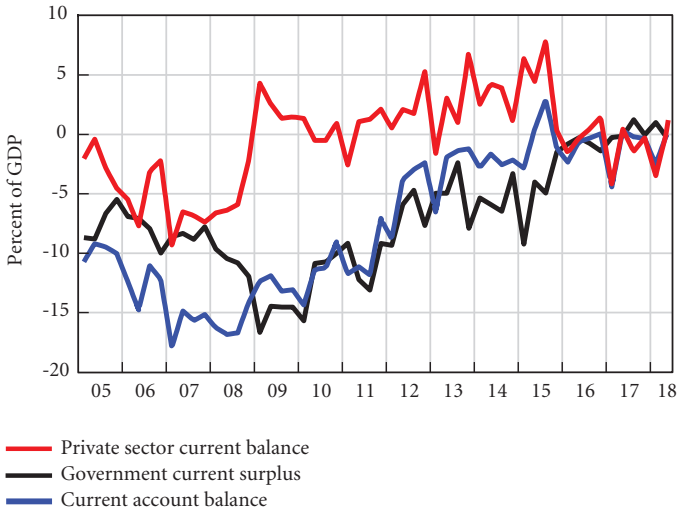
Following the financial balances approach, a country that produces a public sector surplus must also produce an external surplus. For the public sector to be in surplus, public expenditure (G) must be lower than tax revenues and net transfers (T). If the current account balance (CA) is larger than the pubic surplus, NAFA will be positive, i.e., the private sector is accumulating net financial claims (on foreigners). When the constraint on the government deficit is binding, as is the case for Greece, achieving a current account surplus is therefore a priority.

In Figure 3, we report the three financial balances for the Greek economy.[3] It is clear from the chart that before the Great Recession the country's real problem was its current account deficit, which—without taking into account net transfers from abroad on the capital account—had reached 17 percent of GDP. It is also clear from the same figure that this was not only a problem stemming from a large government deficit, but also the private sector's large net borrowing position. When the crisis erupted and the government was called to the rescue, the private sector went back to positive territory by 2009, with the government deficit mirroring the movement in the private sector balance.

In Figure 4, we break down the financial balance of the private sector into its components: the net lending of households, nonfinancial corporations, and the financial sector.[4] As the figure documents, since the beginning of the crisis in 2008, the financial sector registered the biggest gain in terms of reducing its liabilities and increasing its assets. The government's priority was the recapitalization of the banking sector, which further increased the government deficit, leaving no room for improving the balance sheets of households and nonfinancial firms hit severely by the crisis. Consequently, the latter became less and less able to service their debts, which in turn had a sizeable impact on the stock of nonperforming loans (NPLs)—making it necessary to recapitalize banks anew. But let bygones be bygones.

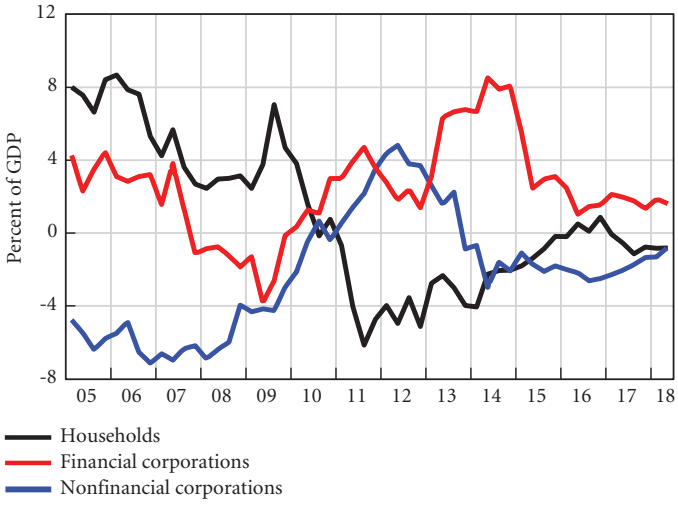
As we have argued elsewhere (Papadimitriou, Nikiforos, and Zezza 2016), the austerity policies implemented in Greece were not motivated by the need to reduce the level of *public* debt, but rather to make the *foreign* debt sustainable by increasing net exports and ensuring a positive current account balance. This can be achieved in the short term by depressing domestic demand (a combination of government cuts and tax revenue increases), which has an immediate impact on imports. Furthermore, an internal devaluation will contribute to improvements in price competitiveness and increases in net exports.

Figure 3 Greece: Sectoral Balances



Source: ElStat

Figure 4 Greece: Net Lending (two-year moving averages)



Source: ElStat, Bank of Greece

The financial balances approach also implies that if the government needs to transform its budget deficit into a surplus, the current account balance must exceed the government budget surplus, or else the private sector must experience a deteriorating net financial position. The private sector's deteriorating position is likely to result in a further drop in consumption and investment and, in turn, a decline in national income. In the following sections, we provide some evidence of the stance of fiscal policy in recent years, as well as discuss the performance of exports and analyze the other determinants of the current account balance, to help us evaluate the prospects of sustainable growth in the coming years.

Fiscal Policy

On August 21, 2018, Greece finally exited the stability support program, which was agreed to with the European Stability Mechanism (ESM), and entered into an "enhanced surveillance framework" established to monitor the actions of the Greek governments in the coming years with respect to debt sustainability and implementation of the reforms agreed upon in past MoUs.[5]

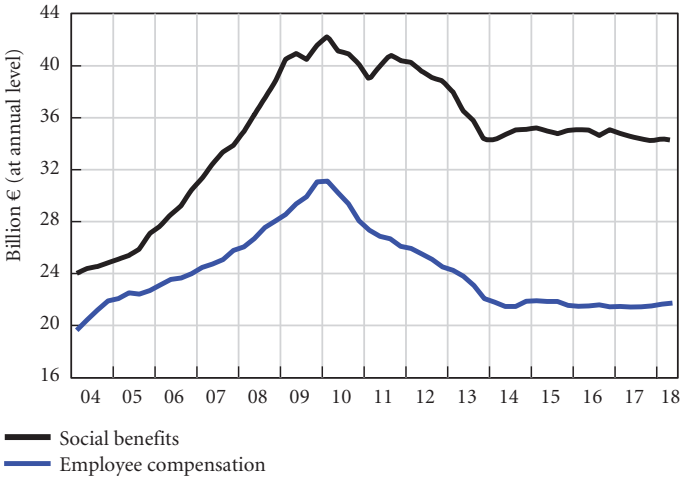
The Medium Term Fiscal Strategy 2019–2022 (MTFS) (European Commission 2018), drafted on June 20, details the path for future government actions, related to:

1. Restoring fiscal sustainability by achieving a medium-term primary surplus of 3.5 percent of GDP, to be maintained over the coming years;
2. Safeguarding financial stability by supporting NPL resolutions, restructuring debt, and liquidating "nonviable businesses";
3. Implementing "structural reforms" aimed at supporting growth, competitiveness, and investment, including privatization and "efficient monetization of valuable State assets"; and
4. Implementing reforms to improve the quality and efficiency of the public sector.

The first constraint is probably the most relevant from a macroeconomic perspective, since it limits the government's ability to stimulate the economy, even in the face of stubbornly high unemployment rates and a large output gap.

For the coming months, the MTFS, depending on the size of budget surplus achieved, may require increases in personal income taxes, offset by reductions in indirect taxes and/or social security contributions and increases in some welfare benefits to avoid depressing domestic disposable income even further.

Figure 5 Greece: Government Expenditure



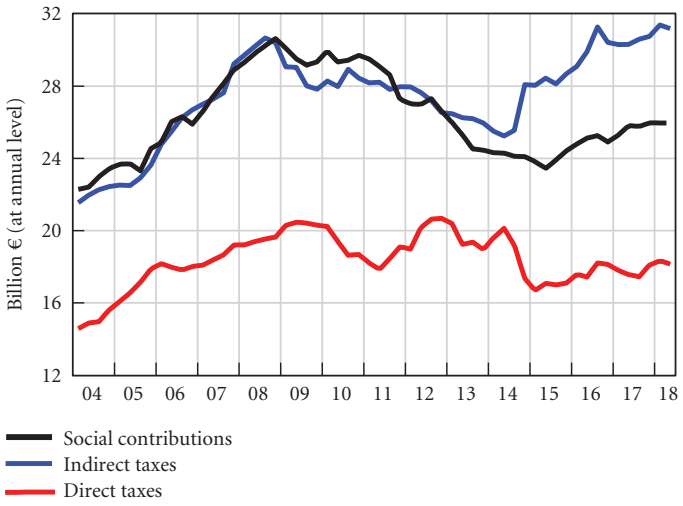
Source: ElStat

Due to austerity, fiscal policy has had a strong procyclical stance since 2010. The GDP component of government expenditure consisting of the public sector wage bill fell by €10 billion (or 30 percent) between its peak (in 2009) and 2014, and since then has remained stable in nominal terms (Figure 5). Social benefits, which include pension payments, fell by about €8 billion between their peak (in 2010) and 2014, and since then have also stabilized.

In 2010, sectors related to public services[6] were employing about 937,000 people, or 21 percent of total employment. This figure was down to 810,000 in 2014, contributing to the dramatic increase in unemployment. Employment has been rising in these sectors from 2014 to the present, reaching 882,000 jobs in the second quarter of 2018. Comparing this trend with the flat wage bill in Figure 5, however, implies that average nominal wages have fallen in these sectors.

In Figure 6, we report the dynamics of the major components of government revenue in nominal terms. During a recession, tax revenues are expected to fall with declining income, so the relative stability of revenues from direct taxes implies an increase in the average tax rate on income. In terms of GDP, direct taxes have remained at the same level (8 percent) from mid-2010 to mid-2018.

Figure 6 Greece: Components of Government Revenue



Source: ElStat

Indirect taxes have increased as a share of GDP, from 12 percent in 2010 to the current 17.5 percent. As Figure 6 shows, they fell in nominal terms (alongside income) until 2014, but have increased since then. Social contributions had been falling with employment and wages, and are now recovering slowly.

The MTFS covers required reforms yet to be undertaken that would improve the government's efficacy in collecting tax revenues in a more equitable way, and the newly established independent agency for Public Revenues Collection has shown significant promise in reducing tax avoidance and evasion. Given the still-difficult economic climate, tax payments continue to lag.

The MTFS mentions that "for the 2014–2020 period, more than EUR 35 billion is available to Greece through EU funds" and "the European Commission's Investment Plan for Europe and the EBRD [European Bank for Reconstruction and Development] will provide additional sources of investment." Additional funds to support various forms of entrepreneurship from the European Investment Bank (EIB) and the European Investment Fund (EIF) are also available to enhance private sector investments. We will use these figures for our simulations of fiscal policy in our projection period, 2018–20, and will assume no further significant increases in public sector investment expenditures over this period.

With private sector demand waiting on a real recovery to materialize so large increases in consumption and investment can occur, and fiscal policy constrained by eurozone agreements, GDP growth can only come from net exports and foreign investments, to which we next turn.

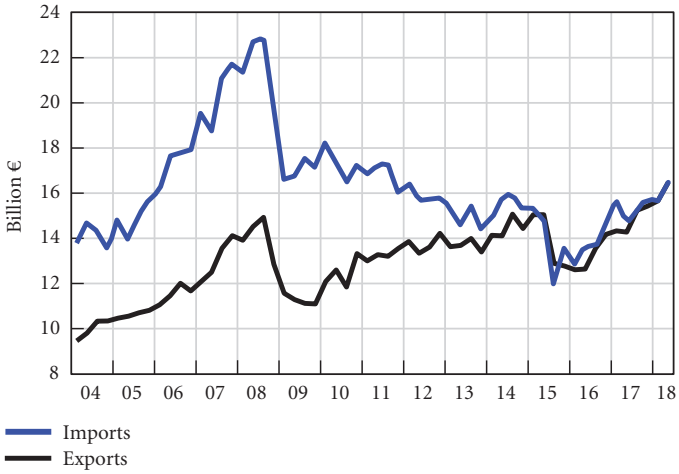
The Current Account and its Components

As discussed above, the main purpose of austerity for Greece was to restore the current account balance so as to make the country's foreign debt sustainable. In Figure 7, we report the components of the balance of trade in goods and services, measured in current prices. As expected, the 2008 global crisis had a large impact on international trade and led to a dramatic drop in Greece's exports and imports. In the following period, imports kept falling in concert with decreasing GDP, the result of harsh austerity measures. Since the third quarter of 2015, imports have been rising again, following the path of exports, as we analyze below.

After a fall during the Great Recession, exports increased steadily up until 2015—when capital controls were imposed—and then recovered once the controls were gradually lifted. Can this resilient performance of exports be the result of "structural reforms" linked to the austerity and internal devaluation policies? The answer is not so straightforward.

In Figure 8, we plot exports of goods and services at constant 2010 prices, along with our weighted index of the real GDP of Greece's main trading partners. It seems Greek exports followed the trend of the real income of their main importers during the austerity period of 2010–14, accelerating above this trend in 2014 and also in the more recent period. If, therefore, the

Figure 7 Greece: Exports and Imports



Source: ElStat

strong performance of exports is due to improved price competitiveness following "labor market reforms," this dynamic would only seem to apply to the 2014 and 2017–8 periods.

Direct measures of price competitiveness can be obtained by examining the movements of the deflator for exports relative to other price indices. The deflator for exports of goods relative to the weighted average of domestic prices of Greece's major trading partners reached its peak in 2010, falling by about 25 percent at the end of 2015 and not recording further improvement afterward. The real effective exchange rate, published by the Bank for International Settlements, records a similar fall, albeit of a smaller magnitude (12.8 percent), and remaining flat from 2015 to the present. The data seem to support the hypothesis that price competitiveness has increased for Greek exports, possibly partly explaining the 2010–14 export growth displayed in Figures 7 and 8, but not for the most recent periods after 2015, when exports increased further.

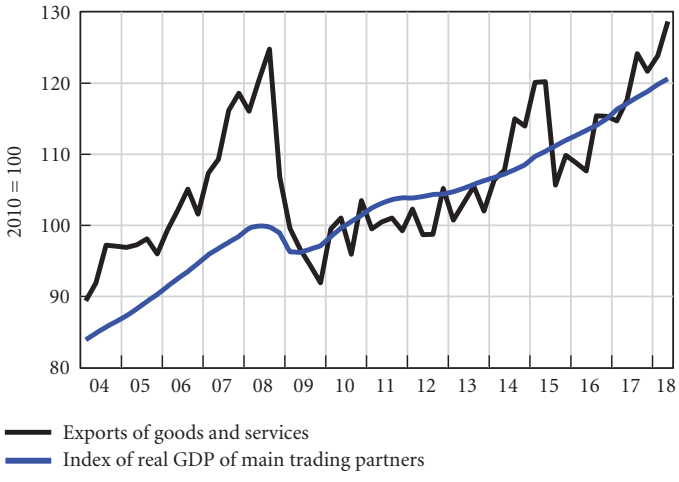
Available data on the destination of Greek export goods do not reveal a clear shift. Greece's exports were mainly to Germany (7 percent of total exports in 2017, down from 11 percent in 2010),[7] Italy (10 percent), the United Kingdom, and the United States (around 4 percent). Exports to other eurozone countries were 37 percent of total exports in 2010, declining to 23 percent in 2013, and recovering to 29 percent in 2017. During the slowdown of the eurozone markets, the share of exports to Turkey increased to a maximum of 13.7 percent of total exports, declining again (to 5.5 percent in 2017) when the eurozone markets recovered.

Since exports are a key factor in the Greek recovery, have Greek exporters fared better than their competitors? The simple answer can be provided by checking the increase in the volume of Greece's exports against those of the eurozone as a whole. According to Eurostat,[8] from 2009 (the year when international trade hit the trough) to 2017, the average growth rate of Greek exports at constant prices was the same as for the whole eurozone area. If the aim of increasing price competitiveness was to gain in trade relative to competitors, the results are not very encouraging. It is interesting to report that AMECO (the annual macro-economic database of the European Commission's Directorate General for Economic and Financial Affairs) projects exports of goods to show an increase in volume of 5.6 percent in 2018 and 5 percent in 2019.

One of the sources of the improvement in the value of Greek exports is connected to the oil trade. Greece imports crude oil and exports it refined, so part of the export revenues (and the value of imports) have been rising in concert with oil prices. In Figure 9, we show this correlation: both exports and imports of oil have risen in value alongside the international price of oil since the beginning of 2016. The oil balance is still negative, although it has shrunk to about €4 billion/year from around €6 billion before 2016.

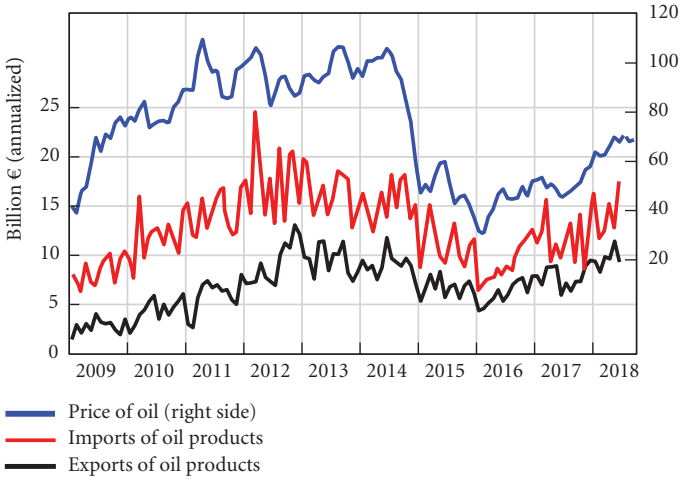
Although further analysis would be required to provide additional details, we believe that Greek industry is sharing the same path as other economies that are increasing their integration in international value chains, where a growing portion of

Figure 8 Greece: Real Exports and Foreign Demand



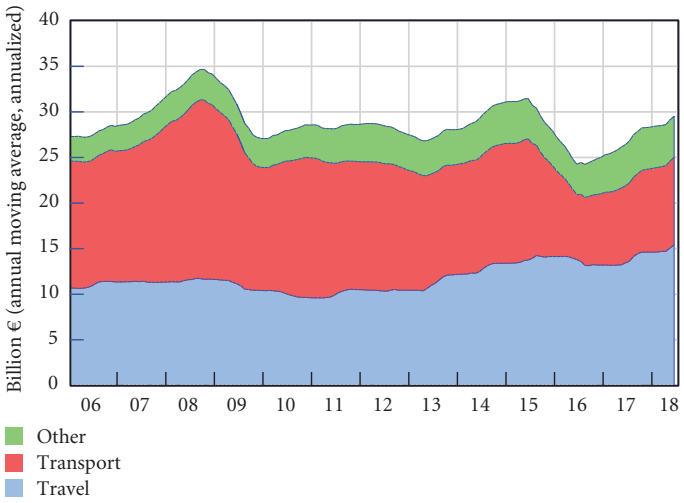
Source: ElStat, and authors' calculations

Figure 9 Greece: Trade in Oil, and the Price of Oil



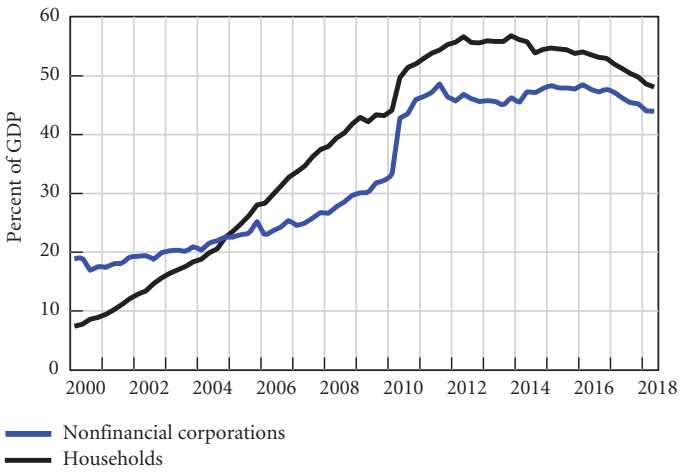
Source: Bank of Greece, US EIA

Figure 10 Greece: Exports of Services



Source: Bank of Greece

Figure 11 Greece: Debt of Households and Firms



Source: Bank of Greece, ElStat

trade is intra-industry and not necessarily driven by aggregate indicators of price competitiveness.

The balance of trade in services has traditionally been the main source of income from abroad for Greece. This is still the case for the second quarter of 2018, recording a deficit in the visible balance of €4.4 billion, and a surplus for the trade in services of the same amount. Historically, exports of services were much higher than exports of goods: before the Greek crisis, in 2008, exports of goods were €24 billion, against €32 billion for exports of services. Since 2009, however, exports of goods have been rising faster than exports of services, and the former have been higher than the latter since 2011. But, as mentioned above, the increase in the value of exports of goods is matched by a similar increase in the value of imports—a sign of the relevance of intra-industry trade—so that the overall visible trade balance remains in negative territory, at about 10 percent of GDP.

In Figure 10, we report the components of the exports of services, as published by the Bank of Greece. The figure shows that revenues from tourism-related activities (travel) have been growing steadily, while the other major source of revenues (transport) has not yet recovered from the first shock during the Great Recession, or the second shock created by the imposition of capital controls in 2015. Overall, exports of services are still €5 billion below their peak in 2008. The gap will be partly filled by the growing tourism-related activities, but attention is required for expanding the other service categories, especially transport.

Consumption and Investment

As mentioned above, consumption and investment have been adapting to the cycle rather than stimulating it. This was not the case in the precrisis period, when private demand grew faster than disposable income, saving became negative, and households and/or firms borrowed. This ultimately resulted in a growing debt-to-income ratio, as shown in Figure 11, which reports long-term loans outstanding for both households and nonfinancial corporations.

When austerity started, households experienced a reduction in employment and average wages, while firms faced a dramatic drop in demand; these factors led to the increase in NPLs and the drying up of credit. As of June 2018, 44 percent of residential loans and 48 percent of business loans are nonperforming (showing small decreases since 2014).[9] More needs to be done to restore the health of the private sector's balance sheets, since it will be inconceivable to expect an increase in domestic demand based on credit expansion when the banking sector is reluctant to support it.

All eyes must turn toward investment, especially foreign direct investment (FDI), which apparently helped Cyprus get out of its own crisis (Darvas 2018). In Figure 12, we report the stock of FDI in Greece, along with the value of Greek equities held by foreign agents.[10] In 2017, FDI was €3.7 billion, denoting a dramatic increase compared to 2016, but smaller than the increase seen in 2015. However, other than FDI, (domestic) investment was essentially nonexistent in 2015, while it increased in 2017.

The trends in Figure 12 show the high correlation between incoming FDI and equities of nonfinancial corporations held abroad: both have been increasing since 2015, accelerating in 2017 and the first two quarters of 2018. But does FDI translate into an increase in Greek real assets—residential and nonresidential—or is it just taking control of domestic corporations? To facilitate increased production geared toward exports, a fraction of FDI in 2017 focused on strategic investments in existing but indebted corporations that were unable to expand needed capacity.

Finally, we note that domestic demand has recently been growing faster than what the dynamics of disposable income and wealth would predict. As a result, the private sector as a whole has gone back to a low net borrowing position: if we combine the net lending data in Figure 4, we can show that the private sector as a whole has turned from a net lender to a net borrower in 2017. This may be due to financing consumption and investment expenditures out of reduced financial assets (since an increase in liabilities is less likely): a trend which we assume will sustain the Greek economy in the near future, but cannot be expected to last for a prolonged period.

Our Projections

As usual in our Strategic Analyses, we construct a baseline scenario adopting hypotheses that are as neutral as possible for all variables that drive our model. Foreign demand and inflation are taken from the International Monetary Fund's (IMF) *World Economic Outlook* projections, while monetary policy is assumed to maintain interest rates at their current level. Fiscal policy is assumed to keep nominal expenditure growing with the expected real GDP growth rate, with no changes in tax rates.

Our first assumptions on government outlays are justified by recent trends: government expenditure, measured at current prices in national accounts, peaked in 2009 at almost €70 billion and was down to €40 billion in 2016, remaining roughly stable up to the second quarter of 2018. Social benefits peaked at €45 billion in 2010, were down to €33 billion in 2013, and fluctuated between €33 billion and €36 billion from 2013 to 2018. Given that the economy is now growing and has reached its target in terms of the primary balance, assuming real public expenditure grows with GDP should imply a neutral stance for fiscal policy.

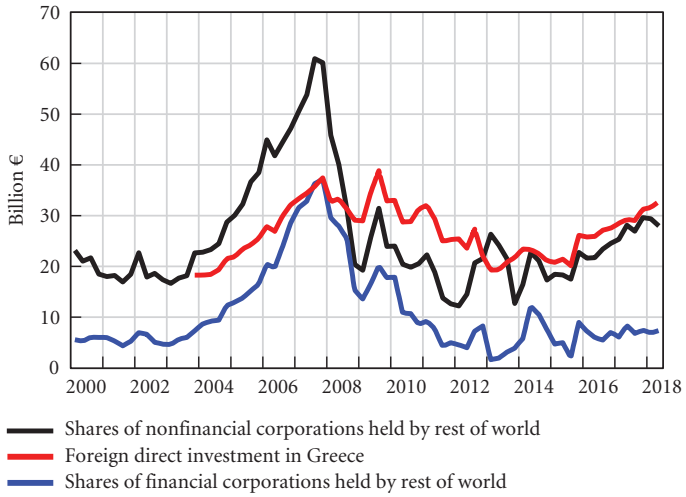
According to the MTFS, the government is supposed to enact further pension reform at the beginning of 2019. At the time of this writing (October 2018), it is still unclear whether such reform will be implemented or modified, given that the government has more than achieved its target for the primary surplus. In any case, should this policy be implemented, we assume that it will be offset by an increase in other types of transfers to the private sector, so that it will be neutral at the aggregate level. Changes to be implemented in direct taxation, following the MTFS prescriptions, are meant to be compensated for by a reduction in property taxes, so again we assume that—should these measures be implemented—they will not have a material impact at the aggregate level.

We assume, following recent data,[11] that the number of tourists in the third and fourth quarter of 2018 grows at an annual rate of 10 percent, to increase by a more moderate 5 percent from the beginning of 2019 onwards. We further assume that average expenditure per tourist, which declined by 30 percent between 2009 and 2016 but increased and stabilized from the beginning of 2017, remains stable at the current level in the forthcoming quarters.

Finally, we assume that transfers from abroad, mainly due to European structural funds, amount to €2.5 billion spent in 2018, and €8 billion spent each year in the rest of the simulation period.

As discussed above, we include in our simulations that domestic demand will be fueled—on a small scale—by a reduction in the private sector's holding of financial assets until the end of 2019.

Figure 12 Greece: Foreign Investment



Source: Bank of Greece

The slowdown in the growth rate of the economy partly depends on our assumption that the additional private expenditure financed by a reduction in financial assets will slowly end as the economy recovers.

As the primary surplus increases, the government may be able to restore public investment to higher levels starting in 2019. A higher growth rate in 2018 and 2019 will have beneficial consequences on tax revenues, and therefore on the size of the government's primary surplus. Although it might be realistic to expect the government will undertake further expenditures as the budget surplus grows, we do not make such an assumption in our baseline.

In the baseline scenario, we do not take into consideration additional increases of investment (other than normal) due to starting new businesses or expanding existing ones. A number of these business starts and expansions took place in late 2017, but more are needed, as a strong recovery cannot be achieved unless productive capacity is expanded. It is also worth mentioning that residential investment was a crucial driving force of growth for the Greek economy before the crisis, having reached 46.5 percent of total investment in 2007. The crisis drove gross residential investment to very low figures and investment would be needed both for expanding productive capacity and to increase the volume and quality of housing.

To evaluate the impact of an increase in investment that could be driven by private foreign capital, we simulate the effects of a boost of €500 million in the first quarter of 2019, increasing in the following quarters so that total investment is roughly €3 billion higher in 2019 with respect to the baseline, and €6 billion higher in 2020. The impact on the economy is reported as the "alternate scenario" at the bottom of Table 1.

As expected, the combined effect of reduced government expenditures and revenue increases generates a larger-than-required primary surplus. Based on the government's previous actions, this "surplus dividend" has been appropriated to various social benefit programs, i.e., an extra month of pension benefits and rent and heating expenditure subsidies. In 2019 and 2020, the primary surplus could be used to reduce indirect taxation and public pension employee/employer contributions as an impetus to increasing domestic demand, income, and employment (this reduction is not, however, included in our scenarios). On the other hand, faster growth in domestic demand, given the country's marginal propensity to import, will affect the current account negatively.

Table 1 Greece: Key Indicators under Alternative Scenarios

	2017	2018	2019	2020
Baseline scenario:				
Real GDP (growth rate)	1.5	1.8	1.9	0.8
Gov. total surplus (% of GDP)	0.8	0.7	2.6	1.9
Gov. primary surplus (% of GDP)	4.0	4.1	5.8	4.9
Current account (% of GDP)	-1.2	-0.9	0.6	1.9
Alternate scenario:				
Real GDP (growth rate)	1.5	1.8	3.5	3.5
Gov. total surplus (% of GDP)	0.8	0.7	3.0	3.1
Gov. primary surplus (% of GDP)	4.0	4.1	6.1	5.9
Current account (% of GDP)	-1.2	-0.9	-0.8	-1.4

A Note on Debt Sustainability

A lot of ink has been spilled on the question of whether Greek public sector debt is sustainable with these growth rates. An interesting projection exercise on debt sustainability has recently been published by Eichengreen et al. (2018), where they conclude that the debt will be unsustainable under reasonable assumptions for growth, primary surpluses, and interest rates, and call for some measures of debt restructuring. We have advocated an intervention to restructure or forgive Greek debt on a number of occasions (see, for instance, Papadimitriou, Nikiforos, and Zezza 2015).

A standard textbook rule to evaluate debt sustainability is given by the following equation:[12]

$$(r-g)\cdot d < s \qquad (3)$$

In this equation, r is the average (nominal) interest rate on debt outstanding, g is the growth rate in nominal GDP, d is the stock of debt relative to GDP, and s is the primary surplus as a percent of GDP. The formula is obtained from simple debt accounting and should be based on net financial liabilities (i.e., financial liabilities less financial assets), even though it is also used with reference to gross government debt.

If we compute d from net government liabilities, as published in the financial accounts of the Bank of Greece, we see

that gross government debt was about €385 billion at the end of March 2018, while net liabilities were €266 billion. Measuring annual GDP from the latest quarterly data, nominal GDP was at €178 billion in the first quarter of 2018. We therefore estimate the debt-to-GDP ratio (d) at 149 percent.

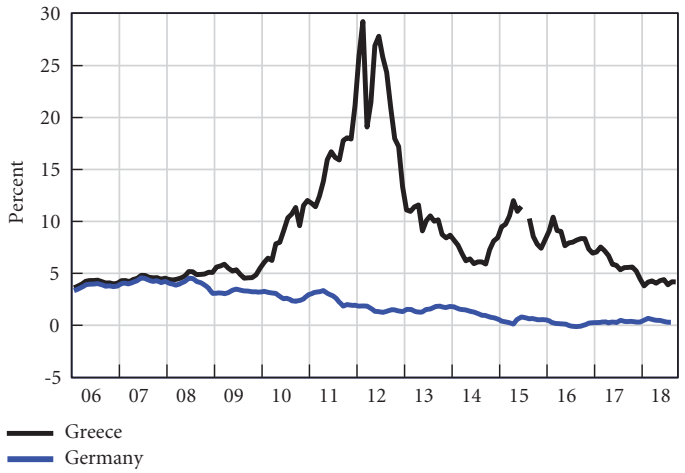
It is not easy to estimate the average interest rate paid on government debt. This must be a weighted average of what the Greek government pays on its loans from eurozone institutions and the IMF—currently very low—and what it pays when borrowing from financial markets. The latter figure can be approximated by the interest rate on Treasuries with a maturity of 10 years (one of the European Monetary Union convergence criteria), which we report in Figure 13, along with the interest rate on German Treasuries. In September 2018 this rate was 4.17 percent. Our own estimate of the average interest rate paid by the government is lower, at 2.3 percent.

With an inflation rate of 1 percent, any growth rate in real GDP above 1.3 percent implies that the left side of equation (3) is negative and the debt-to-GDP ratio, regardless of its current size, will fall (albeit slowly), provided that the primary surplus is roughly zero.

If the average interest rate on debt approximates the current cost of refinancing on the market, at 4.17 percent, equation (3) implies that a primary surplus of 2 percent or higher is needed in order to reduce the debt-to-GDP ratio.

Our baseline figures are therefore reassuring for the sustainability of public finances, provided that interest rates remain under control. Figure 13 also implicitly shows that an increase in the cost of borrowing would have destabilized Greek finances: a discussion on this point would imply addressing the literature on the role of central banks as lenders of last resort to sovereigns, which we avoid for space considerations.

Figure 13 **Greece and Germany: Long-Term Interest Rates**



Source: Eurostat

Conclusion

Greece has successfully exited the international lenders' stability support program and is well on the road to recovery, having achieved steady GDP growth beginning in 2017, together with a larger-than-necessary primary budget surplus.

Data on the growth of exports of goods and tourism-related services have been positive and the signs of this continuing during the years of our simulation period are very encouraging. In addition, 2017 marked a noticeable growth in both domestic and foreign direct investment, but a much larger increase is absolutely necessary if Greece is to regain a significant fraction of the GDP lost during the Greek crisis that began in 2009. The crucially important role of investment is shown in our simulations of the alternate scenario, under which robust growth rates in GDP and the consequent increases in employment would accelerate Greece's return to precrisis economic conditions.

Our report shows that if business continues as usual—documented in the projections of the baseline scenario—growth rates will be modest, recovery will be slow, and it will take a much longer time horizon to achieve the employment and income levels of the precrisis period.

Our report ends with an attempt to answer the much-debated issue of the country's public sector debt sustainability. Debt sustainability analyses prepared by the IMF, European Central Bank, and ESM vary widely. Our own analysis shows that debt may be sustainable, depending on interest rates and length of maturity.

Notes

1. Computed as the difference between gross fixed capital formation (line P.51) and consumption of fixed capital (line K.1) in the nonfinancial accounts by institutional sector, nonfinancial corporations, published by ElStat.
2. To obtain (2) from (1), subtract taxes (T) and all other net payments to the government from both sides, and add net transfers to the foreign sector (TR) to both sides: $YD = Y + TR - T = C + I + (G - T) + (NX + TR)$, where

YD is disposable income. Subtracting consumption (C) from both sides and using the definition of private saving ($S = YD - C$) and of the current account balance ($CA = NX + TR$) yields equation (2).

3. Data from the nonfinancial accounts of the institutional sectors. We have taken out net transfers on the capital account.
4. The data in Figure 4 are based on the financial accounts published by the Bank of Greece, which are not entirely compatible with the data in Figure 3, published by ElStat. In addition, we use a two-year moving average in Figure 4 to smooth the volatility in the financial series.
5. See https://ec.europa.eu/info/business-economy-euro/economic-and-fiscal-policy-coordination/eu-financial-assistance/which-eu-countries-have-received-assistance/financial-assistance-greece_en for a full documentation of the different phases of the agreements between eurozone institutions and the Greek government.
6. Including the following Nomenclature Statistique des Activités Économiques dans la Communauté Européenne (NACE) branches of economic activity: N: administrative and support service activities; O: public administration and defense, and compulsory social security; and P: education (see Elstat, Labour Force Survey, Table 3).
7. Computed on the basis of Organisation for Economic Co-operation and Development (OECD) Quarterly International Trade Statistics. See Stats.oecd.org (accessed October 2018).
8. AMECO database
9. Bank of Greece data, Figure 11, does not include short-term loans, and the Bank of Greece reports an NPL ratio of 57 percent on such loans, which were, however, smaller, at €18 billion in June 2018.
10. Figures for FDI are from the international investment position, while the others are the stocks of listed and unlisted shares from the financial accounts of institutional sectors, all published by the Bank of Greece.
11. The number of inbound travelers in Greece reported by the Bank of Greece increased by 25 percent in the second quarter of 2018, against the same quarter of 2017. In the first quarter of 2018, travelers increased by 10 percent on an annual basis.
12. Let $D_t = D_{t-1} + r \cdot D_{t-1} - S_t$ be the accounting identity for the accumulation of debt (D), given a primary surplus (S) and an average interest rate (r) on the stock of debt. Dividing both sides by $GDP_t = GDP_{t-1} \cdot (1 + g)$, where g is the nominal growth rate in GDP, we get $d_t = \frac{1+r}{1+g} \cdot d_{t-1} - s_t$, where lower-case letters denote ratios to GDP. Subtracting d_{t-1} from both sides gives $d_t - d_{t-1} = \frac{r-g}{1+g} \cdot d_{t-1} - s_t$. Equation (3) approximates this result, showing the condition for an increase/decrease in the debt-to-GDP ratio.

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