Working Paper Series

Should Greece Remain in the Eurozone?

WP 15-04R

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July 30, 2015

Working Paper No. 15-04R

Should Greece remain in the Eurozone at the cost of continued deflation and recession? Alternatively, is it realistic to believe that Greece can return to prosperity by leaving the Eurozone and readopting its own national currency, the drachma? An answer to these questions requires an understanding of why Greece has suffered prolonged recession.

The author is indebted to Heather Gibson, Andreas Hornstein, Marios Karabarbounis, Thomas Lubik, Marisa Reed, and Alexander Wolman for critical comments. Miki Doan and Steve Sabol provided invaluable research assistance. The views expressed here are those of the author not the Federal Reserve Bank of Richmond or the Federal Reserve System.

JEL classification code: E50

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Understanding the way forward for Greece requires understanding the cause of its prolonged depression. The argument popular in Greece's creditor countries is that the depression results from prior fiscal profligacy leading to the collapse of an unsustainable debt burden. The argument popular in Greece is that depression results from fiscal austerity forced on it by its external creditors.[1] These arguments are unsatisfactory and offer little useful guidance for the way forward. An excessive level of debt and the need for fiscal austerity are symptoms or fallout from the underlying root problem. In order to eliminate an unsustainable current account deficit, Greece must undergo depreciation in its internal terms of trade relative to its Eurozone partners. Because Greece is in a currency union with near price stability, I argue that depreciation must occur through Greece having a lower inflation rate than the rest of Europe, which likely means Greece having deflation. The economic disruption from the required deflation has forced austerity on Greece as a consequence of the accompanying deterioration in its fiscal condition. Austerity assures investors of the long-term solvency of the government, which is necessary in order to avoid capital flight and the resulting collapse of the banking system.

Is there any way to avoid the root problem of required deflation?[2] If Greece had never joined the Eurozone but had retained the drachma as its currency, the required depreciation in its terms of trade would have occurred through the depreciation in its currency. Exports would become cheaper to foreigners and imports dearer to Greece as the drachma price of foreign currencies increased. Lacking that mechanism, the only alternative is for the Greek price level to fall relative to the price level of its Eurozone partners. Deflation uncoordinated by a common set of expectations, however, disrupts the price system and the real economy. Moreover, it causes bankruptcies by raising the ratio of euro-denominated debts relative to the income of debtors.

Unfortunately, a return to the drachma is no longer feasible. Greece is "euroized" now in the way that Panama is "dollarized." The euro offers a secure store of value. Even if Greece adopted the drachma and made it the only legal tender, a newly-resurrected drachma would depreciate in value

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[1] A comment in a *Wall Street Journal* (3/23/15, A8) article summarized these alternative views. "The populist rhetoric of many Greek politicians blames the country's economic depression on the terms of the bailout since 2010, rather than on Greece's lack of fiscal discipline in the years up to 2009."

Measuring the impact of fiscal policy and budget deficits is perennially contentious because of the issue of endogeneity. The fact that deficits increase in recession obscures their possible stimulative impact. As a condition for joining the Eurozone, however, Greece reduced its deficit from 13.2 percent of GDP in 1994 to 3 percent in 1999 without any noticeable impact on real output growth (Herz and Kotios 2000 and St. Louis Fred data base).

[2] In the spirit of this paper, Charles Calomiris has proposed a government-mandated reduction in Greek prices:

> My proposal begins with government action to write down the value of all euro-denominated contracts enforced within Greece. This "redenomination" would make all existing contracts—wages, pensions, deposits, and loans—legally worth only, say, 70% of their current nominal value.

The assumption here is that the proposal is impractical because it assumes a pervasive degree of governmental control and enforcement that does not exist in Greece. It would also apply unevenly. Government and unionized workers with contracts would incur a wage decline but not workers with informal contracts.

overnight. Greeks would think, "Why would the government issue it if not to print large quantities in order to finance deficits?" Drachma hyperinflation would result and leave the euro as the only acceptable currency.

Until 2012, Greece accumulated external debt by running a current account deficit. Starting in 2010, it also accumulated external debt from official assistance programs. Now, it must run current account surpluses in order to pay off that debt. For that to happen, it must deflate. Greece has two choices, both painful. One choice is that the Greek government commits to implementation of the reforms required by a third bailout program. Over time, confidence in a stable political environment revives foreign investment in Greece. Foreign capital inflows offset the capital outflows required in order to pay off debt. Greece can thus limit the required internal deflation and economic disruption.

The choice with catastrophic consequences is lack of persistent commitment to market reforms accompanied by political instability. In 2015, Greece's creditors credibly threatened Grexit and collapse of the Greek banking system as an outcome. If Grexit reemerges as a possibility and again sets off deposit flight from Greek banks and capital flight from Greece, a collapse in the Greek financial system and economy will return Greece to the kind of economic prostration experienced after World War II.

Section 1 reviews the economics of balance-of-payments equilibrium within a currency union like the Eurozone. As institutional background, it explains the role of the system for clearing payments among countries in the Eurozone known as Target2. It also elaborates on the two alternatives for making fiscal transfers within the Eurozone, that is, either through explicit aid from governments or from the allocation of the seigniorage revenues of the European Central Bank (ECB). Section 2 summarizes the capital flight crisis in the Eurozone in 2011 and 2012. Sections 3, 4, and 5 provide a history of the Greek current account deficits and explore the economics of how Greece can repay its debts. Section 6 reviews the German experience since the start of the euro and asks whether Germany should serve as a model for Greece. The remaining sections explain the difficulties that Greece will have to confront in achieving sustainable balance of payments equilibria, discuss Greece's future options, and offer a concluding note.

1. Balance of payments adjustment within regions of a currency union

For ease of exposition of balance of payments adjustment within a currency union, consider Greece as standing in for an individual country and Germany as standing in for the rest of the Eurozone. Greece's trade account is the difference between the euros earned from the export of its goods and services and the euros paid for the import of goods and services. The current account adds income earned on Greek investments abroad minus income paid to foreigners on their investments in Greece. There is also an adjustment made for net unilateral transfers like foreign aid.

The financial account is the mirror image of the current account. If Greece runs a current account deficit, then Germans are accumulating debt (IOUs) from Greeks. Equivalently, a current account deficit must be matched by a capital inflow in which Greeks sell assets to Germans. If Greece imports more goods from Germany than it exports to Germany, it must pay the difference, that is, have a capital inflow (export IOUs). That capital inflow could be in the form of additional

foreign ownership of Greek bonds, equity, or land. To summarize, a current account deficit implies an offsetting capital inflow and a current account surplus implies an offsetting capital outflow.[3]

Assume that Greece and Germany had their own currencies and that the Greek drachma and the German mark floated freely against each other. Assume also a sudden-stop in inflows of private capital that had been financing a Greek current account deficit. In this event, the drachma would depreciate relative to the mark in order to maintain balance of payments equilibrium. Greece's term of trade would depreciate in that its goods would become less expensive relative to German goods. However, with a currency union, settlement is in the single currency, the euro. The accounting identity between the current and the capital account of course still holds. If, say, a Greek current account deficit exceeds the private capital inflow from Germany, then the difference is made up for by a transfer of bank reserves from Greece to Germany. Bank reserves decline in Greece and increase in Germany.

In a world without monetary frictions, the associated decline in the money stock in Greece would cause a decline in the Greek price level (deflation) while the increase in the money stock in Germany would cause an increase in the German price level (inflation). The depreciation in the Greek terms of trade arises from this change in relative price levels. In reality, the required deflation in Greece takes time. As a result, when capital inflows precipitately become capital outflows and money contracts ("sudden stops"), the required sudden balance between imports and exports occurs through recession that restricts the demand for imports.

In order to understand better the working of sudden-stops in capital inflows in the context of the Eurozone, it is helpful to understand some institutional detail. First, it is useful to note the way in which the members of the Eurozone clear payments among themselves using the Target2 system.[4] It is a payments clearing system that records net flows of bank reserves among Eurozone member countries. Second, the ECB allows banks to borrow for extended periods. As a result, when the banks in Greece lose reserves, they can replace them by borrowing from the ECB through their national central bank, the Bank of Greece. That is, the national central bank creates new reserves to replace the reserves lost to German banks.

In the context of a Greek balance of payments deficit relative to Germany not financed by capital inflows (official or private), this borrowing from the ECB creates the reserves to pay for the excess of imports. On the ECB's balance sheet, this reserve creation appears as loans to Greek banks. For the Greek central bank, it appears as a liability to the Target2 system. At the same time, however, Greek banks feel regulatory and market pressure to contract their balance sheets in order to repay the ECB loans. As a consequence, they contract loans and deposits. Greek nationals lose deposits while German nationals gain deposits. Over time, this redistribution of deposits causes the changes in relative national price levels that eliminate the Greek current account deficit and turn it into a surplus. Greek banks can then repay the loans from the ECB registered in the Target2 system.

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[3] The financial account records transactions for direct investment, portfolio investment, and other investment, which includes bank deposits and reserves. The discussion ignores the capital account, which is typically small. It records capital transfers such as debt forgiveness.

[4] TARGET2 is the abbreviation for the Trans-European Automated Real-time Gross settlement Express Transfer system 2. It is the large-value cross-border payments and settlement system for the Eurosystem.

The Eurozone has two broad mechanisms for making the fiscal transfers required in order to lessen the harsh adjustments imposed by the sudden reversal of capital inflows to capital outflows. The first is direct aid. Direct aid has included the Eurozone's European Financial Stability Facility (EFSF), which was replaced by the European Stability Mechanism (ESM). The second mechanism is the one described above, which makes use of the seigniorage power of the ECB. Although the borrowing by Greek banks from the ECB buffers the transition from a current account deficit to current account balance (or surplus) required by sudden stops in capital inflows, it is controversial because it constitutes unlegislated fiscal policy.

Central banks earn revenue from money creation (seigniorage) because their assets earn interest in excess of their liabilities such as currency. The ECB distributes the excess of its revenues over its own expenses to its member countries based on their capital contributions. The ECB can effectively allocate some of its seigniorage revenue to the banks of particular countries by lending reserves to them at rates below which they could borrow in the market. Loans to banks occur through various programs.

Under the MRO (main refinancing operations) program, banks borrow reserves by entering into repurchase agreements with the ECB based on high quality collateral. The LTRO (long-term refinancing operations) program, which was followed by a smaller Targeted-Long-Term-Refinancing-Operations program, offered multi-year loans. The ELA (emergency liquidity assistance) program offers loans at a higher rate than the MRO but with inferior quality collateral. In addition, in spring 2010 and summer 2011, the ECB bought the debt of countries directly through the SMP (securities markets program). The possibility also exists of purchases of sovereign debt as part of the OMT (outright monetary transactions) program, which replaced the SMP program.

2. The capital flight crisis

From its start in 1998 through 2008, cross-border financial holdings in the Eurozone increased from about 200 percent of GDP to 600 percent (Pisani-Ferry et al 2013, Figure 20). The purchase of debt rather than equity investment dominated the capital flows. However, the Eurozone experienced two recessions with business cycle peaks occurring in 2008Q1 and 2011Q1.[5] When recovery from the first recession collapsed, financial markets became concerned about the survival of the Eurozone. From mid-summer 2011 to mid-summer 2012, investors fled the sovereign debt markets of the peripheral countries.[6] Fears for the survival of the euro concentrated on Italy and Spain because they were too big to fail and too big to bail out. Italy's debt/GDP ratio was 120% and Spain needed a recapitalization of its banking system. The willingness of the core countries, especially Germany, to backstop the issuance of Eurobonds to bail out a country as large as Italy or Spain was uncertain.

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[5] Hetzel (2013) argued that contractionary monetary policy caused the recessions. Both in 2008 and again in 2010, a commodity-price inflation shock pushed headline inflation far above core inflation, which remained near two percent. In each case, the ECB raised interest rates and maintained them at a level that caused aggregate nominal demand to fall. Real demand and output had to fall in order to keep headline inflation at or below two percent. Hetzel (2012) extended the argument to the United States.

[6] The peripheral countries are Portugal, Italy, Ireland, Greece, and Spain. The principal core countries are Germany, France, the Netherlands, and Austria.

The fear of a self-reinforcing feedback loop between a sovereign debt crisis and a banking crisis emerged. The possibility of sovereign default meant that the country's banks, which held large amounts of their government's debt, could become insolvent. That possibility created an incentive for the foreign depositors of the banks in the peripheral countries to withdraw their funds and redeposit them in core-country banks and for core-country banks to sell the debt of the peripheral countries. In this way, the depositors and banks making the funds transfers protected themselves against "redenomination risk," that is, the risk that a peripheral country would leave the Eurozone and redenominate its bank deposits in a new, depreciated national currency. However, that capital flight exacerbated the government's fiscal difficulties by weakening the banks and the economies of the peripheral countries and thus increased sovereign default risk, and so on. "Between mid-2010 and end-2011, foreign investors cumulatively reduced their exposure to high-spread euro area sovereign debt by about US$ 400 billion" (Arslanap and Tsuda 2012, 26).

Capital flight from the peripheral countries intensified in line with talk of debt restructuring (write-downs or haircuts). In October 2010, in Deauville, France, German chancellor Angela Merkel and French president Nicholas Sarkozy agreed that in the future government debt securities would include collective action clauses, which would facilitate restructuring. The principle of debt write-downs became known as private sector involvement (PSI). "[I]n July 2011, debt restructuring was officially endorsed [by the European Union Council] as an option for Greece. … But agreement on a deep PSI had to wait until October 2011, and negotiations were only completed in February 2012" prior to the Second Economic Adjustment Program announced in March 2012 (Pisani-Ferry et al 2013, 42 and 68).[7] By early 2012, holders of Greek debt, chiefly French and German banks, had either sold or allowed the debt to run off. As a consequence, 80 percent of Greek debt passed into the hands of foreign official institutions (the EFSF, the ECB, and the IMF) with much of the remainder held by Greek banks (Slok 2015).

The decision not to require Eurozone banks to write off their Greek debt but rather to convert it into debt held by official creditors was controversial in that it kept the Greek debt-to-GDP ratio at an extremely high level. At the time, the Euro area ruled out debt restructuring. The required approval of Eurozone parliaments would have been unlikely (IMF 2013b, 27). From 2001 to 2009, Greek government debt held externally by the private sector went from about €80 billion to about €225 billion. By 2012, it had declined to less than €50 billion. On the flip side, between 2009 and 2012, Greek government debt held by official creditors went from zero to about €225 billion (IMF 2013b, 18).

Cecchetti, McCauley, and McGuire (2012) noted that the part of a current account deficit not financed by private capital inflows or official aid would register in the form of a Target2 imbalance. (Target2 imbalances in turn measure the key variable—bank borrowing from the ECB.) They provided the following taxonomy of the capital-flight crisis of the peripheral countries. From 2002 to mid-2007, private capital inflows completely financed current account deficits. From mid-2007 through 2009, private capital flows financed three-fifths of their current account deficits. From 2010 through 2011, as reflected in Target2 imbalances, borrowing from the ECB by banks in the peripheral countries financed all of current account deficits. However, in 2012Q1 and 2012Q2, the growth of Target2 imbalances far outpaced the current account deficits. As Cecchetti et al noted,

[7] Gulati et al (2012, Abstract) put the aggregate haircut on privately-outstanding Greek debt at 55-65 percent depending upon the valuation of the old bonds and estimated the debt relief received by Greece to be on the order of 48 percent of GDP.

their growth corresponded to capital flight, that is, the transfer of deposits from the banks of peripheral countries to those of core countries, especially, to German banks.[8]

Using current account and Target2 data, Vihriälä (2013) concluded:

> Between April 2010 and August 2012, net private capital outflows totaled 167bn [euros] in Greece, 118bn in Ireland and 99bn in Portugal. In terms of pre-crisis GDP, these figures amount to about 75%, 62% and 59% respectively. Starting in summer 2011, private investors started to leave also Italy and Spain, which between May 2011 and August 2012 recorded outflows of 303bn (19% of pre-crisis GDP) and 364bn (35% of pre-crisis GDP)…. Before the announcement [ECB President Mario Draghi's pledge to do "whatever it takes" to preserve the monetary union] a larger and larger share of Greek, Irish, Italian and Spanish bonds had been off-loaded by foreign investors and acquired by domestic banks….

The ECB contributed significantly to the fiscal transfers required to offset capital flight from the peripheral countries of the Eurozone. That fact appears in the increase in the size of the ECB's balance sheet. Measured relative to Eurozone GDP, in fall 2008, it went from about 15 percent to 20 percent. In spring 2011, it began to increase again, reaching somewhat more than 30 percent by early 2013. The expansion in the ECB's balance sheet appeared in the diminution of the importance attached to its traditional means of supplying reserves to banks through the short-term auction of funds, the main refinancing operations (MROs). In their place, the ECB began supplying reserves through long-term refinancing operations (LTROs), which redirected lending toward banks in the periphery.

3. Greek balance of payments adjustment

The underlying premise here is that the capital inflows and current account deficit that accompanied Greek membership in the Eurozone in 2001 caused its real terms of trade to appreciate through an inflation rate in excess of the Eurozone average. The capital flight that began at the end of 2009 reversed this process and has forced deflation and prolonged depression on the Greek economy.

Greek membership in the Eurozone made it an attractive place to invest. The other side of the resulting capital inflows was a current account deficit. For Greece, Figure 1 shows exports, imports, and the current account balance. In fall 2008, private capital inflows ceased because of the recession and financial crisis. Banks in the rest of the Eurozone ceased accumulating loans to Greek banks and Greek government debt. As shown in Figure 2, the yield on Greek 10-year bonds did not increase significantly until November 2009. The earlier cessation in additions to Greek debt thus likely reflected the general increase in bank home bias produced by the financial crisis rather than capital flight (Arslanap and Tsuda 2012, 32).

[8] In the case of Greece, over the period from mid-2011 to mid-2012, the increase in borrowing from the Bank of Greece exceeded the increase in Target2 liabilities by about €30 billion. The difference reflected the extent of an internal currency drain, that is, withdrawals of cash held under mattresses. However, if a Greek bank borrows from the Bank of Greece in order to replace reserves lost due to a wire transfer by a depositor at a Greek bank to the account of a bank in Frankfurt, then Target2 liabilities increase.

In the October 2009 elections, PASOK replaced New Democracy as the governing party in Greece. A restatement of government finances revealed a large government deficit, currently estimated at 9.5 percent of GDP for 2008 (St. Louis, FRED). "Sentiment deteriorated further in November [2009] when the estimated 2009 fiscal deficit was revised from 13 ½ to 15 ½ percent of GDP, and in December there were general strikes and rioting in response to the labor reforms" (IMF 2013b, 35). Concerns then arose over the sustainability of the Greek budget deficit and the solvency of Greek banks, which held considerable amounts of Greek government debt. In 2010, foreign investors began selling Greek government debt and the cessation of capital inflows turned into outright capital outflows. In 2011, private capital flight worsened as part of the general sovereign debt crisis affecting the peripheral countries of the Eurozone.[9]

In March 2010, the European Commission, the ECB, and the IMF formed the Troika in order to coordinate lending to Greece based on "conditionality." [10] Starting with bilateral loans to Greece in April 2010 from member countries of the Eurozone, the Eurozone has provided considerable direct aid to Greece. The Eurozone created the EFSF to coordinate Eurozone government aid. Fear of a Greek exit from the Eurozone grew starting in the last half of 2011 and reached its peak intensity in the first half of 2012.[11] Considerable doubt existed as to whether Greece would implement the terms of the February 2012 Second Economic Adjustment Program, which had replaced the original adjustment program of May 2010. The June 17, 2012 Parliamentary elections resulted in a coalition government formed by Prime Minister Antonis Samaris, who made clear that Greece would accept the Troika adjustment program. In November 2012, the Greek Parliament approved the austerity package.

The ECB is the residual lender financing the Greek payments imbalance (current account deficit plus net capital flows) not covered by the other Troika members. In the first instance, when Greeks import more than they export or capital flows out of the country, Greek banks lose reserves. They replace those reserves by borrowing from the ECB in one of the ways described above. From a negligible amount prior to mid-2008 to mid-2011, the share of Greek banks in total MRO and LTRO financing from the ECB rose to 20 percent (Pisani-Ferry et al 2013, Figure 2). In summer 2011, Greek banks turned to the ELA facility (Milligan 2012). ELA borrowing from the Bank of Greece rose to €120 billion by summer 2012 (Pisani-Ferry et al 2013, Figure 3). By early 2012, the Bank of Greece funded about 30 percent of the liabilities of Greek banks (European Central Bank, "Greece, Share of central bank funding in credit institutions liabilities," 4/7/2015).

Figure 3 offers insight into how Greece has financed its current account deficit and dealt with capital flight. The cumulative current account deficit measures the amount of debt that Greece owes

[9] Eurozone banks' loans to Greece reached about €128 billion in 2008 and fell to about €12 billion in September 2013 (Merler 2015).

[10] The European Commission acts on behalf of the member states whose governments must approve the disbursement of funds from the EFSF.

[11] "As 2011 progressed, a Greek euro exit became a serious possibility particularly after being discussed by Euro leaders at the Cannes summit in November 2011. The government then announced a referendum to test the views of the Greek people. This was subsequently cancelled, but the government resigned later that month and was replaced by a technocratic government" (IMF 2013b, 35).

the rest of the world as a consequence of past trade deficits.[12] That debt can be held by private investors who voluntarily invest in Greece, by the ECB in the form of lending to Greek banks and in the form of Greek government debt held outright, and by foreign official institutions (the IMF and Eurozone stabilization funds).[13]

As shown in Figure 1, Greece ran a current account deficit from 2000 through 2012 when the deficit approached zero. As a result, in Figure 3, the solid line showing the cumulative current account declined until end 2012.[14] The fact that Target2 liabilities (shown by the small-dashed line) were essentially zero until 2008 implies that private capital inflows largely financed the current account deficit until then.[15] After 2008, Greek Target2 liabilities mounted. Greece then financed its current account deficit through spending down its bank reserves, which Greek banks replaced by borrowing from the ECB as indicated by the increase in Target2 liabilities. Starting in May 2010, Greece began to receive regular disbursements from external, official sources. In Figure 3, the large-dashed line measuring this aid mounts to nearly €225 billion. In 2010, 2011, and 2012, Greece financed its current account deficit and offset reserve outflows produced by capital flight through the combined aid of the official institutions and from ECB borrowing as registered by the increase inTarget2 liabilities. Thereafter and continuing through 2014, as shown by the decline in Target2 liabilities, Greece used official aid to repay much of its ECB borrowing and some externally-held private debt.

In January 2015, the uncertainty created by the replacement of the New Democracy government of Prime Minister Samaris with the Syriza government of Prime Minister Alexis Tsipras again produced capital flight and runs on banks. ELA borrowing by Greek banks rose while Target2 liabilities again increased (Figure 3). ECB funding of Greek banks (MRO, LTRO, and ELA lending) peaked at about €135 billion in summer 2012; fell to about €40 billion in late 2014; and then rose again to somewhat above €100 billion in February 2015 (Deutsche Bank 2015, 6). As of March 2015, Greek banks had liabilities of about €550 billion.[16]

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[12] It is roughly equal to the net international investment position, which includes changes in asset valuations of assets held in Greece by foreigners and by Greeks abroad.

[13] *The Wall Street Journal* (6/12/2015) gave the following breakdown (in billions of euros) for early 2015: EFSF (131.0), Eurozone governments (52.9), private investors (34.1), ECB (26.9), IMF (21.1), and Treasury bill holders (14.8). The ECB figure does not include lending to Greek banks.

[14] The line showing the cumulative current account deficit starts at € -45 billion, which is the cumulative current account deficit run from 1980 through 1999 (Eurostat/Haver).

[15] Financial aid from the European Union for structural adjustment (not balance of payments aid) was also significant. As a percentage of Greek GDP, it averaged 2.5 percent from 2000 through 2007 (Bitros et al 2014, Table 1). As a percentage of GDP, the Greek current account deficit averaged 6.7 percent from 2000 to 2005. The ratio deteriorated to 14.2 percent in 2007-2008.

[16] From Bank of Greece, "Aggregated balance sheet of MFIs." The ECB limits the ability of the four largest Greek banks to add to their net holdings of Greek Treasury bills. In doing so, it prevents the Greek government from financing deficits by issuing Treasury bills to the banks, which then use them as collateral to borrow from the ELA facility.

4. The Greek transfer problem[17]

The repayment of the euro-denominated debt owed by Greece to its external creditors (the IMF, the ECB, the EFSF, and now chiefly hedge funds) requires a transfer of resources to foreigners. That is, Greece must run a balance of trade surplus. For that to happen, the Greek intra-Eurozone terms of trade must depreciate.[18] There are two aspects to the required terms of trade depreciation.

First, the Greek terms of trade must depreciate to a level that assures a sustainable current account balance (given net capital flows from abroad). At present, current account balance has been achieved mainly due to a reduction in the demand for imports consequent upon a massive contraction in domestic demand. By 2015, Greek GDP had fallen 26 percent below its 2008 peak. Figure 4 shows the common decline in real GDP and the current account after 2008. Figure 1 shows that since 2008 exports have not increased while imports have declined.[19] The Greek terms of trade must depreciate (the Greek price level must fall relative to the price level of its other Eurozone partners) in order to achieve current account balance (net of private capital flows from abroad) at full employment.

Second, there must be a one-time adjustment (overshooting) in the terms of trade depreciation that generates the current account surplus required in order to pay off the external debt.[20] Greece's Eurozone creditors have lengthened considerably the maturity of the debt owed by Greece. Even with Greece's present elevated debt to GDP ratio, Greece need only transfer about two percent of its GDP annually (Wolff 2015b). Equivalently, it need only run an annual current account surplus of that magnitude apart from net private capital flows.[21] Although these numbers are not unusual for countries, they do add to the required terms-of-trade depreciation.

In a world in which price levels adjusted without friction, the Greek terms of trade would depreciate through a reduction in its domestic price level. According to the classical price-specie mechanism of David Hume, how would this occur?[22] Consider the annual payment for an extended

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[17] The term "transfer problem" came from a debate in the late 1920s between John Maynard Keynes and Bertil Ohlin over the feasibility of making the resource transfers implied by the reparations imposed upon Germany after World War I.

[18] In principle, the euro could depreciate relative to currencies like the dollar sufficiently in order for Greece to run a balance of trade surplus (current account surplus) with the rest of the world large enough to offset a deficit with Eurozone countries. That possibility is unlikely and the analysis focuses exclusively on the Greek intra-Eurozone terms of trade.

[19] Half of Greek exports are services, which are dominated by shipping and tourism. The slowdown in world trade after 2008, something over which Greece has no control, hurt exports. Greek exports had been recovering steadily from the 2009 trough, but the renewed deposit outflows from Greek banks in the first half of 2015 is likely to limit the credit exporters need in order to finance exports.

[20] In 2008, Greece's debt to GDP ratio was 117 percent. It rose to 171 percent in 2012 and then increased slightly to 175 percent in 2014 (St. Louis, Fred).

[21] "Greece benefits from an average loan maturity of over 30 years. The country pays neither interest nor redemption on the overwhelming part of its EFSF loans until 2023" (Credit Suisse 2015).

[22] David Hume (1742 [1955]) described the equilibrating mechanism for the balance of payments known as the price-specie-flow mechanism in a gold standard.

period of, say, €1 billion to external creditors. The Greek government would first run a budget surplus of €1 billion, which would increase its account with the Bank of Greece by that amount and reduce the deposits of Greek nationals by the same amount. It would then write a check, say, to the EFSF. When the EFSF cashes its check drawn on the Bank of Greece, the reserves of the Greek banking system decline. When the EFSF pays down its debt, the deposits of its bondholders increase. Because its bondholders are almost exclusively non-Greek nationals, the reserves end up outside of Greece.

Assuming that Greek banks cannot borrow from the ECB in order to make up the loss, they sell assets or call in loans in order to obtain reserves. As a result, Greek nationals experience a reduction in their euro deposits. (That reduction would not occur if the Greek government had used its budget surplus in order to make domestic purchases.) In order to bring their money holdings back to the desired level, Greek nationals reduce their expenditures. Greece needs to run an annual current account surplus (excess of exports over imports) of €1 billion in order to import the euros required to replenish the depleted cash balances of its nationals. Adjustment occurs when the Greek price level has fallen sufficiently (the Greek terms of trade have depreciated sufficiently) in order to generate the required current account surplus.

The problem is that the price level does not adjust in a frictionless manner. There is the inherent disruption to production in forcing an unanticipated price-level reduction, which disturbs all relative prices. Those relative prices convey the information required to allocate resources. As shown in Figure 5, Greece and Germany both experienced recession with cycle troughs in 2009. Both recovered, but the recovery in Greece aborted in 2010 with the return to monetary contraction shown in Figure 6, related to the capital flight discussed above. Figure 6 shows for Greece the relationship between growth in money (M1) and in nominal GDP.[23] Broadly, the two series move together.

Figure 6 raises the issue of simultaneity. Because the ECB operates with an interest-rate instrument, nominal GDP could determine the behavior of M1 within the Eurozone. Because Greece is only a small part of Eurozone GDP, Greek citizens can control their net exports in order to adjust their money holdings to nominal GDP. Figure 7 shows for Greece real money holdings—the ratio of M1 and M2 to nominal GDP or the inverse of velocity. What evidence is there that the relative stability in the M1 series reflects adjustment of nominal GDP (euro expenditure) to M1 holdings? Consider both series in Figure 7, which show real money demand expressed as the inverse of velocity, that is, the ratio of money to nominal GDP.

The monetary aggregate M2 includes significant amounts of long-term debt.[24] The increase in real M2 over the interval 2005 to 2008 reflects the external flows of funds into Greek bank debt given the optimistic environment of the time. The deceleration in M1 shown in Figure 6 then may reflect substitution out of liquid demand deposits into less-liquid debt instruments. The increased growth in M1 in 2009 likely reflects the reverse, a flight to liquidity. However, the strong deceleration in M1 over 2010 to 2012 is most easily explained by the capital flight prompted by fear that Greece would leave the Eurozone. Over this period, negative M1 growth is evidence of contractionary monetary policy.

[23] In the absence of data on currency, M1 is sight deposits at Greek banks.

[24] M1 comprises currency in circulation and overnight deposits. M2 comprises M1 plus deposits with an agreed maturity of up to two years and deposits redeemable at notice of up to three months.

It seems likely that the transmission of the monetary shock to the real economy occurred to a significant extent through financial frictions. The reduction in bank reserves associated with the sudden-stop in capital inflows caused banks to restrict credit.[25] As a result, households and firms had to restrict expenditures. Exporters could not get the trade credit they require in order to export. Also, when capital flows in and finances a current account deficit, the price of assets like land rises. The fall in asset prices that accompanies a reversal of capital inflows disrupts financial intermediation when those assets serve as collateral. The essential monetary phenomenon remains, however, that a depreciation of Greece's intra-Eurozone terms of trade requires deflation.

The debt-deflation trap that that Irving Fisher talked about in the 1930s applies to Greece. Fisher pointed out that deflation not anticipated at the time the parties entered into the debt contract leaves debtors with unexpectedly high debt burdens. The deflation that Greece must endure in order to generate the current account surpluses required to pay off its external debt raises the real burden imposed by euro-denominated debt. In a world of frictionless renegotiation of debt contracts, some combination of personal bankruptcy and restructuring would occur and economic activity would continue. However, in any country and especially in Greece with a poorly functioning judicial system, debt default is disruptive. Households and firms do not receive the credit they need in order to deal with disruptions to their cash flow and to make productive investments.

In a country like Greece where markets are highly cartelized, deflation is all the more disruptive and occurs only with recession and high levels of unemployment. The recession increases debt in a number of ways. First, it can permanently lower the productive capability of the economy.[26] Second, as output falls, tax revenue falls and the government deficit increases. Third, if households and firms default on their loans from banks, banks need recapitalization, further increasing the government deficit.[27] In order to render tolerable the suffering of the Greek people and prevent complete economic collapse, the "institutions" (the Troika) extend additional loans to Greece. In order to achieve repayment, the addition to the debt burden then requires even more deflation. In 2005, Greece's debt-to-GDP ratio was 98.6 percent, which rose modestly to 105.4

[25] The reserves of Greek banks rose after August 2007 in line with other Eurozone banks. The interbank market for reserves shrank as banks became concerned about lending to other banks whose portfolios could include U. S. subprime securities. The ECB replaced the market through full allotment of MRO lending that increased bank reserves to a level that limited the need for interbank borrowing. The reserves held by Greek banks fell sharply after July 2012 when ECB president Mario Draghi said that the ECB would do "whatever it takes" in order to prevent capital flight from the peripheral countries from breaking up the Eurozone.

[26] "The trauma of recession has been so harsh as to force people and companies, particularly skilled people and good, profitable companies, to leave Greece and set up operation elsewhere" (Congdon 2013, 5).

[27] "The payment culture has been weakened, including through repeated moratoria on auctioning foreclosed assets. And the insolvency framework has been unable to deal with either the rehabilitation of viable entities or the liquidation of non-viable entities…. [R]esources remain trapped in unproductive or inefficient activities…. Greece has one of the highest levels of NPLs [nonperforming loans] globally" (IMF 2014, 15).

percent in 2008. However, during the depression it increased sharply to an estimated 174.9 percent in 2014.

As a matter of arithmetic, the debt-to-GDP ratio (D_t) equals the product of the prior period's ratio (D_{t-1}) times the ratio of one plus the interest rate on the debt to one plus the growth rate of GDP minus the primary budget balance relative to GDP (PB).

$$(1) \quad D_t = D_{t-1}\left(\frac{1+i_t}{1+y_t}\right) - PB$$

Debt sustainability is a requirement of an IMF assistance program. That is, given its program, the IMF must forecast a declining value of D in (1). As part of the two adjustment programs, it did so based in part on a forecast of positive future nominal GDP (y) growth. Specifically, it forecast a return to positive real GDP growth in 2012 combined with continued positive inflation, apart from price stability in 2011 (International Monetary Fund 2013b, p. 13, "Real GDP Growth" and "Average CPI Inflation"). In fact, the growth rate of nominal GDP became negative in 2008Q2 and remained negative through 2013. Instead of turning positive in 2012, real GDP growth was near -6 percent in 2012. It seems likely that additional aid to Greece will require the politically-difficult decision by the Eurozone countries to lend more while also forgiving existing debt, perhaps through lengthening the maturity of repayment.

5. Why deflation is not over

Official IMF forecasts have regularly fallen short in their estimation of the time that would be required for Greece to emerge from recession and exit its bailout programs. One possible reason for the unwarranted optimism was the limited experience of the IMF in dealing with crises in a monetary union. Pisani-Ferry et al (2013, 10-11) noted that the majority of past IMF programs "were accompanied by a sharp currency depreciation." Among countries with fixed exchange rates that received IMF bailouts, almost all had capital controls. In contrast, until July 2015, Greece had "irrevocably fixed exchange rates and a regime of unfettered capital flows." That is, the terms of trade adjustment had to occur through deflation rather than depreciation of the currency.

Using measures of the real effective exchange rate (REER) for countries in the Asian and Latin American crises, Pisani-Ferry et al (2013, 10-11) calculated the currency depreciation that occurred during the crises.[28] For the Latin American countries, the depreciation amounted to about 40 percent. For the Asian countries, the initial depreciation was about 40 percent but then settled down at 30 percent. Comparison with the Asian and Latin American experiences suggests that Greece could need an even larger depreciation in its terms of trade. These countries went into the

[28] The REER is calculated as a trade weighted-average of the exchange rates of the country with its trading partners adjusted by the CPIs of the country and its trading partners. The Asian crisis countries, with crisis dates in parentheses, were Indonesia (1997), Korea (1997), Thailand (1997), and the Philippines (1998). The Latin American countries were Brazil (1998), Argentina (2000), and Uruguay (2002).

crisis with current account deficits not far from 5 percent. Greece went into the crisis with a current account deficit of 15 percent.[29]

A number of factors apart from those mentioned in the previous section exacerbate the internal deflation required by Greece. First, after the crisis, the Greek terms of trade appreciated. Figure 8 shows German and Greek inflation. Greek inflation actually increased after the crisis. The increase in excise taxes and the VAT required by the terms of the 2010 bailout pushed up prices with the effect of increasing the ultimate required deflation. Moreover, as shown in Figure 8, the disinflation in the Eurozone, which appears in declining German inflation, implies that in order to depreciate its terms of trade Greece must deflate.[30]

Second, the adjustment is more severe if the country starts with significant external debt. Payment of the interest and principal on the debt then necessitates running current account surpluses beyond simply eliminating the deficit. Toward the end of 2013, the ratio of external debt to GDP was about 100 percent in Greece (Goldman Sachs, 1/17/13, 3). Third, the smaller the tradeable goods sector relative to the nontradeable goods sector, the more difficult it is to expand exports. In Greece, the tradeable goods and services sector is just above 30%. In Ireland, in contrast, it is near 50% (Goldman Sachs 2013, 6). Although by the end of 2012, Greece had come close to current account balance, much of the improvement came from the effects of severe recession in depressing imports (Figure 4). That fact suggests that the deflation required in order to achieve a sustained surplus in the current account has only just begun. Because imports will increase as the economy recovers, it seems likely that Greece must deflate further in order to achieve an internal Eurozone terms of trade consistent with full employment.

Between 2000Q1 and 2014Q3, the Greek terms of trade appreciated relative to Germany's terms of trade in that the Greek CPI rose 45% and the German CPI rose 25% (Figure 9). If the appreciation in the Greek terms of trade that occurred in the first decade of the Eurozone was due solely to a capital inflow that will not return, Greek deflation will have to undo the prior inflation difference between it and its Eurozone partners. Since 2012, with some Greek deflation, the Greek terms of trade have depreciated but only a little. Moreover, because other peripheral countries like Spain and Ireland have become more competitive, Greece may have to undergo an even more prolonged deflation in order to restore external trade balance.

Figure 10 tells a similar story in terms of the divergence in unit labor costs. The Greek/German difference widened through 2009 but narrowed subsequently.[31] The comparison with Germany rather than with other Eurozone countries does understate the progress Greece has made. Calculation of the real effective exchange rate while showing only moderate depreciation based on the CPI shows significant improvement based on unit labor costs (IMF 2013b, 37). (An offsetting

[29] In the May 2010 assistance program for Greece, the Troika estimated the "need of a real exchange-rate depreciation … of the order of 20-30 percent" (Pisani-Ferry et al 2013, 67).

[30] Since 2009, core CPI inflation for the Eurozone has fallen short of 2 percent. In May 2015, year-over-year core CPI Eurozone inflation was .9 percent.

[31] The May 2010 IMF program had an objective of eliminating a "20-30 percent competitiveness gap … through wage adjustment and productivity gains" (IMF 2013b, 1). Without recourse to a depreciation of its currency, Greece had to achieve the required reduction in unit labor costs through some combination of domestic deflation and productivity increases.

factor is that reducing the Greek unemployment rate of 26 percent and a youth unemployment rate of 49 percent will draw additional workers into the labor force with lower productivity and will likely increase unit labor costs.) As the Eurozone recovery gains momentum, the reduction in its unit labor costs should benefit Greece's exports. The key issue then is whether dysfunction in the Greek banking system will limit exports by restricting the access of Greek exporters to credit.[32]

In order to free the resources required for an excess of exports over imports at full employment, Greece must achieve an internal as well as an external terms-of-trade depreciation. First, in order to channel domestic production into exports, Greek unit labor costs will likely have to decline further. Without increases in productivity, real wages must fall through a greater decline in nominal wages than in prices. Second, in order to draw resources into the export sector, the price of nontradeable goods must decline relative to the price of tradeable goods. According to the International Monetary Fund (2013b, 37), Greece has not progressed in this respect: "Despite reform attempts, professions like pharmacology and law, as well as the transport and energy sectors, remained closed to new entrants. Continuing protection caused prices of nontradeables to remain elevated relative to the prices of tradeables…."

6. Is Germany a good model for Greece?

When the Eurozone began operation, Germany was in some respects in the position in which Greece finds itself in 2015. Germany entered the Eurozone in 1999 with an exchange rate that overvalued its goods and services. As a consequence, after its entry into the Eurozone in 1999, it had to experience low inflation and high unemployment. Prior to its entry, in the context of instability in the European ERM (exchange rate mechanism), capital flows into the German mark, traditionally the strongest currency in Europe, had appreciated the mark. The other reason for the overvaluation of the mark at the creation of the Eurozone went back to German reunification.

As shown in Figure 11, Germany normally runs a current account surplus. That is, it is a net capital exporter. After the fall of the Berlin Wall and reunification of East and West Germany, the requirements of infrastructure investment in East Germany meant that Germany needed for a while to change from a capital exporter into a capital importer (Hetzel 2002). In order to provide the additional resources needed in Germany, Germans had to buy more from foreigners, who in turn had to buy less from Germans. This reversal required that prices in Germany had to rise more than the prices of its trading partners. Germany's terms of trade had to appreciate.

Germany's current account deficit became moderately negative from 1990 through 2001. Thereafter, it rose steadily and stabilized at around 7 percent of GDP. Figure 12 breaks the current account deficit into exports and imports. Germany's success as an exporter appears in the increase in its exports as a percentage of GDP from around 27 percent in the 1980s to more than 45 percent at present. One reason for that success was that German labor unions were willing to hold down wage growth in order to limit the movement of manufacturing jobs to the formerly communist Eastern

[32] In Ireland, Spain, and Portugal, the return to current account balance by 2015 has come in significant part from an increase in exports (Wolff 2015a). The contrast with Greece likely reflects in part the better functioning of these countries banking systems.

European countries.[33] As a result, unit labor costs hardly moved. Also, in 2003, German Chancellor Gerhard Schröder introduced extensive labor market reforms (the Hartz reforms or Agenda 2010).[34]

At the same time, international events, especially, growth in the Chinese economy, created a demand for the specialized exports of Germany such as machine tools. Along with the restructuring of the German economy, the result was a boom in German exports to the rest of the world. An increase in the current account surplus powered growth in the German economy.[35] Export growth came especially from the export of capital goods, which account for 9 percent of German GDP, to emerging markets.[36] It seems likely that if Germany had retained the mark, the mark exchange rate with its trading partners would have appreciated more than the euro appreciated in the first decade of the 2000s.

Can the German model of structural adjustment in the first half of the early 2000s carry over to Greece? Two factors suggest a negative answer. First, until 2009, core inflation in the Eurozone remained near 2 percent. As a result, depreciation of the terms of trade for Germany could occur with low (less than 2 percent) but still positive inflation. As noted above, the subsequent low inflation rate in the Eurozone has meant that Greek adjustment requires deflation. Second, Greece has not benefited either from a strong world economy or from growing world demand for its exports. For example, Turkish beaches have become strong competitors for Greek beaches. Most important, Germany never had to deal with capital flight.

7. Is abandoning the euro a practicable solution for Greece?

The assumption here is that the euro is so thoroughly embedded in Greek society that the reintroduction of the drachma combined with a floating exchange rate would not eliminate the need

[33] "Germany established its own new lower norm of zero nominal unit labor cost inflation resulting from a consensus between the trade unions, workers' representatives and employers that wage restraint was pivotal to preserve Germany's competitiveness, reduce unemployment and prevent further relocation of labor to Eastern Europe and other low-wage countries" (Lin and Treichel 2012, 12).

[34] Germans felt that they had put into place difficult reforms. The *Financial Times* (3/8/13) cited Professor Falter, professor of politics at Mainz University, "It is like the La Fontaine fable of the ant and the grasshopper. German voters are convinced that they have tightened their belts as a result of Agenda 2010.… And like the ant in the La Fontaine fable, they do not see why they should pay again to bail out the spendthrift grasshoppers."

[35] While Germany's trade balance with other Eurozone countries fell from €37 billion in 2007Q4 to €18 billion in 2014Q4, it rose with non-Eurozone countries from €4 billion to €27 billion. As a percent of GDP, Germany's exports rose from 28 percent in 2000Q1 to 48 percent in 2014Q4 (Haver Analytics).

[36] As reported in the Deutsche Bank Weekender newsletter (10/17/14), all of the 3.5 percent growth in the Eurozone since the 2009 cyclical trough through mid-2014 came from net exports with two-thirds of the increase in the goods trade balance coming from emerging markets in which Germany had an advantage.

for continued Greek deflation. The reason is that the Greeks would continue to use the euro rather than the drachma for money.[37]

Money serves three functions. It is a medium of exchange, a store of value, and a unit of account. Reintroduction of the drachma even with its required use for the payment of taxes and in government transactions would not necessarily entail its replacement of the euro for these functions. The reintroduction of the drachma would most surely be accompanied by the expectation that it would depreciate—an expectation likely to be self-fulfilling. Greeks would continue to rely on the euro for money.

In principle, the Greek government could reintroduce the drachma with the commitment to maintain internal price stability. With the passage of years, perseverance could make the commitment credible, and Greek citizens would again use the drachma for all three functions of money. In the interval, however, the euro would continue as the medium of exchange for high-value transactions, as a store of value, and as the unit of account. The depreciation of the terms of trade required for external stability would require the same deflation in the euro prices that Greeks would continue to assign to their goods as is currently required with the euro as the national currency.

The conclusion is that Greece will need to continue with deflation. However, the uncertain pace and amount of the deflation means that it cannot be anticipated in a way that is built into forward-looking price setting and into euro contracts. Consequently, it will continue to depress economic activity. A relaxation of austerity, which might lessen the distress caused by the depression, is unlikely. Greece has had to impose fiscal austerity in order to run a primary fiscal surplus (a surplus before interest payments on debt). It has had no choice but to run a primary surplus. Otherwise, investors would question whether the government would ever raise the revenue to repay its debt. At 1.2 percent of GDP in 2014, the primary balance (excluding one-time adjustments) offers a minimal margin for increasing government expenditure (Darvas 2015, Annex). Structural reform can lessen the need for depreciation in the Greek terms of trade and thus for deflation. The following section offers some comments on why structural reform is so difficult.

8. The difficulty of structural reform

George Bitros (2013, 26), Professor emeritus at Athens University of Economics and Business, argued that "the public budget became the spoils of politicians, tightly organized minorities and interlocking groups of business interests" and that the movement away from a free-market economy to an economy organized around monopolies and government regulation occurred "mainly because of the sharp partisan competition that emerged in the political arena" after the ousting of the military government in 1974. The impression left by Bitros is that given the weakness of Greek institutions politicians found it costly to form the coalitions required to hold power. Given the weakness of the state in raising tax revenues, political parties thus found it expedient to encourage the formation of cartels. These cartels, which are protected from competition, receive rents

[37] From 1991 until 2002, Argentina operated a currency board. That is, it converted dollars and pesos at a one-for-one ratio while allowing the change in pesos to pass directly through to the peso monetary base. Because the pesos continued to circulate as currency, for Argentina, which suffered deflation under its currency board, the option existed of abandoning the currency board and depreciating the peso. Unfortunately for Greece, the fact that unlike the peso the drachma disappeared makes the case of Argentina inapplicable.

(monopoly returns) in return for government-enforced restrictions on entry. Effectively, a monopoly can impose and collect a tax that does not appear on the government's books.

Hayashi et al (2015, 1) summarized the stylized facts surrounding the innovation that leads to new industries. "As new industries evolve from birth to maturity, it is typically observed that price falls, output rises, and firm numbers initially rise and later fall." Researchers term the decline in firm numbers "shakeout." The lesson is that the innovation spurred by competition requires free entry *and* free exit. The highly regulated Greek economy discourages both.

Slok (2012) reported the World Bank ranking of countries according to ease of doing business. In 2013, Greece ranked 78 overall but ranked even lower in key categories. For example, in the category "starting a business," which measures factors such as days required in order to obtain a license, Greece ranked 146. In registering property, it ranked 150, and in enforcing contracts it ranked 87. As a condition for Troika assistance, Greece passed laws liberalizing entry into markets and professions but then delayed their implementation (International Monetary Fund 2013b, 18). In Greece, there are more than 500 regulated professions accounting for about one-third of employment (International Monetary Fund 2013a, 15). Similarly, Greece has moved only slowly to eliminate employment protection laws. The International Monetary Fund (2014, 23) noted with respect to the law that limits collective dismissals, "[N]o such dismissal has been approved for thirty years…." Heavy government regulation along with the arbitrary application of laws encourages corruption (Cambanis 2015).

Still, a balanced view must recognize that over the years 2010 to 2014, Greece did make significant progress in reforming its government and economy. Among the countries receiving bailout support from the countries of the Eurozone, Greek fiscal restructuring was the most rigorous. Zsolt Darvas (2015, "Table 1: Primary budget balance of the general government, %GDP") calculated the structural primary balance for Greece excluding one-off receipts and payments such as the cost of recapitalizing the banking system. His figures thus not only account for one-time adjustments but also for cyclical influences, which increase the deficit, and for payments on debt. For Greece, the structural primary balance went from -10.0 percent of GDP in 2009 to 6.1 percent of GDP in 2014.

A key demand of Greece's creditors has been for pension reform. Greece has made significant cuts in its pension payments both present and promised (Gupta 2012). Because Greece has not had a significant private pension system, pensioners depend upon government pensions and many now live in or near poverty. At the same time, Greek demographics render the government pension system insolvent over the long run. Greece's spending on pensions as a percent of GDP at 17.5% in 2012 is the highest in Europe. Moreover, only 36 percent of Greeks aged 55-64 work compared to 63 percent in Germany (*The Economist* 2015). Long-term demographics are unfavorable. "More than one in five Greeks is older than 65, making it the world's fifth oldest nation. Just 14 percent is under 15, a smaller share of youngsters entering the labor force than all but nine other countries" (Goldenberg 2015).

9. Where to go from here

Unfortunately, dialogue between Greece and its creditors about the way forward is difficult because of the divergence of views about the causes of the Greek depression. A "creditor" view often associated with Germany is that fiscal indiscipline in Greece led to an unsustainable level of debt. The collapse of the stimulus to demand provided by this level of debt led to the depression. A

related "German" view is that the long-term viability of the Eurozone depends upon adherence to rules. Rules enforcing fiscal discipline prevent the Eurozone from becoming a transfer union in which the more fiscally responsible members bail out the less fiscally responsible members. From this perspective, it is essential that Greece run a primary surplus sufficient to repay the loans from other Eurozone members. The debate is intensified by criticism that Greece broke the rules of the Maastricht Treaty requiring fiscal discipline. For example, Jose Manuel Barroso, the former president of the European Commission, argued (European Commission, 2013):[38]

> We have a Stability and Growth Pact. We have rules … so these unemployed people in Greece should be told that the authorities of their country did not respect the Treaties that they have signed…. [T]he biggest lesson of the crisis … is that growth based on debt is not sustainable.

More succinctly, *The Wall Street Journal* (3/8/13) wrote:

> [C]reating a rigid "Europe of Rules" is exactly the German-led strategy for managing the crisis. Berlin's aim is to perfect the monetary union by ensuring countries adhere to rules designed to prevent future crises by addressing what are seen as the causes of the current one: government overspending and excessive risk-taking by banks.

A contrasting view common in Greece is that its recession is due to the fiscal consolidation required by its official creditors. Based on an interview, Hansen (2015, 36, 38, 52) offered insights into the views of former Greek Finance Minister Yanis Varoufakis.

> Varoufakis has staked his academic integrity on a particular economic and moral critique of the crisis…. Greece, he said, would no longer simply acquiesce to the austerity doctrine of the European Commission, the European Central Bank and the I.M.F. ... Varoufakis … wanted to show the Europeans how to save Europe itself. … Varoufakis traces his political consciousness to his childhood in "the junta era" …. "I am not going to fold on pensions" or on restoring collective bargaining rights.

Moreover, many members of Syriza are committed socialists who are opposed to free market reforms and privatization on principle. They do not see a free-market economy as allocating resources to their most productive use but rather as a license for the powerful to exploit the weak. Upon taking power, the Syriza government indicated a desire to undo the labor market reforms agreed to under the previous two adjustment programs such as lowering the minimum wage, weakening collective bargaining requirements, and limiting the prohibition of collective dismissals. No doubt for this reason, the text of the Euro Summit statement on Greece of July 13, 2015, required Greece to comply with detailed reforms in its product and labor markets.

The standoff between Greece and its creditors came to a head on July 12, 2015. The imminent collapse of the Greek banking system forced Greece into accepting the demands of its creditors. From January 2010 through June 2012, deposits flowed out of Greek banks. From July 2012 through November 2014, their deposits stabilized. Starting in December 2014, however, with the political uncertainty created by Syriza coming to power, significant outflows of deposits resumed (Figure 13).

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[38] Critics of the German policy of austerity have pointed out that Germany broke the rules of the Maastricht Treaty when it ran a deficit of 4 percent of GDP in 2004 with a debt to GDP ratio of almost 65 percent. However, Germany never had to worry about capital flight.

In this situation, the ECB became the key player. The Greek government had avoided the imposition of capital controls only because the ECB had regularly raised the cap on ELA lending by the Bank of Greece in order to finance the outflows of deposits from Greek banks. Doing so required the ECB Governing Council every two weeks to certify the solvency of the four large Greek banks that the ECB supervises. However, in the absence of an agreement between Greece and its creditors, the ECB was in a difficult situation. As the single regulator for the large banks of the Eurozone, it had to worry about its credibility for certifying the health of banks. Moreover, in the event of a default by the Greek government on its debt, it would have trouble using Greek government debt to collateralize its lending to Greek banks. As a central bank, the ECB is constrained by the central bank principle of lending only on good collateral.

At the end of June, Greek Prime Minister Alexis Tsipras interrupted negotiations with Greece's creditors in order to hold a referendum on July 5 on their proposal. Greece's EFSF assistance program expired at the end of June and it failed to make a payment owed the IMF. Outflows of deposits from Greek banks then surged. When the ECB declined to raise the ELA limit further, the Greek government imposed capital controls on banks. Greek depositors could only withdraw a limited amount of cash each day from banks and they could not transfer funds out of the country. Lacking the ability to transfer funds abroad, importers could not import. Exporters also suffered from not being able to import raw materials. The possibility that the ECB would close Greek banks by ending ELA lending broke the impasse and started negotiations for a third adjustment program on terms set by the IMF and the European Commission representing the finance ministers of the Eurozone.

10. A reason for hope

It is not realistic to believe that Greece can leave the Eurozone. Even though Greece had its own printing presses before the introduction of the euro, the paper for printing the bills has to be ordered from abroad. It takes time to print money and distribute it among banks. In the time required to plan for the reintroduction of the drachma, depositors in Greek banks will have fled. More fundamentally, money is a public good in the sense that its value comes from its universal acceptance. Only over a long period of fiscal discipline could the Greek government persuade its public to hold drachmas instead of euros as a store of value.

The reality then is that Greece will likely have to continue deflation for many years. In the near term, the increase in the value added tax to a uniform 23 percent is an exogenous cost-push shock that will exacerbate inflation and further depress the Greek economy. However, Greece can mitigate the need for deflation through policies that encourage voluntary capital inflows. Remaining in the Eurozone will limit the need for terms of trade depreciation by encouraging external investment. A national commitment to deregulate markets in order to allow free entry and exit would also promote investment from abroad. In addition, free-market reforms would lessen the need for terms-of-trade depreciation through deflation by creating a more competitive export sector.

There are reasons for optimism about the Eurozone economy. The ECB's policy of quantitative easing will encourage continued recovery and, if sustained, return inflation to the two percent target. As shown in Figure 14, which plots real GDP and real M1 lagged four quarters, strong money growth presages a vigorous economic recovery (Ireland and Oracic 2015). A strong Eurozone recovery will encourage the demand for Greek exports and lessen the need for deflation. Moreover, Spain has reformed its labor markets to a significant degree and Ireland has retained an

open economy. Both are experiencing strong export growth and strong economic recoveries. It is possible that their example will encourage a similar national consensus for reform in Greece.

Figure 13 shows Greek bank deposits and banknotes in circulation.[39] It offers a sensitive barometer of confidence in Greece and its economy. The fact that deposits declined from 2010 to mid-2012 and then only slowly recovered indicates the length of time required in order to rebuild trust in the banking system. Now that Greece has imposed capital controls depositors will be quick to withdraw deposits at any sign of financial stress. Reopening a recapitalized Greek banking system with growth in deposits and in lending will be a key measure of whether Greece can again restore growth. For that to happen, the ECB will have to commit to maintaining liquidity for Greek banks and Greece will have to commit to structural reform.

In significant ways, Greece was dealt a bad hand. Its problems would have very likely been manageable without the double-dip recession in the Eurozone (Hetzel 2013). However, it has also played poorly the hand it was dealt. In the 1990s in the run up to Greece's admission into the Eurozone, Greece engaged in a national conversation about the need for fiscal discipline and the structural reform required in order to become a viable member of the Eurozone. Once admitted to the Eurozone, however, it backed away from these commitments. Now, as part of renewed negotiations over reform combined with continued aid and debt relief, Greece must revive this conversation and decide where its future lies.

[39] Data are from Bank of Greece. Deposits are from Aggregated Balance Sheet of Monetary Financial Institutions. Banknotes in circulation are from Bank of Greece Financial Statement. The series is "Banknotes in circulation," which is based on a formula, plus "Net liabilities related to the allocation of euro banknotes within the Eurosystem," which is based on the additional issuance of banknotes.

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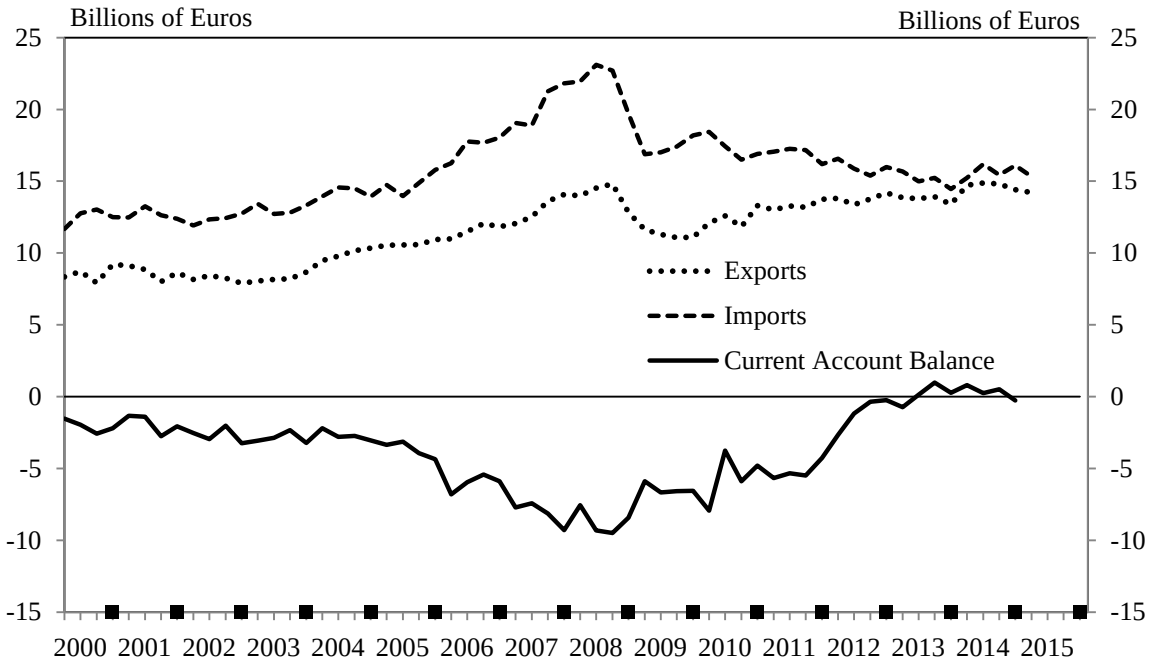
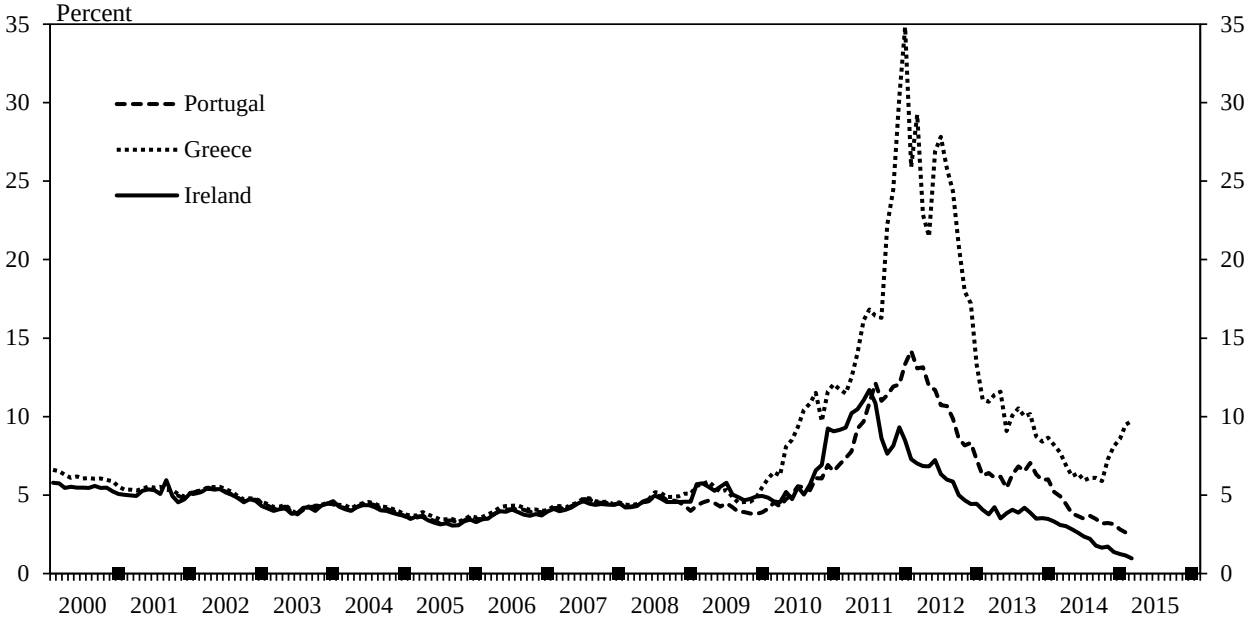
Figure 1
Greece: Imports and Exports of Goods & Services



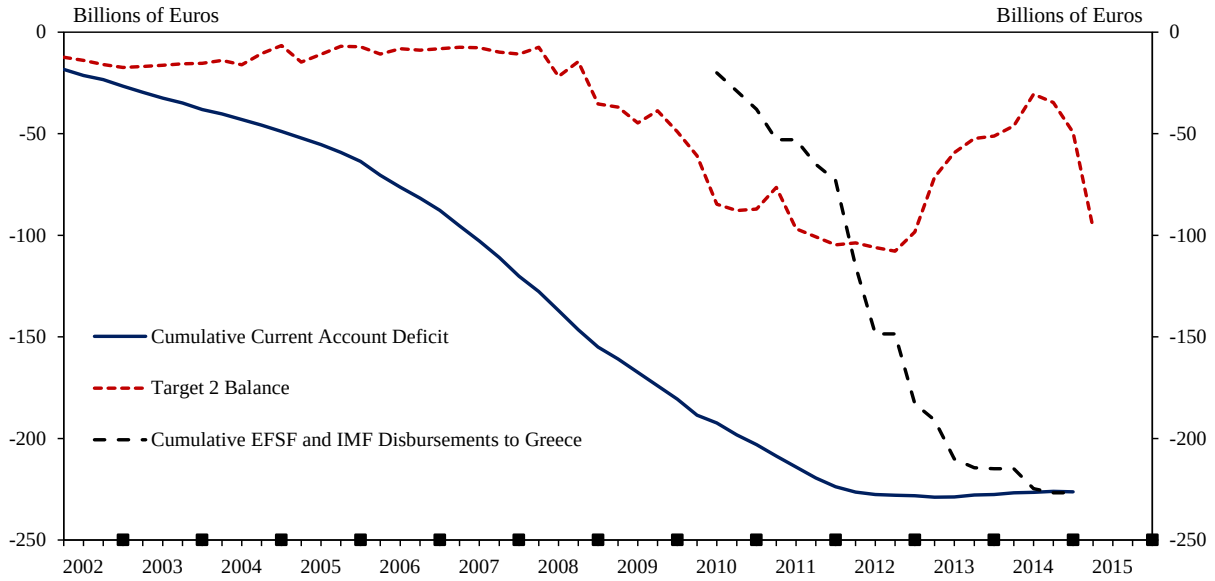
Notes: Data are quarterly averages. Heavy tick marks indicate the fourth quarter of year. Source: Haver Analytics.

Figure 2
Yields on 10-Year Government Bonds



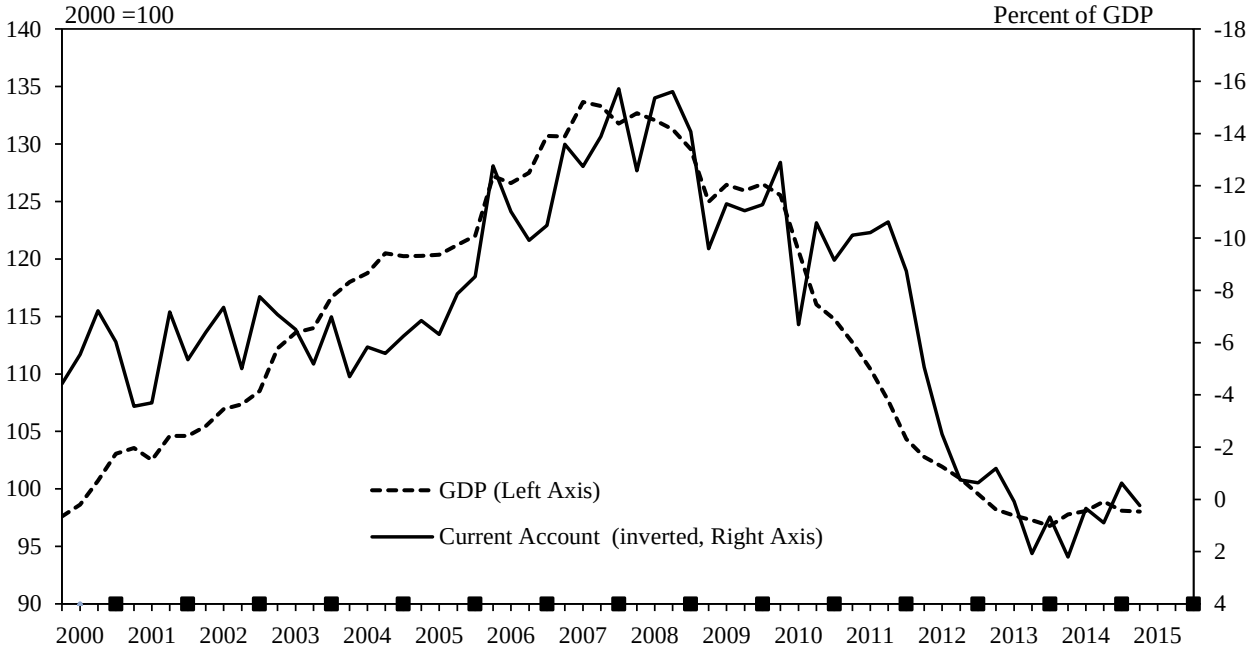
Notes: Heavy tick marks indicate December. Source: ECB and Haver Analytics.

Figure 3
Greece: Sources of Financing the Current Account Deficit



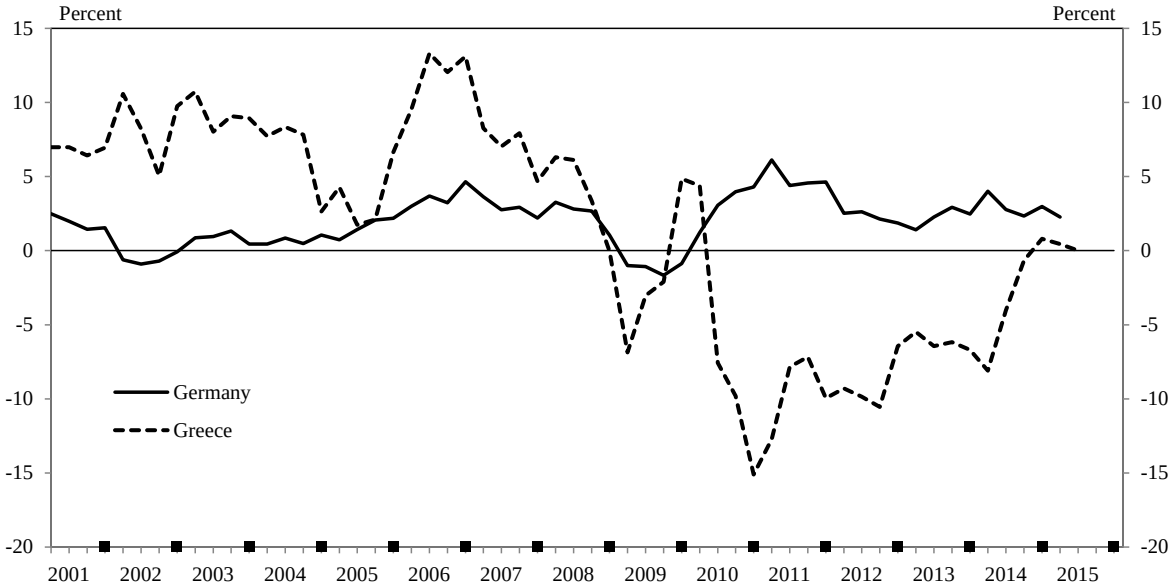
Notes: Heavy tick marks indicate fourth quarter of year. Source: EuroStat, Haver Analytics, and European Commission (April and August 2014).

Figure 4
Greece: Real GDP andCurrent Account



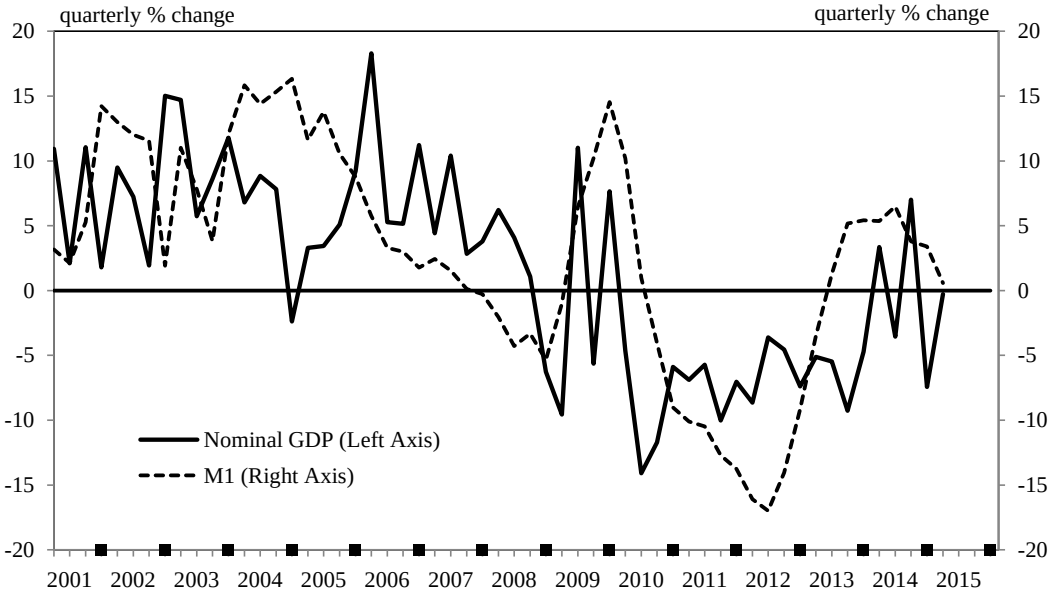
Notes: Current account measured as a percentage of real GDP. Real GDP indexed to 2000=100. Heavy tick marks indicate fourth quarter of year. Source: EuroStat & Haver Analytics.

Figure 5
Germany-Greece: Real Final Sales to Domestic Purchasers



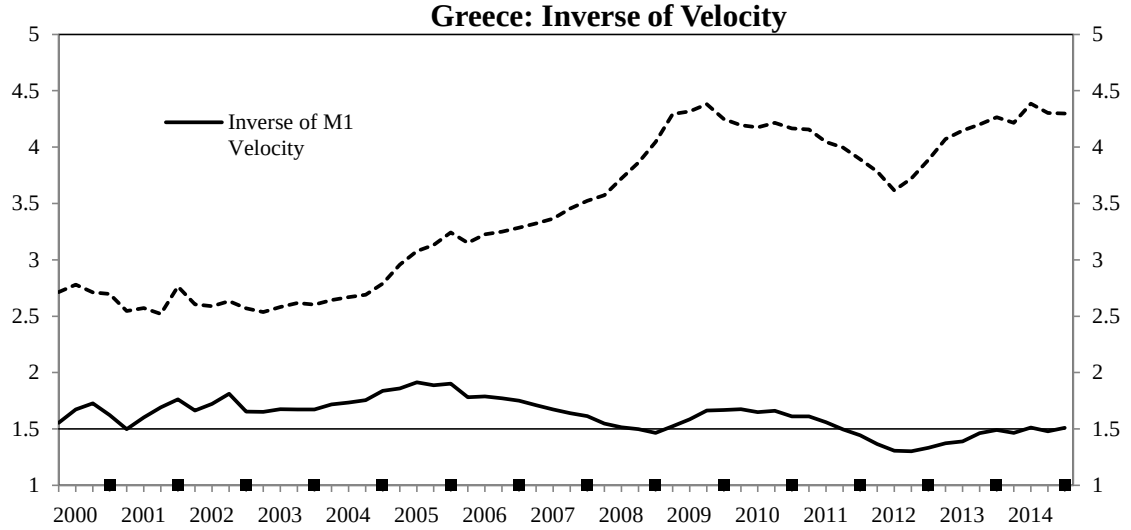
Notes: Real final sales to domestic purchasers expressed as 4-quarter percentage change. Real final sales to domestic purchasers is real GDP minus the change in inventories minus net exports. Heavy tick marks indicate fourth quarter of year.
Source: Haver Analytics.

Figure 6
Greece: M1 and Nominal GDP



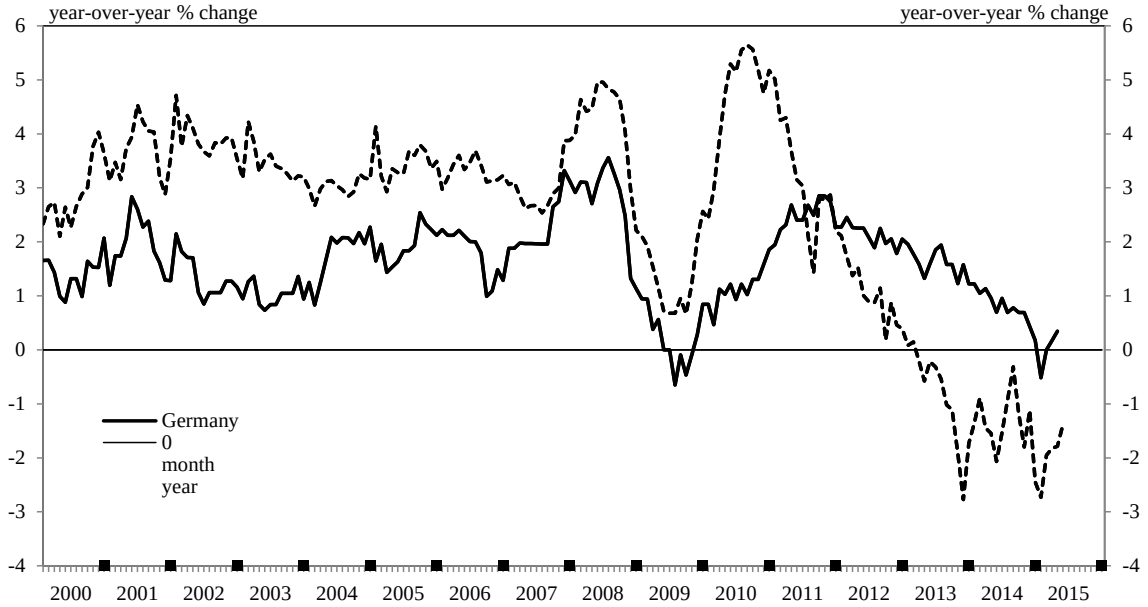
Notes: Quarterly percentage changes in M1 and nominal GDP. Source: Hellenic Statistical Authority (ELSTAT)/Haver Analytics. Heavy tick marks indicate fourth quarter of year.

Figure 7
Greece: Inverse of Velocity



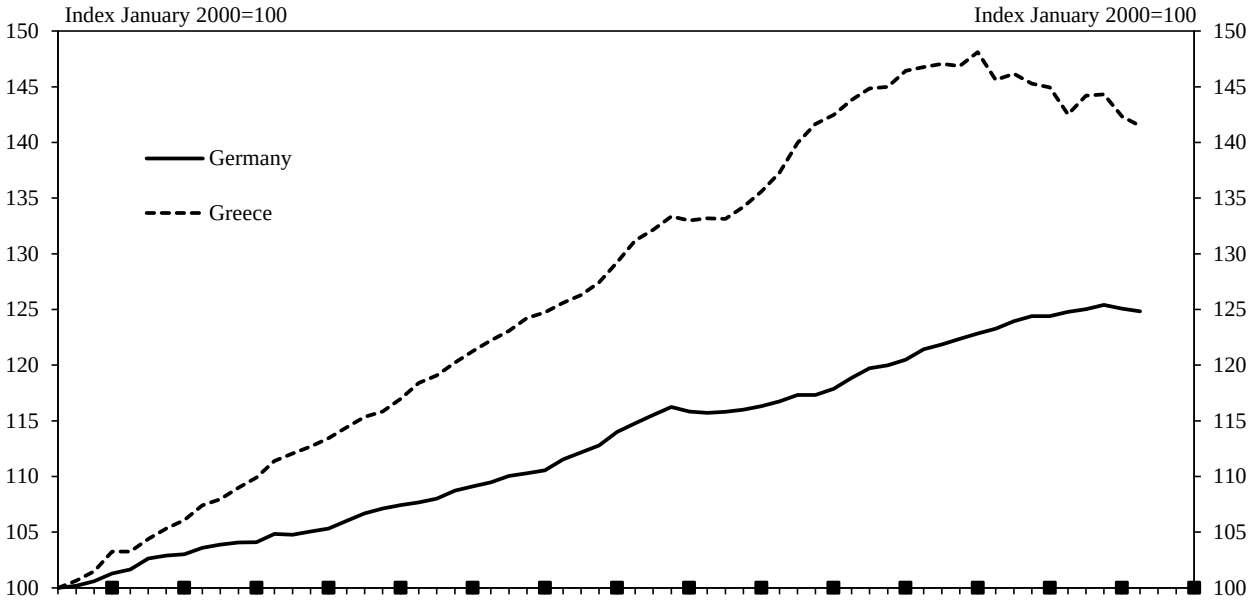
Notes: Quarterly observations of the inverse of M1 and M2 velocity. M1 velocity is nominal GDP divided by M1. M1 excludes currency in circulation. M2 velocity is nominal GDP divided by M2. Heavy tick marks indicate

Figure 8
Germany-Greece: Inflation



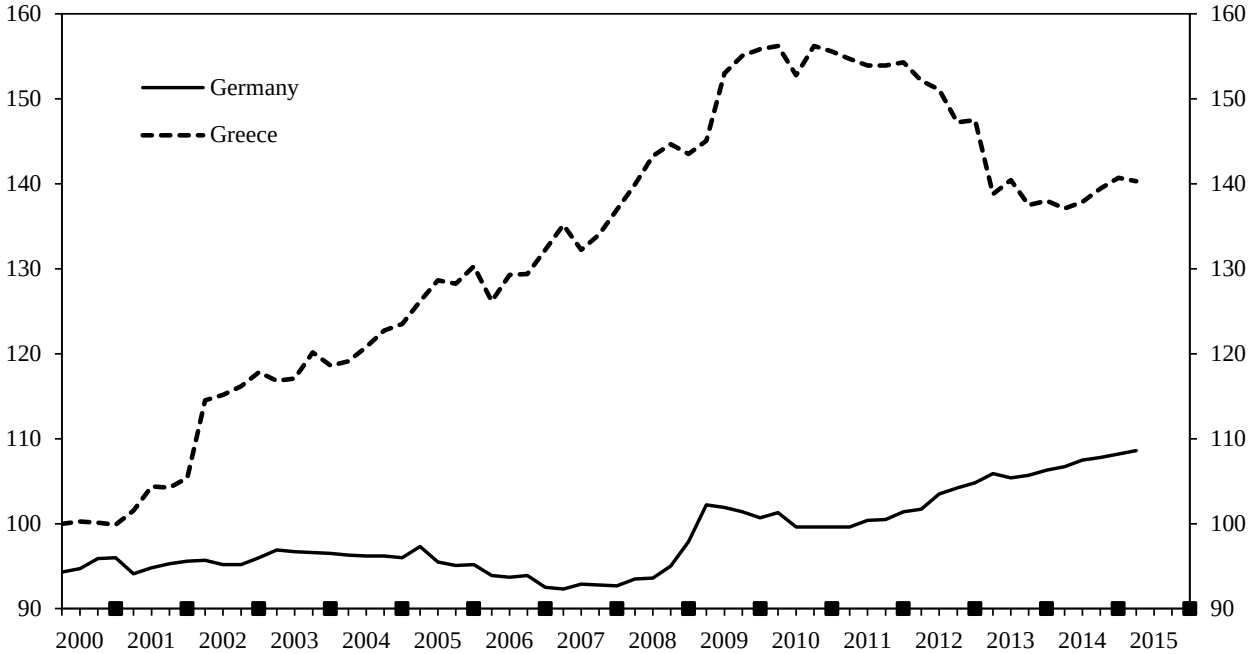
Notes: Inflation is the harmonized CPI. Monthly observations of 12-month percentage changes. . Heavy tick marks indicate December. Source: Haver Analytics.

Figure 9
Germany-Greece Inflation Divergence



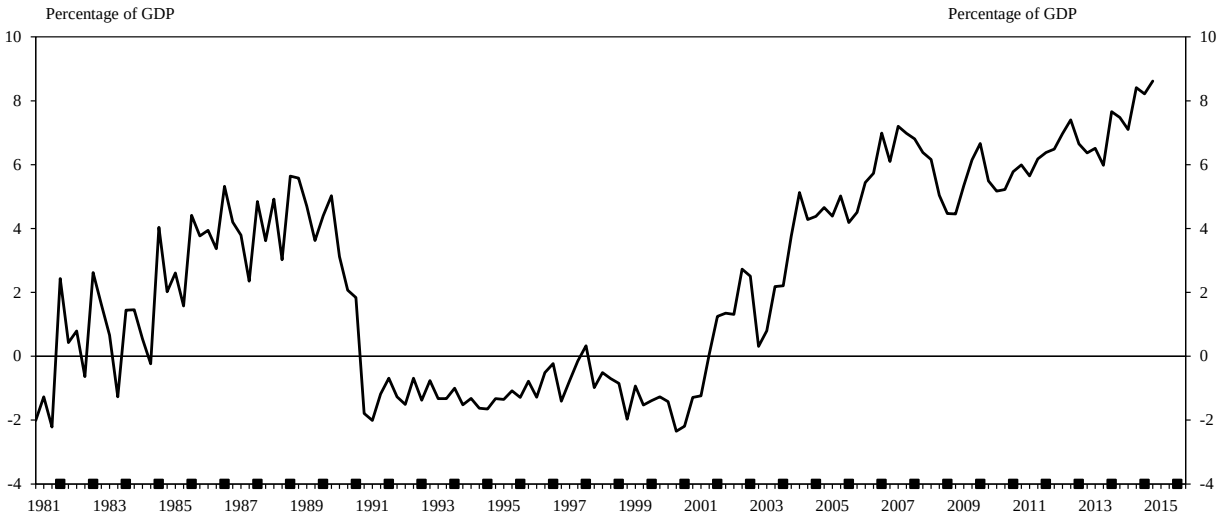
Notes: Consumer prices indexed to January 2000=100. Heavy tick marks indicate fourth quarter of year. Source: EuroStat and Haver Analytics.

Figure 10
Germany-Greece: Nominal Unit Labor Costs



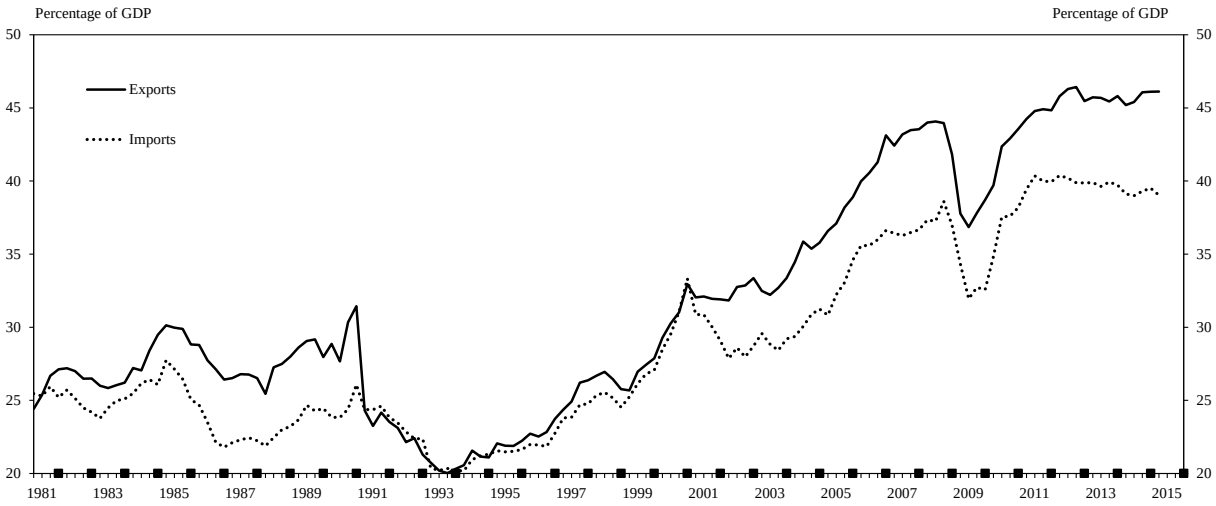
Notes: Quarterly data. Heavy tick marks indicate fourth quarter of year. Source: EuroStat and Haver Analytics.

Figure 11
Germany: Current Account Balance



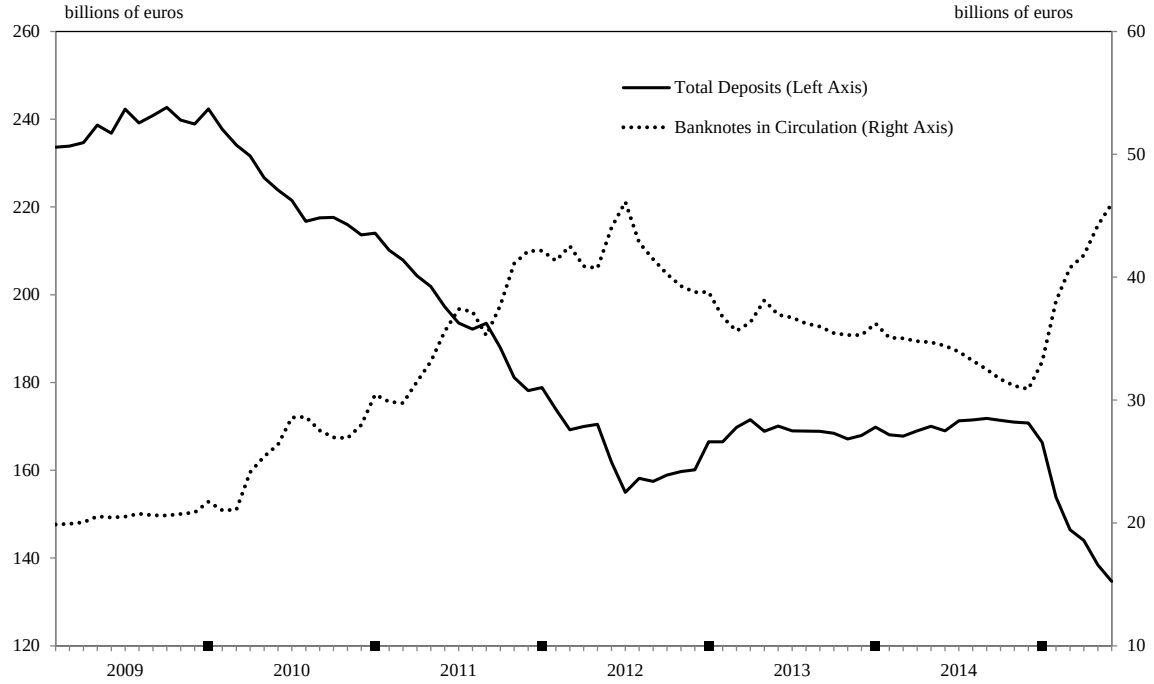
Notes: Current account expressed as a percentage of nominal GDP. Data prior to 1991 are for West Germany. Heavy tick marks indicate fourth quarter of year. Source: Deutsche Bundesbank & Haver Analytics.

Figure 12
Germany: International Trade



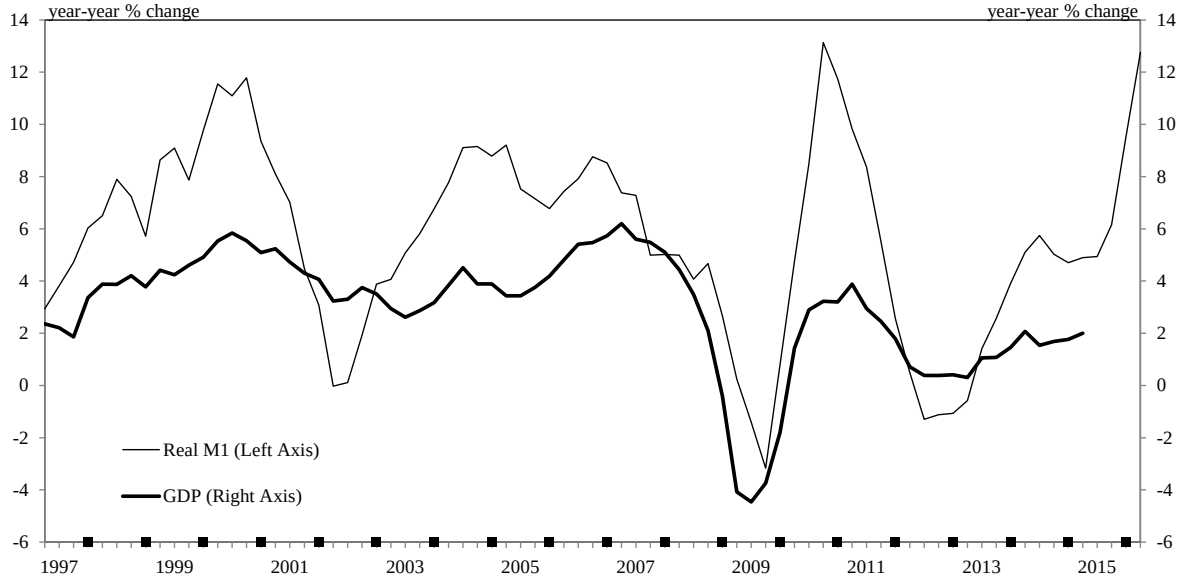
Notes: German exports and imports expressed as a percentage of nominal GDP. Heavy tick marks indicate fourth quarter of year. Source: Eurostat & Haver Analytics.

Figure 13
Greece: Total Deposits and Banknotes in Circulation



Notes: Heavy tick marks indicate December. Source: Bank of Greece and Bloomberg.

Figure 14
Euro Area: GDP and Real M1 Growth Rate



Notes: Quarterly observations of 4-quarter percentage changes in real M1. Real M1 lagged by 4 quarters. Real M1 is M1 divided by the CPI. Heavy tick marks indicate fourth quarter of year. Source: M1 data from 1996 to 2012 are from the Bundesbank and M1 data from 2012 to 2015 are from Haver Analytics.